

Supplemental Pages

The November Calumet was just back from the printer when the news of Leigh Minturn's death was announced. It was appropriate to add two pages in her memory. That change delayed the mailing of the Calumet and also moved the Calumet into the next higher postal rate. I decided to add not only the pages dedicated to Leigh's memory but six other pages for topics at hand. These articles are important to the 'Peopling of the Americas' discussion ("Monte Verde Challenged" and "Bones of Nebraska Mammoths") and to the handling of ancient remains, when discovered, in a manner that allows scientific inquiry as well as support for Native American traditions ("8000-year-old Cave Explorer").

Christmas Party

Get ready for the big social event of the year for our chapter - the annual Christmas Party. It will be held at the museum at the time and date of a regular meeting. That is: 7:00 PM on December 9th. Bring your reluctant spouse or friend that may not be thrilled with archaeology (are there people like that?) because this evening is dedicated to good food, conversation, and fun. Each person (or couple) should bring a main dish and either a salad or dessert to share. Bring your own table service - plates, utensils, and cups. We will eat promptly at 7 PM.

After everyone is full, will enjoy the highlight of the evening - the White Mammoth Gift Exchange. This annual event allows you to get rid of something you no longer need, want, or even wish to look at. Each person brings a wrapped gift for exchange. The gifts are of little or no value (well, some have limited value). But wrap them nice and disguise the contents. All the gifts are placed together and each person draws a number. Number 1 goes first. At each person's turn, they may pick an unopened gift from the stash of presents or take a previously-opened gift from a prior person. The person who has a gift taken may pick an unopened gift from the stash or take a previously-opened gift from someone else (as long as it is NOT the gift that was just taken). It is possible for a number of "takes" to occur in one turn. Does it sound like a high number is better? You bet. Does it sound like fun? You bet.

Dress is casual. Wear your best smile. Bring your appetite. Prospective members are always welcome.

Clovis Site Opportunity

Dr. Bruce Bradley will be leading an expedition to work at the Gault Site in central Texas next April. This is probably the most amazing Clovis site yet encountered. It is on private land and the area has been extensively dug, but almost none of the Clovis deposit has been disturbed. Dr. Mike Collins of the Texas Archaeological Research Lab has arranged with the land owners to undertake controlled excavations, and Mike has invited Dr. Bradley to bring a group (or groups) to work there. Gault is the only Clovis site has produced portable art, in the form of inscribed pebbles (46 to date). The site is the location of an excellent flint source and the Clovis people were taking advantage of it. Gault has also produced numerous blades and blade cores, as well as flakes from knife and point manufacture, and, of course, Clovis points. Animal bone is well preserved in the lower levels - there is from 1 to 2 meters of Clovis deposit over an area of up to 20 acres.

The dates are March 12-25, 2000. The site is located about 40 miles NNW of Austin, Texas. The work will consist of, probably, 5 days of excavation and 1 day of lab per week. Anyone with a serious interest in archaeology is invited (all ages 18 and above are welcome). You will be responsible for your own transportation to and from the site, and will be responsible for your own accommodations. There will be a field camp set up 15 miles from the site that will have a lab area, places for tents and campers and showers. There are motels about 30 miles away. Additional details are still in the works.

A tuition charge of \$50 per day will be paid to Dr. Bradley to cover costs and support the project. Field camping will be at a cost of \$5 - \$10 per day. Food will be at cost. Minimum stay is 6 days. If interested, please contact:

Dr. Bruce Bradley
PO Box 534
Cortez, Colorado 81321

Telephone and FAX: (970) 565-7618
E-mail: primtech1@juno.com
primtech@yahoo.com

8,000-year-old Cave Explorer Challenges Research Team from The Mammoth Trumpet

Very few physical remains of the earliest residents of the Americas exist, despite a substantial and growing archaeological record attesting to their presence. All of the biological, chemical and geological forces that make the record of other species of the past rare are working against preservation of physical remains of early humans. The late Pleistocene and early Holocene were particularly tumultuous times climatically and geologically, initially producing environments unfavorable to preservation of bone, and ultimately assuring that any that were preserved are nearly impossible to find.

