

MAMMOTH TRUMPET



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University of Maine

FLORIDA ARCHAEOLOGISTS PLUNGE INTO THE PAST



PART of Florida divers, left to right, John Delzell, Joe Foy, Mike Stallings, and Marianne Creech talk with archaeologist Michael Faught, far left, after a dive on an inundated chert quarry. The site, in a drowned river channel four miles offshore in the Gulf of Mexico, was discovered after diver Ron Childers led archaeologists to a nearby underwater spring and quarry site. Childers has located at least three other spring sites in the area. (Photo by Bob Vickery).

Underwater archaeology has a long history in the state of Florida, and is playing an increasingly important role in early human studies. Although terrestrial Paleoindian sites have been found in Florida, the inundated sites are unique in their preservation of organic materials, including bone, wood, and even insects. This preservation is largely attributable to the unique geology of the area.

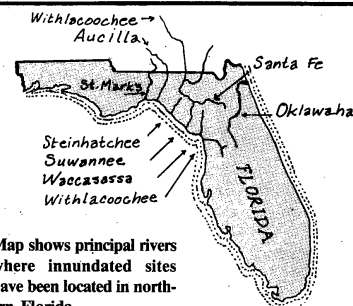
Limestone formations which underlie much of the state create a direct link between sea level and the vast inland Floridan Aquifer. This groundwater reservoir is controlled by sea level. When sea level is high during an interglacial, as is the case today, water levels also rise. Conversely, when much of the world's sea water was locked in ice during a period of glacial activity such as the late Pleistocene, water levels in interior Florida lowered. Inundation of low-lying sites by rising water levels at the end of the Pleistocene and early Holocene created an oxygen-free environment which prevented bacterial decomposition. This, combined with the neutralization of tannic acids from the soil by limestone dissolved in the water, has led to the exceptional preservation of organic material found in many of Florida's submerged sites.

Paleoenvironmental research suggests that the late Pleistocene climate of Florida was considerably different than that which presently exists. Analysis of pollen from early levels indicates that 14,500 years ago much of the state was considerably drier than today. Although later conditions fluctuated somewhat, the modern vegetational assemblage of today did not develop until approximately 5,000 years ago. The late

Pleistocene aridity was accentuated by the accompanying lowering of water tables throughout the state.

As water tables dropped, river channels became the focus of large game activity. Narrow rivers, such as the Santa Fe or Aucilla in north Florida, were probably reduced to oasis-like spring-fed watering holes around which humans and animals clustered during periods of seasonal drought. Broader rivers such as the Oklawaha continued to flow, but at a much lower water level than that of today. Such a situation was probably ideal for a big-game hunting economy, as hunters clambered down the banks of these Pleistocene rivers in pursuit of their water-starved prey. The kill and habitation sites which formed on these dry riverbeds were later covered by seasonal flood sediments. As water levels in interior Florida rose following the end of the Pleistocene, early human sites were preserved intact in many river systems.

Many of the tools recovered from Florida Paleoindian sites bear a strong resemblance to those found



at sites further west. Carved ivory foreshafts, similar to those found at western Clovis sites, were collected in the 1930s from the Santa Fe River by Clarence Simpson, probably the first of a unique group of Florida avocational archaeologists. Simpson made his collections from a boat with the aid of a glass-bottom bucket and a cane pole complete with tongs. Since Simpson's time, a growing number of inundated early human sites have been discovered within the state's waterways. Unfortunately, many tools recovered at these sites so far have been found out of context, redeposited by active stream currents.

Paleoindian sites have been located in the Aucilla, Oklawaha, Santa Fe, Steinatchee, Suwannee, Wekiva, St. Mark's, Waccasassa, Withlacoochee, and Econfinia Rivers. A survey of the Aucilla River basin alone revealed the existence of 33 Paleoindian sites. The quality and location of sites are often consistent within a particular river system. Along the Oklawaha, for instance, sites are frequently found eroding from the banks of the river. Aucilla River sites, on the other hand, are most commonly situated in the middle of the river channel. These differences in site locations are understandable when the various river systems are viewed as they existed during the time of site formation.

The Florida Bureau of Archaeological Research is presently engaged in an ongoing process of locating and evaluating these underwater sites. The most intensive research has been carried out within the Aucilla (Continued on page 5)

AT HOME IN THE PLEISTOCENE?

News of two remarkably early radiocarbon dates has come blowing out of the high Sierra Nevada mountains in California like a trumpet blast—a mammoth trumpet, of course—announcing a new series of debates on the antiquity of humankind in North America. In May, 1985, the mother-daughter firm of Peak and Associates, Inc. from Sacramento found a small, lanceolate-shaped, stemmed projectile point in association with carbon dated at $11,720 \pm 145$ years B.P. This marks the ear, but the public's imagination has been caught by the August, 1986 discovery of a fire pit whose charcoal dates to 9750 ± 180 years B.P.—a date less ancient yet more exciting because the fire pit was embedded in a 20 cm thick clay surface that *could* have been the floor of a building. A corroboration date was also obtained on charcoal found

15 cm above the 9,750 age material; it came in at 9630 ± 125 yr B.P.

If the surface is what remains of a permanent structure, then our understanding of late-Pleistocene

"Is it a floor, or is it merely a surface?"

Paleoindian culture may have to be modified. Paleoindians are currently thought to have been big game hunters who followed an essentially nomadic way of life.

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C E N T E R N E W S

SYSTEMATIZING OUR NEW REFERENCES AND RESOURCES ANNOUNCEMENTS

In order to better serve our membership, we are improving our method of finding and citing items in our "New References and Resources" section of the *Trumpet*. Starting with this issue we are dividing the material into subsections: Articles, Books, Reports/Journals/Databases, and Curriculum Materials.

With the next issue, we will begin surveying major professional journals for articles on the peopling of the Americas and related topics. As in the past, we will also report on items which have been sent to us for our library. Although most of these library donations are on Center-related topics, a few are on more peripheral subjects.

We do not do book reviews in the *Trumpet*. We feel that enough journals and newsletters perform that service already. However, we will occasionally annotate a new reference if it appears to be unusually well-done, if it is not in English, or if its subject is not apparent from the title.

If you are a professional, we urge you to send us reprints of your research articles and reports. *If any of our members are aware of new information—for example, an article published in a journal which isn't covered by the Trumpet review system—please let us know about it.*

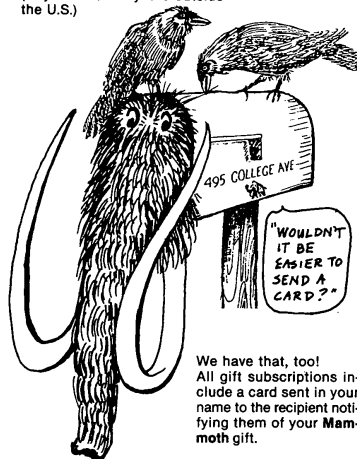
HAVE YOU SENT YOUR CONTRIBUTION YET?

Center members will recently have received a request for donations to fund our operations. We have focused this year on developing the clearinghouse function of the Center—making resources accessible to scholars and laypersons alike.

If you haven't sent your check yet, please do so right away. If you wish to earmark your contribution for the endowment, just let us know. Otherwise, funds from this current drive are to be used for operations.

We still need to raise over \$250,000 for the endowment as well as funding for several special projects. The Center's functions are unique: discovering and communicating the earliest human heritage of the Americas. We are building for the future—organizing and interpreting information about our ancestors for new generations. Please help us.

Four times a year the *Mammoth Trumpet* delivers news of the latest archaeological discoveries, interviews with leading scientists and humanists, a continual update on conferences and newly published resources, fiction, art, and more for only \$7/year or \$18/3 years. (\$8/year or \$21/3 years outside the U.S.)



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THE FIRST AMERICANS: THE EXPEDITION

CSEM Director Dr. Robson Bonnicksen will lead an Earthwatch expedition to the Beaverhead Mountains near Dillon, Montana this summer to search for evidence of early human occupation. The expedition will camp in a mountain valley at an altitude of 6,800 feet as they excavate sites dating to at least 11,000 years old. Dr. Bonnicksen has conducted research in the area for several years, seeking traces of the first Americans.

