INDIGENOUS ARCHAEOLOGY · REEXAMINING KINCAID MOUNDS · CULTURAL LANDSCAPE STUDIES

FALL 2010

american archaeology

a quarterly publication of The Archaeological Conservancy

Vol. 14 No. 3

THE Clovis Comet Debate

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COVER FEATURE

12 **THE CLOVIS COMET CONTROVERSY**

BY MIKE TONER

Did an extraterrestrial impact some 13,000 years ago result in a number of dramatic events?

19 **READING THE LAND**

BY TAMARA STEWART

Cultural landscape studies at Salinas Pueblo Missions National Monument are yielding a glimpse of life there hundreds of years ago.

26 **REEXAMINING KINCAID MOUNDS**

BY SUSAN CABA

Approximately 60 years after the initial investigation of Kincaid, archaeologists employing sophisticated technology are arriving at new conclusions about this Mississippian site.

32 **INVESTIGATING THE MYSTERIES OF THE SHIVWITS PLATEAU**

BY STEVE FRIESS

Until recently, this remote region in northern Arizona had been ignored by archaeologists. Now researchers are trying to understand the lives of the people who once occupied it.

37 **THE DEVELOPMENT OF INDIGENOUS ARCHAEOLOGY**

BY WAYNE CURTIS

What is indigenous archaeology, and is it good for the discipline?

44 new acquisition

A GLIMPSE OF THE RED STICKS

The Conservancy's 400th site is a village and battlefield once occupied by a faction of the Creek Indians.

46 new acquisition

LIFE DURING THE END OF THE ICE AGE

The Cardy site could inform archaeologists how humans dealt with a challenging environment.

48 new acquisition

CONSERVING IROQUOIS HISTORY

Indian Castle is the Conservancy's second 17th-century Onondaga site.

49 point acquisition

PRESERVING A PRISTINE MOUND

For years Alexander Mound had been protected by nothing more than dense brush. Now it will be protected by the Conservancy.

TOM STAFFORD, JR.

LIZ LOPEZ

2 Lay of the Land

3 Letters

5 Events

7 In the News

Ship Found at World Trade Center · Changes To NAGPRA · Ancient Vulcanization

50 Field Notes

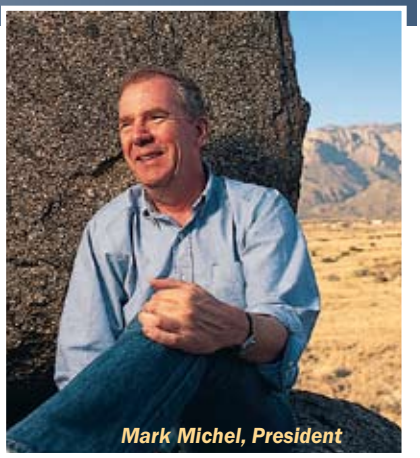
52 Reviews

54 Expeditions

COVER: *Some researchers hypothesize that a comet struck earth about 13,000 years ago, causing a number of important events.*

Credit: *Charlotte Hill-Cobb*

How Science Works


Mark Michel, President

DARREN POORE

One of the most perplexing mysteries of "recent" earth history is the rapid extinction of some 26 genera of large mammals known as megafauna at the end of the last Ice Age. About 13,000 years ago, giants like the wooly mammoth, ground sloth, and saber toothed cat disappeared from the Northern Hemisphere. At about the same time wily Clovis hunters armed with sophisticated stone spear points appeared in North America, prospered, and then disappeared.

In the 1960s, University of Arizona ecologist Paul Martin suggested that the Clovis hunters were primarily responsible for this mass extinction. A fierce debate has raged in archaeological and ecological circles ever since. In this issue of *American Archaeology* we examine a new theory (see "The Clovis Comet Controversy," page 12). A group of scientists is proposing that a meteor or comet struck North America about 12,900 years ago, causing a new, little ice age known as the Younger Dryas. They argue that the resulting dramatic climate change caused the extinction of the megafauna and the decline of the Clovis people, as well.

Their theory has caused a robust debate that shows how science works. New theories require reexamination of old evidence. New technologies are brought to bear on old problems. New data collection is needed to look for new evidence on all sides of the issue. Thus we need well preserved Paleo-Indian sites where the data is intact, and that's what the Conservancy is trying to do at the new Cardy preserve in Wisconsin (see "Life During The End Of The Ice Age," page 46) and other Paleo-Indian preserves around the country.

Mark Michel

Global Warming Isn't What It Used to Be

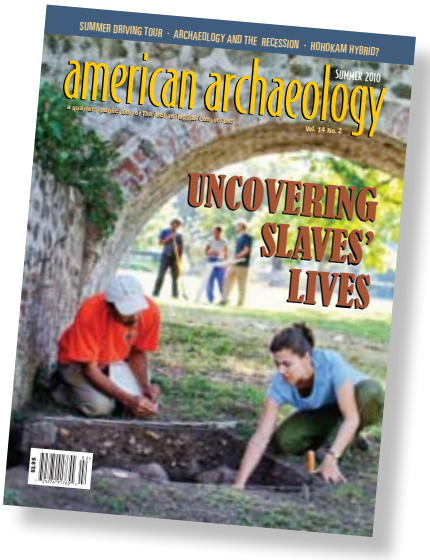
The News article "Ancient Global Warming" (Summer 2010) noted that a stalagmite from a West Virginia cave demonstrated a major change in the carbon record between 100 B.C. and A.D. 1400. In my research I've noted that all living beings pollute, and native cultures' knowledge of this informed their spiritualism and their concept of suppressed greed. This article misses the point that theirs was a different kind of natural usage.

When they recognized their distressed environment, they were able to collapse the civilization, or migrate to a new area to allow the place they previously inhabited to recover. Their attitude toward the environment, which was one of natural sustainability, remained intact until the Europeans conquered them. There is no way to compare their kind of pollution to what we're seeing today.

Monette Bebow-Reinhard
Curator, Oconto Archaic
Copper Museum
Abrams, Wisconsin

A Recessionary Rant

While reading the article "Coping with the Great Recession" (Summer 2010), I found myself becoming more upset the further I read. For example, the author quotes an NPS official, who said the agency can't afford to survey most of the land it owns, much of which is in Alaska: "In an era of flat funding and



increasing costs, those dollars do not go as far as they once did." Alaska must have one booming economy if their costs are increasing. In Washington State every contract for projects is being bid well under the engineer's estimate. Those of us who are still working have had our wages reduced. The cost of everything has dropped.

"Cape Krusenstern National Monument is one of several sites in Alaska that are eroding due to rising sea levels," according to that same official. The average annual rise in sea level is about 1/8 inch, as it has been for the past 12,000 years. Is this impact just being noticed?

Please excuse my rant, for my frustrations are not pointed at you or the author, but at those who create this hyperbole.

Bruce Duncan
Lake Tapps, Washington

Sending Letters to *American Archaeology*

American Archaeology welcomes your letters. Write to us at 5301 Central Avenue NE, Suite 902, Albuquerque, NM 87108-1517, or send us e-mail at tacmag@nm.net. We reserve the right to edit and publish letters in the magazine's Letters department as space permits. Please include your name, address, and telephone number with all correspondence, including e-mail messages.

Editor's Corner

I recently had a conversation with Michael Wilcox, a Stanford University archaeologist of Native American descent. He has written a book, titled *The Pueblo Revolt and the Mythology of Conquest,* that examines the 1680 revolt of the Pueblo Indians against the Spanish from a native perspective. Wilcox's publisher, the University of California Press, stated that his "provocative book poses the question, What if we attempted to explain (Native people's) presence in contemporary society five hundred years after Columbus instead of their disappearance or marginalization?"

Though the Pueblo Revolt has been well researched, Wilcox said his approach to the subject yielded new insights that questioned common assumptions such as the decimation of native populations due to European diseases. Wilcox's book is an example of a movement known as indigenous archaeology. (See "The Development of Indigenous Archaeology," page 37.) This movement is an attempt to redress archaeology's exclusion of Native Americans.

Chip Colwell-Chanthaphonh, an archaeologist who is interested in the movement, said indigenous archaeology is very much about politics, but its ultimate intention is to improve science through a more nuanced and accurate interpretation of the past. However, as our article shows, there is at least one respected scholar who claims indigenous archaeology is unscientific.

Though he suspects there are others who share this skepticism, Colwell-Chanthaphonh is convinced that people like Wilcox, by bringing diverse viewpoints to archaeology, are advancing the science.

Michael Bawaya

WELCOME TO THE ARCHAEOLOGICAL CONSERVANCY!

The Archaeological Conservancy is the only national nonprofit organization that identifies, acquires, and preserves the most significant archaeological sites in the United States. Since its beginning in 1980, the Conservancy has preserved more than 400 sites across the nation, ranging in age from the earliest habitation sites in North America to a 19th-century frontier army post. We are building a national system of archaeological preserves to ensure the survival of our irreplaceable cultural heritage.

Why Save Archaeological Sites?

The ancient people of North America left virtually no written records of their cultures. Clues that might someday solve the mysteries of prehistoric America are still missing, and when a ruin is destroyed by looters, or leveled for a shopping center, precious information is lost. By permanently preserving endangered ruins, we make sure they will be here for future generations to study and enjoy.

How We Raise Funds:

Funds for the Conservancy come from membership dues, individual contributions, corporations, and foundations. Gifts and bequests of money, land, and securities are fully tax deductible under section 501(c)(3) of the Internal Revenue Code. Planned giving provides donors with substantial tax deductions and a variety of beneficiary possibilities. For more information, call Mark Michel at (505) 266-1540.

The Role of the Magazine:

American Archaeology is the only popular magazine devoted to presenting the rich diversity of archaeology in the Americas. The purpose of the magazine is to help readers appreciate and understand the archaeological wonders available to them, and to raise their awareness of the destruction of our cultural heritage. By sharing new discoveries, research, and activities in an enjoyable and informative way, we hope we can make learning about ancient America as exciting as it is essential.

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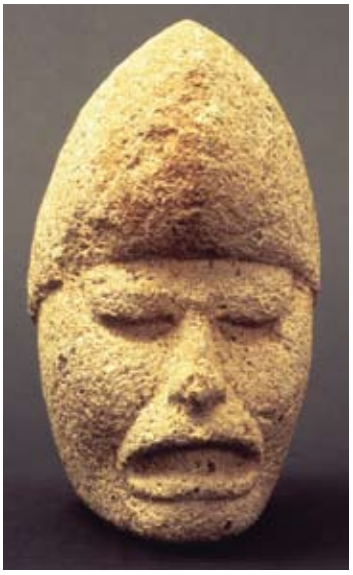
NEW EXHIBITS

FRANK H. MCCLUNG MUSEUM

Frank H. McClung Museum

University of Tennessee, Knoxville, Tenn.—"Painted Metaphors: Pottery and Politics of the Ancient Maya," traveling from the University of Pennsylvania Museum of Archaeology and Anthropology, portrays a time of political change in a troubled outpost of the Maya world and a human story of power and intrigue among people who lived more than 1,300 years ago. Chamá polychrome ceramics are accompanied by more than 100 stunning objects illustrating Maya daily life, religious ritual, and changes in rulers. (865) 974-2144, http://mcclungmuseum.utk.edu (September 16 through January 3)



BOWERS MUSEUM OF CULTURAL ARTS

Bowers Museum of Cultural Arts

Santa Ana, Calif.—Spectacular artifacts from the sophisticated Pre-Columbian cultures of Mexico and Central America are highlighted in the new exhibit "Vision of the Shaman, Song of the Priest." Pre-Columbian art from Mexico and Central America displayed in a series of galleries communicates the power and sophistication of the mysterious cultures that rose and fell in ancient America, with emphasis placed on the ceramic and stone arts of West Mexico, Costa Rica, and Panama. A gallery devoted to the famous "Limestone Tomb of Lord Pacal" includes a life-size reproduction of the elaborately decorated and highly symbolic limestone sarcophagus excavated at the pyramid in the Maya City of Palenque in Chiapas, Mexico. (714) 567-3600, www.bowers.org (Through December 31)

ORLANDO MUSEUM OF ART

Orlando Museum of Art

Orlando, Fla.—Drawing from the museum's comprehensive Art of the Ancient Americas Collection, the exhibit "Aztec to Zapotec: Selections from the Ancient Americas Collection" features more than 180 works made prior to the arrival of Europeans during the late 15th and early 16th centuries. The exhibit gives a rare glimpse into 3,000 years of civilizations from North, Central, and South American regions and includes ancient works of gold, silver, jade, ceramic, shell, and wood from the cultures of the Aztec, Maya, Moche, Nasca, Inca, and Zapotec. (407) 896-4231, www.omart.org (Long-term exhibit)

MINNEAPOLIS INSTITUTE OF ARTS

Minneapolis Institute of Arts

Minneapolis, Minn.—The traveling exhibition "Art of the Native American: The Thaw Collection" consists of 110 of the most outstanding works of art drawn from the Thaw Collection of North American Indian art, revealing the extraordinary range of works produced by Native American cultures. This collection consists of more than 800 masterpieces from across North America and spans more than 2,000 years. (888) 642-2787, www.artsmia.org (October 24 through January 9)

Events

IROQUOIS INDIAN FESTIVAL

Iroquois Indian Festival

September 4–5, Iroquois Indian Museum, Howes Cave, N.Y. The annual festival centers on the celebration of Iroquois creativity and self-expression, featuring an all Iroquois Indian Art Market. The Sky Dancers from Six Nations Reserve in Ontario will perform traditional Iroquois social dances, and a children's tent will feature arts and crafts, including beadwork and cornhusk doll-making. Traditional food will be available. (518) 296-8949, www.iroquoismuseum.org

EL PRESIDIO DE SANTA BARBARA STATE HISTORIC PARK

El Presidio de Santa Barbara State Historic Park

Santa Barbara, Calif.—Discover how ceramics were made, used, and traded in early California through the new Smithsonian-sponsored exhibit "Ceramics Rediscovered: Science Reshapes Understanding of Hispanic Life in Early California." Based on a decade-long investigation of ceramic production using archaeological evidence and scientific analysis, the exhibit offers a rare glimpse into daily life during California's Spanish and Mexican periods (1769-1848). Featuring period artifacts and reproduction pottery, this exhibit traces the evolution of California's earliest potters and the material culture they helped shape. (805) 965-0093, www.sbthp.org/presidio.htm (November 14 through January 28)

■ CONFERENCES, LECTURES & FESTIVALS

Symposium of the Pre-Columbian Society of Washington, D.C.

September 25, U.S. Navy Memorial and Naval Heritage Center, Washington, D.C. Speakers such as Linda Brown, Cecelia Klein, and John Pohl will explore the topic "Under Cover of Darkness: The Meaning of Night in Ancient Mesoamerica." For program details and registration, visit www.pcswdc.org

Plains Anthropological Conference

October 6–9, Radisson Hotel, Bismarck, N. Dak. The conference features papers, poster sessions, and symposia that describe recent research in the Plains region. The activities feature guided tours to the Knife River flint quarries and Plain Village sites. Contact Amy Bleier at ableier@nd.gov, or Paul Picha at ppicha@nd.gov/ (701) 328-2672, or visit http://history.nd.gov/plainsconference/index.html

Midwest Historical Archaeology Conference

October 9, Heidelberg University, Tiffin, Ohio. This year's theme "Archaeological Approaches to the Study of Conflict" will be explored through presentations, posters, and discussions. There will be tours of Johnson's Island Confederate Prison. http://herald.heidelberg.edu/mwhac10

Mogollon Archaeology Conference

October 14-16, Corbett Center Auditorium, New Mexico State University, Las Cruces, N.M. The latest research about Mogollon archaeology, including Jornada Mogollon and Northern Chihuahua, will be presented. Contact Lonnie C. Ludeman at (575) 522-1691, llludeman@nmsu.edu, or visit www.lonjul.net/mog2010

Great Basin Anthropological Conference

October 20–23, Davis Conference Center, Layton, Utah. The conference features paper and poster presentations as well as several field trips. Visit www.regonline.com/GBAC_2010, or contact Lori Hunsaker at lahunsaker@utah.gov

Southeastern Archaeological Conference

October 27–30, Hilton Lexington Downtown Hotel, Lexington, Ky. The conference will feature paper presentations, symposiums, and poster sessions concerning the latest research in the Southeast. There will also be tours of several local archaeological and historical sites. www.southeasternarchaeology.org

New Mexico Archaeological Council's 2010 Fall Conference

November 13, Hibben Center, University of New Mexico, Albuquerque, N.M. The conference will explore the theme "Indigenous Mobile Groups of the Protohistoric and Historic Periods in New Mexico." Topics include the identification, dating, ethnography and oral history of late mobile groups. Contact deniseymour@aol.com, or visit www.nmacweb.org

Ship Found At World Trade Center

Eighteenth-century merchant vessel discovered during construction project.

The discovery of an 18th-century merchant ship unearthed this July during construction at the World Trade Center site in New York City may shed new light on what life was like aboard merchant vessels, where they traveled, and how they were constructed. Very little is now known about these ships, said Diane Dallal, director of archaeology at AKRF, the firm monitoring the construction site. "They were considered mundane, and the building techniques weren't documented," she said. "It's a once-in-a-lifetime discovery."

The ship was found about 30 feet below street level in landfill that extended the lower shoreline of Manhattan Island into the Hudson River. Dallal said only one other ship, the *Ronson,* has been archaeologically excavated from a landfill in New York City. The ship is thought to date to sometime in the 1700s because the area it was found in was filled in during the late 1790s. If it was sunk intentionally for landfill, then it would probably have been a derelict, said Molly McDonald, an AKRF archaeologist. It's also possible that it sank there before the area was filled. Dendrochronology, a science that uses tree rings to identify the age of wood, will be used to determine more precisely when the ship was built.

McDonald first spotted the ship when a backhoe dug up a curved piece of timber. "It was clearly different than other timbers that were being dug up. It looked like a ship, so we immediately stopped the backhoe," she said. Then a team of AKRF archaeologists carefully excavated the mucky area with shovels and trowels. They unearthed about 32 feet of what appears to have been a 60-foot wooden ship. They hope to unearth the other half when construction begins on an adjacent area.

AKRF

Researchers examine the remains of the wooden ship that appears to have been about 60 feet long.

The team retrieved the outer frame of the boat, the ceiling planks for the top of the hull deck, and the orlop deck—a small platform near the bottom of the hull. They also found treenails, bricks, buttons, shoe buckles, rope, a couple of complete leather shoes, dozens of leather shoe parts, and ceramics. A portion of what may have been a swivel gun, cannon balls, and a musket ball were also discovered. "Most merchant vessels were armed because of the threat from pirates, Dallal said.

The remains of marine organisms in the timbers will be studied and may provide clues about where the ship sailed. For example, worms that bored holes into the timbers can be identified by the carcasses they left behind. If Toredo worms, which live only in the Caribbean, were present, that will identify at least one of the ship's destinations. —*Paula Neely*

New NAGRPA Regulation Alarms Researchers

Scientists express concern while tribes praise regulation.

A regulation establishing a process for the disposition of culturally "unidentifiable" Native American remains held by museums, educational institutions, and federal agencies went into effect last May, despite protests from a number of researchers. While the original Native American Graves Protection and Repatriation Act (NAGPRA) passed in 1990 stated that remains determined to be culturally affiliated with certain tribes must be returned to those tribes, the new rule responds to the provision in the statute that a regulation must be promulgated by the Secretary of the Interior to deal with disposition of Native American remains that are not found to be culturally affiliated. In the absence of a rule, the secretary approved each repatriation request on a case-by-case basis. The new rule streamlines that process, according to Sherry Hutt, manager for the National NAGRPA Program with the National Park Service.

"It's a step forward that's long overdue. It is unacceptable in 2010 for one group of people to own another group and refer to them as 'specimens,' said Bambi Kraus, president of the National Association of Tribal Historic Preservation Officers. "It is a basic human right for Native Americans to retrieve their dead and treat them in a respectful manner."

A group of prominent archaeologists and anthropologists, all members of the National Academy of Sciences, wrote a letter to Secretary of the Interior Ken Salazar in protest of the new rule, stating that it will cause "an incalculable loss to science" by permanently making Native American remains unavailable for research.

"I view the new rule as a serious step backward, and harmful to scientific inquiry, our understanding of the past, and potentially harmful to many indigenous groups, as well," said Dennis O'Rourke, population geneticist at the University of Utah and current president of the American Association of Physical Anthropologists (AAPA). "The ability to claim and request repatriation under the original law was predicated on a demonstrable cultural or biological linkage between a contemporary group and historic or prehistoric material. The new rule circumvents this requirement, making it possible for successful claims to be filed with no evidence of ancestral linkage to human remains."

Hutt said the rule applies only to human remains determined to be Native American and exhumed from sites on tribal land, or the aboriginal land of tribes. The new rule recommends, but does not require, that funerary objects move with the associated human remains in the disposition, a sticking point with native groups. "The predominant feeling that I now encounter, from tribes, museum people, and federal agency staff, is that after 20 years of the NAGPRA process, it is time for the rule on disposition to be in place," Hutt said. "When human remains are concerned, there is a recognition of the basic human dignity to be afforded to all, regardless of cultural group."

KEN CEDENO

Bambi Kraus, president of the National Association of Tribal Historic Preservation Officers, favors the new regulation.

