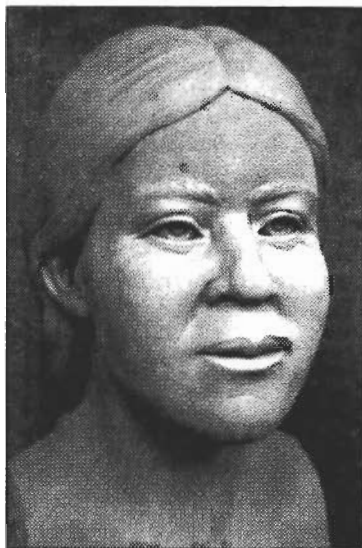




MAMMOTH TRUMPET

Volume 11, Number 4 • October, 1996

Center for the Study of the First Americans
355 Weniger Hall, Oregon State University
Corvallis OR 97331-6510



BETTY PAT. GATLIFF

Who Were the First Americans?

Distinguished artists have fleshed out the face of a Paleo-American woman who lay buried 9,000 years before being uncovered in a Texas archaeological site. Read "Putting a Face on Ancient People," beginning on page 8, "Reproducing the Irreplaceable," on page 9, and Part 2 of our interview with a specialist on human diversity on page 4.



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The Center for the Study of the First Americans fosters research and public interest in the Peopling of the Americas. The Center, an integral part of **Oregon State University**, promotes interdisciplinary scholarly dialogue among physical, biological and social scientists. The **Mammoth Trumpet**, news magazine of the Center, seeks to involve you in the late Pleistocene by reporting on developments in all pertinent sciences.

MAMMOTH TRUMPET



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Oregon State University, Corvallis, OR 97331

Department of Anthropology
ISSN 8755-6898

SIMPLE TOOLS, HEARTH FOUND BENEATH CLOVIS HORIZON

S.E. Virginia Site Yields 15,000-Year-Old Date

A field project this spring in southeastern Virginia confirmed the presence of one and probably two cultural levels beneath the site's well-established Clovis occupation. Volunteer researchers at the Cactus Hill site, 45 miles south of Richmond, found simple stone tools—blades and cores—in the pre-Clovis level, which has been dated to 15,070 years B.P.

This year's excavation was carried out between March 28 and June 15 with support from the Threatened Sites Program of

Virginia's Department of Historic Resources, through its Program Manager David K. Hazzard. Joseph M. McAvoy of the Nottoway River Survey says that more than 1,600 worker hours were volunteered on the project, which investigated approximately 1,400 square feet of the site. The 1996 project explored a part of the site between areas that the research team had previously excavated.

"In several excavation
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Two Places in Virginia



SALTVILLE SITE HAS EVIDENCE OF 14,000-YEAR-OLD FEASTS

Radiocarbon Dates in High-Resolution Context

Stone and bone tools, mastodon bones and ivory, fire-cracked rock, and other evidence found along an ancient river bank in southwest Virginia are giving scientists evidence they believe places people there nearly 14,000 years ago.

Radiocarbon dating from a site in the Saltville Valley indicates that humans probably butchered and cooked a mastodon over an open fire 2,500 years before conventional wisdom dictates people were in the

Americas, according to Jerry N. McDonald, team leader for a paleoecology research project under way since 1980. The dates and associated material are providing "probably the tightest confirmation" now available that humans lived in the United States more than 11,500 years ago, Dr. McDonald, a paleogeographer, said in a telephone interview.

Antiquity of the site was determined from twigs in a sand lens that integrates a variety
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CSFA GALA: Art, Authors, Archaeologists

Authors, Artists and Archaeologists is the theme of a gala dinner and art auction to be held Nov. 1 at the 5th Avenue Suite Hotel in downtown Portland, Ore. The event will benefit the **Center for the Study of the First Americans**. Participants will meet leading Northwest artists and writers, and view outstanding art works. Tickets for the event, available through the **CSFA** office, are \$100 each. 


In Our Next Issue

As museum collections of human bones all across the United States are being returned to tribes, scientists are scrambling to collect as much information as possible from the skeletal material. In our next issue, the **Mammoth Trumpet** will be reporting on how one expert team of physical anthropologists is analyzing material scheduled for repatriation.

What stories can bones tell? What kinds of measurements and assessments are being made? How is the information being preserved for future analysis? What knowledge is being lost? Can Native American groups be assured they are reburialing the remains of their own ancestors and not those of other groups?

Read about it in the January **Mammoth Trumpet**, which will be mailed to all **CSFA** members in mid-December. 

CSFA Information on World Wide Web


Text versions of 1995 and 1996 editions of the **Mammoth Trumpet** are available on the World Wide Web. You can find these and other information about the **Center for the Study of the First Americans** at the **CSFA** World Wide Web site at <http://www.peak.org/csfa/csfa.html>. Our Web site is the creation of **CSFA** volunteer Craig Skinner, a professional archaeologist and obsidian researcher. 

CLOVIS CLARIFICATION

An article in the July Mammoth Trumpet (MT 11:3 "Discoveries in Amazon..." p.19) suggested that most Clovis sites in North America were dated by averaging a number of charcoal samples. A scientist involved in dating Clovis sites, George A. Agogino, Distinguished Research Professor Emeritus at Eastern New Mexico University, offers the following clarification:

Most North American Clovis sites were not dated by using scattered bits of charcoal. I have been involved in five Clovis or Clovis-mammoth-kill sites: Blackwater Draw, New Mexico, in 1963; the Rawlins, Wyo., mammoth-kill site in 1959; the Dent site in Colorado in 1962; the Wapanucket No. 8 site in Massachusetts in 1964; and the Stollens Mammoth site in New Mexico, in 1980. The first three sites were worked in cooperation with geoarchaeologist C. Vance Haynes.

In these Clovis sites, we depended on tusk or bone to date these sites, not specks of charcoal from a common level. At Blackwater Draw and Rawlins sites, we used ivory from tusks as our medium for our basic dating. At the Dent site we used pulverized bone cleaned of preservative to obtain a firm date.

Perhaps your reference to sites dated using scattered bits of charcoal referred to the Lindenmeier site, where in 600 man hours Vance and I collected enough specks of charcoal from the Folsom layer to give the first radiocarbon date for the Folsom people at Lindenmeier. One earlier radiocarbon date was obtained for a Folsom horizon. I obtained charcoal from the Folsom level underlying the Agate Basin layer at the Brewster site in eastern Wyoming in 1959. 

—George A. Agogino



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| Robson Bonnicksen | Director and General Editor |
| Don Alan Hall | Editor, Mammoth Trumpet |
| Bradley T. Lepper | Editor, Current Research in the Pleistocene |
| Alice L. Hall | Office Manager |
| C & C Wordsmiths | Layout and Design |

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New Books

Humans at the End of the Ice Age: The Archaeology of the Pleistocene-Holocene Transition, edited by Lawrence Guy Straus, Berit Valentin Eriksen, Jon M. Erlandson, and David R. Yesner. Plenum Press, New York. 378 6¼-by-9¾-inch pages. 1996. \$65 (hardcover).

This compact book provides a synthesis of worldwide human responses to the environmental changes that occurred between 13,000 and 8,000 years ago. It is the product of the International Union for Quaternary Research's Working Group on Archaeology of the Pleistocene-Holocene Transition.

Its 18 chapters are grouped into four sections covering the Pleistocene-Holocene transition in Africa, Europe, Asia and Australia, and the Americas. Lawrence Guy Straus, chair of the working group, notes in the introductory chapter that there have been about two dozen transitions between glacial and interglacial conditions since ancestral humans first started making tools. "What happened around the globe between 13,000 and 8,000 years ago," he asks, "that led to the creation of the world of humankind as we know it in the present interglacial?" Part II includes chapters covering southern Africa, northern Africa, and southwest Asia. Part III covers archaeology in southwest Europe; resource exploitation, subsistence strategies, and adaptiveness in northwest Europe; the north European plain and Eastern Sub-Balticum; and the transition on the east European plain. Part IV covers Australia, southern Thailand and Southeast Asia; Japan and northeast Asia; and Siberia.

Part V will be of particular interest to **Mammoth Trumpet** readers. David R. Yesner introduces the section with a discussion of climatic change across the hemisphere. In the following chapter, Yesner reviews human adaptation in eastern Beringia using his own research at the Broken Mammoth site as illustrations. Next Jon M. Erlandson and Madonna L. Moss discuss the early archaeological record of North America's Pacific Coast. North America's Plains and Rocky Mountain area are covered by George C. Frison and Robson Bonnichsen, who review data bracketing the Pleistocene-Holocene transition period. The chapter on the eastern United States is by Dan F. Morse, David G. Anderson, and Albert C. Goodyear. Then Luis Alberto Borrero covers the period for southern South America.

Michael A. Jochim's conclusion to the book offers "Surprises, Recurring Themes and New Questions" in the study of the transition. Surprises he notes include evidence of early use of plants, use of prey animals after the time they had been thought locally extinct, and abandonment of certain regions. He concludes by summarizing four general sets of research questions raised by the book's authors.

Life Before Man (revised edition), by Zdeněk V. Spinar and Zdeněk Burian. Thames and Hudson, London. 256 8¼-by-11-inch pages. 1996. \$16.95 (paperback).

Although this new edition of the 1972 Czech publication does contain text, the attraction is the 180 color illustrations painted


by Burian. The final chapter on the Quaternary has many illustrations of Pleistocene elephants and other animals and early hominids.

When the Land Was Young: Reflections on American Archaeology, by Sharman Apt Russell. Addison-Wesley, Reading, Mass. 230 5-by-8¼-inch pages. 1996. \$23 (hardcover).

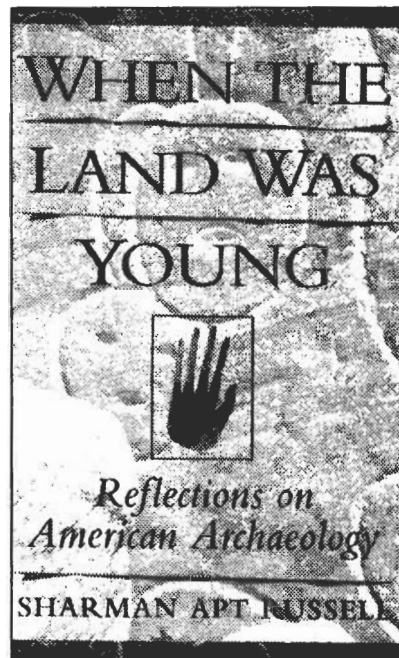
This sympathetic look at American archaeology by a sensitive essayist has much to recommend it to **Mammoth Trumpet** readers. The author reviews the accomplishments and problems of archaeology in a way that will entertain the thoughtful professional and instruct the reader with little or no background in studying the past by its artifacts. Her essay "Emotional Baggage," Chapter 2 in the book, is as good a review of the Clovis-first controversy as you'll find. She reports on her conversations with participants including C. Vance Haynes, David Whitley, and James Adovasio.