Earthwatch teams of up to 15 people will be formed on a first come—first served basis. Three two-week sessions will take place June 27–July 11, July 13–27, and August 10–24. The cost, not including travel, is \$990. For more information on this or other Earthwatch expeditions, contact Sheree Lane at Earthwatch, 680 Mt. Auburn St., Watertown, MA 02172. Phone 617/926-8200.

YOU ARE THE GUARDIAN OF THE PAST

With the motto "You Are The Guardian of the Past," the Office of the State Archaeologist of the Texas Historical Commission is undertaking an important public education program aimed at making citizens of Texas feel responsible for preserving the prehistoric heritage which lies within the borders of their state. Two of their primary tools are land donations and the Texas Conservation Easement Act.

Conservation easement allows the private landowner to protect archaeological sites in perpetuity. To retain ownership of the land while giving up certain rights (such as archaeological rights) a landowner deeds an easement. The agreement is entered into the deed for the property. Easements can be perpetual, as restrictive as the landowner chooses, covering all or any part of the property, can be given to the qualified agency or organization of the landowner's choice, and may be used as the basis for tax deductions.

In 1985 a national survey of government and non-profit conservation easement programs was conducted by the Land Trust Exchange of Bar Harbor, Maine. Of those responding, 26% noted that their reason for obtaining/granting an easement was to protect historic land and archaeological sites. In a special issue of *Exchange* (Vol. 4, No. 3; Dec. 1985) devoted to the results of this survey, it was noted that "conservation easements protected more than 1.7 million acres of strategic natural land resources in the U.S. Easements have been used in all but four states and by some 500 non-profit organizations and government agencies."

To learn more about conservation easements and the federal tax law including estate taxes, write Land Trust Exchange, P.O. Box 364, 13 Albert Meadow, Bar Harbor, Maine 04609. To learn more about how Texas is using conservation easements to help protect part of our nation's heritage, write the Office of the State Archaeologist, Texas Historical Commission, P.O. Box 12276, Austin, Texas 78711.

—Marilyn Roper

DO YOU GET IT?

As you may have noticed, we have new mailing labels for the *Mammoth Trumpet*. To help you keep track of your expiration date, we have included a code on the first line of the label. The letter is a code for your membership level and the 2 digit number is the volume and issue number of the last issue of your subscription. Thus, a 34 means your membership will expire with volume 3, no. 4 of the MT, a 41 means it expires after volume 4, no. 1, etc. The exception to this is the number 94, which means it is a lifetime membership and will not expire. We hope this helps you when it comes time to renew your membership. If you have any questions or comments, please let us know. We will however, continue to notify you when it is time to renew.

ATTENTION LOCAL ARCHAEOLOGICAL GROUPS

Are you an officer of a local or state archaeological society? The Center needs to know you are. We are attempting to contact the major societies all over North America in order to establish and improve communication.

If you haven't heard from us yet, let us hear from you. We need your name, your group's name, and a phone number with times when you can be reached. We hope to contact you by phone to conduct a very short survey and to get acquainted.

GRADUATE RESEARCH FELLOWSHIPS IN QUATERNARY STUDIES PROGRAM

Two graduate research fellowships are available in the Institute for Quaternary Studies at the University of Maine. The fellowships are available to qualified applicants to the Institute's MS graduate program and can be used for research in archaeology, glacial geology, paleoecology, and paleoclimatology. The stipend includes tuition and living expenses. For further information and application materials please write to: Institute for Quaternary Studies, 304 Boardman Hall, University of Maine, Orono, Maine 04469.

KUDOS

Former Center staff person, Stephen P. Nawrocki, has been selected as one of 1986's Outstanding Young Men of America. The OYMA program is designed to honor and encourage exceptional young men who have distinguished themselves as a result of their dedication, responsibility, and a drive for excellence.

Steve worked at the Center while an Honors student earning a BA in anthropology at the University of Maine in 1985. He organized and maintained our fledgling library, contributed to the *Mammoth Trumpet*, and helped out in many other ways. He is currently working toward a doctorate in physical anthropology at SUNY Binghamton. Congratulations, Steve.



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AT HOME IN THE PLEISTOCENE?

(Continued from page 1)

"I've played the devil's advocate with that floor," says Ann Peak, senior member of Peak and Associates. Is it a floor, or is it merely a surface? "That of course is going to be the question that will be asked. I find it very difficult to imagine people would transport that much soil unless it was for a specific purpose. You can live on the sand: the later people certainly did, without manufacturing any kind of surface. This is intention. It might be better to call it a 'surface': I've vacillated between 'floor' and 'surface.' I just know it's there, and it's not natural."

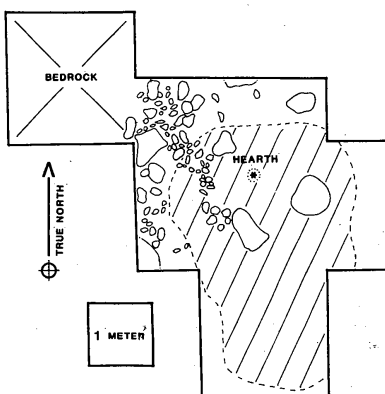
But floor or surface, the clay feature has still been assigned one of the two oldest dates for human habitation in the Sierra Nevadas. The site on which it was found is called Gabbett Meadow CA-ALP-192, and is located in a narrow valley approximately 6600 feet above sea level in the Sierras. It is a beautiful place, with steep granitic bedrock slopes enclosing white fir, lodgepole pine, and huckleberry oak, but also a rather inaccessible one: the steep trail from the parking area is 6½ miles long, so that all equipment and supplies, as well as many of the 32-member crew, had to be lifted in by helicopter. Quite large, the entire site extends about 10,000 m² and the older component about 2600 m².

The excavators encountered the compacted clay surface at about 213 cm below ground surface, exceptionally deep for a Sierran site. The clay was probably imported into the site from Highland Creek, which runs through the Meadow, a tributary to the Stanislaus River. The clay surface is well defined for a 3×4 m area, then disappears. No rim and no post holes are discernible, possibly because the area has taken a 10,000-year beating from erosion and Sierran winters that drop a preposterous forty feet of snow per season. These, along with acid soil which precludes preservation, most likely account for the absence of faunal remains as well; however, new information circulated by Owen Davis, obtained by analyzing the pollen samples and radiocarbon dates from the Meadow and nearby sites, suggests that the climate may have been a bit warmer in Paleoindian times.

The fire pit is constructed into the clay surface itself, and was filled with the 9750 ± 180-year-old charcoal. To the northwest side of the fire pit a linear cobble and rock feature extends about 2.5 m, larger rock below, smaller rock on top, in most places collapsed. "It has the appearance of a wall; that is a little uncertain at this time. But it extends northwest; the



Looking north at excavation of Gabbett Meadow site. Dark area in center is the fire hearth in the compacted clay "floor" surface; rock feature is visible to the left, at a depth of 220 cm. (Photo courtesy of Peak and Associates, Inc.)



Plan view of excavated area at Gabbett Meadow site at a depth of 210 cm. Asterisk indicates source of charcoal sample C-14 dated to 9750 ± 180 yr B.P. Diagonal stripes show extent of compacted clay "floor", irregular ovals are rocks. (Map from Peak and Associates, Inc.)

Peak and Associates have excavated several other sites in Gabbett Meadow and surrounding areas. One in particular, Cal-S342, about 20 miles downstream from Gabbett Meadow and about 1650 m lower in elevation, yielded the 11,720 date (done on free-floating carbon) which was mentioned earlier. This site is deep with deposits in datable materials extending downward over 2 m. Eighteen radiocarbon dates span a time from 11,720 to 6240 ± 210 years ago. The earliest dated level produced a small lanceolate-shaped point and some debitage. Throughout the dated levels nearly 400 points were recovered which Peak would like to draw attention to the apparently long chronological sequence (as much as 5,000 years) of this group of point types. She comments that the types represented are comparable to others previously found in the Great Basin. Now that they have been found in the Sierras, she and others feel an overall umbrella term such as "western stemmed series" could be applied, recognizing the great geographic extent.