One environment that possesses special advantages for preservation is a high-altitude cave. Such an environment could not be a permanent dwelling site, with the accoutrements of daily living, nor would there ever be large numbers of prehistoric people in such a place. However, a discovery high in the Rocky Mountains suggests that archaeologists seeking clues to the earliest North American people might do well to consider caves as investigations sites, with the assistance of qualified cave explorers. Though relatively few archaeologists have expertise in cave environments, Patty Jo Watson of Washington University in St. Louis is a notable exception.

Because of her long involvement with cave archaeology, Dr. Watson was contacted in 1988 when three cavers discovered skeletal remains of an ancient cave explorer in Hourglass Cave at an altitude above 10,000 feet in the southern Rocky Mountains. The cavers, Cynthia Mosch, Tom Shirrell and Richard Wolfert began to map Hourglass Cave soon after they discovered it. In what had appeared to be an untraveled passage, they found disarticulated human bones, and the nature of their exploration immediately expanded. They contacted Watson, who came to the site and brought along Charles Hildebolt, a physical anthropologist at Washington University who also is a caver. Dr. Hildebolt, along with Watson and the discoverers of Hourglass Cave, documented the remains, and invited other experts to help them understand the man who died there.

The first members of the interdisciplinary team were Kenny Frost, Native American Cultural Heritage Representative, who is the Forest Service Liaison with the Ute Tribe; and William Kight, the local U.S. Forest Service archaeologist. Team members directly concerned with providing a biological analysis of the Hourglass Cave man were Anne Stone of Pennsylvania State University, who analyzed DNA extracted from the left tibia; A.M. Haeussler of Arizona State University, who studied the dentition; Tab Rasmussen and Ellen Miller of Washington University, who made casts of the bones; Sam Stout of the University of Missouri-Columbia, who performed histological analyses on a sample of bone from the midshaft of the femur; William Murphy of the Anderson Cancer Center, who did radiologic analysis of the bones.

In addition to physical anthropological researchers, the interdisciplinary team includes a cartographer (Michael Goar), a paleontologist (Rickard Toomey III), a geomorphologist (Fred Nials), speleologists (Tom Shirrell and Neil Shirrell), a cave-gating specialist (Marion Vittetoe), and speleologist and data manager (Richard Wolfert), a stratigrapher (Harvey DuChene), a pictograph/petroglyph-dating expert (Alan Watchman) to attempt to date possible ancient torch smudges on the cave walls, and project coordinator and assistant coordinator, (William Kight and Sue Struthers of the White River and Routt National Forests respectively).

Dating of any North American prehistoric remains is always crucial to its interpretation. Beta Analytic and the University of Arizona provided radiocarbon dates that took the Hourglass Cave skeleton back to what many scientists consider the border between Archaic and Paleoindian. Samples of a rib yielded an Accelerator Mass Spectrometry date of 8,170 \pm 100 radiocarbon years (uncalibrated: Beta 38554/ETH 6765) and a sample from the left tibia yielded dates of 7,714 \pm 77 radiocarbon years and 7,944 \pm 84 radiocarbon years (AA11808). The Hourglass Cave skeleton thus joined an elite fraternity of ancient North American human remains (**Mammoth Trumpet** 11:3 "As Scarce As...").

The first report on the find was made at the First Biennial Rocky Mountain Anthropology Conference in 1993, while a paper presented at the 1994 meetings of the American Association of Physical Anthropologists summarized basic findings on the skeletal remains. The bones were gnawed and scattered by animals; packrats and porcupines now inhabit the cave. Facial bones, mandible, and cranial base were missing, but much of the upper, side and posterior portion of the skull were found, as were 11 severely worn, but otherwise healthy, teeth. The team also found the right humerus, two ribs, both femurs, the seventh neck vertebra, portions of the right and left innominate bones of the pelvis, and four phalanges.

Hildebolt determined that the ancient cave explorer had been male because of the shape of the pelvis bones, and he estimated the age (early 40s) based on features of the pelvis bones, status of the sutures of the skull, tooth wear, and, with Stout's data, long-bone histology. He based his stature estimate of 5 feet 4 inches on lengths of the leg bones. The scientific team performed conventional radiography on all bones and teeth and compared the findings with current clinical standards to assess the man's age and skeletal health. They analyzed some bones by computed tomography, the technique of medical X-ray imaging commonly called a CAT scan.