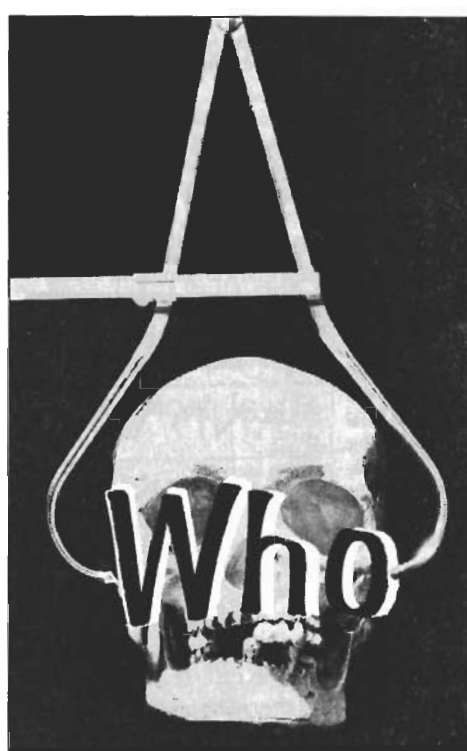
The following chapter, "Clovisia the Beautiful," includes the author's observations of the continuing Overkill debate between Paul Martin, architect of the theory that human hunters caused the extinctions of Pleistocene megafauna, and Don Grayson, who blames climate change. It's a wonderful scientific debate that is presented entertainingly.

Other essays examine nearly all of archaeology's controversies and sensitive issues—differences in perspective between women and men archaeologists, various perspectives on the reburial of human remains, and attitudes of Native Americans toward archaeology. She revisits "New Archaeology." Her guides include Bruce Trigger, Patty Jo Watson, Margaret Conkey, Richard Begay and Ben Rhodd. The author examines cultural resource management as well as the archaeological record of violent first contacts between Europeans and Americans. Her guides to regional archaeological treasures include field workers Todd Bostwick of Phoenix, Brad Lepper of Ohio, and Dale Croes of Washington, among others.

Every profession would benefit from the probing observations of a champion as understanding and compassionate as Sharman Apt Russell. 

—DAH





*An interview with a
specialist in human diversity:
Part 2*

Who Were the First Americans?

To investigate the question of who were the first Americans, the **Mammoth Trumpet** asked Marta Mirazon Lahr, a prominent specialist in human diversity, for her perspective. In our previous issue, Dr. Lahr discussed differences and similarities between Amerindian populations and North Asian or Mongoloid populations. Here, responding to questions by physical anthropologist Roberta L. Hall, Lahr describes her research on South American populations, ponders the question of where the first Americans came from, and comments on the value to science of human skeletal material.

Mammoth Trumpet You have studied the morphology of modern human skeletons from many sites around the world, including archaeological material several thousands of years old, and you have used these data to develop ideas about prehistoric migrations or population dispersals. We'd like to know more about

your ideas of how these skeletal remains and the physical anthropologists' methods help people understand the Paleoindians of the Americas.

Can you tell us a little more about the South American specimens you have examined. How many have you looked at and what sites are they from?

Lahr The southernmost part of South America—Tierra del Fuego and Patagonia—was occupied by a number of groups, separated both in terms of language and subsistence strategy from more northerly groups, and also among themselves along the Andes. These populations spoke languages, which according to [linguist Joseph H.] Greenberg, formed a separate subgroup within the major group called "Andean" (Araucanians, Quechua, Aymara, etc.). Therefore, according to linguistic classifications, they were part of a broader South American population, although relatively distinct. As Green-



Marta Mirazon Lahr is the author of *The Evolution of Modern Human Diversity: A Study of Cranial Variation*, and a detailed article on the origins of Amerindians in the *Yearbook of Physical Anthropology*, 1995. A native of Argentina who grew up in Brazil, she earned a bachelor's degree in biology in São Paulo, and master's and doctorate degrees from Cambridge University, studying with evolutionary biologist Robert Foley, Director of Cambridge's Duckworth Laboratory. She had a research fellowship at Clare College Cambridge from 1992 to 1995. Last year she accepted a lectureship in the Department of Genetics at the University of São Paulo where she teaches courses in evolutionary theory, medical genetics, and human evolution. Lahr is part of the King's College Human Diversity Project, which is headed by Dr. Foley. Lahr and Foley have published an article on modern human dispersals in the journal *Evolutionary Anthropology*.

berg once wrote to me, there is always a possibility that they once spoke an earlier non-Amerind language, but this cannot be either proved or disproved by linguistic methods, so it remains unknown.

Now to the groups themselves. These populations were divided along the Andes into eastern and western groups. The eastern population encompassed the Onas (Selknam and Haush, also known as Manekenk) of mainland Tierra del Fuego. The Tehuelches and Puelches of the Patagonian pampas (the southernmost part of Patagonia, south of the River Santa Cruz, and thus closest to the Fuegian populations) were occupied by a group that called itself the 'AONIKENK', all in present-day Argentina. These were hunter-gatherers, with emphasis on the hunting. They were very big people in terms of body build, and were specialist hunters of the plains—after tuco-tuco, a kind of rodent, and guanaco.

An interesting reference for the Onas is the observations made by Darwin in his travel in the *Beagle*, when he was so impressed to see these people going about naked and barefoot in the snow. The western population had a much more restricted distribution (because of the geography of the place), encompassing the Alacaluf (Kaweshkar) and Yahgan (Yamana) from present-day Chile. These groups specialized in shellfish, but contrary to most maritime-specialized populations, they remained nomads, spending most of their life in canoes going through the Fuegian channels. The sad side about these populations is that they are all virtually extinct. The last Onas died this century, and I heard that a few Alacaluf are still alive in Chile. Really, they, together with the Tasmanians and so many other hunter-gatherer groups we're less aware of, form extinct groups of humans who lived until the nineteenth or twentieth centuries.

There are about 200 Fuegian skulls available to study in the world, some in relatively large series—as in the Natural History Museum in London, the Anthropology Institute in Florence, the Natural History Museum in Vienna, and in Musée de l'Homme—and the rest as isolated specimens elsewhere. I looked at 66 individuals from London, Florence and Vienna.

Because they were fully nomadic, there are almost no "sites" as such, just individual burials found throughout the areas they occupied. Accordingly, Fuegian remains are very rare.

Let me tell you a little about the circumstances of their findings and excavation. The remains in Florence are perhaps the simplest. A large number were collected by an Italian explorer called Bove in 1882, from various places, but others in that collection have almost no information more than the attribution to either Yaghan or Ona, or sometimes a line saying "found by the sea near Punta Arenas" by various individuals. The collection in Vienna is largely derived from the expedition of Gusinde in about 1919, and is mainly composed by crania from western Tierra del Fuego. He also bought some, which although clearly aboriginal, have their geographical origins unknown. The collection in the Natural History Museum in London is more complicated in terms of provenance, because almost each specimen has a different source, but also quite well documented. The material was almost completely collected last century by English and Welsh people who lived in colonies throughout the area who then would send the material to the British Museum by passing English ships. This information is usually recorded in the form of letters [see box, page 7] that are placed together with the skulls in the boxes—I always write them down in full, because I think it's wonderful to understand the minds of those people who, 100 years back or more, built these collections that we're now faced with losing.

MT When were they excavated, and how are they dated?

Lahr Dates? There are none. The material is, by the quality of the bone, recent, but that can mean anything from 200 to 2,000 years old, or maybe more. The sad thing is that material like this will never be dated because it represent single depositions and you'd have to date the lot. So any glimpse into the temporal diversity of these peoples has to come from new proper excavations. There are no such excavations on the Argentinian side of Tierra del Fuego going on right now, that I am aware of, but a team of Chilean archaeologists, in collaboration with researchers from Tel Aviv University in Israel, have been digging for the past four years a site in Isla Navarino (southernmost Chile), where a number of human remains dating to around 7,000 years ago have been unearthed. But these haven't been studied yet. That brings us to the date of occupation of the area. The earliest archaeological sites—like Fell cave, or Pali Aike in the Magellan Strait area, or Tres Arroyos in Tierra del Fuego—are around 11,000–10,000 years old, with continuous occupation since. These earlier sites all correspond to the terrestrial hunters. The earliest evidence of the western maritime people is around 7,000–6,000 years old.

There's an argument going on regarding whether the eastern and western populations of Tierra del Fuego represent two separate dispersals, or whether their differences were acquired from an original point of colonization. The western group, the canoe Indians, are relatively more gracile, and there were important differences in terms of subsistence



strategy, and the two populations were virtually isolated from each other. This argument still goes on, and really until there is material with associated dates that cover the Holocene, I don't believe the issue will be resolved. From the recent bones, I'd say they represent the same population that has acquired certain differences in place.

In terms of archaeological affiliations, these populations had a very simple level of technology until the present, but different cultural affiliations can be made. The earliest remains—from Fell Cave, Cerro Sota, and Pali Aike, locally known as Period I—are similar to other Paleoindian sites in the Americas. They are found with certain paleofaunas too, like *mylodon* (sloth) and the original South American horse. This Paleoindian period is characterized by projectiles known as fishtail points. These tools and all extinct fauna disappear around 9,000 years ago, and there's a change in the character of the archaeological remains—now mainly made on bone.

The first cave paintings correspond to this period—known as Period II. Between 8,500 and 6,000 years ago there's a dispersal of nomadic hunters from the north. These are people who shared archaeological features with a broader South American population, known as Period III. This was during the hottest interval of our present interglacial marked by the expansion of temperate forests in Patagonia and eastern Tierra del Fuego. There are several archaeological indicators of change during this time including shifts in tool form and in diet. Cremations also appear in some sites in Tierra del Fuego at this time. From 5,000 years B.P., there is an increase in the number of sites and spectrum of areas occupied, and the cultural character of the people is maintained until historic times.

I call them "peripheral" populations, and by this name I am not necessarily saying that these populations were totally isolated from the remaining population of South America (there may have been a period of further dispersal between 8,000–6,000 years ago), but by force of their geographic location, they were always peripheral to the main movements (cultural and geographical) within South America.

The agriculturalists to the north never filtered south into Patagonia, neither did the big Andean civilizations (even though these reached well into Argentina). The populations of Tierra del Fuego made simple huts of tree branches with animal skins on top. The people wore unshaped animal skins, which they wrapped around themselves as big coats with the furry side out. From ethnographic photographs, we can tell that they had intricate rituals in which body painting was very important. This area of southern Patagonia is rich in cave art.

In terms of resources, I don't think the environment there was ever poor, either during the Holocene or in historic times, although the temperature is an obvious factor of hardship. But in terms of resources, the canoe Indians had large sources of shellfish; they hunted marine mammals and some birds and caught fish. These resources were very abundant. The terrestrial hunters were well supplied with guanaco, rodents and other mammals, and birds. In earlier periods they hunted some now-extinct animals, too.

MT In one of the maps with your *Evolutionary Anthro-*

pology article you show dispersal routes 50,000 to 15,000 years ago that indicate migrations from Asia along the North Pacific Coast south into South America. This suggests that you see the earliest migration occurring along the coast, an idea that is gaining more favor generally, and that you see this migration in pre-Clovis time.