Ann Peak is 56 years old. A housewife with four children who was forced to find a career after a divorce, she returned to school and added an M.A. from Cal State to the B.A. in anthropology she already possessed. She started working in 1972, and formed Peak and Associates in 1975 with her daughter Melinda Peak (currently doing adjunct graduate work in history) and Robert Gerry. All three are archaeologists. The firm does everything from small-gas-well monitoring to major projects like Gabbett Meadow.

Work on the latter is completed, however more excavation is planned down stream. Meanwhile analysis of the Gabbett Meadow materials is proceeding. Pollen and charcoal samples still being analyzed have the potential to produce still further surprises concerning Gabbett Meadow.

—M. Dolzani

GLOSSARY

Marl A mixture of clay, sand, and limestone in varying proportions, that is soft and crumbly and usually contains shell fragments.

Matrix The rock or earthy material in which a fossil or artifact is found.

Debitage Waste flakes from the production or resharpening of stone tools.

Calcareous A substance of, like, or containing calcium, calcium carbonate, or lime and often forming hard, impenetrable layers.

Blowout An area where sand or soil has been eroded away by wind.

geomorphologist says the rock is too large to have flowed as outwash materials."

In addition to geomorphologist Scott Stine (Berkeley), the Peaks' team includes mineralogist Dr. Philip Lydon (California State, Chico) and ethnographer Mary Peters; palynology is by Dr. Donald Sullivan (Denver), obsidian hydration by Rob Jackson, trace element sourcing analysis by Dr. Richard Hughes. (The obsidian appears to have come from elsewhere.) Also, in California, unlike elsewhere, it has become general practice, according to Peak, to retain a Native American, descended from the most likely group to have used or inhabited the territory, to act as observer and liaison between the archaeologists and the tribe. The Gabbett Meadow observer is from the Washoe tribe, though Peak doubts that group's habitation can be traced back further than about 2,000 years with any certainty.

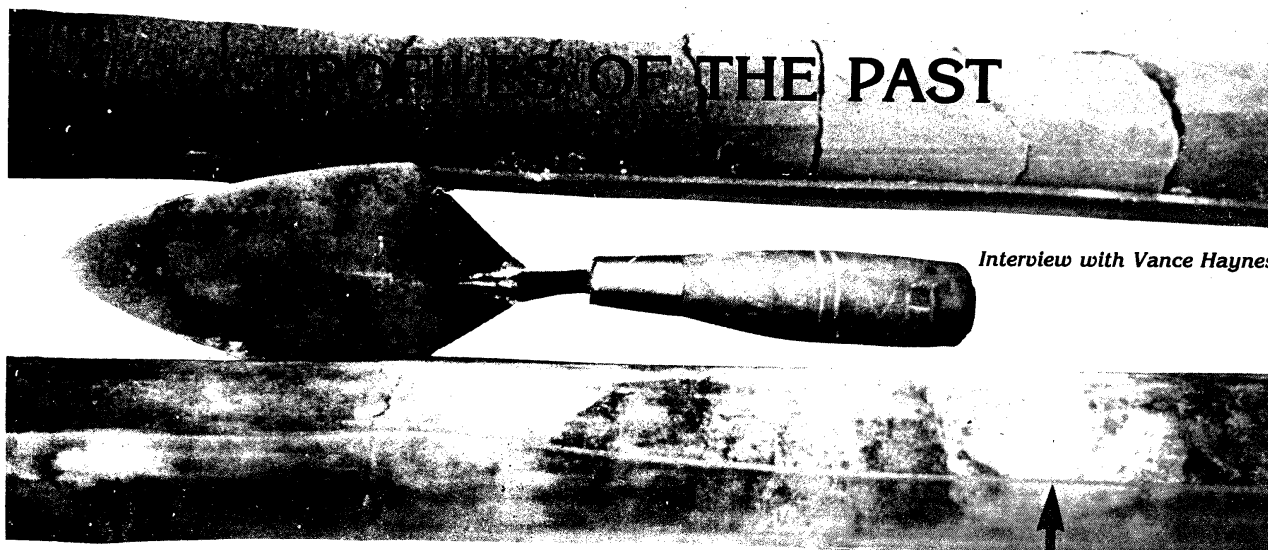
The project is being funded by Northern California Power Agencies, an amalgamation of northern California cities banded together to develop energy; Gabbett Meadow is in an impoundment for the North Fork Stanislaus Hydro Project. Litigation prevented anyone from going into the field from 1981, when the project began, until May, 1985, but the patience and generosity of NCPA paid off, Peak observes, because the group is now getting a great deal of publicity for their prestigious role in excavating several of the most ancient early-human sites on the continent.

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Interview with Vance Haynes

In 1983 and 1984, Vance Haynes returned after an absence of twenty years to Blackwater Draw, one of the most famous sites in North American archaeology. Blackwater Draw is doubly significant. First, it is the type-site for the Clovis culture, named after the nearby city of Clovis, New Mexico: that is, evidence for the existence of Clovis as a distinct cultural type was first discovered there. Second, it provided a large part of the evidence from which geologists E.H. Sellards and Glen L. Evans constructed the entire Paleoindian cultural sequence for the Southern High Plains, from Clovis to Folsom to Agate Basin and onward to the Archaic period. Yet Haynes, member of the Departments of Anthropology and Geosciences of the University of Arizona, a primary expert in the geology of Blackwater Draw, and eminent figure in early North American prehistoric studies generally, was convinced that the site held the potential to yield much more information. And the work of the last several years seems to bear his conviction out.

This is all the more remarkable because the location has been studied off and on for well over fifty years. With its rather poetic name, like something out of a Southwestern ballad, Blackwater Draw sits close to the eastern border of New Mexico. The first surface find was made there as far back as 1929, a fluted projectile point along with some mammoth bone. E.B. Howard and John Cotter worked at the site from 1932-37, and mammoths were soon uncovered with Paleoindian artifacts in association.

Unfortunately, the blowouts that exposed the bones and artifacts also exposed the layer of gravel that lay beneath them to the eyes of gravel miners who subsequently began to quarry it for highway construction: Cannon Air Force Base is close by, and there was always a great demand for gravel for the runways. Haynes makes a grim estimate of how much evidence about prehistory was gravel-mined into oblivion in those first decades. "It makes you sick," he says resignedly, "when you think of what that pit is today and what it could have been if it had received proper protection from the beginning . . . We would have had a national monument there that could have been investigated for probably a century."

All was not lost, however, because of a businessman named Sam Sanders. He operated the gravel pit using modern techniques, making a slurry out of it by pumping in water, then sucking out the mixture of mud, water, and gravel with a big pump. To get to the gravel, he would strip off the overlying layers of sand and earth, erasing the kind of stratigraphic evidence that has been the topic of Haynes' work. And yet, "you have to give him credit," because he made some effort to salvage bones and artifacts, Haynes insists. "He knew that these bones were of interest to people; so when he did hit something that looked as if it were important enough . . . he would hold up and call people in to let them remove it." Thus, five mammoths were recovered in 1962.

Indeed, Sam Sanders may have been too generous for his own good. Not knowing how to discriminate

Core samples from the Folsom level at Blackwater Draw contain bison bone, indicated by arrows, in a diatomite matrix.

amongst them, he allowed so many groups and individuals to excavate that by late 1962-early 1963 an area of only about 50 by 100 feet was subdivided into little claims, with the areas roped off from one another. James Hester, then of the Museum of New Mexico, made every effort to coordinate the excavations and even tried unsuccessfully to get the state to purchase the critical area for protection. The organizer of a local amateur group, James Warnica, was able to salvage and report a great deal; another man simply plundered. Eventually, Sanders reached the limit of his patience and kicked everybody off the site.