Currently more than 124,000 Native American remains have been listed as "unidentifiable" and about 4,000 have been repatriated to tribes. Discussions within the AAPA and other societies and professional associations are ongoing as to how to react to the ruling and how best to formulate a possible appeal. —*Tamara Stewart*

New Theory For Megafaunal Extinction

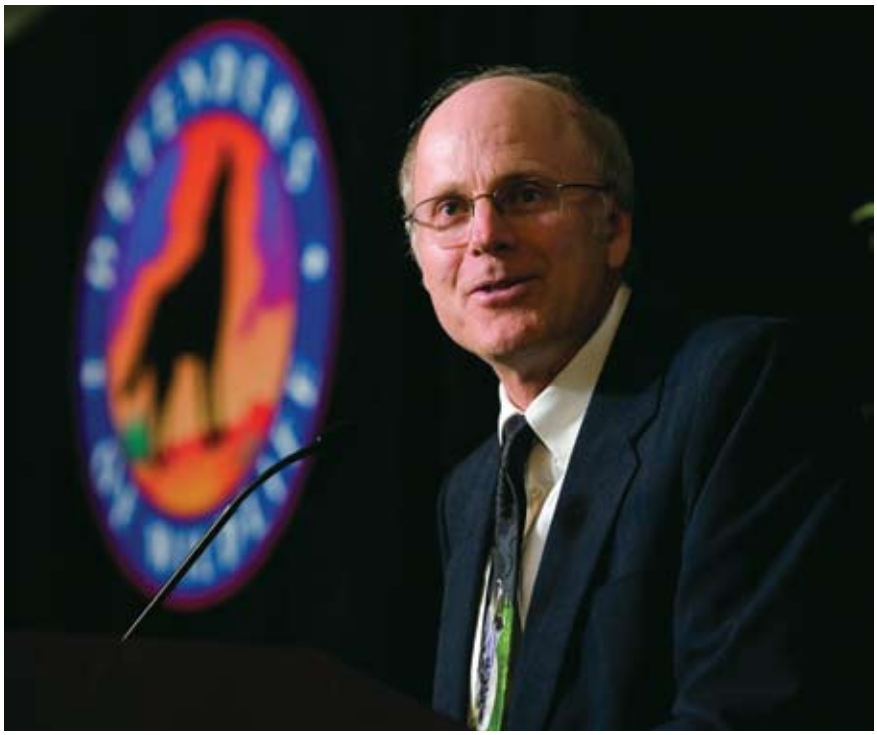
Humans threw a delicate system out of balance.

A recent study published in the journal *Bioscience* brings together a variety of data to suggest that newly arrived humans tipped the delicate balance that existed in North America between carnivores and herbivores, resulting in the mass extinction of large mammals about 10,000 years ago.

Scientists have long debated the cause of the late Pleistocene extinctions when some two-thirds of North America's large mammals went extinct, the two most popular theories pinning the extinctions on declines in food due to climate change and overhunting by humans. However, analyses of mammoth tusk growth rates, and other evidence suggest that the large herbivores such as mammoths were not suffering from food shortages between 10,000 and 15,000 years ago. "In debating the role of humans in the late Pleistocene megafaunal extinctions, the problem is that they didn't really have the greatest technology for killing off these animals," said Blaire Van Valkenburgh, professor of ecology and evolutionary biology at UCLA and co-author of the study. "But they didn't have to, they just tipped the balance that existed."

Rather than humans hunting the animals to extinction, William Ripple, the study's lead author, and Van Valkenburgh propose that by hunting various types of carnivores and herbivores, humans disrupted a delicate balance, triggering a collapse in the large herbivores and, ultimately, the carnivores that preyed upon them.

The researchers compared dental samples of modern and Pleistocene carnivores and found that the latter's teeth were heavily worn and fractured, suggesting that, presumably due to intense competition for food, they consumed much of the carcass, including bones. Humans survived by varying their diets and protecting themselves by using fire, weapons, and living in groups.



William Ripple gives an acceptance speech after receiving an award for his research concerning large predators, herbivores, and plants.

Ripple, a professor of Forest Ecosystems and Society at Oregon State University, has been examining so called trophic cascades in Yellowstone National Park, where the elimination of wolves resulted in an explosion of the elk population, in turn causing widespread overgrazing, damage to stream ecosystems, and disruptions to other animal and plant life. Following the re-introduction of wolves to the park, these processes have begun to reverse themselves.

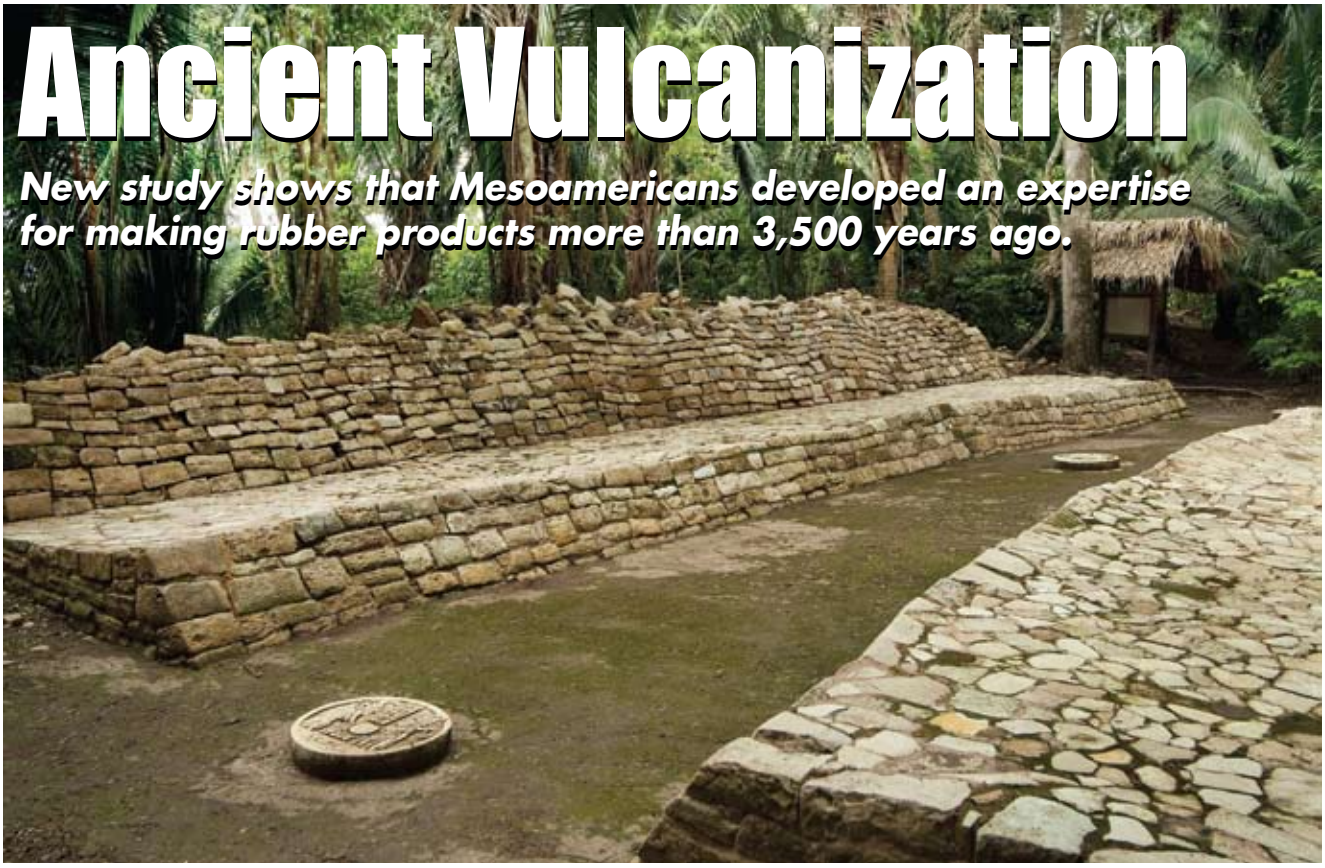
"We think the evidence shows that major ecosystem disruptions resulting in these domino effects can be caused by subtracting or adding a major predator," said Ripple. "In the case of the woolly mammoths and saber-toothed cats, the problems may have begun by adding a predator, in this case humans."

Ripple and Van Valkenburgh have applied for a National Science Foundation grant to examine dental conditions of fossil animals from the late Pleistocene and to further study modern predator-prey systems in Yellowstone and Isle Royale National Park in Lake Superior, focusing on dental conditions of modern carnivores and their predator-limited prey as analogs for late Pleistocene conditions.

—Tamara Stewart

Ancient Vulcanization

New study shows that Mesoamericans developed an expertise for making rubber products more than 3,500 years ago.



JERRY RABINOWITZ

The Mesoamericans made rubber balls that were used in a ceremonial game played on courts like this one at Cancuen, in northern Guatemala.

Ancient Mesoamericans were 3,500 years ahead of our modern day methods of producing rubber, according to a new study led by a Massachusetts Institute of Technology team.

During approximately 10 field trips to Mexico, Michael Tarkanian, a technical instructor of MIT's Department of Materials Science and Engineering, and Dorothy Hosler, an archaeologist at MIT, brought back raw latex from the native *Castilla elastica* tree and juice from the morning glory species *Ipomoea alba*.

Thriving in parts of Mexico and Central America from roughly 2000 B.C. to the Spanish invasion in 1521, the Mesoamericans understood the properties of latex and optimized it for their own use. When the Spanish arrived, they noted that around 16,000 rubber balls were being produced every year, along with a large number of sandals, bands, figurines, and other items. The balls were used in ceremonial games played on stone-walled ball courts. The oldest ball found in the region dated to 1600 B.C.

Latex, a brittle solid that contains an oily chemical called isoprene, was stirred with the morning glory juice, which removed the compounds that made the latex brittle, until it was transformed into a white mass that was shaped into various items. The Mesoamericans not only were able to produce rubber, they developed a sophisticated system that changed the properties of rubber to best suit the objects they were making. For example, the balls were made with rubber of maximum bounciness. Their shoe soles were made with a wear-resistant rubber, and strong, resilient rubber bands were produced to attach blades to shafts.

"Imagine a bucket full of chain links," said Tarkanian. "The juice connects them all so that you can lift one and the rest will come with it." Mesoamericans used "a 50–50 mixture" of latex and morning glory juice for rubber balls, Tarkanian said. A three-to-one mix of latex to morning glory juice produced the most durable substance, which was used for sandal soles. Pure latex was best suited to make wide bands of rubber that joined handles and axe heads.

Charles Goodyear is credited with having invented vulcanization—a chemical process for converting rubber or related polymers into more durable materials—while experimenting with rubber and sulfur in the mid-19th century.

The only difference between the modern and ancient methods of vulcanization is that nowadays every link is attached to another one, whereas for the Mesoamericans most, but not all, were connected.

This study follows others that showed Ancient Mesoamericans having made artifacts out of rubber, but it is the first to go into the mechanics and technology of it.

—Iris Picat

Maya Tomb Discovered

Sixteen hundred-year-old tomb may house a king.

A well-preserved burial chamber discovered at the base of a pyramid in Guatemala could hold the remains of a founder of a Maya dynasty who was buried 1,600 years ago. The tomb is packed with carvings, ceramics, textiles, and the bones of six children who may have been sacrificed at the time of the king's death.

"It's clearly the tomb of a Mayan king," said Stephen Houston, a Brown University archaeologist who is directing the excavation. "From the tomb's position, time, richness, and repeated construction atop the tomb, we believe this is very likely the founder of a dynasty." If so, it would be one of the few to be discovered.

Archaeologists uncovered the tomb, which dates from about A.D. 350–400, beneath the El Diablo pyramid in the town of El Zotz in northern Guatemala, last May. They found a series of caches filled with blood red bowls that contained human fingers and teeth wrapped in an organic substance that left an impression in the plaster. According to Houston, these may have been symbolic food offerings.

ARTURO GODOY

This ceramic vessel depicting a supernatural figure was uncovered at the site.

They continued digging through layers of flat stones alternated with mud until they reached a small hole that led into the tomb. "When I entered for the first time, what struck me was the smell of putrefaction. You can still smell things that were rotting," he said. No air and little water had entered the well-sealed chamber in 1,600 years. The tomb was filled with "all sorts of bizarre organics" including pieces of wood, textiles, painted stucco, and cord that they had never seen before. These are lost art forms that ordinarily would not have survived, Houston said.

The primary occupant of the six-feet-high, four-feet-wide, 12-feet-long, tomb was an adult, probably a male. His teeth were embedded with jade, which is unusual, and hematite, according to Andrew Scherer, an anthropologist at Brown University, who is studying the remains. The man's body rested on a raised bier that had collapsed. He was dressed like a ritual dancer, a major role of kings, with bell-like ornaments made of shells and clappers made from canine teeth. His body had been painted red, a color commonly used in royal burials, according to Scherer. As the flesh decayed, the pigment stained his bones.

ANDREW SCHERER

Two teeth from the royal tomb. The left one is inset with hematite, the right with two pieces of jade.

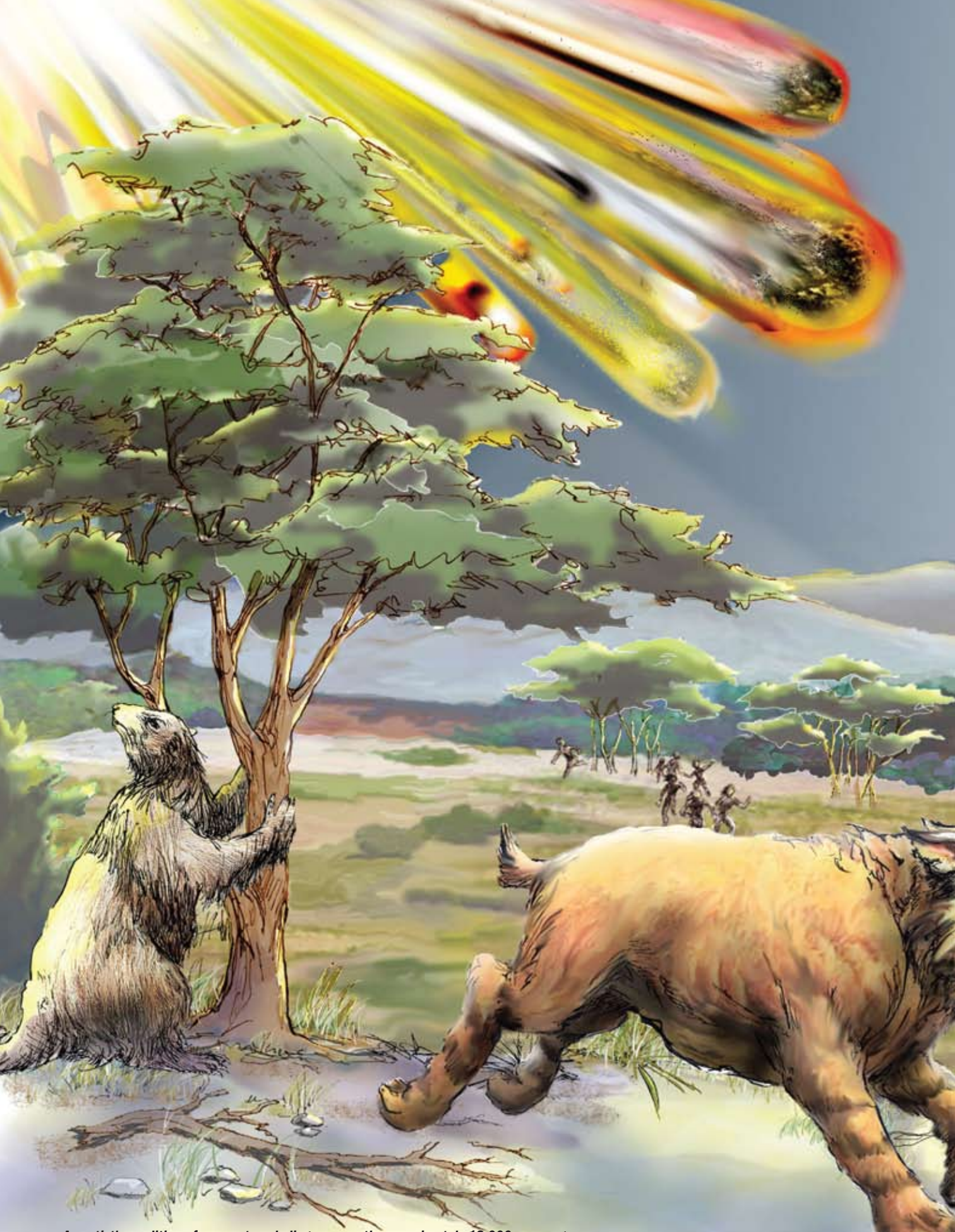
The man may also have worn an elaborate headdress with small glyphs, and he might have held a sacrificial blade. The surface of the blade is covered with red organic residue. "It doesn't take too much imagination to think that this is blood," Houston said.

Based on dental analysis, four of the children were ages one to three, and the others about five years old.

"Royal tombs require years of study to understand," Houston said, "we still have a great deal of work to do." —*Paula Neely*

ARTURO GODOY

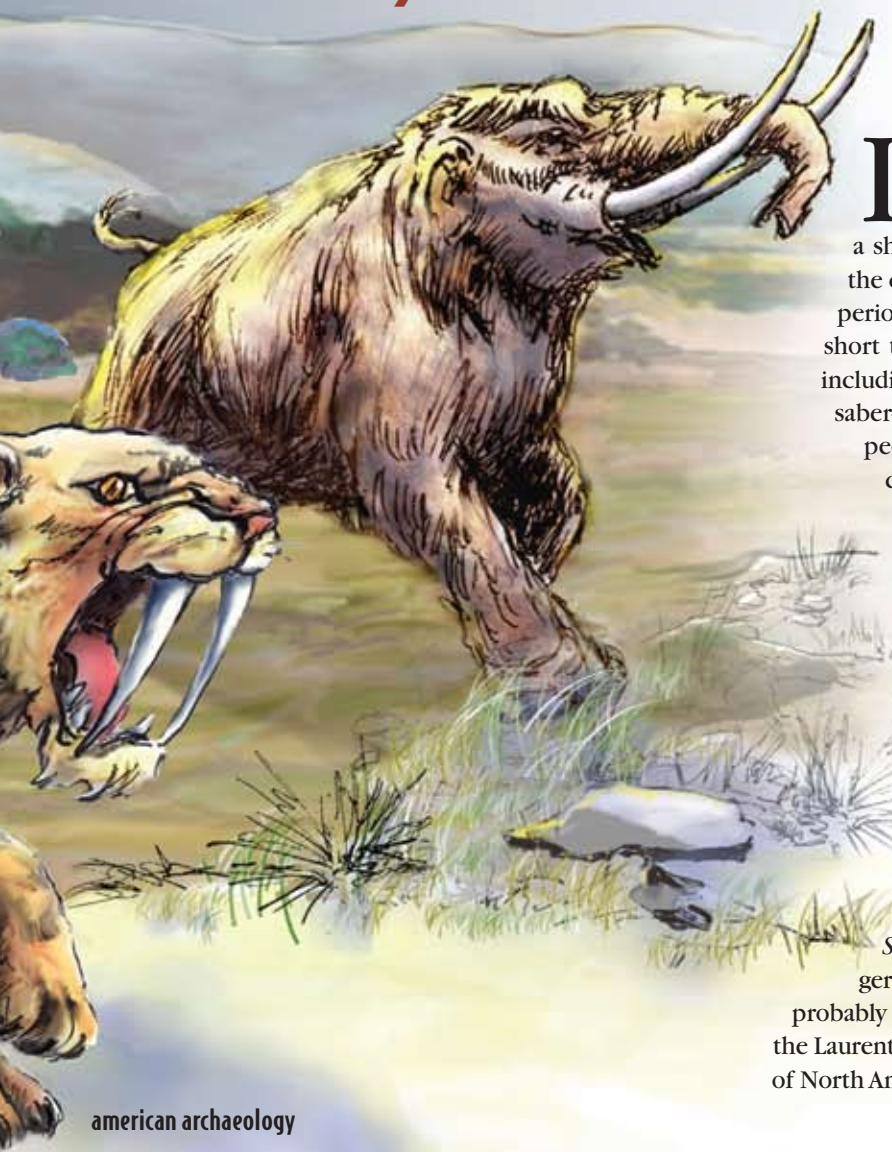
A ceramic bowl depicting the head of the Maya Maize God.



An artist's rendition of a comet exploding over earth approximately 13,000 years ago.

THE Clovis Comet Controversy

Several remarkable events occurred roughly 13,000 years ago. Could they have been caused by an extraterrestrial impact?



By Mike Toner

In the waning years of the last Ice Age, some 13,000 years ago, North America underwent a series of abrupt and puzzling changes. There was a sharp reversal in the warming trend that plunged the continent into another cold spell, a thousand-year period now known as the Younger Dryas. Within a short time, most of North America's largest animals—including the wooly mammoth, the giant sloth, and the saber-toothed tiger—became extinct. And the Clovis people, the New World's first widely recognized culture, faded from the scene.

For decades, archaeologists have wondered why so much happened so swiftly. Did the crafty Clovis hunters drive the continent's megafauna to extinction? Did the changing climate devastate man and beast alike? Was there a continent-wide outbreak of disease? Was there widespread flooding?

Recently, another possibility emerged. In 2007, a team of researchers—representing disciplines ranging from nuclear chemistry and geophysics to oceanography and archaeology—suggested in a paper published in the *Proceedings of the National Academy of Sciences* (PNAS) that all those changes were triggered by a single event: an extraterrestrial object, probably a comet, or comet fragments, that slammed into the Laurentide Ice Sheet, which then covered a large portion of North America, between 13,000 and 12,800 years ago.