Lahr I drew the dispersal as occurring from a coastal route because of archaeological arguments I'd been reading about and not because of any morphological derivation. For me, the actual source of the ancestors of Amerindians within Asia is



In the multiple-dispersals model, from 50,000–15,000 year B.P., humans move into, within, and out of, Europe and Asia, and into the Americas, as indicated by the gray lines. Black areas indicate glaciers. From *Evolutionary Anthropology* 3:2 p55 figure 3(a2). Reprinted by permission of John Wiley & Sons, Inc.

still unknown. Along the Asian Pacific Coast there were generalized Mongoloid populations that could have been a source for the Paleoindians.

From more mainland areas, there were typical Mongoloid populations that could have been the source for such groups in the Americas. And, from Mongolia, in late-Pleistocene times, there were populations with Eurasian affinities that could have been yet another source, as the metric analyses of W. W. Howells and the genetic analyses of L. L. Cavalli-Sforza would point out. It should be noted, however, that other morphological and genetic sources don't point to a Eurasian contribution in the makeup of Amerindians.

I have no strong feelings about the timing of entry to the Americas, and at the time I drew those maps I thought the evidence from Pedra Furada was pretty strong. I have since been told by several people that it is really not enough to make a case, and I have been treating the colonization of the Americas as a process of the last 15,000–12,000 years. The morphology can be accommodated either way.

I view such a diagram very much as I view the whole of the multiple dispersals model I proposed with Rob Foley. That model was built upon an amalgamation of different lines of evidence, *and*—and this is an important *and*—by our attempt at filling the many lacunae in prehistoric data. The ideas portrayed in that model can be affected in two main ways. The



first is by significant changes in the interpretation of any of those lines of evidence that would affect the integration of data. The second is the obvious one, that is, by the actual discovery of new evidence that fills an existing lacuna in a different direction than that predicted by us.

So how do I see these maps and these reconstructions? Definitely, I don't see them as a final word, but they serve as a framework of hypotheses that then can be tested with available data (and the available data are a constant changing parameter!). Whether there was a pre-Clovis colonization of the Americas, for me remains a hypothesis to be tested by every early site found—by first Clovis sites in terms of the sterility of lower layers, and by claimed pre-Clovis sites in terms of archaeological context of earlier layers.

Even if we do move towards wide acceptance of a 12,000-year date of entry, those tests should be fairly made each time. I find that in human evolution we're always having the most wonderful surprises. After such long discussions on the Javanese *Homo erectus* dates, there was a clear consensus that nothing there was much older than 1 million years old, a figure that then was cited everywhere. Then suddenly, [geochronologist C. C.] Swisher's dates push the whole thing back to close to 2 million years!

There is something else regarding the dates that may be interesting. I said above that the morphological data really have no implications for the dates, and this is true as long as it is accepted that not all Amerindians are typical Mongoloids. Because if you take another view, that all human remains in the Americas have a typical Mongoloid morphology, then they must have entered the continent *after* such morphology evolved in Asia, and that was relatively recent. So in a way, my interpretation of the morphological data, like that of Steele and [Joseph] Powell and Neves and [Hector] Pucciarelli, does not point towards an early date, but *removes* a constraint towards a late date.

MT What studies of existing skeletal data do you think


would be particularly helpful to go further into the analysis of Paleoindian dispersals and morphology?

Lahr I'll tell you what I'd do if I had loads of time. I believe that a study of morphological diversity through time—up to and including the present—within the Americas and north-eastern Asia would be wonderful, but to be really valuable, it would have to be done as comprehensively as possible, and by that I mean including as many populations as possible, small groups, the "demes" as it were. Because only then would we understand the complex process of differentiation and gene flow that took place. The other point is, of course, an attempt at integrating morphological diversity and cultural diversity, but that is plagued with problems of unit definition and meaning.

MT How important do you think additional skeletal remains in the Americas might be in answering some of these questions concerning human dispersals? We have very few materials.

Lahr I can't stress enough how important new human remains—fossil and recent—would be for the analysis of morphological diversity. Each fossil is either the face of ancestors of recent groups (and thus a glimpse into temporal change) or the face of an extinct group that, although not part of the makeup of present diversity, may have played a crucial role in the step-wise process of differentiation. That information can only be obtained from the bones.

MT You mean that each specimen is particularly precious?

Lahr Yes, the fact that we have so few fossil remains in the Americas means that each is particularly precious, because each fossil may actually be disclosing a previously unknown group. But even when remains are more common, each is still precious, for numbers translate into statistically stronger tests of hypotheses. 

Excerpts from letters accompanying human skulls presented to the British Museum



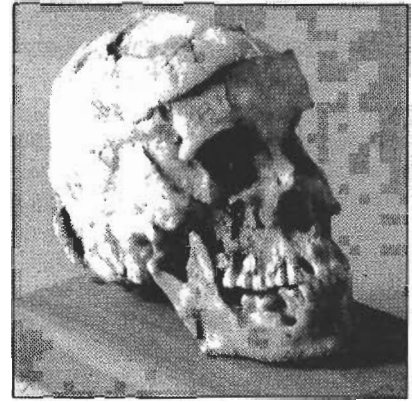
"... Cranium of a Patagonian from Sandy Point, Strait of Magellan. Obtained by Dr. R. O. Cunningham, from H.M.S. *Nassau*, presented by the Admiralty in 1869."

"... Skull from an aged Patagonian Indian found in a valley on E. on Monte Dinero. Found in 1903 or 1904 buried 2-3 ft under stones in sandy soil half a mile inland and 8½ nautical miles due W. of Cape Virgins at E. entrance of Strait of Magellan. Indian graves frequent on this coast, and all buried in a sitting posture. The tribes who hunted in the district were the 'Tehuelches' or southern Patagonian Indians, who kept and cared for their aged relatives. Pres. by H. W. Fenton, Esq., 1916."

"... Skull of a Fuegian. Found in 1879, buried in an old shell-heap near Ushuaia, in Tierra del Fuego. The whole skeleton was found, and was said by the donor (who examined the bones) to be that of a "remarkably tall man." The shell-heaps were the general burying places of the natives before they had spades and other implements. Yaghan or Southern Canoe Tribe. Pres. by Rev. Thomas Bridges, of the South American Missionary Society, 1880."



BETTY PAT. GATLIFF



ARTHUR H. RATHJEN/©1996 DOW CORNING

Wilson-Leonard II as modeled by Betty Pat. Gatliff, an expert in forensic facial reconstructions who operates the SKULLpture Lab in Norman, Okla.

Putting a Face on Ancient People

FACIAL RECONSTRUCTIONS done for archaeological or forensic purposes conjure up an air of mystery. The viewer marvels at the skill involved and wonders how the artist was able to arrive at this distinctive and recognizable face when all she or he had to work with was the skeleton. A step-by-step description of the process can take away the mystery but in no way diminishes the remarkable nature of the achievement of recreating, for example, the face of a young American who died about 10,000 years ago.

In 1983, archaeologists of the Texas Department of Transportation investigated an ancient campsite lying near the proposed extension of a farm road on

Brushy Creek about 20 miles north of Austin. At a depth of about three meters, their excavation encountered a human skeleton—a woman who had been buried lying on her right side with her knees drawn upward in the fetal position. Her arms were flexed with her head resting on her right hand, the left hand resting on the right wrist (*Mammoth Trumpet* 2:1 “An Early Holocene Burial at the Wilson-Leonard Site”).

Subsequent analysis revealed that the woman, known initially to the crew as Leanne because the burial was within a soil zone known as Leanne, had been about 28 years old when she died between 9,800 and 10,000 years ago. Not only was she one of the six most complete

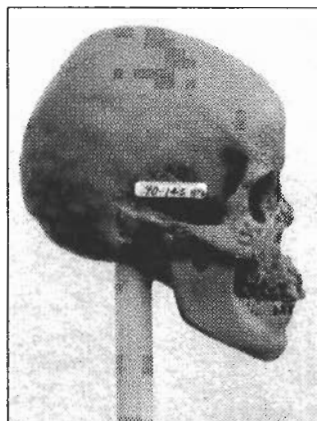
Paleo-American skeletons ever found in North America, she was one of the earliest humans found in this hemisphere. For more than a decade, physical anthropologists have studied and analyzed her skeleton, now known as Wilson-Leonard II because it was the second burial found at the site.

In 1990, in an effort to find out how the earliest Americans may have looked, D. Gentry Steele, a physical anthropologist at Texas A&M University, enlisted the aid of Betty Pat. Gatliff, an expert in forensic facial reconstructions, to work with Wilson-Leonard II. It would be a daunting task because though complete, the skull had been crushed to one-third of its original width by the weight of the overlying

sediments. Gatliff was up to the task—she had sculpted over 140 facial reconstructions on unidentified forensic cases that have ultimately resulted in 105 identifications.

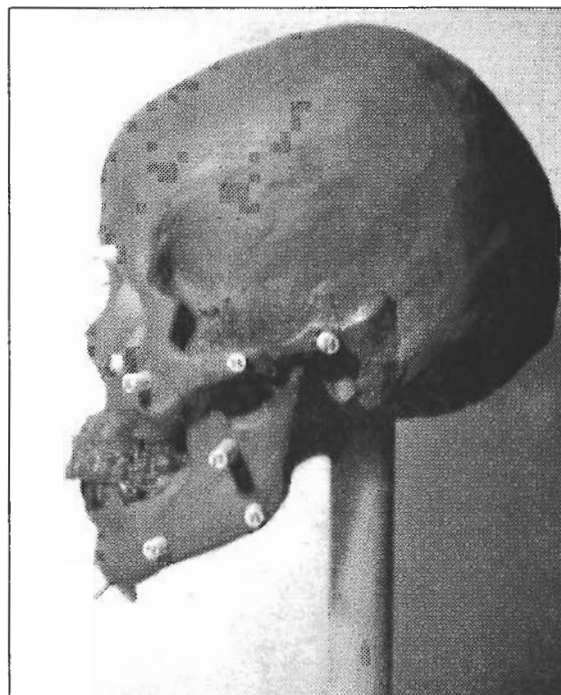
Gatliff, who has a bachelor's degree in art from the Oklahoma College for Women, is retired from the Federal Aviation Administration where she worked for 27 years as a medical illustrator. In addition, she also has 30 years' experience doing facial reconstructions in clay for police agencies and various museums.

Although the majority of her work is connected to forensics, she has also done reconstructions of a historical nature. A Florida museum commissioned her to do the face of Spanish conquistador Francisco Pizarro. She has done seven sculptures for the Custer Battlefield, three of which resulted in identifications. And in 1983, she did a facial reconstruction of King Tut for the Egyptology Society of Miami. It was pictured in *Life* magazine in 1983 and in *National Geographic World* in 1985.



BETTY PAT. GATLIFF

From an acrylic casting of the original skull, Betty Pat. Gatliff used clay to create a reconstruction (above), to which tissue-thickness markers were added (right).