At that point the state of New Mexico expressed interest in acquiring the land and asked Sanders to come up with an estimate of what he thought it was worth. Again Sanders may have been generous: "He came back to them with I think something like \$80,000 for an area much larger than the 100 by 50 feet. People who didn't realize the amount of money he had already put into the location felt that was too much." But "I came out of economic geology," Haynes says. "Had I been involved I would have pointed out that when a man has devoted tens of thousands of dollars to prove up his ore and has already started a commitment to develop ore that is needed to amortize his investments over a long period of time—he may have really been making a sacrifice. He was going to lose some of the major source of his revenue."



Workers excavate an Archaic age bison kill at Blackwater Draw.

Eventually the gravel operation folded up and the property was purchased by the state. "Of course by then that whole north wall section was mined out." The land came under the jurisdiction of Eastern New Mexico University (ENMU). Under the direction of George Agogino, work was conducted on a sporadic basis, including visits by Haynes in the late 1960s and 70s. By the 1980s, the big question became: what, if anything, is left?

Answering this question requires a sketch of the place where most of the digging has been done. To the south lies Blackwater Draw itself. To the north lies what in Paleoindian times was a spring-fed depression, with an outlet that used to run into the Draw. Bison and mammoths came to drink there and were hunted by several Paleoindian cultures in succession. Slowly, the outlet was plugged up by windblown material, making a closed basin out of the pond; yet the basin didn't overflow because the output of the spring dwindled over a few thousand years. When the spring finally disappeared, so did the pond, and the depression is now filled with a basal sand, overlain by diatomaceous earth (earth made of the skeletons of diatoms from the ancient pond), in turn overlain by silt and other deposits. According to Haynes, "The stratigraphy is just fantastic. It's complex, but it's the sort of situation where, because of the complexity, you learn so much more." Moreover, the diatomaceous earth, flowing from the depression through the outlet and downward some unknown distance into the Draw, forms a Folsom bone bed—a bone bed so rich that in many places there is more bone than matrix—in association with Folsom points and knives. "I had always wondered about what would be in that outlet, the old outlet leading down into Blackwater Draw. When Jim Hester and I were working there in 1962, Sanders had made some prospecting pits down in that Draw, for gravel. And in one of those prospecting pits we noticed two layers of bone that looked as if they were from Paleoindian times stratigraphically." There was also a second, closely related place that drew Haynes back to the site after two decades: "When I worked out there with Jim Hester in '62 we were very impressed by what we called the south wall, the southern wall of the gravel pit that Sanders had made. In fact, that was the area that Jim Hester and I had mapped."

"So, with that in the back of my mind, with the significance of what that site *could* have been, and with the possibility that there could be still more down that outlet, Dennis Stanford and I decided that we ought to test that idea." Meanwhile, faunal material from the 1960s that had been salvaged but never examined was still waiting in jackets in a warehouse. So Stanford and Haynes tried to obtain a grant to go back, and simultaneously to have Jeff Saunders, a paleontologist interested in looking at all the Clovis material, unpack the faunal remains.

Thus in 1983, Stanford, funded by the National Geographic Society, brought a crew which joined in Blackwater Draw with George Agogino's group of
(Continued on page 8)

FLORIDA ARCHAEOLOGISTS PLUNGE INTO THE PAST

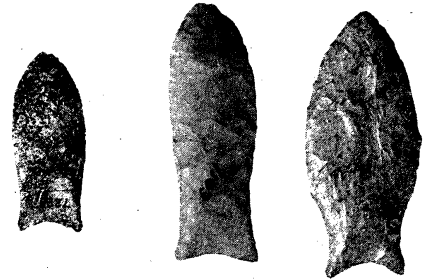
(Continued from page 1)

River basin, notably at the Page-Ladson site. Page-Ladson is a stratified multi-component site which has yielded deposits indicative of human activity ranging in age from 12,000–2,500 years before present. Dr. James Dunbar, an archaeological field supervisor for the Florida Bureau of Archaeological Research, is one of three specialists who coordinate and oversee underwater excavations in the state today. He and David Webb of the Florida State Museum are carrying out archaeological and paleontological research at Page-Ladson.

Several criteria were considered in choosing the Page-Ladson site for intensive testing. While the more recent horizons of Archaic age and younger are river-deposited, the older, deeper layers are intact—buried by sediments from seasonal flooding prior to inundation. The intact horizons consist of at least three early cultural levels. Excavations at the lowest level revealed debitage flakes and remains of extinct horse and camel within layers of peat and marl. The lowest stratum containing Bolen side-notched projectile points was dated at 10,000–9,700 years old. Impact fractures present on many of the projectile points recovered from this site support the assumption that hunting provided an important part of the Paleoindian subsistence base. This level is topped by a sterile zone, followed by a

Clovis, Suwannee, and Simpson projectile points, left to right, represent a continuum of stylistic variation. Shown $\frac{1}{2}$ actual size. (Photo by James Dunbar, Ben Waller collection).

Below, a pothole sediment trap in limestone shallows of the Aucilla River has been “dusted off” to reveal an ivory foreshaft and chert blade, upper center, and other debitage and bone fragments in a sandy organic matrix. Although this type of deposit lacks stratigraphic integrity, it often indicates stratified deposits from which the material eroded may be close by. (Photo by James Dunbar).



Much of the knowledge of Florida's inundated sites has been contributed by sports divers.

horizon which Dunbar has dubbed the “Antler Flaker Zone.” Artifactual evidence recovered from this stratum include biface fragments, flaked stone adzes, and antler pressure flakers. Although the radiocarbon dates from this layer are still out, it is estimated that the Antler Flaker Zone is approximately 9,500–9,000 years old.

Dunbar is leading the work now underway at Piney Island, a site situated on a sandy ridge that borders the Oklawaha River in a tight oxbow. Although in the early stages of investigation, this site promises to be a valuable contribution to Florida Paleoindian studies. The Piney Island site was discovered recently by members of the Paleontological and Archaeological Research Team of Florida (PART), a diving group formed for the support of underwater archaeology, and now a subchapter of the Florida Anthropological Society. While diving in the Oklawaha River, PART members recovered side-notched Greenbriar and Bolen projectile points and a variety of unifacial tool types 20 feet below the river's surface. Further investigation by PART revealed the artifacts were eroding from the bank of the river.

Ther river's down- and side-cutting exposed several stratigraphic horizons in the eroding bank. The lowest level, the river bed, is primarily a calcareous marl, consisting largely of turtle shell intermixed with the bones of early Pleistocene megafauna. Moving up the stratigraphic column, the marl layer is topped by a zone of sterile black mud, followed by a horizon of grey clay. This clay layer yielded the intact jaw of an extinct giant armadillo, the only example found to date in Florida. The grey clay unit grades gradually into a layer of lighter grey sand, the upper portion of which contains evidence of human activity. PART members discovered stone flakes, human skeletal remains, and a variety of bone tools, including deer ulna pressure flakers and bone pins, eroding from this deposit.

Following the report of this discovery to the Florida Bureau of Archaeological Research, Dunbar conducted a test excavation to obtain further information on the site. This excavation indicated that the human occupation zone at Piney Island extends approximately 6 to 12 inches below the water surface and 1 to 2 inches above. In addition to bone tools, denticulate knives, scrapers with graver spurs, spoke-shaves, and more Greenbriar points typical of Late Paleoindian assemblages were recovered from the test

area. The human skeletal remains are currently being C-14 dated and Dunbar estimates this strata will probably be found to be 10,000–9,500 years old. Good preservation of the human skeletal remains and bone tools emphasize the necessity for further work at Piney Island.

Along with research concerning intact riverine deposits, other types of inundated sites are also being investigated. Limestone-bedded sinkholes have yielded further evidence of early humans, while soft-sediment filled sinkholes frequently contain later materials in the 5,000 to 6,000 year old range. An increasing amount of research is also being conducted offshore. Although largely inconclusive thus far, several sites which could possibly date back to Paleoindian times have been discovered one to three miles offshore in the Gulf of Mexico.