CHARLOTTE HILL-COBB

YDB WORKING GROUP

Vance Haynes (left) and Allen West examine a layer of black mat at the Murray Springs site in Arizona. Haynes doesn't believe the black mat resulted from an extraterrestrial impact.

The team said numerous lines of evidence showed that "the catastrophic effects of the impact and associated biomass burning led to abrupt Younger Dryas cooling, contributed to the late Pleistocene megafaunal extinction, promoted human cultural changes, and led to the immediate decline of some post-Clovis populations." Heading the 26-person team were Richard Firestone, a nuclear analytical chemist at the Lawrence Berkeley National Laboratory, Allen, a retired geophysicist, James Kennett, an oceanographer at the University of California Santa Barbara, and his son, Douglas Kennett, an archaeologist at the University of Oregon.

Extraterrestrial objects have struck earth in the past. In fact there are at least 175 known craters that are presumed to have resulted from extraterrestrial impacts. For example, on June 30, 1908 a powerful blast, thought to be the fragment of a comet that exploded in the air before impact, flattened trees in an 800 square-mile area of Siberia. Now known as the Tunguska Event, it's believed to have been caused by an object 50 feet or so in diameter. Sixty-five million years ago, a six-mile wide meteor gouged a 110-mile wide crater that now lies beneath the Yucatan Peninsula. The ensuing global holocaust resulted in the extinction of the dinosaurs and countless other Cretaceous Period creatures. Although the effects of the impact that created Yucatan's Chicxulub crater are now widely accepted, scientists were initially skeptical. It was only in March of this year—30 years after the idea was first proposed—that an international panel of 41 scientists finally agreed that the evidence clearly supported the hypothesis.

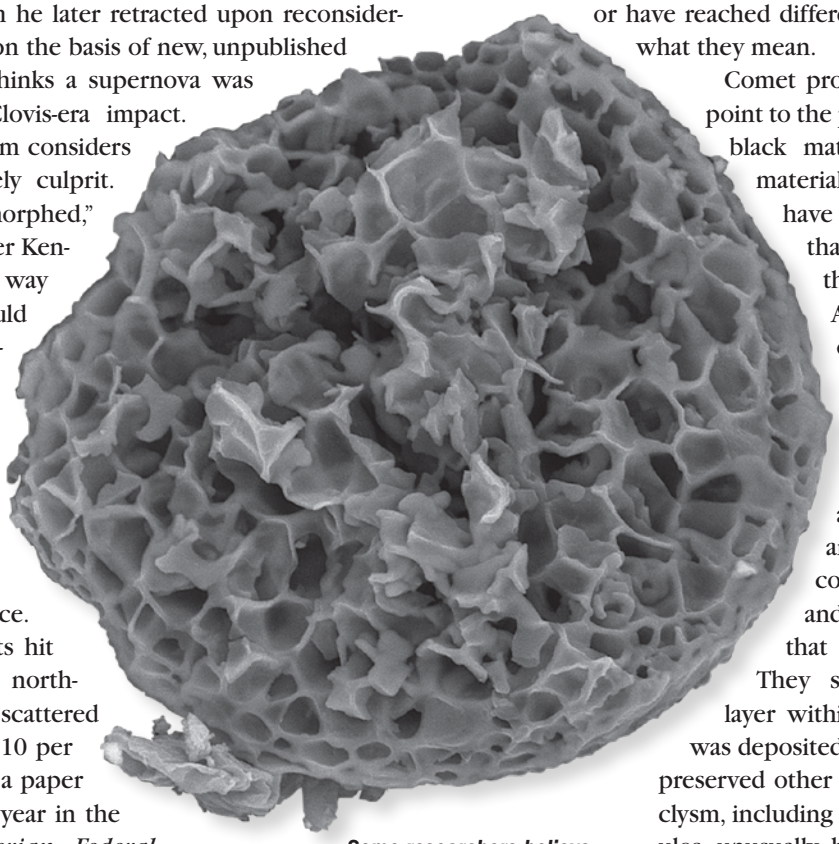
Proponents of what's often called the Clovis Comet Theory draw some comfort from the fact that their ideas, and the traces the event left in Clovis-age soils, have only been under scientific scrutiny for three years. This period, however, has been marked by a growing body of research that has failed to corroborate the theory and a rising tide of acrimony on both sides of the issue.

"In all of the claims that have been examined by independent researchers so far, there is no evidence of an impact

event at 12,900 (years ago)," says Nicholas Pinter, a Southern Illinois University geologist who is one of dozens of researchers who have tested soil samples from Clovis sites for the evidence.

Firestone acknowledges that the effort got off to a rocky start when he first suggested that the impact was the result of "shrapnel" thrown off by a supernova, the explosion of a nearby star—a claim he later retracted upon reconsidering his evidence. But on the basis of new, unpublished information, he still thinks a supernova was the source of the Clovis-era impact. But the rest of the team considers a comet a more likely culprit. "The hypothesis has morphed," acknowledges the elder Kennett. "But that's the way science works. It should change as new evidence comes in."

"The core of our hypothesis now," according to West, is that the impact was caused by "a comet that broke up while it was still in space. Some of the fragments hit the ice sheet in the northern hemisphere and scattered debris across roughly 10 per cent of the planet." In a paper published earlier this year in the *Journal of the Siberian Federal University,* Firestone and West suggested that four deep areas of the Great Lakes are "possible craters produced by the airburst breakup of a loosely aggregated projectile."



ALLEN WEST

Some researchers believe microspherules like this are debris from an extraterrestrial impact.

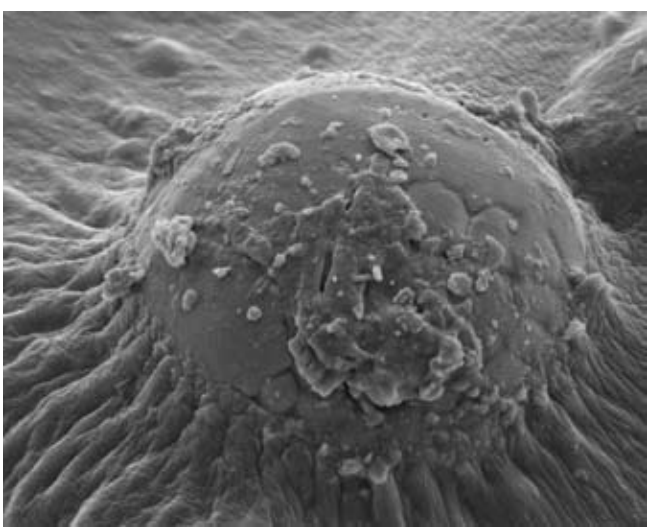
But West says he now thinks that, too, is unlikely. He contends that because the North America ice sheet was so thick, it is likely that no crater was created. But he and other PNAS authors say the resulting debris—and the continent-wide fires and widespread die-offs that followed—left faint, but tell-tale markers in the geologic record that are detectable today by sophisticated analytical methods. However, a number of other researchers have either failed to find them or have reached different conclusions about what they mean.

Comet proponents, for instance, point to the presence of a so called black mat, a layer of organic material that archaeologists have documented at more than 70 known sites throughout the country. At a number of sites, it overlies the remains of mammoths or other megafauna. The PNAS authors contend that the black mat also contains soot and carbon from the continent-wide fires and widespread die-offs that followed the impact. They say that a miniscule layer within the black mat that was deposited 12,900 years ago also preserved other indicators of the cataclysm, including magnetic microspherules, unusually high levels of iridium, and tiny "nanodiamonds" that, in their view, resulted from the impact.

C. Vance Haynes, professor emeritus of anthropology at the University of Arizona, tested that theory at Murray Springs, a well-documented Clovis site in Arizona's San Pedro Valley. The samples he collected were analyzed at the university's Lunar and Planetary Laboratory. They confirmed Firestone and West's data, but not their conclusions.

"Something big clearly happened 12,900 years ago that we don't yet understand, but we didn't find any compelling evidence for a cosmic catastrophe," says Haynes, who has dedicated his career to the study of the Clovis people. He argues that the slow, steady rain of comet and meteorite debris that falls on the Earth every day could easily have been concentrated by running water or wind. To make his point, Haynes took a sample from the roof of his Arizona home. "I was amazed," he recalls. "My roof was covered with microspherules from windblown dust."

Intrigued by the comet theory, Todd Surovell, an archaeologist at the University of Wyoming, also tried to confirm traces of an extraterrestrial impact by searching for unusually high concentrations of magnetic microspherules in the



MALCOLM LECOMPTE

This photo of a microspherule found at the Topper site in South Carolina was taken with an electron microscope.

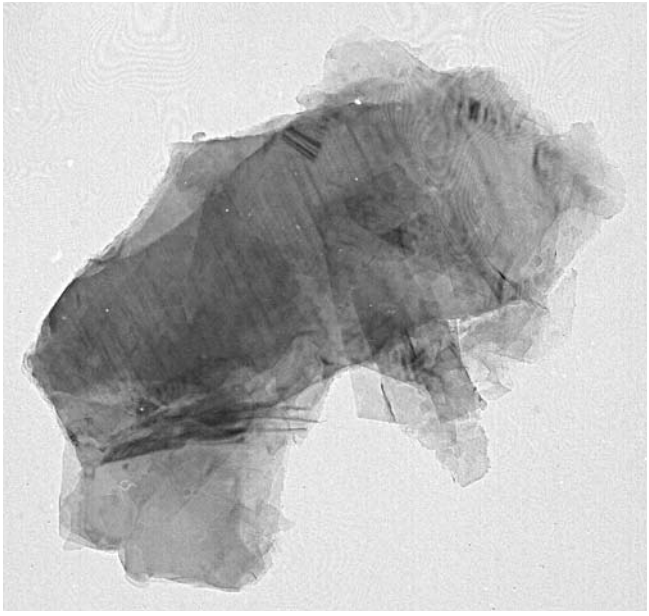
soil from seven well-dated Clovis sites. "It was one of the most difficult, labor intensive tasks I've ever undertaken," he says. "I had to extract the magnetic particles, sprinkle them on a slide, look at them through a microscope, and count them. I spent 16 months on the project and over a hundred hours in the lab. I found no peaks in microspherules at the start of the Younger Dryas. I could find no support for an extraterrestrial impact."

University of Hawaii geologist Francois Paquay couldn't either. He checked Clovis-age soil samples for high levels of iridium, a silvery white metal. Iridium served as a definitive marker for meteorite impact that marked the end of the age of dinosaurs, but he found little evidence of the metal in the samples.

University of Wisconsin-Madison paleoecologist Jacquelyn Gill examined Clovis-age lake sediments in Indiana and Ohio for unusual levels of charcoal, magnetic grains, silicate spheres, titanium, and chromium—all suggested as diagnostic signatures by Firestone and his team. She reported "no physical trend to suggest an impact event."

Andrew Scott, a University of London geologist, did find something when he examined Clovis-age sediments in search of carbon spherules the PNAS authors claim is evidence of an impact, but it wasn't what they had been hoping for. He says the organic particles were merely "fecal pellets from insects, plant or fungal galls, and wood, some of which may have been exposed to regularly occurring low-intensity wildfires."

The comet proponents maintain that the most persuasive evidence of an extraterrestrial impact is the discovery, at six Clovis-age sites across North America, of nanodiamonds—diamonds that are mere billionths of a meter in diameter—that they say could only be produced in the intense heat and pressure of the massive impact.



Clovis comet proponents believe an extraterrestrial impact produced this microscopic diamond found at the Arlington Springs site in California.

ALLEN WEST

NICOLE WAGUESPACK

Archaeologist Todd Surovell measured the amount of magnetic microspherules in soil samples taken from seven Clovis sites. After placing the samples in water (top), he extracted the microspherules using an extremely powerful magnet wrapped in a plastic bag (middle). The microspherules, which adhered to the bag, were then cleaned in a series of baths (above). He did not find an increase in microspherules that would corroborate the comet theory.

"The concentrations of nanodiamonds we found at all six locations exist only in sediments associated with the Younger Dryas boundary layer, not above it or below it," says archaeologist Doug Kennett. "These discoveries provide strong evidence for a cosmic impact event at approximately 12,900 years ago that would have had enormous environmental consequences for plants, animals, and humans across North America."

But some geologists aren't so sure. As part of a comprehensive look at all of the 175 craters caused by extraterrestrial impacts, Bevan French of the Smithsonian Institution and Christian Koeberl the University of Vienna also looked at the Clovis comet claims. They reported that while microscopic diamonds might, in some cases, be the result of a collision, they are not proof positive. They concluded that "none

MEG GAILLARD

Tariq Ghaffar excavates a Clovis-period floor at the Topper site in South Carolina. The white items on soil pedestals are Clovis artifacts. Researchers led by Malcolm LeCompte, formerly of Elizabeth City State University in North Carolina, found 20 times more microspherules on the Clovis floor than beneath it, which could suggest that a comet struck earth during the Clovis period.

of the materials so far identified in the Younger Dryas sediments can be regarded as diagnostic or unarguable evidence of meteorite impact."

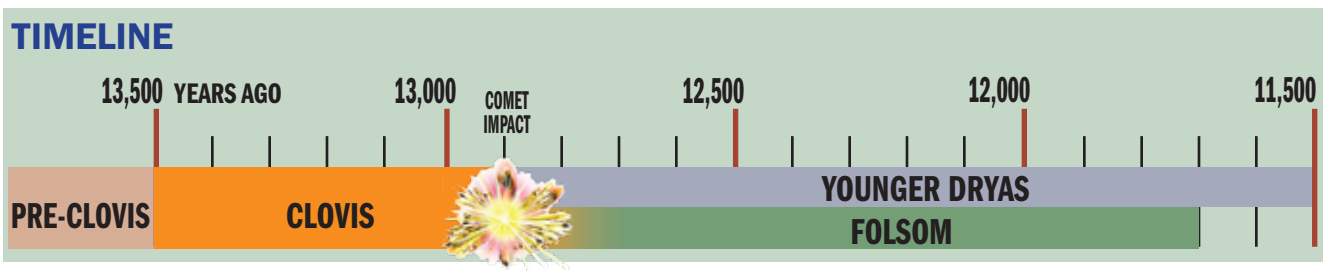
"Over and over again, various independent research teams have failed to reproduce the results presented by the impact team," says University of Arizona archaeologist Vance Holliday. "Regardless of why the results vary, this says to me that the impact hypothesis has some serious flaws."

Firestone and his colleagues have, at times, been visibly piqued by the growing list of comet naysayers. "There has been a lot of sloppy research getting expedited publication in the *Proceedings of the National Academy of Sciences* and elsewhere because it disagrees," he says. "Meanwhile, supporting information remains difficult to publish. "The truly extraordinary results of my research receive little or no discussion for reasons that I cannot understand."

There was already a fairly polarized debate about the settlement of the Americas, so this hypothesis got a lot of attention," says James Kennett, himself a member of the National Academy. "Some of the problem is due to interdisciplinary wars that have nothing to do with science." Kennett describes the periodic public meetings where both sides present their supporting evidence as scientific "shootouts."

"I've got friends on both sides of the issue," says archaeologist Jon Erlandson, director of the Museum of Natural and Cultural History at the University of Oregon. "But I've been a little surprised at how close-minded some of them are, particularly on the anti-comet side." Erlandson was one of the coauthors of the initial hypothesis in 2007, which he says was "a best effort to achieve a consensus" of more than two dozen researchers from a half dozen disciplines. Many of the individuals hold differing views. "Some of them don't even think it was a comet," he says.

There are archaeologists who would like nothing better than a neat, single-event explanation for the changes that occurred in the Northern Hemisphere during the Younger Dryas, which was named for the reappearance of a cold-tolerant flowering Arctic shrub in the European fossil and pollen record. "If it's true that there was a comet impact, the environmental disruption would be a unifying theory



VANCE HOLLIDAY

Unlike Topper, the San Jon site in eastern New Mexico did not yield a greater amount of microspherules in its Clovis-period layer compared to the site's older and younger layers.

behind the origin of the Younger Dryas, the loss of ice age megafauna, and the demise of the Clovis people," says Al Goodyear of the South Carolina Institute of Archaeology and Anthropology. Firestone and his team have found evidence of the impact at the Topper site, which Goodyear has been investigating.

"Thirty five genera of mammals were extinct by the end of the Pleistocene, but the timing of the extinctions remains uncertain," says David Meltzer, an archaeologist at Southern Methodist University. Many of them, he says, may have disappeared even before 12,900 years ago. Equally problematic is the fact that mammoths in South America, as well as in some islands in the Arctic, didn't disappear until hundreds, and in some cases thousands, of years after the presumed impact.

There is no doubt the material culture of the Clovis people ceased production around 13,000 years ago. The distinctive bi-faced, fluted points that are the hallmark of America's first recognizable lithic technology all date to a few hundred years on either side of that date. But archaeologists say there is little doubt that humans survived, and perhaps even thrived, in the post-Clovis Americas.

Any certainty about what happened after Clovis is complicated by sparse data. The most comprehensive record of prehistoric material, University of Tennessee archaeologist David Anderson's Paleo-Indian Data Base of the Americas, shows what at first appears to be a dip in the number of sites and artifacts immediately after Clovis. But Anderson says, however, artifact counts don't necessarily equate with population trends, especially when the data is based, in large part, on the voluntary reporting of discoveries by avocational archaeologists.

"There were more local cultures and they covered smaller areas of the landscape, he says. "In the parts of the country that are better sampled and more accurately dated, it appears that populations were actually growing." In the West, for instance, an abundance of artifacts left by the Folsom culture attests to a thriving bison-hunting people that dominated the region after Clovis. In the East, the picture is less clear. Many Clovis sites show no evidence of continuous occupations. "An extraterrestrial impact is an unnecessary solution for an archaeological problem that doesn't exist," says Holliday. "But sterile layers between occupation zones are the norm."

"What we're witnessing with this debate is how science does its business," says Michael Waters, director of the Center for the Study of the First Americans at Texas A&M University. "Most archaeologists would probably agree that a comet impact is within the realm of possibility. Everybody would like some sort of explanation for the things that were happening around 13,000 years ago. The comet impact is an interesting hypothesis, but right now the evidence isn't very compelling."

But archaeologist Doug Kennett says he is pleased that the comet controversy has stirred new interest in other nagging questions about the Younger Dryas. "Even if our hypothesis turns out to be wrong, it points out the need for more data, much more accurate dating of sites, and a better understanding of this important period in North America."

~~MIKE TONER *is a Pulitzer Prize-winning writer in Atlanta, Georgia. His article "Working To Reveal The Working Class" appeared in the Spring 2010 issue of* American Archaeology.~~

READING THE LAND

LIZ LOPEZ

A field at Abó is seen through a window of the ruins of the mission baptistery.

Cultural landscape studies at Salinas Pueblo Missions National Monument are revealing the complexities of past land use and settlement.

By Tamara Stewart

He strides purposefully across the desert hillside, beyond the massive sandstone mission church ruins and surrounding rubble mounds to point out blooming currants, a sea of sand plum trees, white buds deep as drifts of snow, blooming wolfberry, algerita, cholla, and other native fruit-bearing plants.

"This whole valley is a big seep spring, the water is just a couple feet below the surface, and look how lush!" exclaims Baker Morrow as he points out features and vegetation patterns at the Quarai unit of Salinas Pueblo Missions National Monument in central New Mexico. Morrow, a principal with Morrow Reardon Wilkinson Miller, Ltd. (MRWM) Landscape

Baker Morrow examines a bush of currants at Quarai with writer Tamara Stewart.

Architects and founder of the University of New Mexico's master of landscape architecture program, has been conducting cultural landscape inventories of the three units contained within the monument since 1990, comparing the Puebloan, Spanish Colonial, Hispanic, and Anglo/Euro-American occupations at the different units. His extensive knowledge of plants and their history of use, combined with 35 years as a landscape architect, give Morrow insight into the land and how to read it.

Along the eastern flanks of the Manzano Mountains on what was once the remote northern frontier of New Spain, Salinas contains the prehistoric pithouse, jacal (wood pole and mud) structures, masonry pueblos, and Spanish Colonial missions of Abó, Quarai, and Gran Quivira (earlier known as Las Humanas Pueblo) that date from around A.D. 800 through the late 17th centuries, and the ruins of four rare Spanish Colonial mission churches. At its height in 1627, Gran Quivira was one of the region's largest villages and a major trade center before and after the Spanish arrived. Morrow's firm has completed inventories of Quarai and Abó, and is finishing another at Gran Quivira.

"After studying the old landscapes at Quarai for a few years, I was standing in the middle of the gardens eating currants and whatever else was ripe at the time, when suddenly I realized they were all cultural species that had been intentionally planted by Pueblo peoples and later by the Spanish," Morrow recalls. "There are two distinct layers of cultural landscapes here about 200 years apart, often the Spanish features are right next to the Pueblos'." Nonetheless, the Spanish landscapes have little effect on those of the Pueblos. Wolfberry, algerita, currants, sand plums, cholla cactus, chokecherries, rose hips, serviceberry, and others totaling some 20 native species of fruit-producing plants all continue to thrive at Quarai. The series of underground springs that run throughout the valley have enabled these plants, established centuries ago, to still flourish here today.