BETTY PAT. GATLIFF

A Special Problem

Gatliff relies on the anthropologist or archaeologist with whom she works to sup-

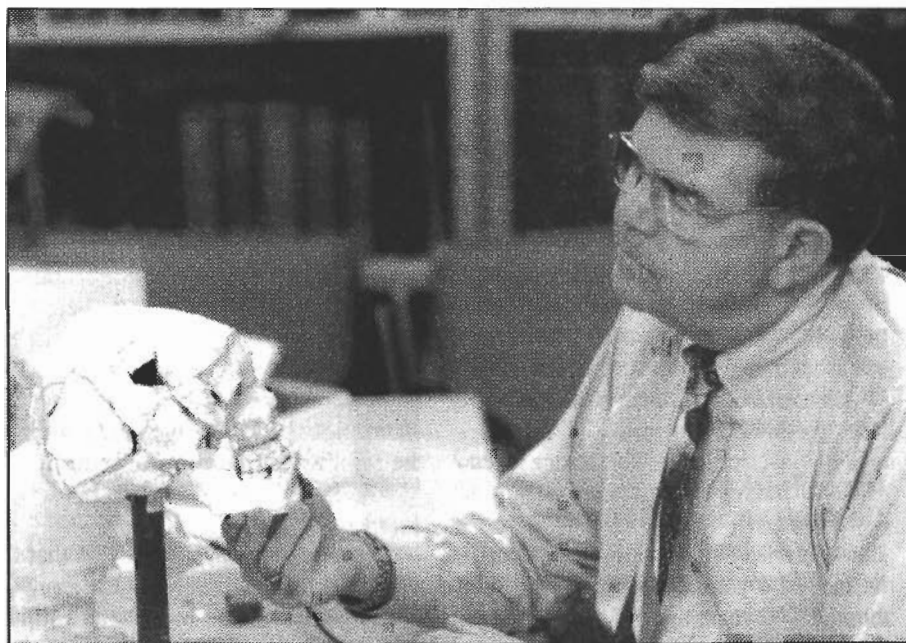
ply her with the age, sex and race of the skull before she can go to work on the sculpture. The compressed skull of Wil-

Reproducing the Irreplaceable

HUMAN REMAINS from ancient archaeological contexts are storehouses of scientific information that may hold clues to questions of human origins and migrations, as well as to the health of living people.

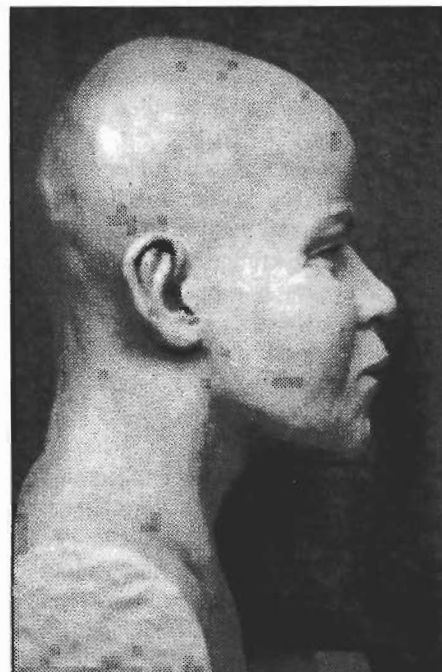
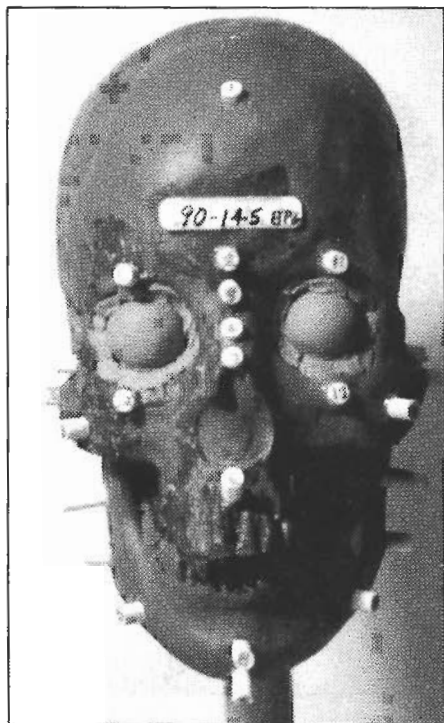
Human remains are also considered sacred, and in the United States remains of native American prehistoric people are protected under the Native American Graves Protection and Repatriation Act. Before human bones from archaeological context are repatriated to tribal groups, scientific teams attempt to preserve as much of the information that they offer as is possible. One aspect of the preservation of scientific information is the physical duplication of original materials with high-quality casts that continue to display detailed information about the original material long after skeletal remains themselves have been repatriated.

Replication of the Wilson-Leonard II
continued on page 12



ARTHUR H. BATHJEN/©1996 DOW CORNING

Denis Lee, professor of medical and biological illustration and professor of post-graduate medicine at the University of Michigan School of Medicine, examines the cast of the uncorrected Wilson-Leonard II skull.



BETTY PAT. GATLIFF (AU)

After tissue-thickness markers were in place, Gatliff added clay to create her model.

son-Leonard II presented a special problem that Dr. Steele and Gatliff worked on together. It was necessary to first make a cast of the skull. Gatliff then cut the cast into pieces with a dental burr, a small rotary cutting tool, and refitted them, with measurements given to her by Steele, to approximate the original shape of the skull.

"To facilitate her work," Steele says, "we estimated the natural shape of the Wilson-Leonard female's braincase, basing our work on the specimen itself and on the cranial shape of the other Paleoindian females. . . . It was apparent that the Wilson-Leonard female, like the Paleoindian females from Pelican Rapids and Gordon Creek, had a relatively small face with a distinctive alveolar prognathism," the forward projection of the upper jaw (a trait more common in today's European and African people than in Asians).

Tissue Thickness

The shape of the face is based upon the relationship between the location, size, and shape of the features of the skull in conjunction with a measurement of tissue thickness at 26 points on the head. A series of tissue-thickness tables have been constructed by authorities through the years. Depths of soft tissue differ by

sex, race, and body build (emaciated, normal or obese), with separate tables being compiled for each. By using these tables, the sculptor can arrive at a general shape of the face for that particular skull.

For archaeological reconstructions, Gatliff chose to use the tissue-thickness tables compiled by Kollmann and Buchly in Vienna in 1898. They were based on the diet and lifestyle habits of nineteenth-

*She is one of the
earliest humans found
in this hemisphere.*

century Europeans and probably come closer to representing ancient Americans than would measurements of modern-day Americans.

Each tissue thickness is a measurement in millimeters of skin, muscle and fatty tissue at 26 standard spots on the head, taken before embalming by inserting a needle in cadavers within 24 hours after death. To compile the table, measurements were taken from several cadavers of a particular type at specific points on the skull and then averaged.

Referring back to the tissue-thickness table, a measured cutting is then taken for each of the 18 facial landmarks from a rubber material that resembles a pencil eraser. Each is glued to its corresponding place on the skull.

Then modeling clay is applied between these rubber-marker reference points, thus forming the basic shape of the face. The depth of the rubber markers, Gatliff says, "tells me how much clay to put on that particular bone to give me the shape of the face. Then all the features are measured on that individual skull—the width of the nose, the projection of the nose, the placement of the eyes, the width of the mouth, and so on."

The Mouth

The formation of the mouth is the next step in the facial reconstruction process. It is the front teeth that form the shape of the mouth with the lips covering the six front teeth. Three measurements are needed to form the "mouth barrel," says Gatliff:

1. The depth of the upper lip margin is provided by tissue marker No. 7.
2. The vertical thickness of the lips is obtained by measuring gumline to gumline on the teeth.
3. The width of the mouth is approxi-

mately the distance between two lines radiating out from the junction of the canine and the first premolar on each side.

The mouth barrel is then bent around the teeth, and the parting line of the lips is created horizontally along the halfway line and to each edge to mark the width (or corners) of the mouth. Chin and cheek areas are then connected to the mouth barrel. The lips are spread, rounded and striated so as to give a lifelike appearance and texture.

The Eyes

For the eyes, Gatliff prefers to use plastic prosthetic eyes, which help to give the sculpture a more realistic look. It is also possible to carve the iris and pupil out of a ball of clay.

The eye is a ball that is centered within the bony orbit. The apex of the cornea is approximately tangent to a centrally located line drawn from the superior and inferior margins of the orbit. The eyelids bend around the eyeballs and give them a three-dimensional quality. The lower lid comes up to the bottom of the iris and the pupil seems to hang from the upper lid. She says there doesn't appear to be any standard relationship between the shape of the orbit and the shape of the individual's eyelids.

Gatliff says a pleasant quality can be given to the face by closing the eyelids slightly and forming a little puff under the eye, which makes it look as if the person is just starting to smile.

The Nose

In order to reconstruct the nose, two measurements are needed—the width and the projection. To compute the width you measure the bony nasal aperture at its widest points and increase the dimension by 10 mm for Europeans and Native Americans or by 16 mm for Africans. The projection of the soft tissue of the nose is three times the length of the nasal spine. Then, says Gatliff, the tip of the nose is connected with the bridge and built out with clay to the width measurement. She says there seems to be a relationship between the shape of the bridge and nasal spine and the shape of the tip of the nose. The wings (lateral portions) are then rounded and the nares (nasal openings) carved out to complete the nostrils.

SUGGESTED READINGS

ON Human Morphology

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Lahr, M. M. 1995 Patterns of Modern Human Diversification: Implications for Amerindian Origins. *Yearbook of Physical Anthropology* 38:163–198.

Lahr, M. M. and Robert Foley 1994 Multiple Dispersals and Modern


Human Origins. *Evolutionary Anthropology* 3(2):48–60.

ON Putting a Face on Ancient People

Snow, C. C., B. P. Gatliff, and K. R.

McWilliams 1970 The Reconstruction of Facial Features from the Skull: An Evaluation of its Usefulness in Forensic Anthropology. *American Journal of Physical Anthropology* 33:221–228.

Gatliff, Betty P., and Clyde C. Snow 1979 From Skull to Visage. *The Journal of Biocommunication* 6:2.

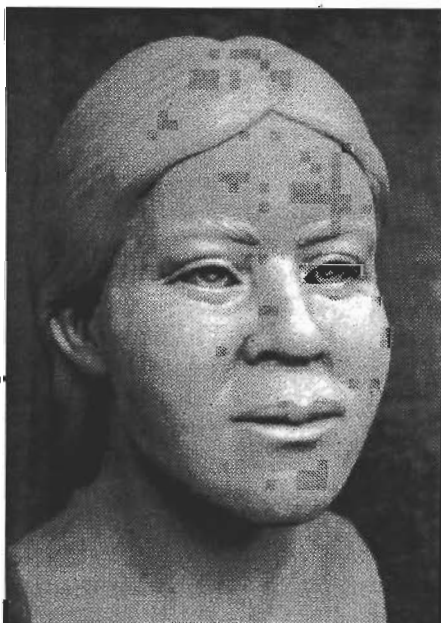
Glassman, D. M., Gatliff, B. P., and R. McGregor 1989 Applications of Facial Sculpting to the Biological Study of an Archaeological Population. *Journal of the Plains Anthropological Society* 34:125:223–231. 