Much of the knowledge concerning in-place deposits of Florida's inundated sites has been contributed by sport divers. The impetus behind the current interest in Florida underwater archaeology can be directly ascribed to the efforts of these divers. PART of Florida is based in Palatka, FL. Its members presently include divers Romona Bailey, Vi Carter, Don and Marianne Creech, John Delzell, Joy Foy, Tony Di-carlo, Bruce Hamlen, Paul Horton, Mitch Holbrook,

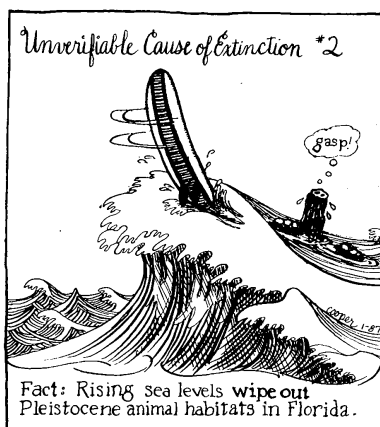
Andy May, Walon and Terri Rowe, Chris Runk, Mike and Darlene Stallings, and Mike Warren.

In the mid 1960s, divers from around the state observed artifact concentrations in several rivers in northern Florida. These divers include Don Serbousek, John Cottrill, Ben Waller, Paul Lien, Hub Chasen, Wayne Grisset, Jim Knight, Dennis Ross, Jack “Gator-man” Simpson, Alvin Hendrix, Bill Webster, Ellis Moore, Jarl Malwin, and Richard Ohmes. While it had been previously assumed by the archaeological community that such accumulations were the result of redeposition, the divers were persistent in bringing intact site concentrations to the attention of professionals. One of the eventual outcomes of this effort was the initiation of the Aucilla River Project in the early 1980s.

At about the same time, Roger Alexon, Bill Mathen, and Bob Gingerich, another group of Daytona divers, found fragmentary bison remains in the Wacissa River. Upon examination, the divers found that many of the fragments could be pieced together to form a single skull. The tip of a broken projectile point was stuck in one fragment.

With the aid and support of sport divers and the general Florida populace, intact early human sites are being reported in ever increasing numbers. As James Dunbar comments, “I think it's going to be one of the Paleoindian treasure chests of North America. It's been sitting here for 12,000 years and is just waiting to be unlocked.”

—Karen L. Turnmire



SUGGESTED READINGS

On Underwater Sites

Palmer, Jill, James Dunbar, and Danny Clayton 1981 Report on Phase II Underwater Archaeological Testing at the Fowler Bridge Mastodon Site (8HI 393c/uw). Interstate 75 Phase II Archaeological Report No. 5. Florida Department of State, Tallahassee.

The Florida Anthropologist 1983 Volume 36, Nos. 1–2. Florida Anthropological Society, Coral Gables.

Lazarus, W.C. 1965 Effects of Land Subsidence and Sea Level Changes on Elevation of Archaeological Sites on the Florida Gulf Coast. Florida Anthropologist XVIII (March) pp. 49–57.

Milanich, Jerald T. and Charles H. Fairbanks 1980 Florida Archaeology. Academic Press, Inc., New York, New York.

Webb, S. David, Jerald T. Milanich, Rober Alexon and James S. Dunbar 1984 A Bison Antiquus Kill Site, Wacissa River, Jefferson County, Florida. American Antiquity 49(2) pp. 384–392.

NEW REFERENCES AND RESOURCES

*New materials received by the Center library.

ARTICLES

Bonnichsen, Robson, et al. 1986 False Cougar and Shield Trap Caves, Pryor Mountains, Montana. *National Geographic Research* 2(3):276-290.

Doran, Glen H. 1986 Anatomical, cellular and molecular analysis of 8,000-yr-old human brain tissue from the Windover archaeological site. *Nature* 323:803-806.

Mott, Robert J. 1986 Late-glacial climatic oscillation in Atlantic Canada equivalent to the Allerød/younger Dryas event. *Nature* 323:247-250.

BOOKS

*Coe, Michael, Dean Snow and Elizabeth Benson 1986 *Atlas of Ancient America*. Facts on File Publications, New York. Price: \$35.00 (hardbound), \$47.95 Canada. 240 pages, 6 on the Paleoindian period, 56 maps; 329 illustrations, 233 in color, bibliography, gazetteer, index.

Davis, Simon J.M. 1987 *Archaeology of Animals*. Batsford Books, London. \$19.95. Available from B.T. Batsford, 4 Fitzhardinge Street, London, W1 U.K.

*Howe, Carrol B. 1979 *Ancient Modocs of California and Oregon*. Binford & Mort Publishing, Portland, Oregon. Second printing July, 1986. 265 p. \$9.95 (softcover).

Kurtén, Björn 1986 *How to Deep-Freeze a Mammoth*. Columbia University Press, Irvington, New York. 121 p., line drawings, \$16.95.

*McIntosh, Jane 1986 *The Practical Archaeologist: How We Know What We Know About the Past*. Facts on File Publications, New York. 192 p. \$18.95 (hardbound).

*Neils, Selma 1985 *The Klickitat Indians*. Binford & Mort Publishing, Portland, Oregon. 215 p. \$9.95 (softcover).

White, Randall 1986 *Dark Caves, Bright Visions: Life in Ice-Age Europe*. American Museum of Natural History, New York. Catalog of exhibit at the American Museum of Natural History. \$35.00 hardback, \$18.95 paper.

Major Topics in Primate and Human Evolution. Edited by B. Wood, L. Martin and P. Andrews. Cambridge University Press: 1986. 364 p. \$39.95.

Primate Evolution and Human Origins. Edited by R.L. Ciochon and J.G. Fleagle. Benjamin/Cummings: 1986. 396 p., \$31.95.

Repertoire International de l'Archéozoologie (International Archaeozoological Directory) 2 volumes 1986. Compiled by Nathalie Desse-Berset. Centre National de la Recherche Scientifique. Dossier de Documentation Archeologique No. 11. Order from: Registre des Recettes, CNRS/CRA, Sophia-Antipolis, 06565 Valbonne Cedex, France. Price: 304.68 FF, personal check or International Money Order accepted.

Narr, Karl Joseph 1985 *Des Mammuts Ende: Aussterben oder Ausröttung? in Jagen und Sammeln*. Jahrbuch des Bernischen Historischen Museums. Verlag Stampfl & Cie AG, Bern. Contains good bibliography, mostly in English, consisting of three pages of references to recent publications on peopling of the Americas, kill sites, extinctions, etc. No English abstracts.

REPORTS, JOURNALS, DATA BASES

*Palmer, Jill, James Dunbar, and Danny H. Clayton 1981 *Report on Phase II Underwater Archaeological Testing at the Fowler Bridge Mastodon Site (8HI393c/uw) Hillsborough County, Florida. I-75 Phase II Archaeological Report No. 5*. Submitted to the Florida Department of Transportation. Copies available from Florida Dept. of State, Division of Archives, History and Records Management, Tallahassee, Florida.

*OSTEO; Base-reseau de données ostéométriques pour l'archéozoologie. (Data base, coding, measurements, and philosophy of a computer system utilized in osteoarchaeology.) J. Desse, L. Chaix, and N. Desse-Berset. Notes et Monographies Techniques No. 20. Centre National de la Recherche Scientifique, Centre de Recherches Archeologiques: 1986. Order from CNRS/CRA, Service des Publications Sophia-Antipolis, 06565 Valbonne Cedex, France.

Smith Symposium: late Pleistocene and Early Holocene Paleoeconomy and Archaeology of the Eastern Great Lakes Region, Program and Abstracts. Buffalo Museum of Science: 1986 Buffalo. Over 20 abstracts of papers.

The following two references are summaries of papers and discussions from the 2nd and 3rd meetings of the *Groupe de Travail No. 1: Outillage peu élaboré en os et en bois de cervidés*, a working group of the *Commission de Nomenclature sur l'Industrie de l'Os Préhistorique*, international in membership and centered in France under the general leadership of H. Camps-Fabre. Order from C.E.D.A., 22a, rue de la Gare, B6390 Viroinval, Belgium.

Artefacts 1 1985 Editions de Centre d'Etudes et de Documentation Archeologiques (C.E.D.A.), Viroinval.