Landscape features like plaza areas, terraced gardens, trade routes, and check dams can offer clues about past inhabitants' skills and strategies for everyday survival. "Cultural landscape is manipulated, artificially created landscape that includes farms, ranches, estates, roads, cities, gardens, parks, pastures, and other areas," writes Morrow in his book *A Dictionary of Landscape Architecture.* "Man-made landscape is always an expression of society, culture, and local geography … [It] may also be the larger, regional landscape in which a society traditionally finds its home, develops its myths, and imagines its future."

About 20 years ago, Morrow's firm started looking at ancient landscapes to see how far into the past they could detect land use patterns. They found they could go back

GEOFF STEWART

LIZ LOPEZ

Plant life around the Salinas pueblos is surprisingly diverse and often consists of a mixture of native and cultivated species.

at least a thousand years in New Mexico because of the exceptional preservation. "The soil color, texture, and plants themselves indicate the features lying underneath," Morrow notes. He points out a dense rectangular stand of native sand dropseed grass at Quarai that could indicate, for example, that a ramada—a covered trellis frequently found in pueblo plazas and courtyards—once stood here. When the ramada collapsed and disintegrated, the carbon in the wood could have served as a soil conditioner that spurred the grass growth.

Cultural landscape studies reveal phases of settlement, abandonment, and reoccupation, along with the details of agricultural, social, and spiritual practices. Landscape architecture and landscape archaeology, based on archival and land survey methods, are being utilized more by researchers because they can yield a comprehensive picture of land use and settlement, refuting the conventional view that formal architecture is the most important element of the built environment.

Although the National Park Service (NPS) has recognized the significance of landscape characteristics and features in parks since the 1930s, no formal policies or guidelines for preserving and managing cultural landscapes existed until 1988, when they were acknowledged as a type of cultural resource and a policy was established to protect those with significant historic, design, archaeological, and ethnographic values. In the mid-1990s, NPS developed the

Many historic landscape features are found along Espinoso Creek at Abó.

LIZ LOPEZ

The ruins of the lower convento, one of Quarai's two conventos, is shown here. The circle in the center is the remnants of a kiva.

The remains of Quarai's once grand Mission La Nuestra Señora de La Purisima Concepción de Cuarac.

cultural landscape inventory (CLI), a database that provides information on the locations, historic development, characteristics, and associated features of cultural landscapes, and such inventories of parks became federally mandated.

"The CLI program as we know it today was first started in 1996 and has grown and evolved since then," explains Carrie Mardorf, the NPS Intermountain regional CLI coordinator. "It has spurred a broader nationwide trend where other organizations are realizing the benefits of cultural landscapes and have started initiatives to inventory such places."

This rock art panel is found at Abó.

LIZ LOPEZ

MRWM's work at the Salinas Pueblo Missions has consisted of documenting cultural landscape features, associating them with the relevant prehistoric and historic periods through archival research, and describing their significance. The firm produces reports that include graphic depictions and descriptions of the land and its man-made features and changing uses through time, extensive lists of plants grown during the various time periods, chronologies of historic photographs, and many other details not typically included in archaeological reports. MRWM has completed similar studies at El Morro and Petroglyph National Monuments, and inventories at the Old Santa Fe Trail National Park Service headquarters, and the Santa Fe Plaza, for which they won a Historic Preservation Award last year.

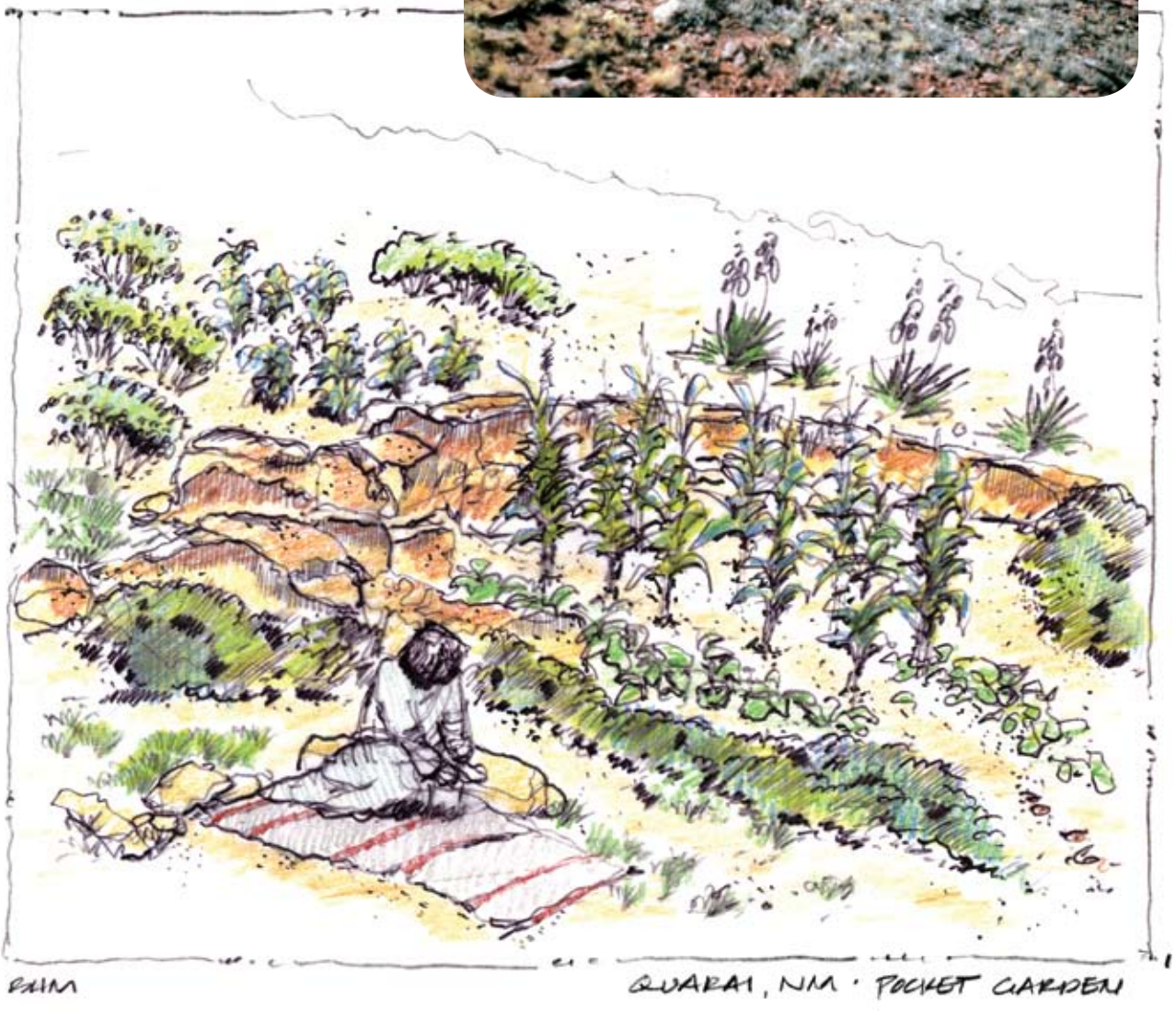
"While the information contained in the CLI is not new and unknown to us, and Baker Morrow's interpretation of features are sometimes controversial and unsupported by current archeological and historical evidence, it gives us some perspective on how to manage the landscape as a whole, not just individual features," says Glenn Fulfer, Salinas National Monument's superintendent since 1994.

Morrow's group first looks for changes in the form of the landscape that might, for example, represent historic agricultural fields. Next, they look for contrasts in soil colors and textures, noting that, generally speaking, darker soils have been enriched in some way. Then they search for associated features, such as stone check dams that may have channeled water to the fields. Finally, they look for associated artifacts,

such as stone garden tools. "If we're very lucky, we'll find marker plants such as the wolfberry at Quarai," he says, adding that wolfberry is a native fruit-bearing plant that tends to grow in disturbed soil, so it indicates the land served some use in times past. While the NPS staff agrees that wolfberry grows in disturbed soil, they believe the disturbance could have been the result of nature, such as wildfire or flooding, rather than humans.

Around the 12th century, Tiwa-speaking people from the Rio Grande Valley to the northwest and Piro-speaking people from the west moved into the "Salinas Jurisdiction," so named for the ancient salt flats around prehistoric Lake Estancia that were quarried for this valuable trade good. Abó was permanently occupied around A.D. 1200 by Tompiro-speaking people (mountain dwelling relatives of the Piros) who lived in pithouse and jacal structures.

A modern picture of a Quarai check-dam is juxtaposed with an illustration depicting how this landscape could have looked hundreds of years ago. The dam served a pocket garden of squash, corn, beans, wolfberries, currants, and yuccas. The garden was watered by snowmelt and rain runoff.



BAKER MORROW

"Small-scale fields planted in corn, tomatillo, beans, squash, amaranth, and possibly Indian rice grass and cotton were common between A.D. 1300 and 1622," says Morrow, who documented many agricultural terraces with stone tools above a creek. "Plazas, shrub-crop fields, and courtyards were primary landscape architecture features during this period."

By the 15th century, Abó was a thriving pottery production and trade center. Morrow is trying to determine when a well-traveled road that passed through Abó was established there. The road joined the 1,500–mile long Camino Real, on which wagons loaded with mission supplies arrived from Mexico City every three years. The wagons returned with salt that was used for smelting in the silver mines of Santa Barbara, Mexico, as well as piñon nuts, woven goods, and other products. When the Spanish arrived in the 1620s, about 800 people were living at Abó, and the population surged to 1,500 people by the 1640s.

In the early 1620s, Franciscan friars coordinated the construction of a mission church. A much-expanded, nearly 40-foot-tall cruciform church and convento known as Misión San Gregorio de Abó was completed at the site in 1651. The friars set up mission schools and Abó was designated as a *doctrina*, a teaching mission with one or more resident priests, whereas outlying pueblo missions were designated *visitas*, or missions visited by the priests that were assigned to the *doctrina*.

"The cultural landscape at Abó is rich, intricate, and old," Morrow wrote in his inventory. "It includes such carefully planned features as Puebloan courtyards and plazas, a Spanish atrio [atrium-like feature] and cloister, late Spanish period, Mexican period, and Territorial fields, gardens, orchards, and modern landscape elements."

Located about 14 miles northeast

of Abó, Quarai consists of a small mid-13th- to 15th-century prehistoric settlement, a large pueblo that dates from 1600 to 1675, a massive 100-foot-long by 40-foot-tall early 17th-century mission church and convento known as Misión La Nuestra Señora de La Purísima Concepción de Cuarac, and a 19th-century chapel.

Here Morrow and his crew documented what he believes to be gardens in woodland clearings and along a creek. These gardens yielded corn, beans, squash, native grasses, and amaranth, and they were lined with fruit-producing shrubs. The researchers also found what they believe to be tri-faced stone digging points, bi-faced flat hoes or shovels, as well as scrapers, small knives, and stone tool fragments still lying beside the gardens. NPS staff, however, consider these items to be naturally occurring broken limestone rather than artifacts.

LIZ LOPEZ

The interior of the courtyard of Abó's convento. The circular kiva is in the foreground.

LIZ LOPEZ

The convento at Gran Quivira. The area surrounded by the square wall in the center was once a pen where livestock were kept.

While investigating the Spanish Colonial-period walled gardens, agricultural fields, and corrals at Abó, Quarai, and Gran Quivira, Morrow confirmed historical accounts of Old World crops such as peaches, apricots, grapes, and other fruits, cabbage, peas, cereal grains, and livestock such as donkeys, horses, cattle, pigs, sheep, and goats. North America's earliest wheat fields and the region's first apple orchards were introduced by the early 17th-century Franciscans. Other Spanish Colonial landscape features identified at the sites include the priests' patios, waiting rooms, courtyards, and a walled pond with irrigation ditches.

"The Pueblo people had a large series of gardens along hilltops, slopes, and valleys—not in big two-acre plots like the Spanish, who grew newly-introduced, cold-tolerant winter wheat," says Morrow. "Another big difference was the Spanish introduction of animal husbandry, with their herds of cattle, horses, pigs, donkeys, and chickens."

Widespread drought resulted in famine for much of New Mexico by the late 1660s, especially eastern areas such as the Salinas that were most vulnerable to increasing Apache raids. Spanish documents from this period tell us that during the winter of 1668, 480 people died of starvation and disease at Gran Quivira alone, and the remaining residents fled to Abó in 1671. In 1673, Abó was abandoned, and four years later the 200 families and resident priest remaining at Quarai were forced to flee north to Tajique Pueblo, and then on to Isleta Pueblo, seeking refuge from the raids. All of the Salinas area pueblos were abandoned prior to the Pueblo Revolt of 1680, the residents having joined Tiwa neighbors at Sandia and Isleta Pueblos and other settlements around what is now El Paso, Texas.

About 130 years later Hispanic villages were established among the Pueblo and Spanish Colonial ruins at Abó and Quarai, creating new landscape features that included town walls, small plazas, a stone lookout tower, new orchards and fields, an expanded irrigation system, and sheepfolds. The descendants of the Sisneros family, mid-19th century settlers of the area, still live at the site of Abó today.

"These landscapes form an integral part of the development of the settlements and help to explain the uses of the sites since occupation began there several hundred years ago," Morrow wrote in one of his reports. "I think of myself as a student of these old gardens, which don't teach all their lessons at once. One can't be 20th-century impatient to understand these ancient landscapes."

His findings at the Salinas Mission Pueblos complement the archaeological and historical records, identifying differing environmental and cultural adaptations and showing clear differences in how northern Tewa and southern Tiwa and Piro Puebloan peoples designed and built their landscapes, with northern communities such as those of the Chama Valley and Jemez Mountains heavily relying on extensive gravel-mulched stone grid gardens, and those in the Salinas country to the south creating shrub-hollow, berry, and pocket gardens. "These regional trends," Morrow says, "once we recognize them, can give us a better sense of place and help us to interpret and preserve the landscape."

Tamara Stewart is *the assistant editor of* American Archaeology *and the Conservancy's Southwest region projects coordinator.*

Reexamining Kincaid Mounds

TAMIRA BRENNAN

Tamira Brennan walked barefoot around the perimeter of a freshly dug pit, sketching lines and circles with a stick into the hard-packed Illinois clay. Her muddy shins and sweat-soaked T-shirt testified to the heat, humidity, and hard day's work excavating a structure inhabited a thousand years ago.

With her stick, Brennan—an archaeologist at Southern Illinois University Carbondale (SIUC)—traced what were probably the walls of the house. At this preliminary stage, Brennan is letting variations in the texture and color of the soil guide her hand. A few yards away, a dozen students in archaeological field methods take a break from their work to swig water and slather themselves with SPF 50 sunscreen.

As Brennan worked, she conferred with Paul D. Welch, another archaeologist at SIUC. Since 2003, Welch and Brian Butler, Director of SIUC's Center for Archaeological Investigations, have been investigating this sliver of Illinois river bottom known as the Kincaid Mounds, a Mississippian site that was occupied from roughly A.D. 1000 to 1450, found across the Ohio River from Paducah, Kentucky. Brennan, one of Welch's doctoral students, directs the field school and supervises the day-to-day activities. "There's a lot that we're trying to understand about how they functioned as a society. Kincaid was a regional political and religious center," said Brennan.

"Our goal is to learn about the layout of the community—the sizes and locations of the buildings," said Welch. Brennan outlined splotches of orange in the otherwise dark-brown soil. The stains were burned remnants of clay daubed on the house exteriors. A small but sturdy stub of a pole at one corner could prove to be a support post. "Right now, what we're looking for are the edges of this building," he said.

The Kincaid Mounds may be one of the best known but least explored of Mississippian sites. It's well known because Kincaid was the laboratory in which Fay-Cooper Cole, co-founder of the Society for American Archaeology and head of the Anthropology Department at the University of Chicago during perhaps its most influential period, developed many of the basic principles of field archaeology. Cole is credited with broadening archaeology's scope from a museum-oriented study of artifacts to a discipline that encompasses social behavior and relies on rigorous scientific methods—many of those methods first put into practice during his investigation of Kincaid between 1934 and 1941.

Subsequently the privately-owned land was farmed, as it always had been, for a few more decades. Cole and his

In the 1930s, archaeologists from the University of Chicago utilized new field methods while investigating Kincaid Mounds. Some 60 years later, with the help of recent technology, another team of archaeologists is drawing new conclusions about this well-known Mississippian site.

By Susan Caba

Students expose the remains of a large burned building. Three of Kincaid's extant mounds are seen in the background.

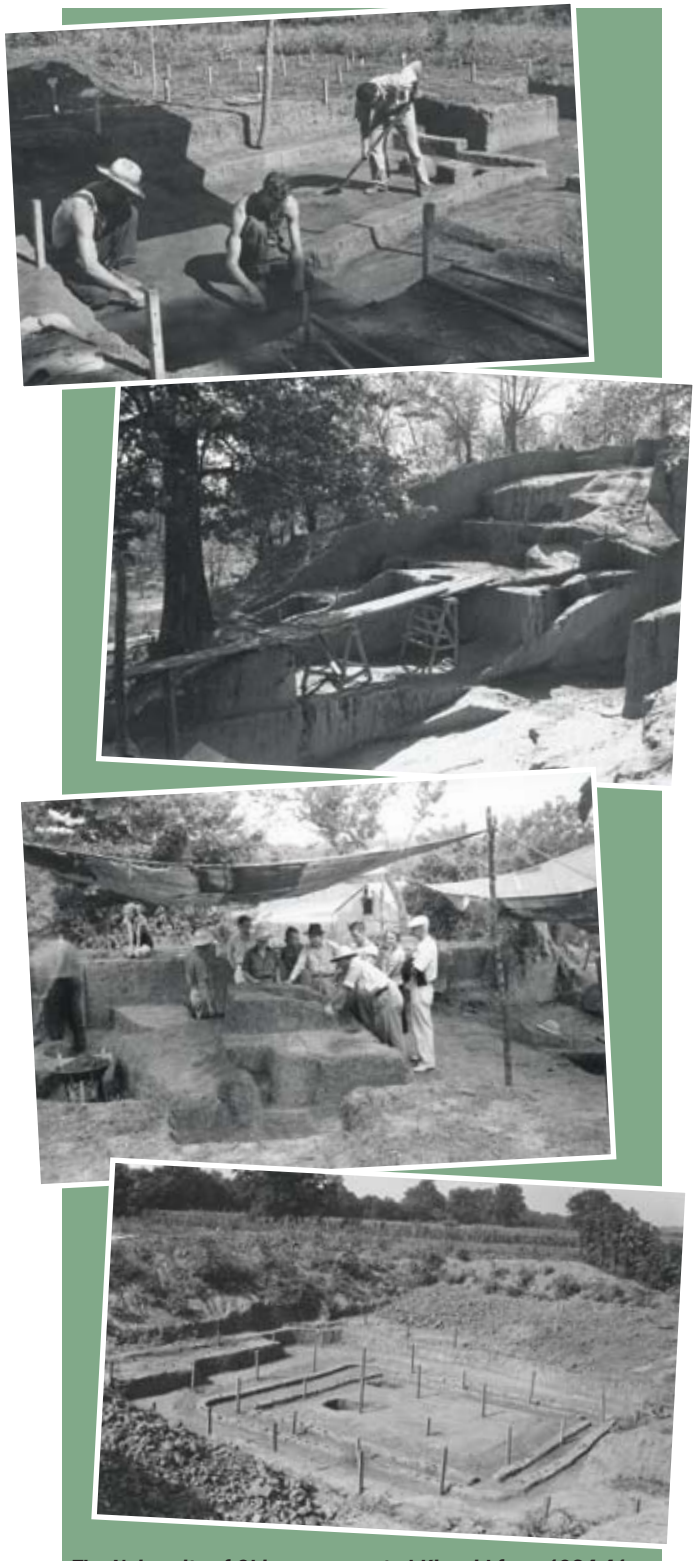
graduate students compiled the group's findings in the book *Kincaid, a Prehistoric Illinois Metropolis,* published in 1951 by the University of Chicago Press. But in the world of archaeology, the Kincaid excavations were more noteworthy for the novel techniques they introduced and the great names in archaeology—Richard MacNeish and Jesse Jennings, among many others—who trained there, than for the site itself.

Six decades passed before archaeologists again excavated Kincaid. Using techniques developed by Cole that have since been highly refined, and new technology that Cole—who died in 1961—never dreamed of, SIUC archaeologists are learning that Kincaid was much more complex than previously thought.

Welch and his colleagues and students have determined that Kincaid was larger than Cole believed. It included many more structures, which varied in size, shape, and purpose. The center of the settlement grew, and then contracted, judging by a log palisade that was built and rebuilt over time to

ILLINOIS STATE MUSEUM PHOTO NO. MX672

Archaeologist Fay-Cooper Cole (left) of the University of Chicago talks with Horace Miner, who directed the fieldwork at Kincaid in 1938.



The University of Chicago excavated Kincaid from 1934-41.

ILLINOIS STATE MUSEUM PHOTOS NUMBERS PP551, MX1082, MX1136, MX271.

encircle the major mounds and buildings.

One of the techniques Cole tried at Kincaid was dendrochronology—using tree rings to establish dates—but he was handicapped by the quality and quantity of trees available as a basis for comparisons. As a result, the dendrochronology suggested that Mississippians were still living at Kincaid as late as A.D. 1600, at least 150 years off the mark. SIUC researchers radiocarbon dated the same cedar samples, arriving at the conclusion that the site was abandoned no later than A.D. 1450

Still, the University of Chicago work provided a base of knowledge for these subsequent investigations. "Some of the conclusions in the 1951 book may not be correct," said Welch. "But they were developing the first field techniques for excavations—and they were excavating things archaeologists had never seen before."