The Ears

Although there is no way to know the exact shape of the ears, there is a rule of thumb that the ear and nose are approximately the same length, says Gatliff. The ear is constructed in the following stages:

1. A C-shaped bit of clay is formed to be the concha (the external ear's central concavity) and spreads at the top for the antihelix (the relatively flat elongation that spreads out and above the concha).

2. The helix, the curled outer extremity, is curved around and fastened to the antihelix and around the concha.
3. The lobule, or lobe, is flattened and added to the lower portion of the ear, under the concha.
4. At this point the ear is attached. To properly place the ear, the external auditory opening of the concha should be at the top of the tragus, the prominence in front of the opening. The ear is tipped back at about 15 degrees.
5. The tragus is constructed and attached and then smoothed into the cheek and the ear is complete.




After adding hair, the model of Wilson-Leonard II is complete. A bronze cast is on display at the Houston Museum of Natural Science.

The Hair

With facial reconstruction now complete, only the hair remains to be depicted. For Wilson-Leonard II, medium-length hair falling below the earlobes on the sides was chosen. A bronze casting of Wilson-Leonard II is currently on display at the Houston Museum of Natural Science.

Cost

As might be expected, Gatliff charges more to do a sculpture destined for a museum bronze casting than for a forensic case. A forensic case, for which the charge is \$1,000, usually takes her about three days, while a museum sculpture may take four or five days and cost somewhat more. 

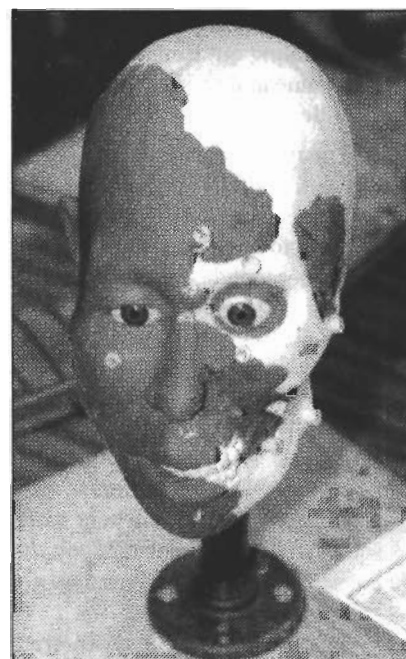
—Carol Ann Lysek



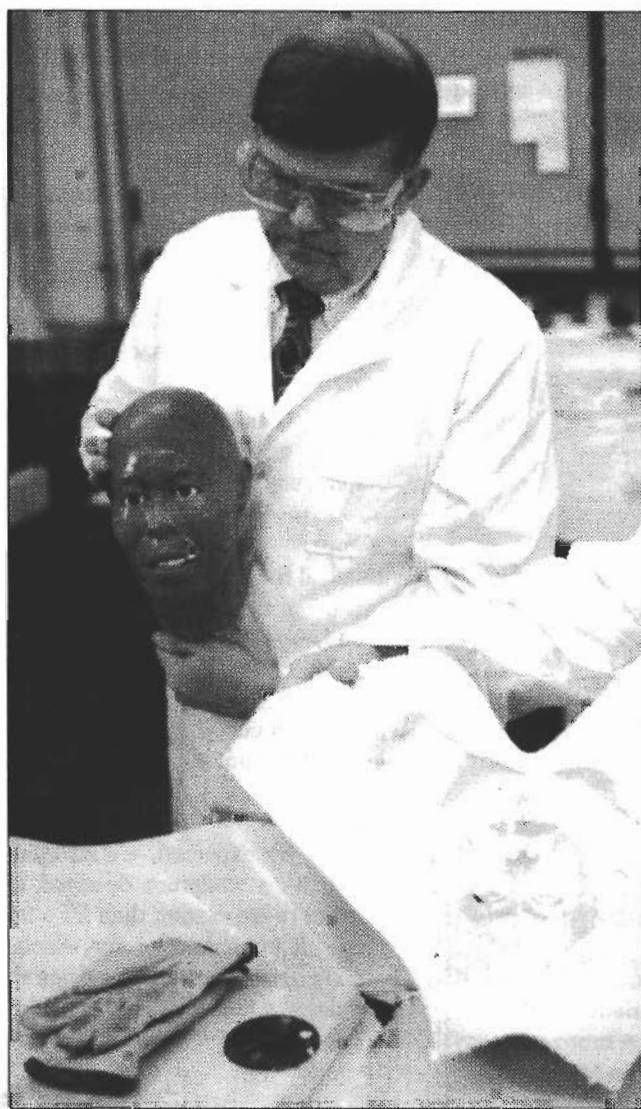
Clockwise from left:
A high-quality cast, such as this one of the Wilson-Leonard II skull, provides detailed morphological information after the original skeletal remains are no longer available to scientists.

A step in Prof. Lee's process of creating a life model from the Wilson-Leonard II skull.

Lee, who also directs the graduate program of medical and biological illustration at the University of Michigan School of Art and Design, holds the face he has created.



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Creating Casts

continued from page 9

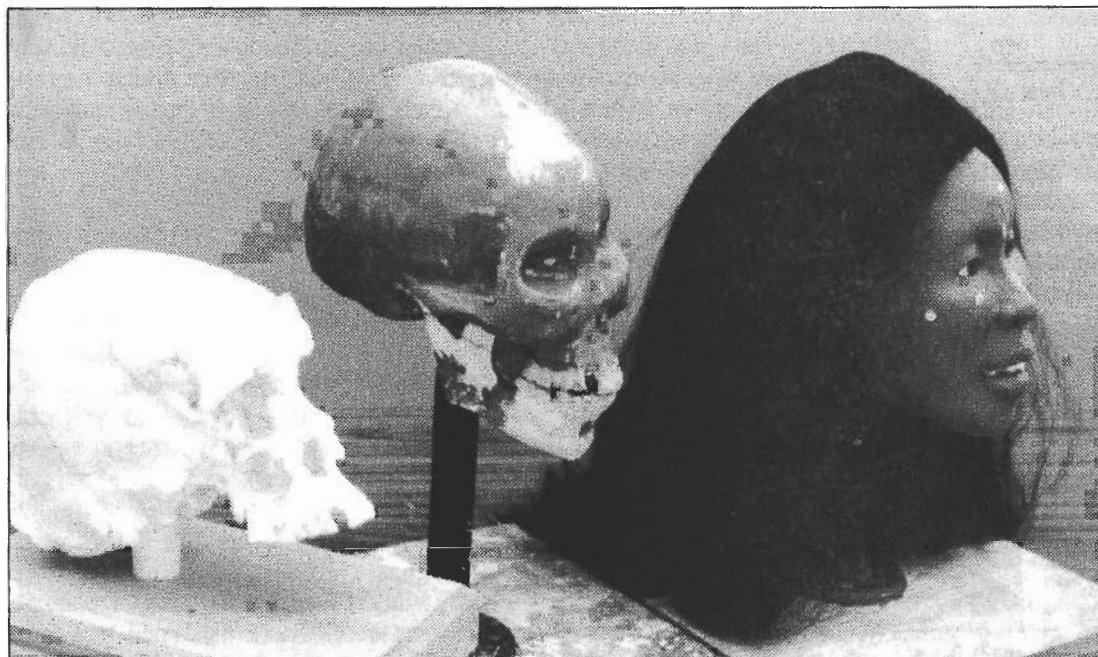
skull is one such project. Physical anthropologist D. Gentry Steele of Texas A&M University said that more than one cast has been made to preserve information about this Paleo-American woman. Dr. Steele, who for several years has been studying the cranial morphology of North America's oldest human remains, explained that the project was carried out by Denis Lee, a renowned medical illustrator and sculptor, and the Dow Corning Corporation, long known for its expertise in silicone polymer chemistry and the manufacture of a variety of mold-making products. Lee, professor of medical and biological illustration and professor of postgraduate medicine at the University of Michigan School of Medicine, also directs the graduate program of medical and biological illustration at the University of Michigan School of Art and Design. He prepared a cast of the skull in its unreconstructed condition, another as it likely appeared before being deformed during its long burial. Subsequently he created a reconstruction of the face.

Lee is now working on another reconstruction of the skull, said Steele, seeking to create one that is even more accurate.

To learn about the casting project, the **Mammoth Trumpet** interviewed Arthur H. Rathjen Sr., director of medical/professional liaison for Dow Corning in Midland, Mich. Rathjen began by explaining that Dow Corning has long been involved with research projects in conservation with the Department of Nautical Archaeology at Texas A&M University.

"While visiting Texas A&M last fall, I was asked to speak with Gentry Steele about the problem of replicating the Wilson-Leonard II skull before it was repatriated," said Rathjen. After talking with Steele, he agreed to undertake the project.

"In October 1995, we took the skull into the lab and over a three-day period made negative molds of the original skull and mandible. Once we had the silicone negative mold made, we poured the positive molds."



ARTHUR H. RATHJEN/©1996 DOW CORNING

The three principal stages of casting and modeling the Wilson-Leonard II woman: the cranium as it was discovered; the skull as it probably was at death; Prof. Lee's life model complete with hair.

The process was supervised by Dow Corning's top molding specialist, Robert Kelly, a veteran of 34 years with the company. Besides Lee, the project involved C. Wayne Smith of Texas A&M.


"The entire process, including subsequent reconstructions of one of the replicated skull molds, and a final head reconstruction to accurately simulate what this Wilson-Leonard II female would have looked like, was documented on film and video tape," says Rathjen. Specialists interested in an instructional video tape on the lab work involved may contact Rathjen at P.O. Box 994 Mail No. CO1108, Midland MI 48686-5913.

These reconstructions of the Wilson-Leonard woman received considerable publicity at a cultural festival in Michigan

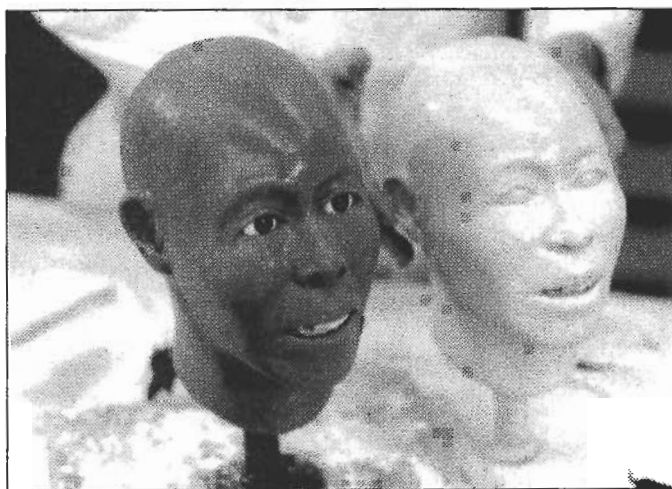
*Any anthropologist or archaeologist
should be able to make a reproduction.*

when Steele, Lee, and Kelly gave presentations about the reconstructions that were featured in news media, including Cable News Network.