Artefacts 3 1986 Editions du Centre d'Etudes et de Documentation Archeologiques (C.E.D.A.), Viroinval.

Archaeozoologia D. Pierre Ducos, editor. Editions La Pensée Sauvage, Grenoble. This is a new journal first published on the date of the 5th ICAZ, Bordeaux, France, August 1986; Entitled *Mélanges*, it contains several papers on the status of zooarchaeology world-wide. The next issues (1987-1988) will publish the papers from the 5th ICAZ in topical and geographic groupings. Order from Editions La Pensée Sauvage, B.P. 141, 38002 Grenoble Cedex, France. For information from the editor, write: Dr. Pierre Ducos, Laboratoire d'Archéozoologie, 07460 St. Andre de Cruzieres, France.

ASVNET/ESAFNET Archaeological Society of Virginia and Eastern States Archaeological Federation combined efforts have produced "the first archaeological network directed toward the amateur archaeologist". It will provide a single source for date/location of archaeological meetings and conferences all over the U.S., list new books and monographs, short articles on new discoveries, site reports, museums and displays, fieldschools, state and local society activities, and more. ASVNET/ESAFNET will go on-line January 1, 1987, and is free to callers. Computer phone number is 703/354-2827; use CompuServ communications settings, but no ID number or password is needed. For more information write or call Wm. Jack Hranicky, 703/256-1304, P.O. Box 4190, Arlington, VA 22204.

CURRICULUM MATERIALS

Historical Footprints A series of 60-minute video tapes on American History, including prehistory, available individually (\$39.95) or on a subscription basis (\$159.80/year). Quarterly. Recommended for secondary and college level classes. Historical Footprints, Department DM86, Box 694, Lead, SD 57754.

CONFER

ICAZ

The Fifth International Conference of the International Council for Archaeozoology (ICAZ) was held August 25-30, 1986 at the University of Bordeaux, France. The general chairman for the conference was Dr. Pierre Ducos, with organizational help of the ICAZ executive council, personnel of the Quaternary Institute at Bordeaux and French scientific and political groups. Approximately 150 people registered for the conference and nearly 100 papers were delivered. Conference sessions were divided into topical and geographical themes: faunal identification; quantification; taphonomy; species distribution; hunting strategies and butchering techniques; bone modification; domestication; environmental reconstruction; seasonality; aquatic and terrestrial utilization; diet; social and ideological implications; North and South Europe; Near East and Africa; USSR; Southeast Asia and Oceania; and New World. The conference adjourned mid-week for a day of field trips to Lascaux II, Font de Gaume, La Quina, Laugerie-Haute, Moustier, La Madeleine, La Micoque, and Vaufray.

Conference papers will be published; to this end, a new journal, *Archaeozoologia*, was introduced. The first issue, "Mélanges," is a compilation of papers including faunal reports, methodology, and species syntheses; with sites and authors from the Sudan, Indonesia, Chile, Denmark, Italy, Spain, and Australia. The 1987-1989 volumes (two issues per year are planned) will feature, but not be limited to, the papers of the 1986 ICAZ Conference. For more information, see New References and Resources, page 6.

Sponsored by the Centre National de la Recherche Scientifique (CNRS) in France, ICAZ also coordinated the publication of a two-volume, cross-indexed directory of practicing archaeozoologists

Clovis Origins at INQUA '87

The following papers will be delivered at the symposium entitled *Peopling of the Americas: Clovis Origins*. This symposium, organized by Robson Bonnichsen and Knut Fladmark will be presented at the XIIth INQUA Congress to be held August 3rd in Ottawa, Canada.

- Robson Bonnichsen: "Fluted Points in the Northeastern United States: What is the Meaning of Variation?"
- Gerard Ardila-Caderon: "Early Man and Peopling in Northern South America."
- Donald Clark: "Northern Fluted Points (Alaska-Yukon)"
- James Dunbar: "Clovis Origins"
- Eileen Johnson: "Late Pleistocene Cultural Occupation on the Northern Plains, U.S.A."
- David Keenleyside: "Early Man in the Maritimes Region of Canada."
- Thomas Lynch: "The Identification of Paleo-Indians in Western South America."
- David Meltzer: "The Late Pleistocene Human Occupation of the Central and Southern United States."
- Gustavo Politis: "Fish-tail Projectile Points and Early Cultural History: An Overview from the Southern Cone of South America."
- Anthony J. Ranere: "The Paleo-Indian Occupation in the Central American Tropics."
- Brian O.K. Reeves: "Late Pleistocene Occupation and the Deglaciation of Western Canada."
- Peter Storck: "Imperialists Without a State: The Cultural Dynamics of Early Paleo-Indian Colonization as seen from the Great Lakes Region."
- John Taylor: "Perspectives on Two Macroblade Industries."
- Judith Willig: "Clovis in the Great Basin and California: Regional Pattern and Environmental Context."
- Roy Carlson, C. Vance Haynes, and Richard Morlan: Discussants

MORE
LIM ERICKS

The Paleo were taking great pains
To tidy their site on the plains
"Now clean up this mess
For someday I'd guess
We'll be discovered by Dr. Vance Haynes."

—Michael Scullin

A pert little chert from Wooster
Complained when a man reduced her
But now thin and trim
Fluted and slim
She thanked the man who produced her!

—John Shrader

ENCES

entitled *Repertoire International de l'Archaeozoologie*. (See New References and Resources, page 6).

The formation of ICAZ was promoted primarily by a need for international communication between zoologists, archaeologists, and paleontologists who practice their faunal identification art and science within the province of archaeology, and guided by issues of discovery, technology and methodology, standardization of nomenclature, and publication format. Corresponding membership is available to anyone interested in zooarchaeology (c/o General Secretary, A.T. Clason, Biologisch-Archaeologisch Instituut, Poststraat 6, 9712 E.R. Groningen, Netherlands). ICAZ sends out a yearly newsletter which includes notices and actions of the council, upcoming conferences, and an address and research interest list of its membership.

ICAZ will move to North America for the next international congress in May of 1990, hosted by the Smithsonian, under chairperson Melinda Zeder.

Following ICAZ, a handful of archaeozoologists from Belgium, France, Spain, Italy, West Germany, England and USA met at Viroinval in southern Belgium, for the fourth "Réunion due Groupe de Travail, No. 1; Industrie osseuse peu élaborée" (Working group #1 on unspecialized bone industries). Hosts for the four-day workshop/round table (Sept. 2-5) were Claire Bellier and Pierre Catelain, directors of the Centre d'Etudes e Documentation Archaeologique (CEDA). This working group, whose charter is an extension of the European "Commission du Nomenclature sur l'industrie de l'os préhistorique" coordinated by Henrietta Camps-Fabre of France, emphasizes the analysis of bone modification.

Groundwork was laid for close cooperation between this group and the working group recognized by ICAZ, based on overlapping goals aimed at documenting and systematizing bone modification causes and effects, and a compilation of an international lexicon of nomenclature.

It is anticipated that the next reunion of the working group will meet on the occasion of the 11th UISPP at Mainz, West Germany in September, 1987. Information of the working group may be obtained from Dr. Marylene Patou, Institut de Paléontologie Humaine, 1, rue René Panhard, 75013, Paris, France. Papers, texts of discussion, and action items of the second, third and fourth "Réunion" are available by subscription to the publication *Artefacts* (CEDA, 22A, rue de la Gare, B6390, Virvoinval, Belgium).

Contributed by Suzanne Miller, Museum of Natural History, Idaho State University, Pocatello, Idaho. Miller and Adrien Hannus represented the Nomenclature Committee formed at the First International Conference on Bone Modification in 1984.

Great Basin Conference

The Great Basin Anthropological Conference was held October 9-11, 1986 in Las Vegas, Nevada, organized and chaired by Judith Willig (U of Oregon). The conference expanded upon a symposium on the same topic held at the SAA meetings in New Orleans last April. Fifteen papers were presented, divided between specific site reports (Dietz, Lake Hubbs, Lake Tulare, Long Valley, Gabbett Meadow, and Lake Mojave) and methods and issues reports (technology, migration and settlement patterns, archaeology, historic overviews, and taphonomy). Additional new information was presented by local scholars who did not attend the SAA meetings. Papers from both the SAA and Great Basin symposia are being compiled and edited by Judith Willig and C. Melvin Aikens for publication in late 1987.