Like other Mississippian sites, Kincaid is distinguished by flat-top mounds that served as platforms for community buildings, such as temples and council houses, and possibly homes for the society's elite. Five major mounds and seven smaller mounds ringing a central plaza are visible. However, Welch estimates—based on topography and subsequent excavations—that there were as many as 27 mounds. Some have eroded or been plowed, making them all but indiscernible.

Using stone hoes and spades, the Mississippians dug up soil—as much as 90,000 cubic yards—then stacked basket loads of mixed soil and clay to create the mounds. Some were enlarged over many years. Others seem to have been built in a single phase. The major mound is 30 feet high and covers two acres. Another is 20 feet high, close to 500 feet long, and 200 feet wide at the base.

The site, which is split by the Pope-Massac county line, takes its name from the family that farmed the Massac County portion from 1830s into the mid-20th century. The Kincaids built their house on one of the large mounds in 1876, and it was torn down 90 years later. Kincaid became a National Historic Landmark in 1964 and was listed two years later on the National Register of Historic Places.

The state of Illinois stepped in and bought the Massac County half in 1975, which included most of the mounds. To prevent looting, heavy brush and trees were allowed to overrun the mounds. That concerned a group of locals, who established the non-profit Kincaid Mounds Support Organization (KMSO) to maintain the site. "They've taken it upon themselves to be docents of the mounds," said Welch.

One of the new technologies being used at Kincaid is geophysical survey, principally magnetometry. The work was done by Berle Clay of the Center for Archaeological Investigations, Michael Hargrave of the U.S. Army Corps of Engineers, John Schwegman of KMSO, and Staffan Peterson of the Indiana Department of Transportation. The geophysical survey map—liberally punctuated with dark spots on a light gray background—illustrates subsurface characteristics of the soil throughout the site. The dark spots indicate a change in the magnetic properties of the subsoil. A number of factors can cause such changes, and at Kincaid one of the most likely possibilities is fire, consequently the spots could represent the locations of a hearth, a fire pit, or a house that burned down.

As it happens, Mississippians periodically shifted their possessions to a new house and burned the old one. Why? "One reason may have been to get rid of the fleas, ticks, and

Paul Welch examines an excavation unit.

various other vermin living in the grass-thatch roof," said Welch, noting that historic accounts mention infestations in the thatch roofs. Since the ash would fall into the trenches at the base of the walls, the perimeters of the burned buildings show up particularly well on magnetometry images. "Working with magnetometry has been the key to our effectiveness," said Butler. "It serves as a guide for deciding where to dig."

In 2003, the Kincaid Mounds Support Organization wanted to build a small interpretive overlook for visitors. They consulted the SIUC experts, who commissioned the first magnetometric survey to guide placement of the overlook. Since then, approximately 75 acres of the 105 owned by the state have been surveyed. The images have gone a long way toward satisfying one of SIUC's research goals, which is mapping the site.

The magnetometry images reveal that the biggest mounds are arrayed around a plaza. There are indications of large structures, possibly temples or public buildings, on some of the mounds—the evidence is large areas that show high magnetization, consistent with large burned structures—and dozens of spots throughout the site that most likely represent houses. The houses are arrayed in clusters, almost like neighborhoods or clan compounds.

One of the earliest revelations was that the Kincaid community was much larger than originally believed. "It extended much farther to the west," Welch said, pointing to a slight rise well outside what had been considered the perimeter. The Chicago researchers surmised it was a hillock created by a modern farmer, similar to two across the road. Welch and Butler suspected it was a Mississippian mound. To their surprise, the magnetometry map showed a constellation of 16 houses nearby. A dig in 2005 confirmed the rise was a mound surrounded by Mississippian houses.

RUSSELL BAILY/SIUC UNIVERSITY COMMUNICATIONS

Tamira Brennan and Brian Butler (standing) watch as students measure an area prior to excavating it.

CAI SIUC

These miniature vessels were found on the floor of a burned building in the main plaza during excavations in 2009. The purpose of these vessels is not known, but it's assumed they were not toys.

The route of the palisade of upright logs, indicated on the survey image and confirmed by excavation, also supported the idea of a more extensive settlement. The wall was plastered with mud and punctuated periodically with defensive bastions. SIUC excavations revealed the palisade had been reconstructed and, at times, rerouted. At the community's peak, in approximately 1200, the palisade snaked for a mile, enclosing at least 150 acres. When the community began to dwindle, the wall was rebuilt to encompass a smaller area. "We now know the site is much larger and there is a great deal more complexity to it." said Butler. "The palisade gives you a de facto boundary."

In 2007, the field school dug into the top of the second largest mound. The geophysical survey revealed a circle with a diameter of 72 feet and what appeared to be a large hearth in the center. No hearth was uncovered, but the archaeologists discovered that the perimeter circle was the foundation trench for a huge round building—unusual because most buildings at Kincaid are rectangular or square. Corin Pursell, an SIUC Ph.D candidate, thinks it would have held hundreds of people. He speculates it was a council hall intended for public meetings that would have drawn residents from throughout the region.

The chief of this community—perhaps advised by a council of lower ranking leaders that met periodically—may have controlled or influenced an area with a radius of about 30 miles that contained many smaller mound communities. The residents of the outlying locations were likely affiliated with Kincaid, much as farms and small towns today are connected to a county seat.

R. Berle Clay does a geophysical survey using a dual magnetometer.

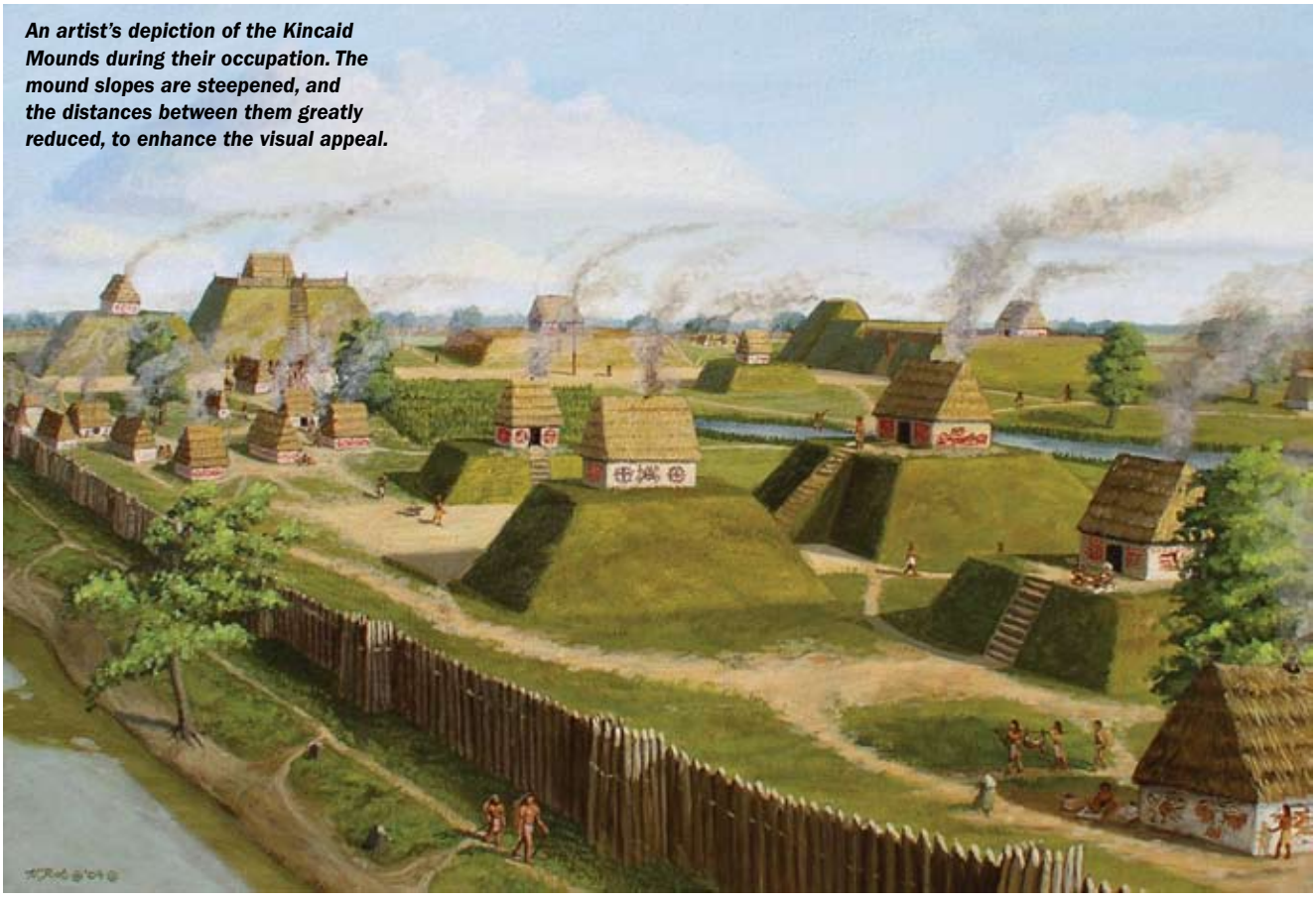
As it happens, those outlying areas have been thoroughly studied. Jon Muller, now professor emeritus in the Department of Anthropology, conducted SIUC field schools for almost two decades. With Kincaid mostly inaccessible, they concentrated on locations throughout what is known locally as the Black Bottom, both for the quality of its soil and the African-American farmers who later settled in the area. Muller's studies—both archaeological and ethnographic—inform the findings of the later SIUC field schools.

"They clearly restricted their locations," said Muller, pointing out Mississippian sites in the Black Bottom, near Kincaid. "The sites were almost 100 percent all on the same loam—a very narrow band of soil types, in swampy zones. They were close to marshy areas that would produce an abundance of fish, birds, whitetail deer, raccoons, wild turkey, and other wildlife, as well as edible vegetation." Mississippians, he said, relied on maize for about 40 percent of their diets. "Corn has a very distinctive carbon pathway…by testing the bones of the people who ate it, we can tell what percentage it was of their diet."

Before the magnetometry survey gave a more accurate picture of the size of the Kincaid community, Muller had estimated there were about 300 people living at the main mound site. With the new information, the belief is that the population inside the palisade was closer to 1,000 and that there were probably 3,000 to 3,500 people throughout the Black Bottom.

"There's a huge amount of diversity in the way they were living, the size of their houses and the organization of their houses," said Brennan. "These people were not as homogenous as we once thought. Earlier houses are more likely to be rectangular, later houses are more commonly square. We were kind of shocked, when the magnetometry came out, to see that the houses were in discrete groups, set in little clusters. In one area, there are bunches of square

BRIAN BUTLER



An artist's depiction of the Kincaid Mounds during their occupation. The mound slopes are steepened, and the distances between them greatly reduced, to enhance the visual appeal.

HERB ROE

houses, sort of in courtyard groups. In other areas, there are small rectangular houses in rows, all aligned in one direction. Then there is another group of much, much larger houses lined up in a different direction. One possible explanation, Brennan said, is that the clusters indicate differences in status, clans, or ethnicity of the residents.

Since 2005, the researchers have excavated six houses. "In almost every case, we would dig a house and there would be another house underneath it. That was common and, in some cases, there were at least three re-buildings at the same location," she said.

"We typically will dig the wall trenches, then we'll find another floor and then another set of wall trenches. We'll be totally done digging a house and then we find more artifacts—a lot of pottery, a lot of chipped stones from the tools they used. Every now and then we find some goodies, some fluorite, which is purple or blue or pink and was used to make ornaments, sometimes animal effigy heads, and even some human figures."

CAI SIUC

This ceramic effigy of a human figure was recovered from the site.

The Mississippians' propensity for burning and rebuilding a house, or enlarging it, led the University of Chicago archaeologists to mistakenly surmise that the ancient people built double-walled houses for insulation. In fact, Welch said, the wall trenches for one generation of the building could run parallel to the trenches for another generation, which could have led to that mistaken interpretation.

The first house excavated this summer was fairly typical—large, square, and semi-subterranean with daubed walls. It did yield large pieces of several pots, most notably a blank-faced, hooded water bottle with two "ear-like projections coming out of the top of its head," said Welch. Graduate students will clean, date, and study the artifacts in the coming year. If absolute dates for the pottery can be established, the house can be tied into the chronology of the site.

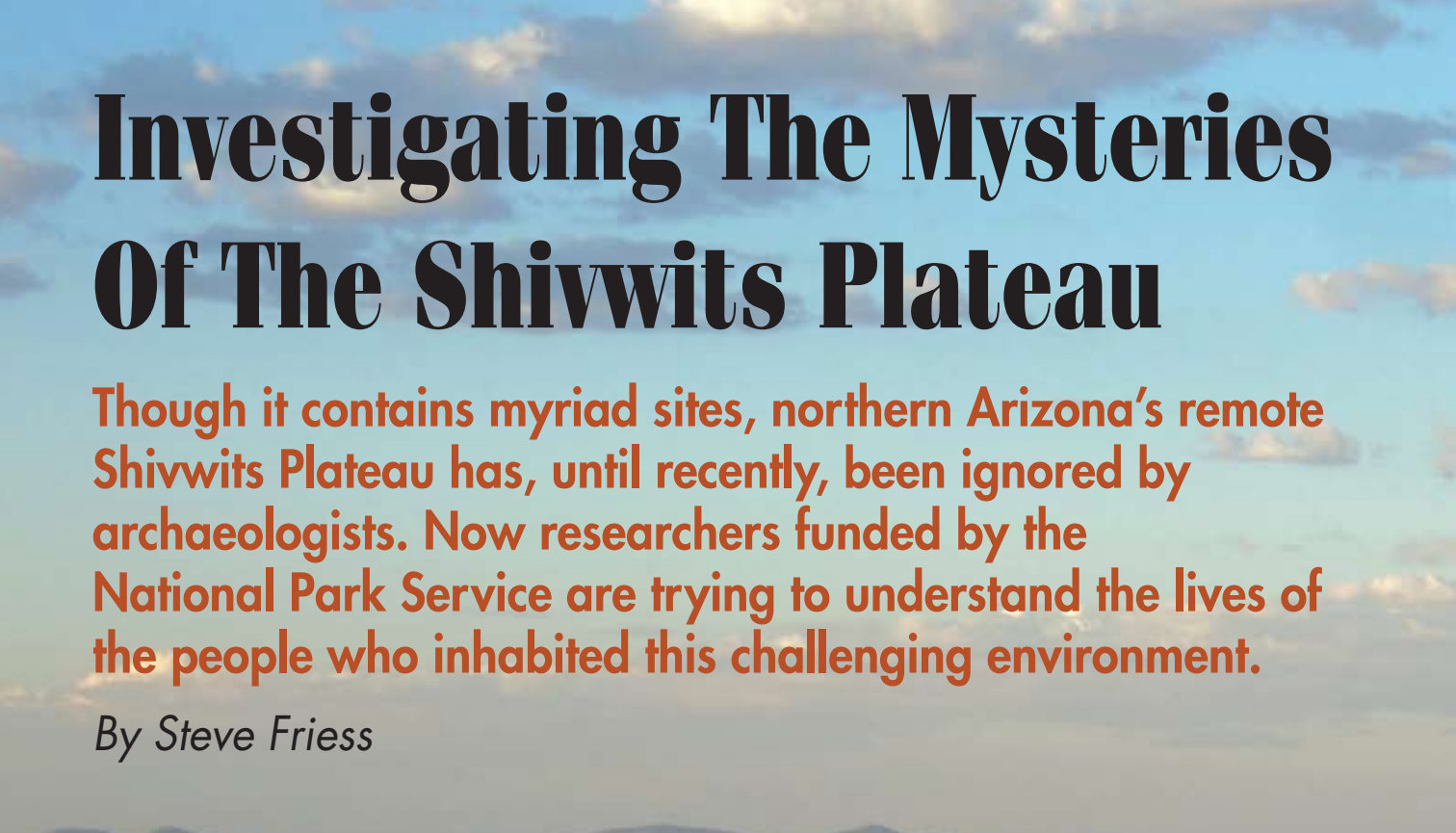
Twenty shovels lay in two rows next to the house site. The field school used them to remove the soil, grid by grid, working diagonally across the structure to create the bear-claw-shaped excavation. The magnetometry map that guided them fluttered in Welch's hand. Using one of the oldest instruments in the archaeologist's arsenal and one of the newest, the SIUC crews have revealed a few more chapters in the mystery of Mississippian daily culture. The Kincaid Mounds Historic Site undoubtedly has more to reveal. "There are still a lot of things we don't understand," said Butler. "And some of what we think we know—we still argue about what it means."

SUSAN CABA *is a freelance journalist who writes about the arts, material culture, and the built environment.*

Investigating The Mysteries Of The Shivwits Plateau

Though it contains myriad sites, northern Arizona's remote Shivwits Plateau has, until recently, been ignored by archaeologists. Now researchers funded by the National Park Service are trying to understand the lives of the people who inhabited this challenging environment.

By Steve Friess



The students eagerly gathered around the excavation unit known as Room 4 shortly before noon. Not even an experienced archaeologist like Karen Harry, of the University of Nevada Las Vegas (UNLV), could contain her excitement. Earlier in the month, UNLV students Jennifer Durk and Dana Foster, who were participating in a six-week field school directed by Harry, had come across an oblong, golden-colored sandstone slab about the size of a garbage-can lid. The slab had been placed beneath the layer of floor mortar of this room of a pueblo inhabited around A.D. 1150 on the vast Shivwits Plateau immediately north of the Grand Canyon in Arizona.

Imaginations had run rampant as to what they might find: A burial? A cache of turquoise or some other valuable commodity? But when Foster lifted the sandstone slab they found nothing but dirt, a sample of which Durk scooped into an airtight bag. The sample will be analyzed for pollen content to determine the types of plants that grew here some nine centuries ago.

Harry later inspected the area beneath the slab and found charred material, suggesting that the Shivwits Plateau Anasazi once had a fire pit in this area. She surmises that the fire pit was capped when the original habitation room was remodeled into a storage room. Her students also unearthed two other similar-looking slabs beneath floor mortar in other rooms, but there was no evidence that they had used it to cap fire pits. A sample of the sandstone will be sent to a geologist to find out where it was quarried. Harry believes it came from somewhere within the Grand Canyon.

Harry's field school is part of her effort to understand

the pre-historic peoples who occupied this vast, high-desert area about 25 miles north of the Colorado River that, prior to the last few years, had been ignored by archaeologists. She wants to know how these people sustained themselves in this remote, arid, and often cold environment. Despite these challenges, the Shivwits Anasazi not only survived, they also established a thriving trade network, sending their surplus pottery to their neighbors some 50 miles west, in what is now known as the Moapa Valley of southern Nevada.

Harry spent more than a month last summer with 12 students, half from UNLV and half from across the nation, at what they call Site 82. She and Brigham Young University archaeologist James Allison have each done two other field schools over the past five years on the plateau. The two work independently, but regularly consult each other. Allison's research questions are similar to Harry's. Did the people live here year-round or seasonally? Did they farm? How long did they occupy this area? What kind of houses did they reside in?

Answers to those questions could help solve the central mystery: What did the Shivwits people receive from their trading partners and why did the two parties exchange goods for just 100 years, from A.D. 1050 to 1150? The archaeologists suspect this trade network existed because Shivwits pottery has been found in large quantities in the Moapa Valley, and most of that pottery is found at sites dating to between about A.D. 1050 and 1150.

The Shivwits Plateau encompasses more than a million acres of land, more than half of which falls within the Parashant National Monument established by President Clinton in 2000. Only a fraction of this monument, which is co-managed by the Bureau of Land Management and the National Park Service, has been archaeologically surveyed. Even so, the evidence suggests that the monument contains thousands of archaeological sites, but most are even more remote than the ones Harry and Allison have excavated.

This is one of the reasons why the plateau has been largely ignored by archaeologists. Another is that it's bereft of intact, aboveground pueblos and, thus, less alluring than some other areas of the northern Southwest. Allison noted that the entire Arizona Strip—the expanse that lies between the North Rim and the Utah border—has been overlooked because of its remoteness.

"When you look around, it looks like a pretty challenging place to be a farmer," Harry said, surveying a landscape

Student Jennifer Durk looks out from the top of Mt. Dellenbaugh. The Shivwits Plateau is in the foreground and the Grand Canyon is in the distance.

RYAN WASHAM

The large sandstone slab in the foreground was found in Room 4 at Site 82. The slab was discovered beneath a layer of floor mortar.

dotted by piñon and juniper trees and lots of desert scrub. "There are no permanent rivers here and we get a very short growing season with frost until about May and starting up again in September. So how did they make a living up here? And what made them leave?"

These and other questions remain unanswered, but data from Harry's two prior digs—Lava Ridge, which she excavated in 2006, and Granary House in 2007—both of which are near Site 82, combined with evidence from this field school, have led her to hypothesize that the Shivwits people lived there year-round and that they traded their surplus pottery.

The key to both assumptions, Harry said, is found in the iron-rich, deep red basalt soil. It is a distinctive volcanic material found in the ceramics at Moapa Valley sites. Research done in the late 20th century by UNLV professor emeritus Margaret Lyneis showed that Shivwits pottery had a unique signature, a combination of that red earth tempered with crushed pottery produced by people from Mount Trumbull, about 10 miles east. This pottery is much lighter-colored and contains olivine, a mineral that, in this region, is found in abundance only in the Mount Trumbull area, according to Lyneis. It's assumed that the Shivwits people traded for the Mount Trumbull pottery, and then once it broke, crushed it to use as temper, Lyneis posits.