Top technicians and scientists can make extremely high quality reproductions of archaeological material, but what about the ordinary archaeologist? Rathjen says the answer is simple: "Using the same mold-making and release material that we used, and paying attention to detail, any anthropologist or archaeologist would be able to make a reproduction."

Noting that Dow Corning undertook the Wilson-Leonard project as a favor to Texas A&M because of long-standing research programs there, Rathjen said that he and Lee, with whom he has worked for more than 20 years, have discussed the possibility of a replication service that would be functional and that would cover expenses. 

-DAH



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Above, Two steps in creating a life model. Below, Working on the model are Dr. C. Wayne Smith of the Texas A&M University anthropology department's conservation research lab, left, and Prof. Lee, who is holding the skull.



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Cactus Hill Site

continued from page 1

units where there was a clear Clovis presence there also was an indication of site use before Clovis," McAvoy reported. "The most identifiable artifacts found below the Clovis level were consistently of one type—core blades of local quartzite."

Clovis-era tools from the site tend to be made from a fine grade of chert.

"We can see what appears to be two periods of occupation before Clovis," McAvoy said in a recent telephone interview. Further, there seems to be a progression from larger quartzite blades and blade cores to smaller ones.

The site is in an area of old sand dunes that became a sand mine. It is near the

interior of southeastern Virginia's coastal plain on the floodplain of the Nottoway River, a small river that drains the relatively moist region before joining with two other rivers to ultimately discharge into the Albemarle Sound in North Carolina.

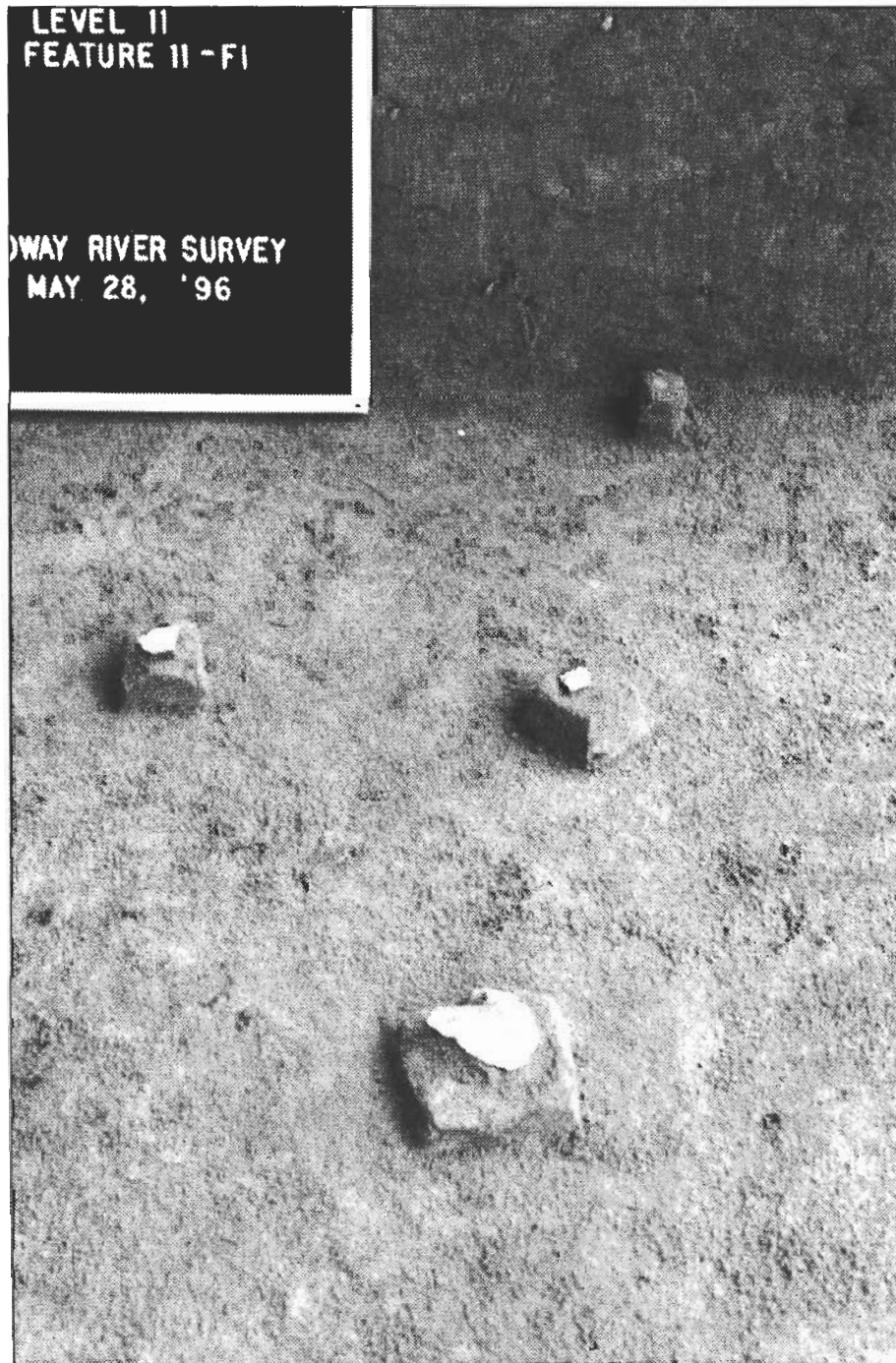
Curiously, the Cactus Hill site was initially located by a discovery in the next county. Two local collectors found artifacts alongside a logging road in Dinwiddie County. They realized that their discoveries were old—early Archaic-period projectile points—and that the source was road ballast that had been trucked in to keep log trucks from sinking into the local clay. They traced the source of the material to a sand mine across the Nottoway River in Sussex County. There, Union Camp Corporation owns a 1,400-acre hardwood tree farm with the sand pit in the middle of it.

The collectors reported their finds to the Nottoway River Survey, which was then investigating another site about three miles up the river. McAvoy said that a few excavations at the edge of the sand pit did not reveal a great deal, but he met collectors who had dug up three Clovis points from the site. Further, Mike F. Johnson, an archaeologist with Fairfax County, Va., who was conducting the Virginia fluted-point survey for the Archaeological Society of Virginia, had recorded two more Clovis points from the sand pit, officially site 44SX202, called Cactus Hill because of the prickly pear cactus that cover the ground there.

"We had not seen sites down in the river flood plain that had produced five fluted points," said McAvoy, "so Mike Johnson and I immediately started to organize independent, larger excavations of the site." Begun in October 1993, the Nottoway River Survey excavation, which was directed by McAvoy, yielded, among other things, the 15,000-year-old-date. Johnson and McAvoy have each worked at the site at various times, several times a year.

The land owner has been cooperative, setting the archaeological site aside, and no longer mining it or taking timber off of it. However, the surface probably has been altered considerably. The area has been farmed since the early 1700s.

McAvoy said there is about a meter of cultural material now buried about a



Below the Cactus Hill site's Clovis level, the last of three clusters of blades discovered earlier this year is pictured in situ on the floor of the freshly excavated unit.



Joseph M. McAvoy of the Nottoway River Survey, center, describes work at Cactus Hill to visiting archaeologists. From the left are C. Vance Haynes of the University of Arizona, Jack Holland of the Buffalo Museum of Science, McAvoy, Dennis Stanford, Chairman of the Department of Anthropology at the Smithsonian Institution, and Kenneth B. Tankersley of Kent State University.

meter deep. "In areas of the dune that are very old, we see lamellar banding." Fine layers of silt represent a secondary geological process in the formation of the soil. "All the Clovis material that we have found has been in areas of very heavy lamellar banding." The finds include a Clovis hearth with chert tools found in 1994 by the survey. The hearth included a scatter of hard southern pine charcoal that dated $10,920 \pm 240$ years B.P. (Beta 81589).

During the 1993 excavation, the Nottoway River Survey team came upon a Clovis working surface in a lamellar silt band. They found a fragmentary fluted point—three pieces that fit together, and then a complete fluted point as well as a variety of other lithic tools, but no hearth. They took the excavation down another level and into a lower silt band.

"Towards the bottom of that level, we hit a scatter of carbon that all appeared to be in the same silt band, undisturbed below and capped by the Clovis working surface," McAvoy said they initially assumed it to be a Clovis hearth set about three inches below the working surface and sent carbon samples to a radiocarbon laboratory for dating and to an archaeobotanist for identification.

Lucinda McWeeny of the Yale Uni-

versity Herbarium identified carbonized wood from the hearth as white pine. "We were excited about that," McAvoy said, "because white pine is no longer in this area of Virginia. It has now receded a hundred miles up to the slopes of the Appalachian Mountains, so here we had charcoal of a wood species that probably hasn't been in this area for at least 10,000 years."

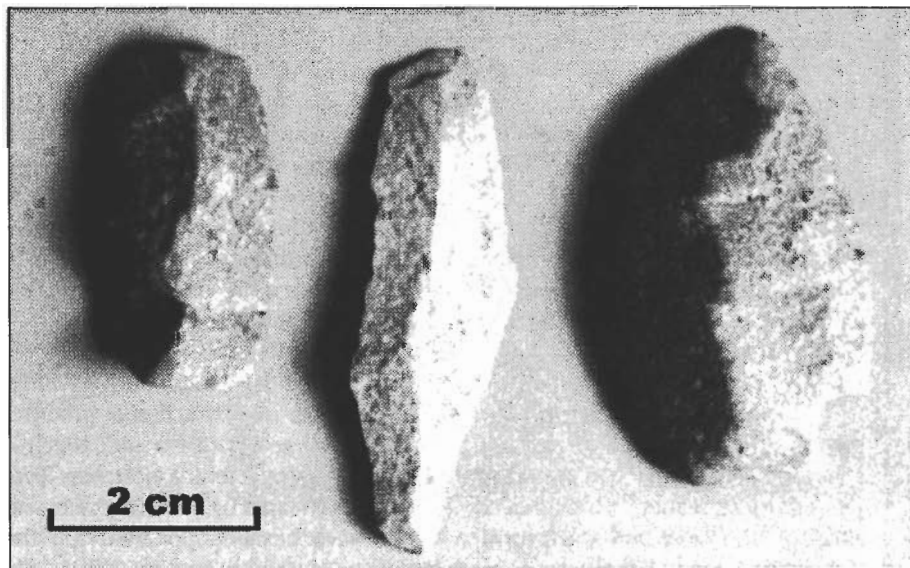
Then they received their accelerator

mass spectrometer date from the lab— $15,070 \pm 70$ years B.P. (Beta 81590)—and they knew they were dealing with something older than Clovis. Either the feature with its seven quartzite flakes and three quartzite core blades had somehow drifted down from the Clovis level into a level with charcoal where a white pine had died in a forest fire or lightning strike, or else the apparent hearth with its lithic materials was from a cultural occupation older than Clovis. Nearby excavation units at the site also revealed core blades and cores below Clovis material. But, as McAvoy noted, sandy sites pose questions of stratigraphic integrity.

Study of the lithic material continued, but obviously more investigation would be needed.