Wet Sites Conference

The International Conference on Wet Site Archaeology was held December 13-14, 1986 at the University of Florida in Gainesville. Twenty participants discussed problems and possible solutions

for excavating and preserving wet sites throughout the world.

Wet sites constitute a unique opportunity to recover and examine organic materials preserved undisturbed in oxygen-free, water-saturated environments. Destruction of wet sites through exploitation of related natural resources (water, peat, land for development) threaten their fragile material components. New tools and procedures must be developed to find and excavate these sites before they are lost. Specialized conservation, involving long-term commitments of money and adequate housing facilities are necessary to maintain artifacts for study. These artifacts provide rare opportunities to examine environment, diet, technologies, and artistic expressions in wood, bone, and other perishable substances.

A field trip was taken to the Windover site near Titusville, where 8,000-year-old human skeletal remains, some still containing brain tissue within the crania, have been recovered from a peat stratum.

World Archaeological Congress

The World Archaeological Congress met September 1-7, 1986 in Southampton and London, England. Eighteen Academic sessions were held, including two of special interest to *Mammoth Trumpet* readers.

Pleistocene Perspective was organized by Arthur ApSimon, Michael Day, and Robert Foley, and included sessions entitled "Hominid Dispersal Patterns—Peopling of the New Continents" chaired by Brian O.K. Reeves; "Adaptations to Rising Temperatures c 15,000 B.P. Onwards"; and "Early Holocene Adaptations."

Communal Land Mammal Hunting and Butchering was organized by Leslie Davis, Nanna Noe-Nygaard, and Brian Reeves. Seven meetings discussed procurement and processing of Pleistocene animals, including mammoth, bison, antelope, cervids, and sea mammals.

Plans are currently being made to publish the proceedings of the Congress. The *Trumpet* will list it in New References and Resources when it is available.

Archaeological Geology Division of the GSA

Most of the Archaeological Geology Division activities were focused on the annual meeting of the Geological Society of America, held in San Antonio, Texas, November 10-13, 1986. At the meetings, John Gifford, the new Division Chair, organized the Division symposium entitled *Surveying and Prospecting for Archaeological Sites*, in which 10 papers were presented. In addition, 13 oral papers and five poster papers were presented at the general session.

The Division adopted a new policy of interest to students. Beginning in 1987, the Division will pay the registration fee for up to three GSA student members giving papers on either the Division symposium, the Division general session, or the Division poster session. The tentative title of the Division symposium for the 1987 annual meeting to be held in Phoenix is *Archaeological Geology of Human Origins and Civilization*.

Prior to the meetings in San Antonio there was a Division-sponsored field trip entitled "Archaeological Geology of Classic Paleoindian Sites on the Southern High Plains, Texas and New Mexico," organized by Vance Holliday. A total of about 25 people participated in the 2-day tour which focused on the archaeology, geology, and history of investigations at the Lubbock Lake, Plainview, and Clovis (Blackwater Draw Locality 1) sites. A number of past and current investigators at all three sites were involved in the trip and included Eileen Johnson and Vance Holliday (Lubbock Lake), Roberta Speer (Plainview) and Vance Haynes, Dennis Stanford, and George Agogino (Clovis). In addition, a particularly enjoyable aspect of visiting these famous localities was the presence and active participation of Glen Evans and Grayson Meade, who worked at all three sites, as well as a number of others in the region, for E.H. Sellards and the Texas Memorial Museum from the late 1930s into the 1950s. These gentlemen pioneered regional, interdisciplinary Paleoindian studies on the Southern High Plains, one of the first such ventures in North America.

A 129-page guidebook was published for the field trip. Copies are available for \$8.00 from the Department of Geography, Texas A&M University, College Station, Texas 77843.

Contributed by Vance T. Holliday, Department of Geography, University of Wisconsin, Madison, Wisconsin 53706.

UPCOMING

March 5-8, 1987 SOCIETY OF ETHNOBIOLOGY, 10th Annual Conference, Florida State Museum, University of Florida.

Contact: Elizabeth S. Wing, Florida State Museum, Gainesville, FL 32611; 904/392-1721.

March 13-14, 1987 ALASKA ANTHROPOLOGICAL ASSOCIATION, 14th Annual Conference, Sheraton Anchorage Hotel, Anchorage, Alaska.

Program chair: Jim Payne, Alaska Pacific University, Department of Anthropology, 4101 University Drive, Anchorage, AK 99508; 907/564-8216.

40th ANNUAL NORTHWEST ANTHROPOLOGICAL CONFERENCE, Salishan Lodge, Glendon Beach, Oregon.

Contact: Richard Ross, Department of Anthropology, Oregon State University, Corvallis, Oregon 97331.

March 25-28, 1987 SOUTHERN ANTHROPOLOGY SOCIETY, Annual Meeting, Ramada Hotel-Capitol Plaza, Atlanta, Georgia.

Contact: Tom Collins, Urban Studies, Memphis State University, Memphis, TN 38152.

April 3-5, 1987 CENTRAL STATES ANTHROPOLOGICAL SOCIETY, 63rd Annual Meeting, Victorian Inn, Columbus, Ohio.

Contact: James Hamill, Department of Sociology and Anthropology, Miami University, Oxford, OH 45056.

SOCIETY FOR CALIFORNIA ARCHEOLOGY, Annual Meeting, Fresno, California.

For further information contact Meeting Chair Greg Greenway, Forest Archaeologist, Sierra National Forest, 1130 O Street, Fresno, California 93721; 209/487-5163, or Program Chair Scott Carpenter, Park Archaeologist, Yosemite Res. Ctr., P.O. Box 700, El Portal, California 95318; 209/372-0462. Send abstracts to Program Chair by Feb. 1, 1987. For reservation information call 209/268-1000.

April 22-26, 1987 CANADIAN ARCHEOLOGICAL ASSOCIATION, 20th Annual Conference, Westin Hotel, Calgary, Alberta, Canada.

Abstracts of papers due January 7. Contact M.C. Wilson, Program Chair, Department of Geology and Geophysics, University of Calgary, Calgary, AB T2N 1N4, Canada, or Lesley A. Nicholls, Conference Coordinator, Department of Archaeology, University of Calgary, Calgary, AB T2N 1N4, Canada.

May 1-2, 1987 EXPLAINING ARCHEOLOGY'S PAST: THE METHOD AND THEORY OF THE HISTORY OF ARCHEOLOGY, Southern Illinois University at Carbondale.

Contact: Andrew L. Christenson, Center for Archaeological Investigations, Southern Illinois University Carbondale, IL 62901; 618/536-5529.

May 6-10, 1987 SOCIETY FOR AMERICAN ARCHEOLOGY, 52nd Annual Meeting, Royal York Hotel, Toronto, Ontario, Canada.

Program Chair: Timothy Kaiser, University of Toronto.

May 25-27, 1987 GEOLOGICAL ASSOCIATION OF CANADA - MINERALOGICAL ASSOCIATION OF CANADA Annual Meeting, Saskatoon, Saskatchewan, Canada.

Contact W.O. Kupsch, Department of Geological Sciences, University of Saskatchewan, Saskatoon, Saskatchewan, Canada S7N 0W0.

July 31-August 9, 1987 12th CONGRESS, INQUA, Ottawa, Ontario, Canada.

Contact Dr. Alan V. Morgan, Department of Earth Sciences, University of Waterloo, Waterloo, Ontario, Canada N2L 3G1.

September 1-7, 1987 UNION INTERNATIONALE DES SCIENCES PREHISTORIQUES ET PROTO-HISTORIQUES, XIth Congress, Mainz, West Germany.

For details contact Dr. K. Weidemann, Generaldirektor des Römisch-Germanischen Zentralmuseums, Ernst-Ludwig-Platz 2, D-6500 Mainz, Federal Republic of Germany.