Harry is also convinced the basaltic soil's composition enabled it to retain water, making it sufficiently fertile for

ISAAC BREKKEN

Karen Harry discusses the slab with her students prior to removing it.

farming. The analysis of soil samples from Harry's prior digs revealed corn pollen and kernels as well as cattail pollen, which suggests an adequate supply of water. In addition, Harry noticed rock formations arranged by the ancient people to control the flow of water onto growing patches, and she also found two primitive hoes.

"I think that if you came up here and planted while the snow was melting in May, that would cover you while you were germinating, and then it was summer and you have the monsoons, and that would cover you while you're growing," Harry said. "I think they could get a crop. The biggest problem is the freeze cycle—there is frost as late as late April and again in early September. I'm wondering if something happened climatically that lengthened that growing season."

The archaeologists have uncovered limited data because the ancient people removed most of their useable items when they departed, often tearing down the rock walls and burning the wooden beams. The pueblo found at Site 82 is a prime example. Evidence there suggests that when it was abandoned, artifacts were removed from the houses, the rooms set on fire, and the fire then smothered with nearby trash and dirt. "They didn't leave us very many clues at all," Harry said of the occupants. "They seem to have thrown their trash out, which is the first thing that's made it really hard on us. They must have eaten something, but we're not finding any intact trash deposits. The coyotes have long since scavenged all the animal bones and the rains have come along and washed away all the ashy stuff when they cleared out their fire pits. What we have left are the pieces that don't get washed away, like the lithics and the sherds and the pottery."

What does seem clear to Harry is that these pueblos required more effort and materials than ancient peoples would have used if they were seasonal occupants. "The level of labor investment suggested that to me," she said. "You don't do all of this if you're only here seasonally." All of the habitation rooms, and most of the storage rooms, were constructed partially underground. The excavation of subterranean pits would have helped the rooms stay warm in the cold plateau winters, but they also would have required a substantial labor investment.

But neither she nor Allison has a clue as to why they stopped trading with the Moapa Valley people. The hike to that area was long and difficult, so "how does that make economic sense?" Allison wondered. "What does it tell us about the people who lived there? It is interesting that there are strong economic ties between these areas for a time, and then in other times there's not."

KAREN HARRY

Students construct a room with a hearth to test Harry's theory that the seasonal freeze-thaw cycle destroyed evidence of hearths and other interior features at sites in the region.

A miniature Shivwits fingernail incised jar recovered from Site 82.

One of Harry's goals is to refine the chronology for the area. Presently, the dating of archaeological sites on the Shivwits Plateau relies either on ceramic cross-dating (in which painted pottery styles are dated through comparison with similar, better-dated pottery styles to the east) or on the radiocarbon dating of organic matter. However, both techniques result in a date range of perhaps a hundred years or so, rather than providing a date of a specific year. "To understand why the trade network flourished and why it stopped, we need better dates. We can address more specific questions if we have a more specific chronology."

Toward that end, samples of wooden beams recovered from Site 82 and Lava Ridge Ruin will undergo tree-ring analysis at the University of Arizona, a technique that can yield precise dates. Tree-ring dating relies on the fact that, in certain species of trees, a single growth ring is laid down each year. The width of the ring is determined by climatic conditions, and the wetter the year, the wider the ring will be. Within a given area, variations in ring widths will be patterned chronologically. In most areas of the northern American Southwest, regional sequences have been developed so that the tree-ring patterns can be correlated to specific calendrical dates. If these sequences are found to apply to the Shivwits Plateau, then it may be possible to obtain calendrical dates from the wooden beams recovered from Site 82 and Lava Ridge Ruin.

Allison, however, cautioned that the lack of prior research on the Shivwits Plateau could make tree-ring dating difficult. He, too, has some wood samples at the lab from his sites, but he's pessimistic: "One issue is whether we'll get good dates, because we lack a sequence of this area specifically. In fact, we have virtually no tree ring dates from the Shivwits and some lousy ones from southwest Utah. To get some dates, we're going to have to hope the climactic changes there were similar enough to the climactic changes across the Grand Canyon, where we have very solid data."

Allison and Harry speculate that the Shivwits Anasazi may have received salt, turquoise, cotton, and other goods in return for their pottery. Allison further proposes that they may have joined their trading partners in the Moapa Valley during harvest time to assist with the crops in exchange for a share of the produce.

Harry now awaits the outcome of analyses of pollen to learn what the people at Site 82 ate and grew as well as of tree-ring samples. She and Allison are jointly applying for a National Science Foundation grant to do more extensive tree-ring testing on older living trees on the Shivwits Plateau that could provide a baseline. She's also plans to send samples of sherds found at Site 82 to the University of Missouri Research Reactor Center for neutron activation analysis, a process that reveals the sample's elemental composition. This, she hopes, will help pinpoint the place on the Shivwits Plateau where the pottery found in the Moapa Valley was made.

Yet there is one other somewhat more novel experiment Harry is excited about. She has been bothered by the lack of hearths on her sites, but she surmises that the basaltic clay freezes with moisture from snowfall during the winter and thaws and dries in the summer, a cycle that obliterated evidence of hearths. To test this theory, Harry and her students constructed a room with a hearth, burned items in it, and then buried it. She'll return to Site 82 next year to see if the freeze-thaw cycle results in the hearth's disappearance.

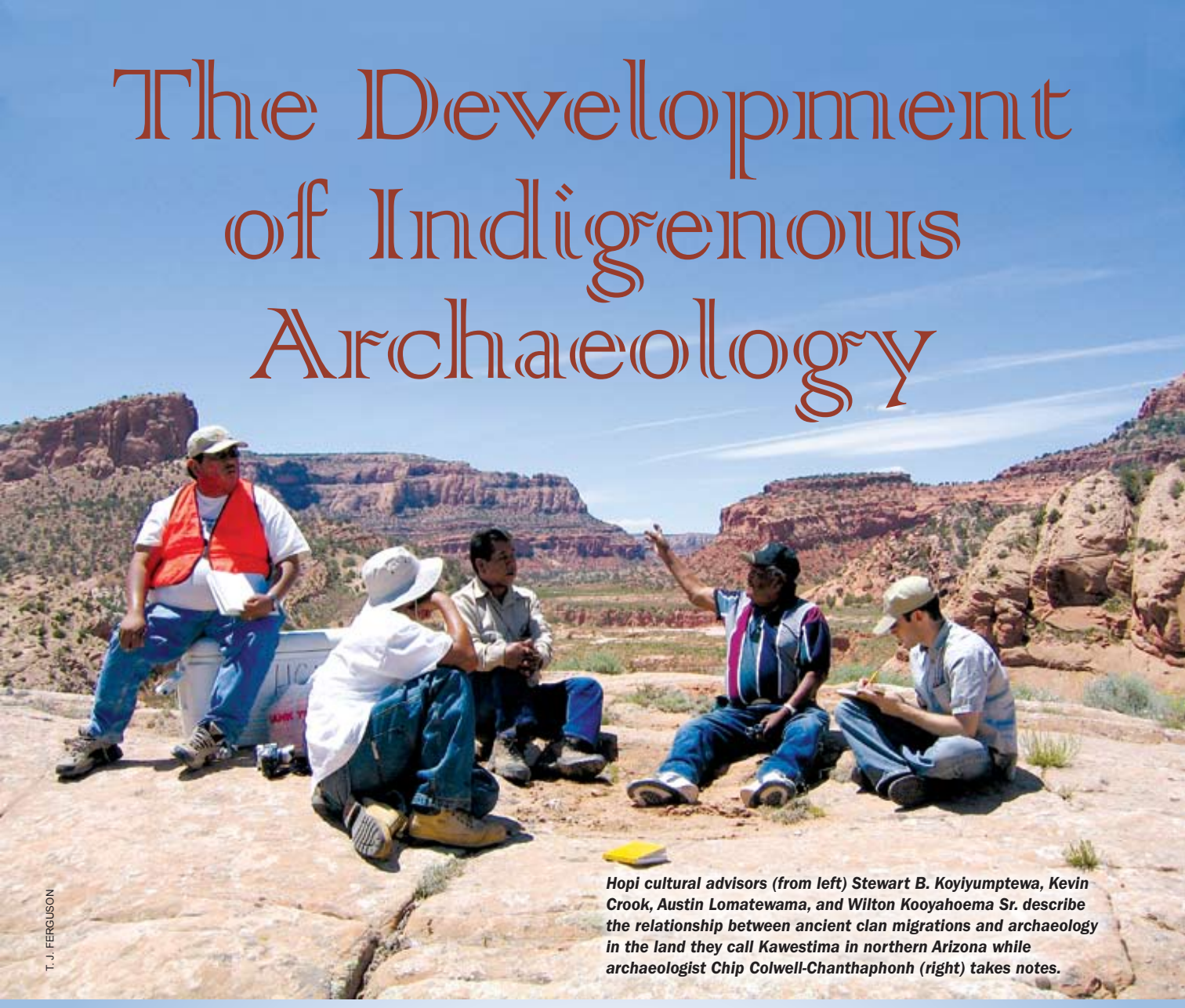
NOELLE BLAIR

The design of this black and white bowl sherd is similar to the styles of ceramics found at other Anasazi sites that date from about 1040 to 1220.

Before 2006, "nobody had excavated up here at all," Harry said. "It helps that there are two of us (Allison and Harry) because the more work that's done up here, the more you have that context. But we still have a very long way to go."

STEVE FRIESS *is a Las Vegas-based freelancer whose work appears regularly in* The New York Times *and many other publications.*

The Development of Indigenous Archaeology



T. J. FERGUSON

Hopi cultural advisors (from left) Stewart B. Koyiyumptewa, Kevin Crook, Austin Lomatewama, and Wilton Kooyahoema Sr. describe the relationship between ancient clan migrations and archaeology in the land they call Kawestima in northern Arizona while archaeologist Chip Colwell-Chanthaphonh (right) takes notes.

For decades Native Americans have felt that archaeology has ignored them. In the 1990s a movement emerged, known as indigenous archaeology, that incorporated native culture. As the movement evolves, a debate is taking place as to exactly what it is and if it's good for archaeology.

By Wayne Curtis

Imagine there are two archaeologists examining an artifact. One is a traditional archaeologist who notes such facts as the material the object is made of, its size and shape, decorative elements, and so on. She feeds this and other data into a vast matrix of information. She and other archaeologists will use analytical methods honed and refined over the decades to reconstruct the material culture of the past as accurately as they can, building hypotheses from the data to better understand how these centuries-old tribal cultures were structured, and how their members lived.

The other archaeologist is a Native American, a descendant of the people who produced these artifacts. He and fellow members of his tribe consider this and other artifacts their cultural patrimony. The artifact fits into a preexisting information matrix, one born of long traditions, and it may offer tangible evidence of a lore that has been passed down through song, or myths, or art, or all of these forms of cultural transmission. He views this item not just as data but as part of a larger story that his people have been telling for generations.

LARRY ZIMMERMAN

Native American students in St. Paul, Minnesota build an historically accurate Ojibwe teaching lodge based on knowledge passed from generation to generation. Archaeologists learned valuable information about the Ojibwe by observing the construction of the lodge.

These are two very different approaches: one narrowly scientific, one broadly cultural. But recently, a handful of archaeologists—some Native American, some not—have been working to combine these two approaches, suggesting that maintaining a hard and fast boundary may be counterproductive. This third approach has been dubbed "indigenous archaeology," a method of interpreting the past in which hard data and cultural knowledge perform a complicated dance. Proponents believe that this hybrid approach can result in a more insightful view of the past. They say it's a legitimate if unconventional means of studying cultural artifacts, and that we have much to learn about the past by placing it within the context of living cultural traditions.

Not everyone agrees. Some suggest that indigenous archaeology is to traditional archaeology what creationism is to evolution—a matter of selectively using data to support cultural myths. Heading down this road is a dangerous detour away from hard science toward a softer landscape of cultural studies. They say it's not archaeology at all.

In 2008, George Nicholas, an archaeologist at Simon Fraser University in British Columbia, was asked to write the entry for "indigenous archaeology" in Elsevier's Encyclopedia of Archaeology. He's written about the subject for 15 years, and a decade earlier had published a simple, serviceable definition: it's archaeology "with, for, and by indigenous people." "I thought this was going to be a piece of cake," he said. It wasn't. He was a year and half late submitting the piece. "It was such a challenge because over the course of years, indigenous archaeology became so multifaceted and often so situational that it had all of these different meanings," he said.

So, what exactly is indigenous archaeology? To better understand that, one could profitably consider some of the episodes and attitudes that led to its emergence. A handy starting point is the Antiquities Act of 1906, which was signed into law by President Theodore Roosevelt. Created to protect cultural sites on federal lands from looters, the law codified the government's control over many Indian artifacts. But what the law didn't do was equally significant: it didn't give Native Americans any say in the process. The federal government, in effect, assumed by fiat the full ownership of many Native American artifacts. Tribal members believed their heritage had been hijacked and resentment smoldered for decades.

That resentment flared up into resistance in the mid-20th century. In 1969, members of the Onondaga tribe in New York State moved to reclaim the wampum belts being displayed in state museums—what Joe Watkins, author of the 2000 book *Indigenous Archaeology: American Indian*

Values and Scientific Practice, called "one of the first salvos from American Indian groups for control of their own history and their cultural artifacts." Two years later, Native Americans disrupted excavations in Welch, Minnesota, and another group occupied the Southwest Museum in Los Angeles to protest the display of sacred artifacts.

These and other conflicts over the control of artifacts continued in subsequent decades. Among the most contentious was the fight over a 9,400-year-old skeleton that washed out of an eroded riverbank along the Columbia River in 1996. The Army Corps of Engineers assumed control of the skeleton, named Kennewick Man, and announced its intention to repatriate the bones to five local tribes. Eight non-native scientists filed a lawsuit to stop this, marking the first in a series of suits, findings, and plans for the disposition of the site and the remains.

The divide between native and non-native claims over artifacts has long deterred many young Native Americans from entering the field of archaeology. But that began to change in the 1980s and 1990s—more indigenous students entered the field, in part to become gatekeepers to their own heritage. For 16 years, George Nicholas directed an archaeological program on a small satellite campus that Simon Fraser University opened on the Kamloops reserve in British Columbia. "What I saw emerge beginning in the 1990s was that more First Nations or Native Americans were seeking the tools by which they could start to do archaeology," Nicholas said. "My philosophy was: here are the tools of archaeology, but it's not my expectation that you use these tools in the same way I use them."

Watkins defines indigenous archaeology as "archaeology that takes into account indigenous perspectives on the past and discussing the relationships between the past and contemporary society." He doesn't believe that traditional and indigenous archaeology need be mutually exclusive. "I think they can be bridged as long as neither one presumes the other to be wrong," he said. "I think a problem arises when we dismiss traditional knowledge out of hand at the beginning rather than wondering if there's some way the two of them can work together."

What indigenous archaeology is not may be easier to grasp than what it is. Nicholas' encyclopedia entry defining indigenous archaeology now runs more than 5,000 words. "Indigenous archaeology is an expression of archaeological theory and practice," the entry begins, "in which the discipline intersects with indigenous values, knowledge, practices, ethics, and sensibilities, and through collaborative and community-originated or -directed projects, and related critical perspectives."

"It's a really slippery thing," Nicholas admitted. "But you know it when you see it."

Robert McGhee, the former Curator of Arctic Archaeology at the Museum of Civilization in Ottawa,

GEORGE NICHOLAS

Field school students at Simon Fraser University's Kamloops Indigenous Archaeology Program review the day's excavation results.

agreed that indigenous archaeology is indeed a slippery thing. But he suggested that's because "it doesn't exist. As to what it actually is, it's impossible to define."

McGhee, it might go without saying, is not a supporter of indigenous archaeology. He penned a long and much-discussed critique of it in the journal *American Antiquity* in 2008. He said that he welcomes indigenous people's burgeoning interest in archaeology, and that many have already made great contributions to the field. But they've done so by working within the parameters of traditional archaeology. The alternative approach of striving to balance cultural concerns with science will effectively grant one group special rights denied to others, McGhee feared, and ultimately undermine the scientific tradition upon which archaeology has been built.

Indigenous archaeology, he suggested, is wrong both on philosophical and practical grounds. Philosophically, it marks a reversion to "exceptionalism," a 19th-century belief among academics that "Indigenous societies and cultures possess qualities that are fundamentally different from those of non-Aboriginal peoples." And doing that, no matter the intent, excludes non-native people with a legitimate interest in the past, McGhee said. "The assumption of exceptionalism… allows aboriginal individuals and groups to assume rights over their history that are not assumed by, or available to, non-aboriginals," he wrote in his 2008 critique. "These privileges go beyond those that are normally accorded to the governments of sovereign territories, and include proprietary rights over archaeological and other heritage materials, jurisdiction over how these materials are investigated, and claims to authority over the dissemination of information recovered by archaeological and historical research."

Many of those familiar with indigenous archaeology said that while issues of control of archaeological data may be problematic in theory, insurmountable issues rarely come up in practice. While the motives of indigenous and non-indigenous archaeologists may diverge—traditional archaeologists typically want to know about material cultural of the past; tribes often want to know how the past has informed the present—they both strive to base their analysis on an accurate assessment of the past, which means sharing information on all finds.

"There are some outspoken individuals who think pot sherds and the like are the intellectual property of the Cherokee people, and if we say don't study them, then that should be all that matters" said Russell Townsend, the Tribal Historic Preservation Officer with the Eastern Band of Cherokees in North Carolina. "I don't agree, and in practice the tribal government doesn't agree. We want to share in the study and the results the data gives us." He added that human remains

STEPHEN SILLIMAN

Natasha Leullier Snedeker (left), a researcher with the University of Massachusetts Boston's Eastern Pequot archaeological field school, shows recently discovered artifacts to Eastern Pequot elders Norma Parrish and Robert Sebastian.

and funerary artifacts require more sensitivity, but nothing is automatically off limits. "We'd want to talk with the archaeologist about how that material should be studied— should it be photographed or illustrated, or should it be displayed?" he said. "But we can come to compromises on that."

Chip Colwell-Chanthaphonh, the curator of anthropology at the Denver Museum of Nature and Science, noted that singling out issues of control in indigenous archaeology missed a larger point. "The issue of control is a real one, but it's an issue for all of archaeology," he said. Private landowners have de facto control over information about sites on their property, and he noted that many archaeologists don't widely disseminate detailed information about site locations to deter looters—all issues of data control dealt with by archaeologists every day. "These are important issues, but they're issues we struggle over outside the indigenous communities as well," he said

McGhee's broader charge is that, even if these issues of intellectual control can be negotiated, allowing cultural concerns to become part of the archaeological process will debase the science—akin to geologists accepting a creationist interpretation of the strata in the Grand Canyon as evidence of the biblical flood. "It's very similar to the creationist problem," McGhee said, "and dealing with

LARRY ZIMMERMAN

Native American students participate in a University of Iowa field school that was designed to address Native American concerns.

Christian fundamentalists is somewhat along the same lines as dealing with aboriginal fundamentalists who believe they have the truth that is not available and is not reachable by scientific or Western techniques." He wrote that, "Every community has a right to deal with its own history and heritage. It is the discipline of archaeology that I would restrict to those who wish to play by the accepted rules of the game."

"To begin with, I would ask him, what are the accepted rules?" said Colwell-Chanthaphonh. (He was one of seven authors who penned a response to McGhee that was published in the April 2010 issue of *American Antiquities*. The issue also contains McGhee's response to them.) "If you look at the history of archaeology…. you see that it has always been evolving, and it's always shifting what it considers to be good practice. It involves people tackling questions of history and material science in many different ways, and to me, one of the amazing things about archaeology is its grand intellectual diversity. It's important to get as many different perspectives as possible, and diversity becomes a virtue of science rather than something that impedes science's progress."

"Part of the problem that McGhee has, and he's a very respected archaeologist, is that he and many others have a particular view of archaeology that is very traditional," said Nicholas, who was also one of the seven respondents. "It's based on the standard definition of the study of past behavior through material culture. There's a whole other generation that certainly accepts that, but says it's not as simple as that, that there are added dimensions—that science can

DALE CROES

According to a Makah tribal elder, this 2,800-year-old quartz crystal microblade could have been used in minor surgery. It was found in northwest Washington State.

CHIP COLWELL-CHANTHAPHONH

A team from the Hopi Cultural Preservation Office collaborates with archaeologists at the Amerind Foundation Museum to better understand Ancestral Pueblo ceramics from southern Arizona.

never be totally objective, for example. In doing traditional archaeology, you can never truly remove all of the Western biases of how you interpret things."

Indigenous archaeologists insist that working closely with tribal groups isn't just a matter of good politics and good social policy, correcting the historic arrogance of archaeology toward people once deemed primitive. They say it also has many practical benefits.

Colwell-Chanthaphonh, who said he's not necessarily a practitioner of indigenous archaeology but is "intensely curious and definitely hopeful for what it can become," points to the benefits of taking a more collaborative approach. He cited the work of Wesley Bernardini on Hopi migration. "His beginning point was taking seriously Hopi oral tradition about ancient migration," he said. Bernardini developed a hypothesis based on this, and subsequent digs at settlements in the Southwest discredited previous assumptions that the Hopi's ancestors migrated along simple pathways. Instead, the oral tradition of more complex migrations, with multiple clans forming and splintering and some clan members returning to their original villages, was borne out by the archaeological evidence. "And he was basically able to use the model from Hopi traditions to demonstrate a much more complex archaeological history of migration than had been demonstrated before."