"We undertook the work this past season to try to determine if we could again find material that looked like it was in undisturbed context below the fluted-point working surfaces," McAvoy explained.

"We did in three cases." Three excavation units contained clusters of four to eight blades struck from cores; in a fourth unit, apparently pre-Clovis artifacts were intermixed with Clovis artifacts. "The unfortunate thing about this year was that we were unable to find solid carbon." A soil sample sent for dating contained so little carbon that technicians were not able to apply an alkali wash necessary to remove organic acids. However, with only an acid wash to eliminate



These three blades were found in association with the scatter of carbon that yielded a radiocarbon date of 15,070 years B.P. Each had been struck from the bottom end.



Looters have left parts of the Cactus Hill site, in a remote part of southeastern Virginia, with a bombed-out look.

Seeking Beautiful Artifacts, Thieves of Time Ravage Site

Cactus Hill is a severely threatened site that since October 1993, has been excavated as a salvage project. The sandy soil is riddled with trenches and pits left by looters interested only in finding lithic artifacts made from the area's beautiful blue, cream and milky-jade cherts or chalcedonies, and glassy quartzites.

Of the 1,400 square feet of the site investigated in 1996, about 400 square feet yielded very little data because of looting.

The archaeological work of the Nottoway River Survey volunteers was supported in part by the Virginia Department of Historic Resources through its threatened-sites program. The survey, and the Archeological Society of Virginia, began initial excavations in 1993 with more than 60 volunteers because of concern for the continuing, and apparently escalating, destruction of the site. No state or federal law protects the site, and there are no requirements for cultural resource management. The area had been used for sand mining since about 1978.

"The land owner has set it aside just for archaeological research," said Joseph M. McAvoy of the Nottoway River Survey, "which itself would be wonderful if we could stop the looting." However, it is not possible for the owner, a timber-products company that produces computer paper, to control access to the site, which is about five miles from the nearest residence and near a stretch of the Nottoway River set aside for recreation. A tract that contains the site is leased by a hunting club, and although the club and the property owner have been cooperative with the archaeology project, several roads allow motorists access near enough that the site is only a short walk for looters.

carbonates, the sample yielded an AMS date of more than 10,000 years B.P.

"I think there's a reasonable possibility based on what we've found that Clovis folk were not the first people to use this area of Virginia," says McAvoy.

The tool kit associated with early site use is primarily a blade-core technology. In one part of the site there is evidence of a very thin trianguloid to lanceolate biface associated with an early occupation. Further, McAvoy sees a progression over time from large quartzite cores and blades to smaller ones, "and in some cases almost microcores and micro-blades."

Lithic material is an important factor in analyzing the earliest levels of Cactus Hill. "In this area of Virginia we have a very small number of discrete chert quarries, and those quarries were known and used by the fluted-point makers," McAvoy explains. However, the earliest toolmakers apparently did not know of, or care to use, the chert materials. The earliest blades and blade cores are all fine-grain quartzite. "The first people appear to have been using totally local—site-available—materials, and they're the quartzite cobbles."

McAvoy and the Nottoway River Survey researchers are quite familiar with the quartzite. "Sites in this area of the Nottoway are prolific cobble-quarry sites." He described the material as a good-quality, glassy, gray and brown quartzite. At the most productive part of Cactus Hill, an excavation unit measuring 10 feet by 15 feet, the team uncovered 62,000 pieces of debitage from all levels including Paleoindian and Archaic periods. Yet when people were making fluted points, chert seems to have been the preferred material.

Cactus Hill is one of many Paleoindian sites the Nottoway River Survey has studied in the quest for knowledge about the area's earliest human inhabitants. The local team, primarily made up of avocational archaeologists, has been assisted over the years by scientists from many disciplines. Aiding this year's excavation was an archaeological field school from Appalachian State University under the direction of Thomas Whyte. Dr. Whyte also is analyzing faunal remains found at the site. Geologists K. B. Jones and Dr. G. H. Johnson of the College of William and

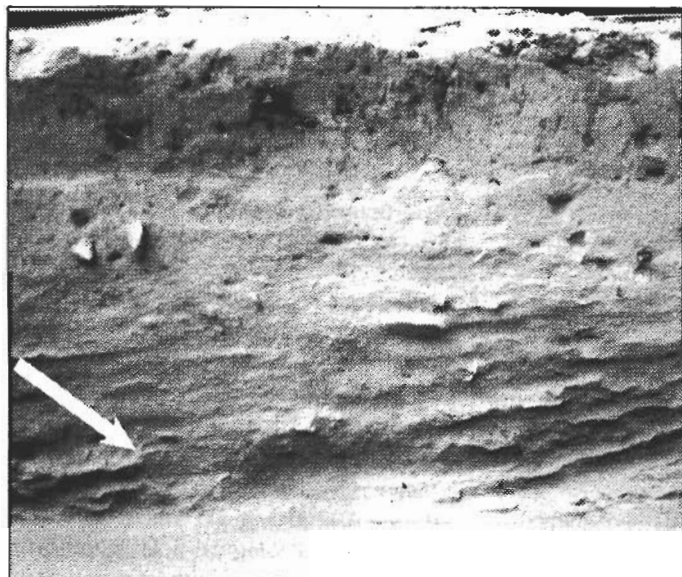
The Quest

The Nottoway River Survey has been conducting privately financed archaeological research in southeastern Virginia for more than 17 years. Many of the volunteers are members of the Archeological Society of Virginia. The area was selected for the survey because of its high density of Paleoindian and early-Archaic artifacts and because its high percentage of accessible, cleared land lacking industrial development would facilitate field study.

The study area is 20 miles east to west and 15 miles north to south more or less centering on the town of Stony Creek. Most of the survey area lies on the Coastal Plain, but the westernmost includes the Fall Zone with its chert quarries.

The Cactus Hill project was survey members' fourth major threatened-site excavation; they have surveyed more than 100 sites in the area. Results of some of their research have been published in a book *Nottoway River Survey Part 1: Clovis Settlement Patterns*, by Joseph M. McAvoy, Archeological Society of Virginia Special Publication No. 28. The book can be purchased for \$25 from Nottoway River Publications, 5861 White Oak Road, Sandston, VA 23150. It is also available at the same price from the CSFA office at Oregon State University.

Mary are analyzing the geology of the area, and soil scientist Robert Hodges is assisting. Dr. McWeeney of Yale University and Dr. C. Margaret Scarry of the University of North Carolina (formerly of the University of Kentucky), analyzed charcoal remains and plant remains respectively. Dr. Margaret E. Newman of the University of Calgary has done immunological analysis of stains on lithic artifacts.



Cultural material at Cactus Hill is about a meter deep. Lamellar banding, visible in the lower half of the excavation sidewall (left), has proven indicative of old deposits. Arrow indicates the layer where Clovis material was found. In 1993 the team came

COMING CONFERENCES

Oct. 26-29 Eastern States Archaeological Federation, Wilmington, DE.

Contact: Faye L. Stocum, Delaware SHPO, No.15, The Green, Dover, DE 19901. 302-739-5685.

Oct. 28-31 Annual Meeting, Geological Society of America, Denver.

Contact: Vanessa George, GSA, 3300 Penrose Place, Boulder, CO 80301. 303-447-2020; fax 303-447-1133.

Nov. 20-24 Annual Meeting, American Anthropological Association, San Francisco.

Contact: AAA, 4350 North Fairfax Drive, Suite 640, Arlington, VA 22203. 703-528-1920.

Dec. 2-6 Fall Meeting, Materials Research Society, Boston.

Contact: Materials Research Society, 9800 N. McKnight Road, Pittsburgh, PA 15237. 412-367-3003; fax 412-367-4373.

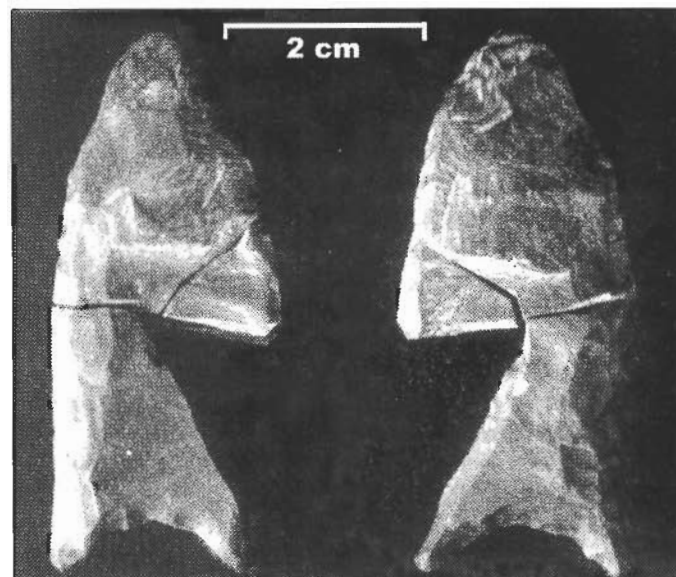
April 2-6, 1997 Annual Meeting, Society for American Archaeology, Opryland, Nashville, TN.

Contact: SAA 900 Second Street NE, Suite 12, Washington DC 20002. 202-789-8200.

Send conference notices to the Mammoth Trumpet, 37112 Moss Rock Drive, Corvallis OR 97330.

The site's fragmentary faunal record does not now include any big Pleistocene animals.


McAvoy argues for protection and continued research at Cactus Hill. "There likely is a very old tradition in Virginia not



upon three pieces of a fluted point in a lamellar silt band (right). After discovering a complete fluted point, they took the excavation down another level and found a scatter of carbon that proved to be 15,000-year-old white pine charcoal.




associated with fluted points, but still in the time period of 10,000–15,000 years B.P. Hopefully the remaining radiocarbon dates on soil samples from hearths at the core-blade level will confirm this.”

Much of the remaining area that most likely would have contained information about the earliest inhabitants, however, has been vandalized. The attraction of the region's beautiful blue, cream and jade-colored chert, quartzite and chalcedony artifacts has outdistanced the desire to learn about the first Virginians. 

—Don Alan Hall

S. Africa Tours

Sacramento archaeologist David Abrams and art historian Diane Kelly will lead tours to South Africa in January and July, 1997, offering visits to paleontological excavations, shamanistic art sites, private fossil collections and historical sites. The tours also will offer viewing of the area's wild animals and an excursion to Victoria Falls and Zimbabwe. For information, contact Past Times Archaeological Tours, 800 Larch Lane, Sacramento CA 95864-5042, phone 916-485-8140, e-mail dmabrams@ucdavis.edu. 



Volunteers excavating earlier this year seek further evidence that human occupation of Cactus Hill predated Clovis.

NOTTOWAY RIVER SURVEY

Saltville Site

continued from page 1

of presumably cultural material. The carbon-13-adjusted date was found to be $13,950 \pm 70$ years (Beta 65209); the corresponding carbon-14 age is $13,990 \pm 70$ years.