The good preservation of bone mineral content and thick ridges of the cortex of the tibia and femurs indicated to the research team that the ancient cave explorer had no nutritional deficits. They saw no evidence of arthritis in the ribs, although the next vertebra showed osteophytic lipping that was consistent with the estimated age. The condition would have caused little or no arthritis, however.

The team recovered both nuclear and mitochondrial DNA from the bones; researchers believe that the cold and the constant environment of the cave enhanced preservation. DNA analyses produced no surprises. They confirmed the sex estimate made from the pelvic bones, and the features of the DNA linked the Hourglass Cave man to living Amerindian populations, but to no specific tribe. Molecular studies of the mitochondrial DNA indicated the presence of a nine-base-pair deletion in the lysine tRNA region, a feature found in a number of contemporary American Indian populations. Examination of the mtDNA control region sequence from nucleotide position 16048 to 16400 indicated other mtDNA features that also have been reported in the modern Nuu-Chah-Nulth, Maya, Yakama, and Yanomama populations, but not in many of the other peoples of the world.

The Hourglass Cave man, while not the earliest human skeleton from North America, is one of very few from the early Holocene. He lived approximately 500 years after the time--8,500 years ago--that physical anthropologists Gentry Steele and Joseph Powell have defined as the youngest age for Paleoindians (**Mammoth Trumpet** 7:2 "Paleoindian Skeletal Data Re-examined"). Powell and Steele would consider this skeleton in the general cultural period known as Early Archaic. Time periods and cultural associations are provisional, however, and some investigators use a later time period as a border, one closer to the Hourglass Cave man's age.

Too little is known of these early North American cultures and of the physical features of the people of both eras for any definite distinctions between them, and thus any information concerning the physical features adds considerably to our understanding of these First Americans. His presence high in the mountains, deep in a cave, offers some interesting information and poses questions regarding his purpose and use of the high-altitude resources.

Mosch, who is an expert cave explorer as well as a cave scientist, says that entering the cave requires crawling and "wiggling" in a prone position for the first 18 meters before one can stand upright. She says the way is difficult--full of twists, turns, climbs, crawls, and dead-end side passages. Geological analysis indicates the general aspect of the cave has not changed since the time of the ancient explorer. Today's entrance, crawlways and chambers are as they have been for thousands of years. Because the ancient explorer was found about 320 meters from the cave entrance, he must have had a strong determination to go into the cave where passage was so difficult, dark, cold and damp. Smudge marks have been noted along the passageway, apparently the marks of a torch or torches used by prehistoric visitors. Radiocarbon dates on charcoal found near the cave entrance indicate an age of about 2,000 years, six millennia after the man died there. The research team hopes to date smudge marks they found farther back in the cave and also charcoal fragments gathered from the floor below the smudges. These may help to tell the story of the Hourglass Cave man's trip into the cave, or reveal whether there were other visitors, earlier or later.

Watson reports that available evidence in the cave does not indicate whether this visitor had been there previously or had been out alone and simply discovered the cave opening and decided to explore it on a whim, afterwards perhaps becoming disoriented or succumbing to an injury that his partial skeleton does not reveal. Frost believes that the Hourglass Cave man was familiar with the region, including the cave, had been inside the cave previously, and made his last trip into it intending to die there, as he did.

Because Hourglass Cave is on U.S. Forest Service land, and because the remains of a Native American were found inside it, the Forest Service declared the cave a sacred site and closed it to the public. The remains of the Hourglass Cave man have been laid to rest by the Southern Ute tribe, but the interdisciplinary research team gathered and preserved a substantial amount of information regarding this early resident of the Americas. Their research will be valuable for comparison with existing data on early Archaic as well as Paleoindian peoples and cultures.

The discovery itself suggests the importance of cave sites, high in the mountains, as protectors and preservers of rare physical and cultural information concerning the First Americans.