Dale Croes, an archaeologist with South Puget Sound Community College, has been studying native sites for four decades. When he started, he said he approached his work "from the tradition that archaeologists were really the only ones who could work on this, and understand this, and describe and explain the past." His attitude changed in the 1970s, and he now approaches tribes to co-manage his investigations. "The parties must respect equally the Western scientific approach and the tribes' cultural approach—both

respecting and facilitating each other's unique needs—without one side's needs superseding the others," he wrote in another response to McGhee in *American Antiquity*.

Croes, who specializes in wet site archaeology, said the cooperative approach has helped broaden his understanding of the past. One tribe he worked with insisted that he spend time with local basket weavers to fully understand any artifacts he found. He resisted at first, he said, but "we had a partnership and I had to respect their request." It turned out to be a great boon, and helped him better interpret the artifacts. "I got more cultural knowledge than I could have in graduate school," he said.

Colwell-Chanthaphonh noted that the dispute over the remains of the Kennewick Man actually offered a good defense for embracing a more collaborative approach—at least, in a backhanded way. "In my opinion, that's a case that went awry," he said. "But it went awry for very specific reasons."

He noted that about the same time of the Kennewick discovery, another set of ancient remains—it turns out, about a thousand years older than those of Kennewick Man—were found in the On Your Knees Cave in Alaska. But instead of becoming embroiled in controversy over their study and disposition, the local tribal communities supported study of the bones. "In the On Your Knees Cave case, the archaeologists worked collaboratively with Native Alaskan communities from the very beginning," Colwell-Chanthaphonh said. "They engaged them, they talked about the processes of how they could work together to better understand what these remains were and what sort of history they represented. And not only did the native Alaskan communities give permission to do archaeological analysis, they even went so far as to donate their own DNA to try to connect contemporary communities with these individual remains."

Colwell-Chanthaphonh believes the Kennewick Man case could have had a very different outcome if it had been approached differently. "With Kennewick Man, it's been exactly the opposite," he said. "To my mind, it's been in part because the people involved took a very antagonistic approach, and they saw this as a battle rather than as an opportunity for a partnership and working together."

McGhee and Croes both called for "courage"

in their papers—although the courage to do very different things. McGhee calls for courage to stand up for science and resist efforts to compromise traditional archaeology. Croes calls for the courage to work more openly with tribal groups, to fully share the information and direction of projects involving indigenous artifacts.

McGhee said that backchannel communications suggest to him that many North American archaeologists support his point of view. But he said speaking out isn't a good career move, claiming that many individuals in government and academe have embraced the principals of indigenous archaeology. Making reference to indigenous archaeology has "become a useful tool for measuring one's insider status

DALE CROES

Squaxin Island tribe basket weavers analyze a 400-year-old basket with handles that was recovered from the Mud Bay wet site in western Washington State.

in current archaeological communities, and it's certainly useful for grant-getting and getting along with government agencies, he said. ("It's amazing how retirement allows you to talk about this," he added. When asked if he had any public defenders, he paused for a moment, then said "No, I have no defenders. Nobody is coming forward in public.")

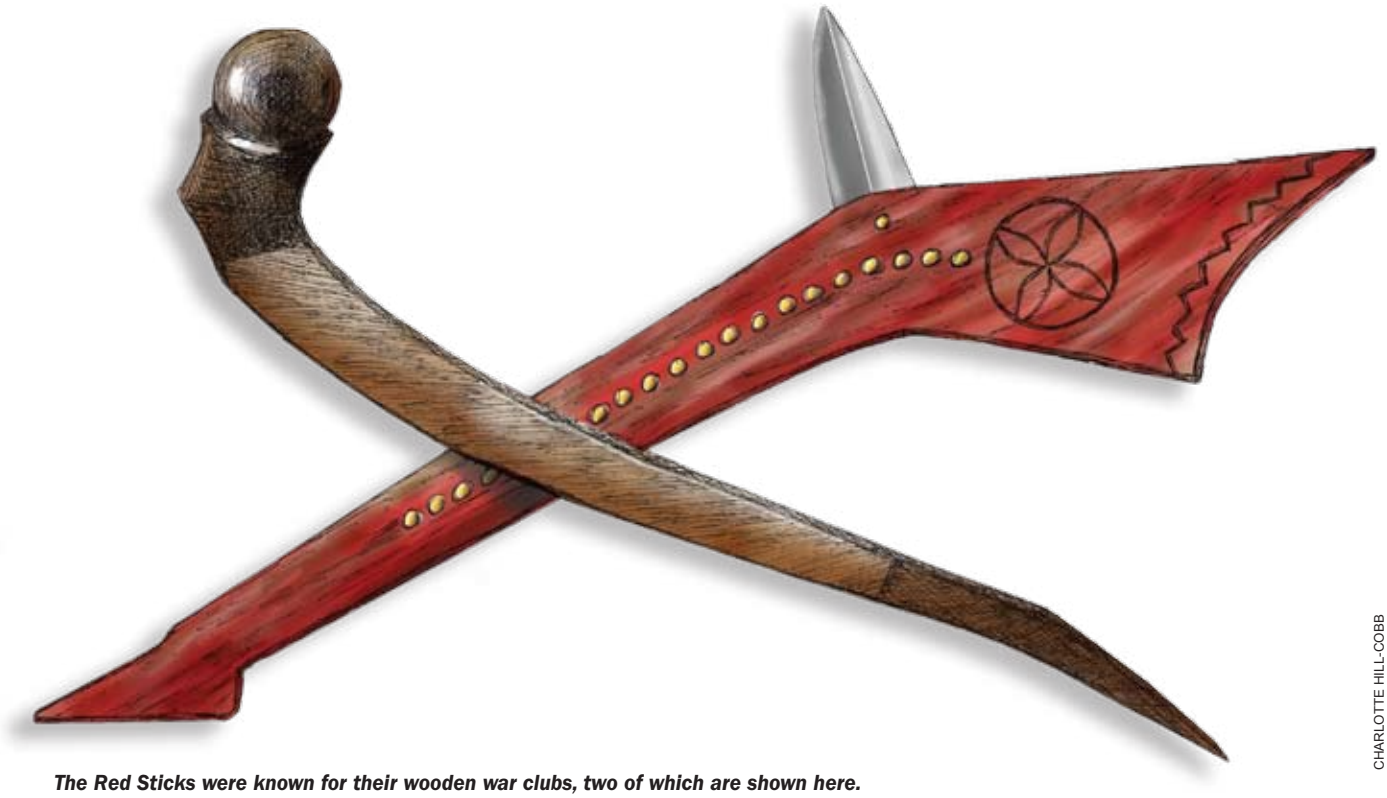
Indigenous archaeology is still finding its way, and a concise, broadly accepted definition remains elusive. In fact, many practitioners now prefer to refer to it in the plural, as "indigenous archaeologies," to suggest that it embraces multiple approaches rather than a single set of rigid protocols. Many suggest the rise of indigenous archaeology represents more of a seismic shift in attitude than a change in technique or interpretation.

"All of this does signify a sea change in how archaeology is going to be practiced in the 21st century," said Colwell-Chanthaphonh. "So in that sense, I don't think it matters too much at the end of the day if you're calling it indigenous archaeology, tribal archaeology, or just good archaeology. I foresee an emerging model for the entire discipline in which archaeologists are expressly aware of native values, native concerns, native interpretations of the past, and they take these into consideration."

WAYNE CURTIS *is a contributing editor at* The Atlantic *magazine. His article "Collaborating with Cuba" appeared in the Fall 2009 issue of* American Archaeology.

The Conservancy To Acquire Its 400th Site

Holy Ground is a 19th-century village and battlefield that was occupied by a faction of the Creek Indians.



CHARLOTTE HILL-COBB

The Red Sticks were known for their wooden war clubs, two of which are shown here. The ball-head club eventually gave way to the gunstock club, which was sometimes made from the stock of a colonial gun embellished with brass tacks. This club also has an embedded blade.

In the first half of the 19th century, Creek Indians in what is now Alabama watched with alarm as white settlers encroached on Creek lands. The Creeks were divided over how to cope with the intrusions of land hungry settlers, partly because the Creeks' lives were so intertwined with those of the settlers and their African slaves due to intermarrying. It was inevitable that what started out as a civil war within the Creek nation would involve everyone on the southwestern frontier and forever change its cultural landscape. The Conservancy's 400th site, Holy Ground Village and Battlefield, played an important role in these historic events.

Although they had spent years peacefully coexisting with the Euro-Americans and their slaves, not all Creeks accepted the U. S. policy of acculturation that promoted the planting of cash crops, the acquisition of private property, livestock, and slave ownership. Some factions within the Creek tribe opposed the abandonment of sacred traditions and believed that the redistribution of traditionally communal lands to individuals would lead to the loss of all Creek lands and as well as their tribal identity. These people were urged by religious leaders called "prophets" to destroy things such as plows, looms, livestock, and all vestiges of white influence and to return to traditional ways. Tensions increased and the Creeks fractured into warring camps. The traditionalist camp became known as the Red Sticks, an allusion to the red wooden war club used by the Creeks.

In August of 1813, following their devastating attack on a stockade housing a militia and settlers, which became known as the Massacre at Fort Mims, Red Stick leader William Weatherford and his warriors regrouped at a village

PAULA WEISS

Gregory A. Waselkov (left) and Craig Sheldon consult maps during a metal detecting survey of the Holy Ground site.

called *Econochaca*, or the Holy Ground. Located near the Alabama River and surrounded by swamps and ravines, Holy Ground had been established a few months earlier by a Red Stick prophet named Josiah Francis. Francis claimed to have erected an invisible barrier around the village that no white man could penetrate.

On December 23, 1813, the invisible barricade was penetrated by U.S. Infantry and Mississippi Territorial troops who were bent on avenging the deaths of their comrades at Fort Mims. Accompanying the troops were Chief Pushmataha and 150 Choctaw warriors. Knowing an attack was imminent, the Red Sticks had already moved their women and children across the river to safety. The Red Sticks were outnumbered and out gunned, but most managed to escape. Weatherford was one of the last to be seen on the battlefield, and legend has it that he and his horse leapt off the bluff and into the Alabama River to make their escape.

With financial assistance from a National Park Service grant, archaeologists Gregory A. Waselkov with the University of South Alabama and Craig Sheldon with Auburn University recently found the Holy Ground site near the confluence of House Creek and the Alabama River. Recovered artifacts and an 1818 land survey plat helped confirm the site's location. What was once an Indian village of approximately 200 houses is now a residential development. Fortunately, most of the lots haven't been sold and the owner is sympathetic to the site's historic importance. The Conservancy plans to purchase seven lots to ensure the site's preservation. As Waselkov points out, almost nothing is known about Red Stick material culture or the extent to which they avoided white influences. So far, quite a few nails have been found at the site. Archaeologists will have the opportunity to compare Holy Ground to contemporaneous Creek villages that were not part of the Red Stick movement. According to Waselkov, official accounts of the battle are vague and future research at the site could shed light on that aspect as well.

Because so many significant archaeological sites in this region have been lost to mining or recreational and residential development, Waselkov and Sheldon were pleasantly surprised the Holy Ground site was still intact, and they are extremely pleased that the Conservancy has acted to ensure its survival. "It is hard to believe that Greg and I first started talking about finding Holy Ground only a few months ago," Sheldon said. "We are so glad that this will come to a good end, having found so many sites only to see them destroyed." —*Jessica Crawford*

Conservancy Plan of Action

SITE: Holy Ground Village and Battlefield
CULTURE AND TIME PERIOD: Historic Creek and Red Stick Wars, 1813-14
STATUS: The site is threatened by development.
ACQUISITION: The Conservancy needs to raise $180,000 to purchase the lots.
HOW YOU CAN HELP: Please send contributions to The Archaeological Conservancy, Attn: Holy Ground, 5301 Central Ave. NE, Suite 902, Albuquerque, NM 87108-1530.

Life During The End Of The Ice Age

The Cardy site could inform archaeologists about how humans dealt with a challenging environment.

The Conservancy has obtained a two-acre lot in Sturgeon Bay, Wisconsin that contains a 12,700-year-old hunter-gatherer campsite. At that time, near the end of the Ice Age, glaciers had largely retreated from what is now the United States, but northern Wisconsin remained largely under ice. The Cardy site is unusually far north for this period of time, and may have been within walking distance of the edge of the continental ice sheet.

An archaeological mystery lay hidden in Clayton Cardy's garden for almost one-half of a century. For many years the Cardy family had collected chipped stone implements while raising vegetables here at their homestead on the outskirts of Sturgeon Bay. Interest in the chipped stone tools was rekindled in the 1950s when Clayton's son Darrel left Sturgeon Bay to pursue a degree at the University of Wisconsin-Madison. Armed with new information from his archaeology textbook, Darrel surmised that the projectile points found in the Cardy's garden were similar to those found at Clovis, New Mexico, and hence among the oldest artifacts known in North America. Darrel took the artifacts to Madison seeking confirmation, but local scholars quickly pronounced this unlikely, since it was "known" that northeastern Wisconsin was ice-bound and uninhabited some 11,000-13,000 years ago when Clovis-like artifacts were in use. Interest in the site waned.

In 1979, some 20 years after the denial of the Cardy site's antiquity, interest was sparked anew when a grant from the National Oceanic and Atmospheric Administration brought David F. Overstreet, then director of the Center for Cultural Research at Marquette University, to the Cardys' doorstep. Clayton expressed interest in the archaeologist's desire to confirm or deny the presence of Ice-Age people at Sturgeon Bay and he understood the great significance of this issue, but he was unwilling to disturb his garden. Another 23 years would pass before, at the age of 88, Clayton decided to give Overstreet permission to excavate in order to resolve the nagging questions about the site's validity and its antiquity.

In 2002, the long-awaited test excavations commenced.

DARREL CARDY

Gainey projectile points, scrapers, and bifacial tools are examples of the worked stone recovered from the site.

A series of 17 test pits were carefully excavated within the garden and the surrounding property. The test pits yielded a bounty of chipped stone tools including four broken spear points, scrapers, flake cutting tools, and chipping debris from stone tool manufacturing. Much of the material used to make these tools was nonlocal stone that was quarried near Moline, Illinois, or perhaps even as far distant as central Ohio.

The projectile points recovered by the excavations are classified by archaeologists as Gainey points, a type closely related to the Clovis points that caught young Darrel Cardy's eye in 1959. These points are known to date to about 10700 B.C. so we know the Cardy site was used at about that time.

Paleoenvironmental studies carried out near Sturgeon

DAVID OVERSTREET

(From left) Clayton S. Cardy, Donna L. Wolske, Midwest Regional Director Paul Gardner, Darrel E. and Margie A. Cardy at the site. The Paleo-Indian deposits have been found in this section of the site.

Bay and elsewhere in Wisconsin indicate that the environment at that time was much different than it is today. Lake Algonquin, which occupied the Lake Michigan and Lake Huron basins at the end of the Ice Age, would have been about 25 feet higher than the nearby city of Green Bay is now. Hence the Cardy site would have been closer to the shore of Lake Algonquin than it is today, but not right at lakeside. The vast forests that greeted the first white settlers of Wisconsin were not as yet established. Rather, treeless tundra like that of modern northern Canada would have dominated the landscape. It is uncertain exactly where the edge of the continental ice sheet would have been located, but it was probably quite close.

We can only speculate about what drew these people to this spot. Was it simply a sense of adventure to roam and occupy new lands? Were they drawn to the tundra at a time when mammoth, caribou, and muskoxen grazed on the sedge meadows and grasslands? Did they compete with the big-toothed cats, dire wolves, and short-faced bears for these prey animals?

Archaeologists will be able to examine these and other questions because of the Cardy family's generous donation of the site, which is listed on the National Register of Historic Places, to the Conservancy. By preserving the site, researchers will have an opportunity to study human adaptation to the rapidly changing climatic conditions along the margins of the continental glaciers at the end of the last great ice age.

—Paul Gardner and David Overstreet

CONSERVING IROQUOIS HISTORY

Indian Castle is the Conservancy's second 17th-century Onondaga site.

Indian Castle is a 17th-century Onondaga village located in the center of New York State near the town of Pompey. The site is thought to have been inhabited during a time of tremendous cultural change resulting from Europeans moving into the area.

Indian Castle is situated on a steep hill overlooking a stream. Its name comes from the European practice of describing Iroquois towns, with their fortified hilltop communities surrounded by wooden palisade walls, as 'castles.' The Onondaga were part of the five nations that formed the Iroquois Confederacy. The other nations included the Seneca, Cayuga, Oneida, and Mohawk. The Tuscarora later became the sixth member.

No professional archaeological excavations have taken place at Indian Castle, but amateur archaeologists Greg Sohrweide of the New York State Archaeological Association has done controlled surface collections and limited test excavations of previously disturbed areas. James Brady, the founder and president of ArchLink, a nonprofit organization linking archaeology with education and preservation, has also done research based on the collections from the site as well as historical documents. Both researchers conclude the site was occupied from 1655 to 1663. Indian Castle appears to have been established when the occupants of another Onondaga village, the Lot 18 site, abandoned that village because of a fire.

Indian Castle could be the location where two Jesuit priests, fathers Dablin and Chaumont, arrived in 1655 to establish the St. Jean Baptist mission. The success of this mission led the French to establish their first settlement among the Onondaga at St. Marie de Gannentaha from 1656 through 1658. There was also an influx of native refugees who arrived during that time, and the Jesuits observed that there were seven different nations settling at *Onnotaghe*' (the Onondaga term for their village) in 1655.

COURTESY OF THE NEW YORK STATE MUSEUM

Different angles of a ceramic snapping turtle effigy pipe that was recovered from the Indian Castle site.

Though it has been impacted by road construction and excavations by another amateur archaeologist in the 1950s, Indian Castle retains a great deal of integrity. Some of the artifacts from that excavation are curated at the Rochester Museum and Science Center. They include glass tubular beads in a variety of colors, several sizes of wampum, and many marginella shell beads. Indian Castle is also the first Onondaga site where glass bottle fragments appear. Among the French artifacts are Catholic medallions and rings with the stamped inscriptions "HIS" and "L."

Thanks to the efforts of Sohrweide, who informed the Conservancy of the site, and the generosity of landowner Nicholas Cappoletti, we acquired over 64 acres containing the Indian Castle site and the associated middens and cemeteries, in a bargain sale to charity.

Conservancy Plan of Action

SITE: Indian Castle
CULTURE AND TIME PERIOD: 17th-century Onondaga
STATUS: The site is threatened by development.
ACQUISITION: The Conservancy needs to raise $170,000
HOW YOU CAN HELP: Please send contributions to The Archaeological Conservancy, Attn: Indian Castle, 5301 Central Ave. NE, Suite 902, Albuquerque, NM 87108-1530.

POINT-4
Protect Our Irreplaceable National Treasures

UNIVERSITY OF SOUTH FLORIDA

Preserving A Pristine Mound

For years Alexander Mound had been protected by nothing more than dense brush. Now it will be protected by the Conservancy.

The Conservancy has acquired one of the best-kept archaeological secrets in west Tennessee. Alexander Mound is a near-pristine conical mound that apparently dates to the Woodland Period (approximately 1000 B.C. to A.D. 1000). The site is hidden in the wooded hills of southwest Madison County, near the little village of Denmark.

The site is located on land formerly owned by Harbert Alexander, a prominent banker, local historian, preservationist, and amateur archaeologist. During a visit to another site in 2009, Alexander told Tennessee state archaeologists Mike Moore and Mark Norton and George Lowry, the Conservancy's Southeast Region field representative, about a recorded, but little-known mound site that was less than a mile away, hidden from view by dense brush. That mound site, which was later named after Alexander, was impressive enough that Lowry got the Conservancy to purchase it with POINT funds.

Very little is known about the site. An archaeologist from Union University in nearby Jackson excavated the mound in the 1930s, but his field notes and other documentation have been lost. Conical mounds are one of the signatures of the Woodland people, and consequently Alexander Mound is assumed to have been built during that time. Because so little work has been done at Alexander, the site has tremendous research potential.