OF THE PAST

(Continued from page 4)

students from ENMU. Haynes joined them, prepared to do geological studies funded by the National Science Foundation. To begin with, Haynes wanted to test the outlet with a coring operation to get an overall look at its general stratigraphy. "Now, coring is kind of a hazardous way of looking at stratigraphy, because you're looking at just that little segment of it; but for a first shot, it is the least destructive way to go."

Coring is an engineering testing technique. In Haynes' explanation, "They have a truck with a hollow auger. Down through the center of the auger they hydraulically force a meter-long tube into the ground like a biscuit cutter, so that they take out solid core segments. As long as you're in sediments that aren't cemented or full of gravel, this produces good cores about 6 cm in diameter for depths up to 9 m." The punch moves about a meter at a time; the hydraulic ram forces the core out of the tube into a cardboard tray. Several lines of almost seventy core holes were laid out across the outlet channel for about a half mile

Looking east into excavation trench at Blackwater Draw Area #2. Note the stratigraphy on the far wall of the trench. (Photos courtesy of C. Vance Haynes)

NATURAL HISTORY TRACES THE FIRST AMERICANS—

Natural History, published monthly by the American Museum of Natural History, has begun a 14-part series of articles concerning the peopling of the Americas. The series, which began in November, 1986, is divided equally into issue/method-oriented articles and site-oriented articles. Each of the articles will explore the evidence for the earliest human presence in the Americas along the lines of the author's beliefs and expertise.

The November issue featured the first article in the series, "Getting One's Bearings," by Knut R. Fladmark, reviews the environmental factors that would have acted as constraints on the peopling of the Americas. Given the well-dated archaeological sites that indicate people were present in the Americas around 12,000 years ago, one of the major questions becomes, "When did people first arrive?" This article presents the arguments and counter-arguments for many of the current hypotheses. It discusses some of the newer discoveries that challenge several old assumptions, namely: that the Laurentide (eastern North America) and Cordilleran (western North America) ice sheets reached their maximum expansion at the same time, completely covering the northern part of the continent; that late Wisconsinan (25,000 to 10,000 yrs B.P.) Beringia was the same rich steppe tundra that it was during the mid-Wisconsinan Interglacial (60,000 to 25,000 yrs B.P.); and that areas became devoid of life long before the glacier covered them. Boat-using people, who could have migrated at any time during the last Ice Age and survived in the sheltered shoreline environments of North America, and people crossing a winter-frozen Bering Strait during the mid-Wisconsinan Interglacial are two of the scenarios proposed in this article.

The second article in the series, "Pennsylvania Pioneers," by J.M. Adovasio and Ronald C. Carlisle, appears in the December issue. The first of the site-oriented articles, it discusses the history of and discoveries from Meadowcroft Rockshelter. Investigations at Meadowcroft began in 1973. Although they had few expectations for significant discoveries, radiocarbon dates from the first field season included one of about 15,120 years B.P., much earlier than expected in that area. However, dates obtained in subsequent field seasons confirmed the first one, with the oldest artifact (a piece of basketry) directly dated to

19,600 ± 2,400 yr B.P., a time near the maximum extent of the last glaciation—which would have come within 36 miles of the site. Tools found at that early level include a series of small, prismatic blades and one unfluted lanceolate projectile point unlike those generally thought to be associated with Clovis-age (circa 12,000 yr B.P.) sites. Although the fifty radiocarbon dates associated with major levels of the site are highly consistent, the archaeological community has been slow to accept the pre-Clovis dates. The authors hope that one day the evidence from Meadowcroft will be added to that from other well-dated sites to help resolve the issue of when the earliest Americans arrived.

The following is a tentative list of the authors and subjects of future articles:

- Christy Turner—"Telltale Teeth" Dental Evidence of Three New World Groups, with Origins in China about 20,000 B.P.
- William Irving—"New Dates from Old Bones" Old Crow Basin
- Donald Grayson—Extinctions and Faunal Change at the End of the Ice Age
- Paul Martin—Extinctions and Human Colonization
- Merritt Ruhlen—Linguistic Evidence of Three Migrations to the New World
- Dennis Stanford—Using Experimental Methods to Test Hypotheses at Selby, Dutton, etc.
- Stephen Zegura—Review of Attempts to Partition Genetic Variations of Native American Populations, and Possible Inferences
- Alan Bryan—Northern South America and the Isthmus of Panama
- Nikolai Dikov—Excavations in Kamchatka and Chukota
- Tom Dillaway—Monte Verde
- Niède Guidon—Toco do Boqueirão and Toca do Meio
- Cynthia Irwin-Williams—Valsequillo Basin

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—Barbara Harrity

or so to the south of the site. "And in an amazing number of those holes, we encountered bone: in some cases bone so dense that the core actually went through two layers. In other places it would be just chips and fragments." The other job in 1983 was to clear up the south wall, "so we could plot the stratigraphy and collect pollen samples, and at the same time look at the archaeology there and the faunal situation."

Consequently, when they returned to the spot in 1984, Stanford sank three test pits, of 30 to 40 m² each, one along the south wall and two down the outlet, on the basis of what they had learned in 1983. Then, on the walls of the test pits, Haynes mapped sedimentary strata so detailed that the geologist in him cannot help rising up to speak of them in glowing terms. For the strata on the test pit walls, although of course similar to those in the exploratory cores, can be seen in a much more detailed state. Haynes was able to separate them into six major divisions, A-G, and into as many as twenty microdivisions each. He has obtained from these a 12,000-year-old date on pre-Clovis organic material "that had been kicked around by the spring water."

The ever-recurring possibility of human evidence in the pre-Clovis level raises its head here: "If there was ever a place where the prospects for pre-Clovis are maximum it's Blackwater Draw . . . We have a number of places where there's faunal material from 20,000 years ago; we have several 15,000-year dates associated with good faunal localities; no evidence of man." As a matter of fact, not a great deal of archaeological material of any sort has been found at Blackwater Draw since 1983. A Folsom point was discovered in pit two, south of the south wall; Archaic-period artifacts were discovered associated with bison in the overlying sand.

But the hunt is still on: last summer, Anthony Boldurian then of Eastern New Mexico University, tested an area on the west side of the gravel pit, an area that in the past has produced a lot of Folsom material on the surface, and came upon some buried material that is indeed still *in situ*. Saunders, in his analysis of the bones previously excavated, discovered a mammoth tusk that obviously had been cut, then snapped: the Paleoindian people who hunted mammoth and bison at Blackwater Draw were clearly procuring ivory—for what purpose no one knows, though Haynes would not be at all surprised to uncover some ivory points like those that have come out of certain spring-fed rivers in Florida.

Haynes and Stanford have done no more excavating since the 1983-84 fieldwork. "We're trying to put that work together in such a way that it can be published and at the same time provide a data base for future work." And there remains, Haynes believes, an indefinite amount yet to be done. "It's an area where you have probably as complete a multicomponent site as has ever been found. There's Clovis there, there's Folsom, there's Agate Basin, there's material like Plainsview, Cody Complex, and Plains Archaic—in stratigraphic context. Associated with these are fauna very clearly showing changes with time, particularly in bison . . . And it contains material that is good for all kinds of paleoecological studies . . . It is, by the way, the first Paleoindian site in the New World where there was a deliberate interdisciplinary program: in other words, the work that was started by Howard not only involved archaeologists but some of the top geologists and paleontologists. So it was an integrated, interdisciplinary project—in the 1930s." Haynes goes so far as to speculate that there is a half-century's work left in the outlet to match the half-century's work that has been accomplished in the gravel pit—not to mention other items of interest such as a mound southeast of the site, beyond even the outlet draw. On the theory that it looked like a spring mound, Haynes and Stanford tested it and got a lot of bone; but because it is highly cemented, the bottom of it has not yet been reached. In both figurative and literal senses, the same is true of much else at Blackwater Draw.

—M. Dolzani

Editor's note: This article is the first in a series. The archaeological and paleontological findings at Blackwater Draw will be reviewed in future issues of the Trumpet.

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