McDonald is a research associate with the Smithsonian Institution's National Museum of Natural History, department of paleobiology, and the Virginia Museum of Natural History. Though noting that he is not an archaeologist, McDonald emphasized that research conducted in the Saltville Valley since 1980 has led him to conclude that humans were among the Pleistocene animals that left an imprint on the ecology of the area. He presented his findings in April at the annual meeting of the Association of American Geographers.

Cultural evidence gathered from the

Saltville site by McDonald and his team through 1995 includes a collection of 60 fragments of evidently altered elephant leg bones; exotic rocks, some of which are apparently tools or tool material; fire-cracked rock; a mastodon tooth that probably was discolored and broken by fire; and concretions that probably originated as fat rendered from elephant bones. What are presumed to be a sharp stone ax and an ivory-polishing bone tool were found in the midst of scattered tusk fragments.

Virginia's Saltville Valley has intrigued archaeologists since 1782, when Arthur Campbell sent a mastodon tooth to Thomas Jefferson. There also have been periodic excavations in the area by the Carnegie Museum, the Smithsonian Institution, and Virginia Tech.

A river flowed through the one-mile-long and half-mile-wide triangular-shaped valley until about 13,500 years ago, McDonald said. A lake replaced the

river, sealing the valley bottom with muds that preserved a diverse and detailed record of plant and animal life during the past 15,000 years. The team's other sites in the area have provided environmental information that goes back to 27,000 years ago.

Researchers discovered the segment of the site with evidence of early humans atop a pedestal of bedrock beside the channel of the ancient Saltville River. An overflow channel is opposite the river's course. The excavated area measures roughly 30 meters by 20 meters. Industrial activity in the 1960s altered the upper surface, so much of the excavation is somewhat less than a meter in depth below the altered surface.

McDonald and his team began to suspect in 1992 that they had evidence of human occupation. He recalls the 1992 season started slowly. "We weren't finding a damned thing—it was the driest two weeks we ever had. Then, all of a

sudden, we came across some very well preserved ribs of a mastodon." The bones were in a deposit of mud, not in gravel. As the bones began coming out of their excavation, McDonald's team suspected they might be onto a complete skeleton. And in association with the bones they found a small, flat, hand-sized slab of sandstone.

"Under ordinary circumstances it might not have attracted very much attention," McDonald said. But when the rock was cleaned, closer examination revealed that it possibly was a tool. About "35 percent of its edge appeared to have alternating serrations so it might have been artificially sharpened after it was knocked off the end of a larger piece of sandstone." Team members didn't rule out the possibility that the stone could have been naturally shaped. "But context and configuration raised the possibility that it could have been of cultural derivation," McDonald said. Although it wasn't a conventional tool of chert or harder stone, he observed that it fit well in the hand and had a sharpened edge.

"If it were gripped well, it could have served as a combined cutting edge and a wedge to slip in between layers of meat or to separate meat from bone."

The discovery caused McDonald and his team to shift their excavation site somewhat, and in the process they found bones and stones that didn't seem to fit patterns observed during the previous 10 years of excavation. Further work that year revealed more mastodon and musk ox bones. A fractured tibia of a woodland musk ox (*Bootherium bombifrons*) had a point worn on both sides like a tool, and also had a high polish on parts of exposed edges. The breaking and weathering were inconsistent with alterations that they would have expected from fluvial action in high-energy or low-energy stream environments, but the bone obviously would have been useful for cutting, scraping or, for digging in mud, sand or gravel. With some experimentation, McDonald found he could produce a similar bone-fracturing pattern in a cow tibia by striking it five or six times.

"We think it was used either for cutting or scraping, or as a tool to dig in sand or gravel. I tend to lean toward the latter because of the wear pattern on one end."

Continued excavation also produced a collection of long, thin fragments of leg



JERRY N. McDONALD

Excavation of the midden in 1995. The midden lies directly above the darkest stratum of sediment (arrow) This portion of the site incorporates colluvial muds that washed into the floodplain episodically between about 15,000 and 13,500 years B.P., most apparently about 14,000 years ago.

bones and tusks. "They were placed layer upon layer on top of each other. We had three layers of these long fragments laid at right angles to each other." Such a configuration of bones is unlikely to have been the product of natural fluvial processes. Not only were the bones arranged at right angles to each other, but their similar size and shape suggested human involvement.

More unnatural-looking arrangements of bone appeared, and the team

found bones that were blunt and seemed to have been cut with a heavy, sharp object. They also discovered fragments of a mastodon tooth that at first was interpreted as pieces of high-quality jasper. The tooth was evidently altered by heat. The team also found rocks, apparently fire-cracked, amidst the bones and tooth fragments.

McDonald and his team are continuing to study modified tusks and musk ox bones. "We have found fragments of tusk that appear to have been systematically reduced to a certain size." And they seem to be from a certain part of the tusks. A piece of a musk ox skull seems to have been made into a tool or possibly a gauge for finishing ivory products.

They found five fire-cracked rocks, or rocks that were fractured in such a pattern that fire-cracking was the simplest interpretation. "You could pick the pieces up side by side and fit them back together, and to find such a concentration of five such rocks in an area no more than a half-meter square was very unusual." No other such concentrations of fire-cracked rocks were found in the surrounding 10 square meters.

Continuing their excavation, the team found elongated bone fragments standing on end. These bones were attached to what McDonald describes as a "large



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concretion with the shape of a fluid mass." He suspects the concretion had started as a glob of fat that accumulated from a cooking fire. Then the fat was gradually replaced by minerals from groundwater.

"We are trying to get geochemical information about the concretion that will help us determine one way or the other, if it is animal fat." He cautioned that determining that it is animal fat won't clinch the case for human involvement. "It will just open more doors from which to explore, and we will carry the investigation a step or two farther."

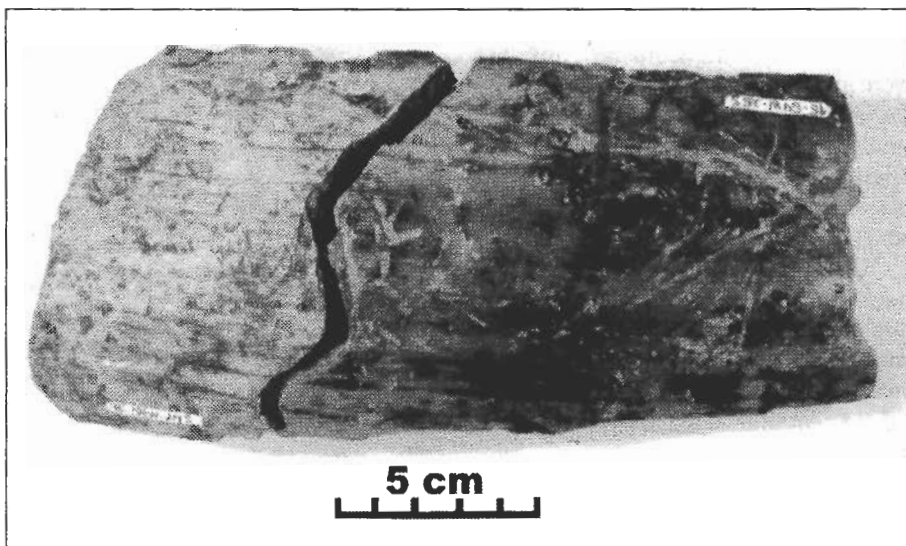
This season McDonald and his team are examining more evidence of human habitation—a shell mound, partially incorporated by the sand lens dated to about 14,000 years ago. "It is unusual in shape and in the quantity of clams that are in it," he explained. "It was mounded, and at a right angle to the axis that one might expect if it were laid down by fluvial processes." McDonald's initial examination of the midden revealed a large

*"I knew I'd be there
a couple of hours—
here I am 15 years later."*

number of small vertebrates including a lot of fish and amphibians. "In fact, we can make inferences about how they ate their fish," he said, noting that they apparently didn't eat the heads. Very few vertebrae and ribs were found, however, a pattern dramatically different from that they found in unquestionably fluvial sands.

McDonald is confident the site is important for two reasons: its antiquity; and its high stratigraphic resolution that is supported by a sequence of radiocarbon dates. The dates of the twigs in the sand lens, for example, were exactly what McDonald anticipated based on other dates from the site.

"I see it as being a tight confirmation of the presence of humans here before 11,500 years ago." But, he added, the site isn't going to carry the argument one way or another. "I don't have any delusions that they set out from Siberia to find



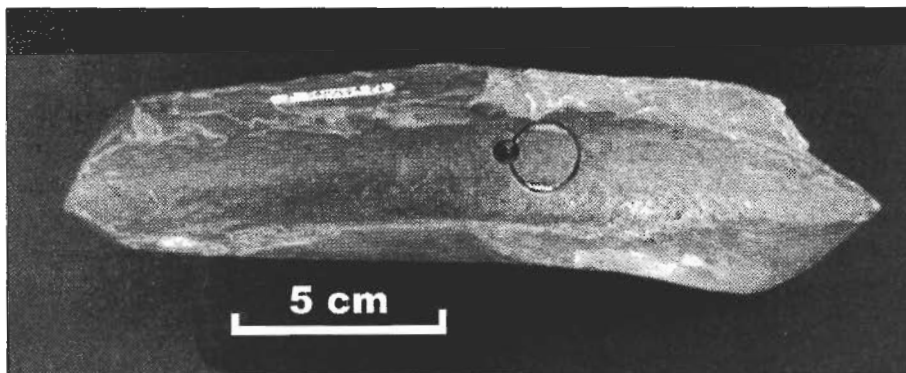
Two pieces of the external portion of a mastodon tusk are among five that fit together. Additional fragments of the tusk, all unabraded, along with one crude stone ax and a modified fragment of what is believed to be a musk ox skull, were associated with these pieces of tusk.

Saltville and came there first," he said. "In all likelihood there are older sites known that are not tied down. In Saltville, we may have other, older sites that might very well contain evidence of humans." Scientists have traditionally held that humans have been in the Americas for only about 11,500 years, but recent evidence suggests a considerably longer human presence. For example, 14,000-year-old dates from the Meadowcroft site in Pennsylvania and 13,000-year-old dates from the Monte Verde site in Chile are gaining acceptance, and researchers are studying evidence that people were in Nebraska more than 18,000 years ago (**Mammoth Trumpet** 10:1 "Bones of

Nebraska Mammoths Imply Early Human Presence"), and were in Alberta more than 20,000 years ago, (**Mammoth Trumpet** 10:2 "Pre-glacial Site in Alberta Suggests Early Human Presence").

Enthusiastic about the site's continuing promise, McDonald reflected on his years studying Saltville. "When I first went down there, I went knowing I'd be there a couple of hours and that would be it. And here I am 15 years later. Those deposits are a storehouse of such a variety of information on the environmental history of the region that it keeps you looking—it keeps yielding information." 🐘

—George Wisner



A probable tool made from a tibia of a woodland musk ox (*Bootherium bombifrons*) bears the marks of diamond-drill plug pulled for radiocarbon dating. This object, found on the surface of the ancient floodplain, has three pairs of mirror-image fractures, all contemporaneous, and a discontinuous and non-randomly distributed high polish on portions of the fracture surfaces.