**Bones of Nebraska Mammoths Imply Early Human Presence
From The Mammoth Trumpet
Don Alan Hall**

Sites at Least 18,000, 14,000 Years Old

Two sites on Nebraska's high plains are offering evidence that people were in the Americas before Clovis time 11,000 years ago. Mammoth bones from these sites reveal patterns of modification researchers believe could only have been caused by humans.

Because both sites are in well-studied, primary deposits of Peoria loess that are confidently dated, the investigators are convinced people were there at least 18,000 years ago. "There appears to be a tradition of mammoth-bone fracturing and flaking here in the plains that went on for seven to eight thousand years," says Steven R. Holen, Public Archaeologist and Research Assistant Professor with the University of Nebraska State Museum in Lincoln. He suggests that modifications to mammoth bone at the two sites appear the same as patterns documented at Clovis-age sites in the region. Samples of mammoth bones and soil humates from the La Sena site on the Medicine Creek Reservoir in Frontier County have been radiocarbon dated at between 19,000 and 18,000 years ago. At the nearby Jensen Mammoth site, where mammoth bone also appears to have been fractured and flaked by humans, radiocarbon dates of bone collagen and soil humates range between 15,000 and 14,000 years ago. But unlike Clovis sites containing modified mammoth bone and well-made flaked stone tools, these two sites have revealed no stone tools.

The discoveries present Holen and his colleagues with a weighty challenge because according to the conventional wisdom in North American archaeology, there were no humans in the Western Hemisphere before the makers of Clovis tools that date to no more than 11,500 years ago. By offering evidence to the contrary, they are likely to be told that either their chronology is wrong or the mammoth bone was modified by natural processes. Holen, however, is confident of the data. "I think we can demonstrate that this can only be human modification," he said in a recent telephone interview.

"The stratigraphic sequence is really well known and there's no doubt about the dates for these sites. They're well dated and the stratigraphy is well understood. That's the strongest part of our argument at this point." Working with Holen on the project is geomorphologist David W. May of the Department of Geography, University of Northern Iowa, a leading specialist on deposits of Holocene and late Pleistocene age in central and southern Nebraska. They are confident that at each site bones of one individual mammoth were buried by loess--fine-grain, wind-blown silt--relatively soon after the animal died.

"We think we have very reliable radiocarbon dates," Holen said after explaining that the bone, especially at the La Sena site, is in good condition. Though water leaching down through loess can destroy bone, a weakly developed B soil horizon containing clay seems to have protected it. At the La Sena site this soil horizon actually caused some bones to become coated with a mineral deposit that helped protect them. "At the La Sena site the collagen content of the bone is very good."

"There's absolutely no doubt about how old these sites are," Holen added. The radiocarbon dates from humates in soil samples and mammoth bone collagen from the La Sena site appear in a paper May and Holen recently published in *Quaternary Research*. Humates are organic acids in humus; collagen is an insoluble protein that is a chief constituent of bone. Two soil samples from approximately four meters below the surface were found to date to 18,860 +/- 360 (Tx-7006) and 16,730 +/- 490 (Tx-6708) years ago. The latter sample (8 kilograms) was immediately adjacent to a large piece of mammoth bone at the buried B horizon, while the former was a larger (50-kilogram) sample taken about 20 centimeters above the horizon and the bones. Collagen in the mammoth bone was dated to 18,000 +/- 190 years ago (Beta 28728). May and Holen consider the older soil date more reliable because modern rootlets, which would skew the dates toward the present, were found around the mammoth bones in the B horizon. The larger sample avoided animal burrows, rootlets, and cracks in the loess.

Fracture Patterns

If they are so confident of the antiquity of the sites, how can they be sure people were there? "Our interpretations are based primarily on the fracture patterns of the bones," says Holen. At the La Sena site the bones are disarticulated. Limb bones are very highly fractured but among them are unbroken ribs and vertebrae. "We see evidence of high-velocity impact points." Whatever broke the bone left impact scars that measured approximately four centimeters. "You can tell by the way the impact fractured the bones--the negative bulbs of percussion--that these were hit with something that had to be fairly large and coming at a pretty high rate of speed."

Further, the breakage occurs in the middle of the bone shafts, suggesting that the intent was to gain access to the marrow. Holen noted that studies of prehistoric bone breakage as well as ethnographic studies of people breaking elephant bones indicate that they were broken open for marrow. "We know that recent hunter-gatherer groups in Africa broke open elephant bones to extract marrow. We have good reason to think that people utilized marrow in prehistory." He noted evidence of marrow usage from Paleoindian bison kills. "People used marrow--it's a high-energy food."

Bone as a "Lithic Resource"

Holen and his colleagues have observed that patterns in bone flaking in Clovis sites support their argument for human presence at the La Sena and Jensen sites. "There are well-documented cases at Clovis-age sites in North America of people breaking and flaking mammoth bone," says Holen, who has been investigating one Clovis site himself. In these cases, he says, "we see evidence of the bone being struck by something very hard, probably a hammerstone, and we see indications of high-velocity impact points. "These points are very distinctive--they cause negative bulbs of percussion, and they cause radiating fractures from the point of impact," he said.

Clovis sites also provide evidence that people were flaking mammoth bone and using it as if it were a lithic resource. "They could take nice flakes off of these bones, which were presumably used as expedient tools in the butchering process. Bone flakes in very similar patterns to stone. You can see the platforms, bulbs of percussion, hinge fractures, and other diagnostic features of stone flaking on the bone flakes. These are the patterns we are looking for--and the patterns we see at both Jensen and La Sena sites as well as at Clovis-age sites."

Modification by Natural Processes?

How can Holen be sure the mammoth bones from these two Nebraska sites were not modified by natural processes? Couldn't natural erosion have caused much of the breakage? And what about the teeth of those big Pleistocene carnivores, the massive feet of live mammoths, or the hooves of bison? His most important evidence to the contrary may not be the bone itself but the stratigraphy which has held its secrets for so long. Loess-- windblown silt from meltwater of the continental glacier, which would have been no more than a few hundred miles north and east of these sites at the time the mammoths died--covered the bones within a few years. Deposition of the loess began about 20,000 years ago and continued for approximately 10,000 years; by then 12 meters had been deposited on southwestern Nebraska. Both sites are solidly within the loess deposit; the bones have not been moved by running water or erosion.

The fact that the bones are situated in a fine wind-blown deposit eliminates many natural processes that could have broken the bone, for example, transport in rock-filled streams. "There's no rock that could have fallen and broken these bones naturally. There's no rock that could have washed against them and broken them." He also discussed and rejected two natural causes that have been found to modify modern elephant bone--carnivore actions and trampling by other elephants.

"Carnivores always begin gnawing at the articular ends of the bones and then work their way into the shafts," Holen said, pointing out that all the breakage at the La Sena and Jensen site occurs at mid-shaft. "We see very little evidence of carnivore action at these sites. It should be very apparent if carnivores are in these bone assemblages, and that evidence just isn't there. There's only very minor evidence of carnivore activity."

Trampling?

"We have very highly fractured limb bones lying right next to complete ribs and vertebrae." That suggests that mammoth trampling is not the cause of this fracturing because the ribs would be broken much more quickly; they're lighter bones. Further, there is the evidence that something with an impact point of 4 cm broke the bone. "That is much larger than carnivore teeth and much smaller than mammoth feet," Holen observed.

"Basically we're rejecting the natural processes in favor of the human process by eliminating the arguments of natural processes, and using comparisons with known human modification of proboscidean bone. And we're seeing a very strong relationship between our assemblages and the patterns caused by human breakage."

Mammoths are believed to have become extinct soon after 11,000 years ago, but mammoth bones from sites approximately of Clovis age have frequently been found to show evidence of butchering. Bones at the La Sena site are completely disarticulated and limb bones are heavily fractured; at the Jensen site bones are scattered, but they're more or less in anatomical order with front bones being toward the head and rear bones in the opposite direction. "So far we haven't seen any cut marks from stone tools," Holen said. "Nor have we found any stone tools."

Divers Return To Wreckage Of Blackbeard's Flagship

By Misti Lee, October 13, 1999

JACKSONVILLE, N.C. (Reuters) - Divers exploring what is believed to be Blackbeard's sunken flagship off the North Carolina coast located another cannon Wednesday, further linking the wreckage to the legendary 18-century English pirate.

The eight-foot long cannon, found while divers were using instruments to scan the sunken wreckage of what is believed to be Blackbeard's "Queen Anne's Revenge", was the second one discovered this week and the 20th since excavations began at the site in 1997. "The Queen Anne's Revenge purportedly had between 25 and 40 guns on board", project conservator Wayne Lusardi said. "Any other ship in that area that we have records of that sank, none of them had anywhere near that many cannons. So the more guns we find on the bottom the more likely it is to rule out other candidates all together".

Legend has it that Blackbeard, whose real name was Edward Teach, ruthlessly prowled the shipping channels off the Carolina coast before he was captured and beheaded by Lt. Robert Maynard of the British Royal Navy in 1718. Blackbeard's flagship was a French slave ship captured by the pirate in 1717 and renamed the Queen Anne's Revenge. The ship ran aground in the Beaufort Inlet in June 1718.

Excavation of the wreckage resumed last week in 25-foot waters about a mile off the Beaufort Inlet, and was expected to end Friday. Divers hope to expand their expedition next year to at least five weeks, Lusardi said. Monday, divers recovered an 1,100 pound concretion, or mass, of barnacles and stone, which they dubbed "Baby Ruth" because of its resemblance to the candy bar, and were surprised to discover a small carriage gun beneath the mass. The four-and-a-half foot cannon, which weighs about 300 pounds, was likely used on the deck with a carriage mount and shot a one-pound cannon ball. "The small one brought up a few days ago was unexpected", Lusardi said. "It was a large conglomeration of stone and miscellaneous objects and when they picked it up they could see a clear outline of the cannon. It was very exciting".

On previous dives, archaeologists had discovered the outlines of 18 cannons, 17 of which had the same dimensions and appeared to be eight-foot cannons weighing about a ton. Two of the large cannons were brought to the surface in 1997, and last year divers recovered a six-foot cannon. Experts began sketching and documenting the small gun recovered Monday, and Marines from nearby Cherry Point air station are using a portable X-ray machine to photograph the gun and check for other artifacts hidden inside the concretion.

The cannon discovered Wednesday will remain below the surface until the N.C. Underwater Archaeology Unit has enough space and manpower to raise it and store it. "We're systematically going through the items", Lusardi said. "We don't bounce around and pull things up. Essentially it's got to wait its turn to come up".

Monte Verde Challenged

Until 1997 no site was widely accepted as pre-dating the Clovis culture (11,000 to 11,500 radiocarbon years before present). That year, a blue-ribbon commission of Paleoindian specialists visited Monte Verde, a site in Chile with dates averaging 12,500, and declared it to be valid. Other possible pre-Clovis sites include Hebior and Schaefer, Cactus Hill, and Topper. Meadowcroft and Pedra Furada have also been proposed as pre-Clovis. Additional early sites include Taima-Taima, Pedra Pintada, Santa Barbara in the Channel Islands, Quebrada Tacahuay, and Quebrada Jaguay. Acclaimed in 1997 as the earliest known site in the Americas and the first undoubted pre-Clovis site, Monte Verde, in southern Chile, is now being questioned. Radiocarbon dates place the site at about 12,500 years before present, a millennium before the Clovis culture--named for a New Mexico site where distinctive fluted points were found with mammoth bones--which was long thought to represent the first people in the New World. The challenge throws the debate about the colonization of the Americas wide open.

According to Stuart Fiedel (1999), an archaeologist with John Milner Associates, close scrutiny of the various reports on Monte Verde--especially the 1,100-page final monograph--raises "troubling doubts." Ambiguities, inconsistencies, and missing information, he says, make it impossible to demonstrate that artifacts at the site are associated with the plant and animal remains that were dated. Monte Verde, he concludes, is not proof that people were in South America before the advent of Clovis (11,500). Fiedel's criticisms are sure to ruffle feathers of the site's excavators and members of a blue-ribbon delegation of Paleoindian specialists who visited Monte Verde in 1997 and declared it valid.