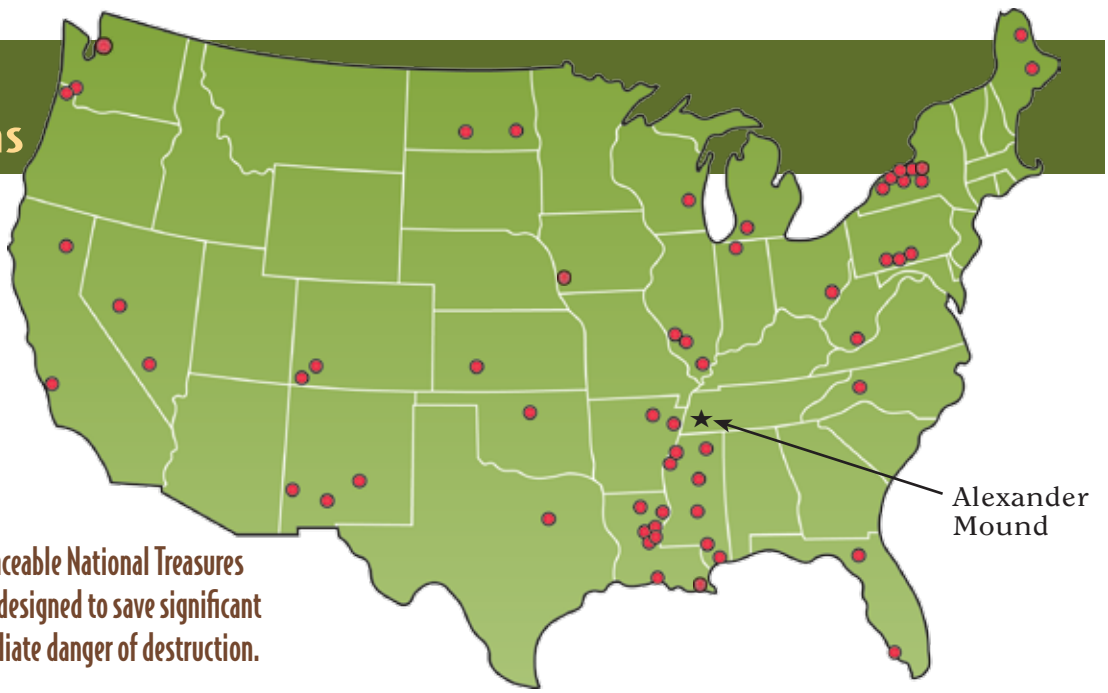
By preserving this important site, the Conservancy will give researchers an opportunity to reveal its secrets.

—George Lowry

GEORGE LOWRY

Jessica Crawford, the Conservancy's Southeast Region director, and Harbert Alexander and his daughter stand on the mound.

POINT Acquisitons



The Protect Our Irreplaceable National Treasures (POINT) program was designed to save significant sites that are in immediate danger of destruction.

CONSERVANCY

Field Notes

Work Continues at Puzzle House

SOUTHWEST—The Conservancy's staff has undertaken a number of management tasks at the Puzzle House preserve in southwest Colorado. This 154-acre preserve is located next to Lowry Pueblo and the archaeological sites on the preserve are an important element of the larger community that developed in the central Mesa Verde region of southwest Colorado.

Puzzle House contains a wide range of archaeological sites that include specialized activity areas, field houses, at least three major pueblos, and three to five pre-Columbian road segments connecting these outlying settlements with the monumental Great Kiva and Great House at Lowry Pueblo. The sites represent Basketmaker III through early Pueblo III settlements that date between A.D. 650 and 1250. A portion of the Puzzle House site was excavated in the 1990s by Fort Lewis College staff and students under the direction of W. James Judge.

The preserve's perimeter fence has been repaired and work on the long-term management plan has begun. Work is also beginning on a public interpretative program that will focus on Judge's excavations. The site steward program, in which volunteers are recruited to patrol the preserve, is also being organized. Volunteer site stewards who regularly monitor the property are also a fundamental part of our preservation and protection program.

The current projects should be completed by the middle of 2011. The acquisition and preservation of the Puzzle House has been paid for in part by a State Historical Fund Grant from the Colorado Historical Society.

STEVE KOCZAN

One aspect of the Conservancy's management plan was repairing the perimeter fence and installing a gate.

Excavations at Parchman Mounds

SOUTHEAST— The University of Mississippi has conducted numerous research projects at the Parchman Mounds site since it was acquired by the Conservancy in 2001. Guided by the results of gradiometer and magnetometer surveys, researchers

ANNA SEMON

An excavator works at a burned house floor at Parchman Mounds.

have conducted excavations on Mound A, the larger of the two mounds at this site in Mississippi. They have also excavated the plaza and habitation areas around the mounds.

Parchman was occupied during the late Mississippian period (ca. A.D. 1400-1500), and a great deal has been learned about when and how it was used. Archaeologist Erin Stevens Nelson earned her master's degree at the University of Mississippi, and she participated in previous excavations of the site. Nelson, who is now a Ph.D candidate at the University of North Carolina, Chapel Hill, returned to the site this summer to take a closer look at the small residential areas that were detected by the gradiometer surveys, which revealed outlines of clusters of square houses around the mounds.

Excavating trash pits associated with the various house groups, she recovered artifacts such as pottery and food remains that reveal the daily activities at the site. She also hopes to learn about the chronology of the houses as well as the organization of this community and the relationships between its inhabitants.

The cornfields in Mississippi's Yazoo River basin aren't the easiest place to do field work. The seven-foot tall corn stalks tend to block out any breeze that might alleviate the intense humidity. Despite the challenges, Nelson and her crew are determined to make her contribution to our understanding of Parchman Mounds.

Learning More About New Philadelphia

MIDWEST—This summer a field school was conducted at the New Philadelphia site in west-central Illinois, to uncover more details about the town founded in 1836 by "Free Frank" McWorter. The Conservancy recently purchased nine acres of the 42-acre town, which was located a few miles from the Mississippi River. The field school presented a rare opportunity to investigate a site with a large population of free African Americans in the years leading up to, and following, the Civil War.

The researchers conducted geophysical surveys, soil probes, and excavations. The excavations focused on the remains of the Louisa McWorter homestead, uncovering a cellar and remnants of an abandoned well. Twentieth-century residents remembered the home, owned by the widow of Frank McWorter's son, Squire, as one of the most imposing in the town. Project directors Christopher Fennell of the University of Illinois, Terrance Martin of the Illinois State Museum, and Anna Agbe-Davies of the University of North Carolina will use the data from the McWorter dwelling to make comparisons with other African American or Euro-American households.

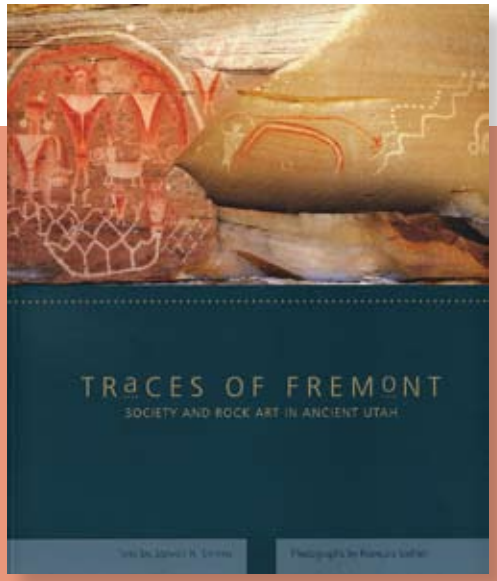
As a result of a new collaboration with scholars from the University of Iowa, the exploration of several modern farming terraces will give archaeologists a sense of the transformations that resulted as the town lots reverted to agricultural fields. Analysis of soil core samples this fall by geosciences professor Art Bettis and doctoral student Mary Kathryn Rocheford could provide information about buried surfaces in an area previously thought to have been severely eroded. Phytolith samples will allow for the reconstruction of the botanical landscape of the frontier community, and will complement the extensive analysis of faunal material that's already taken place.

The students received training in field techniques thanks to a National Science Foundation-Research Experiences for Undergraduates grant.

ANNA AGBE-DAVIES

Students take soil core samples during the field school at New Philadelphia.

Reviews



Traces of Fremont: Society and Rock Art in Ancient Utah

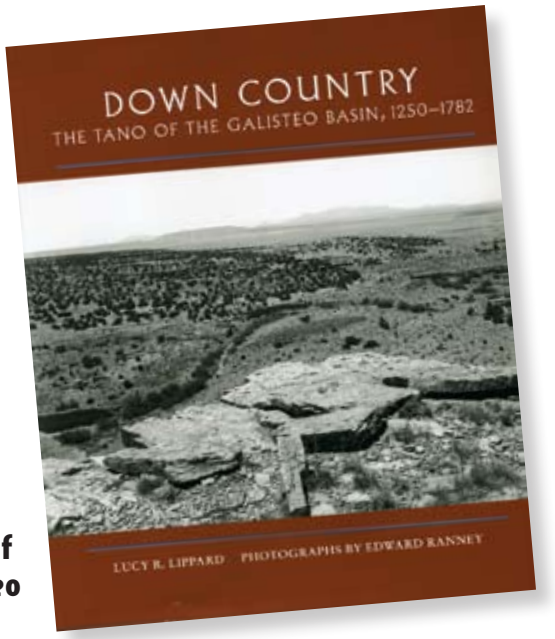
By Steven R. Simms — Photographs by François Gohier

(University of Utah Press, 2010; 144 pgs., illus.; $25 paper; www.UofUpress.com)

Between roughly A.D. 300 and 1300, a group of people dominated the Great Basin of Utah and Nevada, developing a dramatic rock art tradition. Archaeologists call them the Fremont people, naming them after the river basin where many examples of their art are preserved. For many years archaeologists considered the Fremont to be hunter-gathers with weak ties to the Pueblo people of the Four Corners. Steven Simms, an archaeologist at Utah State University who has studied the Fremont for four decades, sees a much more complex social structure that relies heavily on corn agriculture and hamlet-village organization that has close cultural links with the Puebloans.

In this beautifully illustrated volume, Simms and photographer François Gohier paint a vivid picture of a robust people as shown in their material culture. Simms insists the rock art cannot stand alone and must be interpreted within the context of the overall culture. The images in Fremont rock art are, Simms writes, "part of an ideological fabric stretched across a sacred landscape." Giant figures with elaborate headdresses and jewelry as well as more familiar animals and designs jump from the pages.

It has become common to link Fremont and other rock art to "shamanism," often drug induced. Simms argues that shamanism is not synonymous with political leadership. Some of the Fremont rock art may be tied to shamans, but most is probably not. Instead, the rock art is an incomplete representation of Fremont social, political, and ideological organization.



Down Country: The Tano of the Galisteo Basin, 1250–1782

By Lucy R. Lippard — Photographs by Edward Ranney

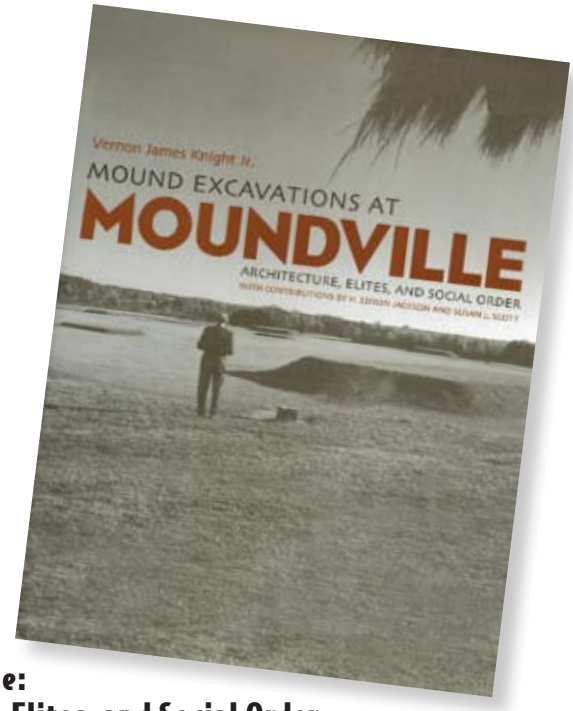
(Museum of New Mexico Press, 2010; 388 pgs., illus.; $50 cloth, www.mnmpress.org)

The Galisteo Basin between Albuquerque and Santa Fe, New Mexico is one of the richest archaeological districts in the United States. Between about A.D. 1250 and 1680, it was home to eight huge Native American pueblos and countless smaller native sites.The large ones, like Pueblo San Marcos with its 2,000 surface rooms and 12 plazas, are the biggest pueblo ruins in the United States. (Pueblo Bonito in Chaco Canyon, for example, has only 800 rooms.)It was one of the first native communities to be impacted by the Spanish conquistadors—Coronado passed through in 1541—and it's the home of the first Spanish mission churches.The area is of such great national significance that Congress set out to protect it as a special archaeological district in 2004 by enacting the Galisteo Basin Archaeological Sites Protection Act.

Renowned art critic and Galisteo resident Lucy Lippard has authored this beautiful new book that synthesizes archaeological and historical research. It's a landmark study of the basin and its Native people.Acclaimed photographer Edward Ranney contributed 80 stunning landscape images that are complemented by historical photos, drawings. and maps.

Despite the number and size of the ruins (or perhaps because of that), there has been little research in the Galisteo. Nels Nelson did a major exploration in 1912-15 for the American Museum of Natural History, and several subsequent smaller scale projects built on his work. Beginning with the arrival of Coronado's army in 1541, the native people went into a long decline, then in 1680 they rose up in the Pueblo Revolt. They killed the Catholic priests and drove the Spanish from New Mexico, but when the Spanish returned they found much of the Galisteo Basin in ruins, and the native people never recovered.

Drawing on the archaeological research, historical accounts of the Spanish conquerors, and contemporary stories of neighboring pueblo people, Lippard has woven a wonderful account of a truly fascinating American place.



Mound Excavations at Moundville: Architecture, Elites, and Social Order

By Vernon James Knight, Jr.

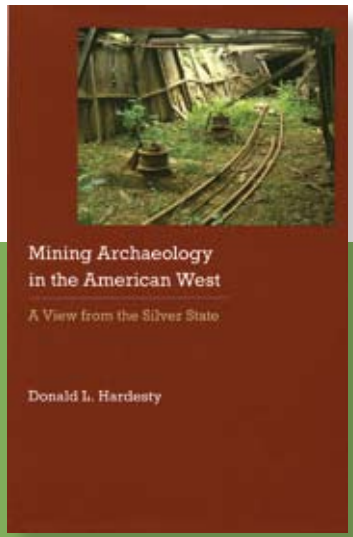
(University of Alabama Press, 2010; 496 pgs., illus.; $75 cloth, $60 ebook; www.uapress.ua.edu)

Located on a high bank of the Black Warrior River in west-central Alabama, Moundville is the nation's second largest mound complex after Cahokia. A wooden palisade enclosed some 185 acres with 32 mounds that are symmetrically arranged around a huge plaza. It was continuously occupied by Mississippians from roughly A.D. 1120 through 1520. The site, along with a small museum, is owned by the University of Alabama and is open to the public. It's certainly worth a visit. It is a monumental place, and there is no doubt that it was one on the most important places in the Eastern United States for several centuries.

More than a century of research has taken place at Moundville, and this volume reports on that research in general and the most recent explorations in particular. Between 1989 and 1998, Vernon "Jim" Knight of the University of Alabama led a major archaeological project at Moundville that included limited excavations at five mounds and other studies, including examinations of previously recovered materials. The 10-year project produced tons of material and immensely increased our understanding of this great complex. It is also a guide to mound excavation techniques that will serve students and scholars for years to come.

Knight tested two major hypotheses in this study. The first proposes that the mounds are laid out as a sociogram, and the principal ones are contemporaneous. Because of numerous additions and rebuildings, it is a difficult question to answer. The second hypothesis has to do with specialization of the mounds. It appears that smaller burial mounds alternate with large platform mounds that supported buildings.

This volume is a major addition to the understanding of Moundville and the archaeology of the entire region. It is first-class scholarship that researchers and lay people alike will want to have on their bookshelves. *—Mark Michel*



Mining Archaeology in the American West: A View from the Silver State

By Donald L. Hardesty

(University of Nebraska Press, 2010; 240 pgs., illus.; $45 cloth; www.nebraskapress.unl.edu)

Utilizing the various methodologies that inform historical archaeology, Donald Hardesty provides a close look at mining practices and the human culture that developed during the boom years of the Nevada frontier. Hardesty employs an abundance of historical documents, including government maps and records, Sanborn insurance documents, industrial and mechanical drawings, archived photographs, diaries and letters, technical handbooks, company records, newspapers, and census records, to name only a few. By reading the physical landscape of mining ruins, the author interprets social, cultural, and physical/spatial environments, leading to a deep analysis that utilizes a broad array of interdisciplinary theoretical models.

Evaluating the archaeological record, Hardesty, who is an archaeologist at the University of Nevada at Reno, also provides a close, detailed look at the physical environment. From these various sources, the reader is given a clear and in-depth understanding of the technological, social, cultural, historical, environmental, and archaeological aspects of 19th-century American industry, and the qualitative experience of the humans who worked and lived in these remote Western communities. The numerous photographs, charts, drawings, maps, tables and other visual aids help to bring the story to life. *—Cynthia Martin*

Oaxaca

When: October 29–November 8, 2010
Where: Mexico
How Much: $2,495 per person ($350 single supplement)

Join us in Oaxaca, Mexico during one of the most unusual festivals anywhere—the Day of the Dead. On this day, people prepare home altars and cemeteries to welcome the dead, who are believed to return to enjoy the food and drink they indulged in while alive. The Day of the Dead is one of celebrations.

You'll have the opportunity to explore Oaxaca's museums and markets. Our tour will also visit the Mixtecan and Zapotecan archaeological sites in the region, including Mitla, Monte Albán, San José Mogote, and Dainzú. You'll also see several crafts villages featuring weaving, pottery, carved animals, and other local art.

Visitors explore the extensive ruins at Monte Albán, a city built by the Zapotec and Mixtec.

Archaeologist John Henderson points to El Castillo, a huge pyramid at Xunantunich in Belize.

Belize and Tikal

When: March 13–23, 2010
Where: Belize and Guatemala
How Much: $2,795 per person ($375 single supplement)

Our tour begins on the coast of Belize, where you'll tour Belize City, see Altun Ha, and take a boat ride up the New River to Lamanai, a Maya trading center established before Christ and occupied until A.D. 1641. From the coast you'll travel to the inner reaches of the country and explore the splendid mountaintop palace of Cahal Pech.

A ferry ride will take you to the ruins of Xunantunich, once an important trading center. There you'll tour El Castillo, a classic example of the Maya technique of constructing a pyramid over an older pyramid. From Xunantunich you'll visit the recently excavated ceremonial site of Caracol, the largest Maya site in Belize. You'll also visit Yaxhá, a city 19 miles southeast of Tikal that features an impressive series of plazas and platform groups. At Tikal, you'll spend two days exploring one of the most magnificent Maya centers situated in the Petén rain forest. Thought to have had a population exceeding 75,000, Tikal once spanned an area of more than 25 square miles. John Henderson will lead the tour.

JIM WALKER

MARK MICHEL

Palenque's magnificent ruins make it a popular destination. The city's palace is seen in the upper right of this photo.

Maya of Chiapas and Tabasco

When: February 9–19, 2010
Where: Mexico
How Much: $2,795 ($375 single supplement)

This tour takes us to some of the more out-of-the-way but spectacular Maya ruins in southern Mexico that flourished between A.D. 300 and 900. We begin in the tropical lowlands and end in the fabulous highlands of Chiapas among the modern Maya people. We'll see tremendous pyramids, unbelievable sculptures and murals, and modern arts and crafts.

We begin our adventure with a visit to the major Olmec site of La Venta, with its great earthen pyramid. We will then visit Comalcalco, Palenque, Bonampak, and Yaxchilán. Then we leave the tropical lowlands for a long climb into the Chiapas mountains to the large Maya center of Toniná. The site is dominated by its acropolis, which rises in terraces and buildings some 233 feet up the side of a steep hill. We'll continue climbing to reach the colonial town of San Cristóbal de las Casas where we'll spend two nights. We'll then visit the charming Tzotzil Maya villages of San Juan Chamula and Zinacantán. Our guide will be noted Maya scholar John Henderson of Cornell University.

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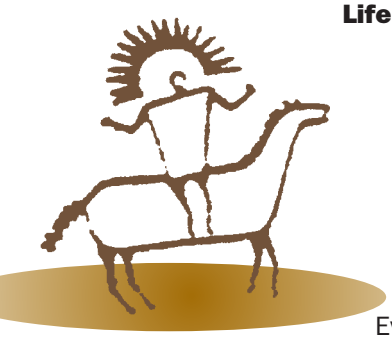
The Archaeological Conservancy would like to thank the following individuals, foundations, and corporations for their generous support during the period of May through July 2010. Their generosity, along with the generosity of the Conservancy's other members, makes our work possible.



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Americans recognize the importance of charitable giving. The charitable gift annuity is an opportunity to support your favorite charity and provide personal and family security. From gifts of cash to appreciated securities to real estate, a donation to The Archaeological Conservancy will not only provide for our organization, but also for your financial future.

You can retain a fixed lifetime annuity payment by providing the Conservancy with a charitable gift annuity. You will receive this fixed payment for life in exchange for your donation.

The payment will not fluctuate with changes in the economy, so you will always know how much you will receive annually.

Congress has provided a series of tax benefits for those who donate through a charitable gift annuity. For example, donors will receive an immediate and substantial income tax charitable deduction as well as minimal taxes on capital gains on highly appreciated securities.

For more information on how to attain income for life while supporting The Archaeological Conservancy, please contact Mark Michel at (505) 266-1540.

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Make your gifts to the Conservancy go even further by joining the **Heritage Club,** our monthly giving program. You will not only provide continuous support of our preservation efforts, but also reduce our fundraising expenses by eliminating the need to send paper renewals. When you participate in our monthly giving program:

- Your gift will be charged to your credit card every month on or around the same day.
- You set your donation amount and can change it at any time.
- We'll send you an email confirmation of your gift every month.
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The Archaeological Conservancy

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Sherwood Ranch Pueblo
Arizona
Began as a Conservancy Preserve in 2003

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Some Conservancy members think the only way to help save archaeological sites is through membership dues. While dues are a constant lifeline, there are many ways you can support the Conservancy's work, both today and well into the future. And by supporting the Conservancy, you not only safeguard our past for your children and grandchildren, you also may save some money.

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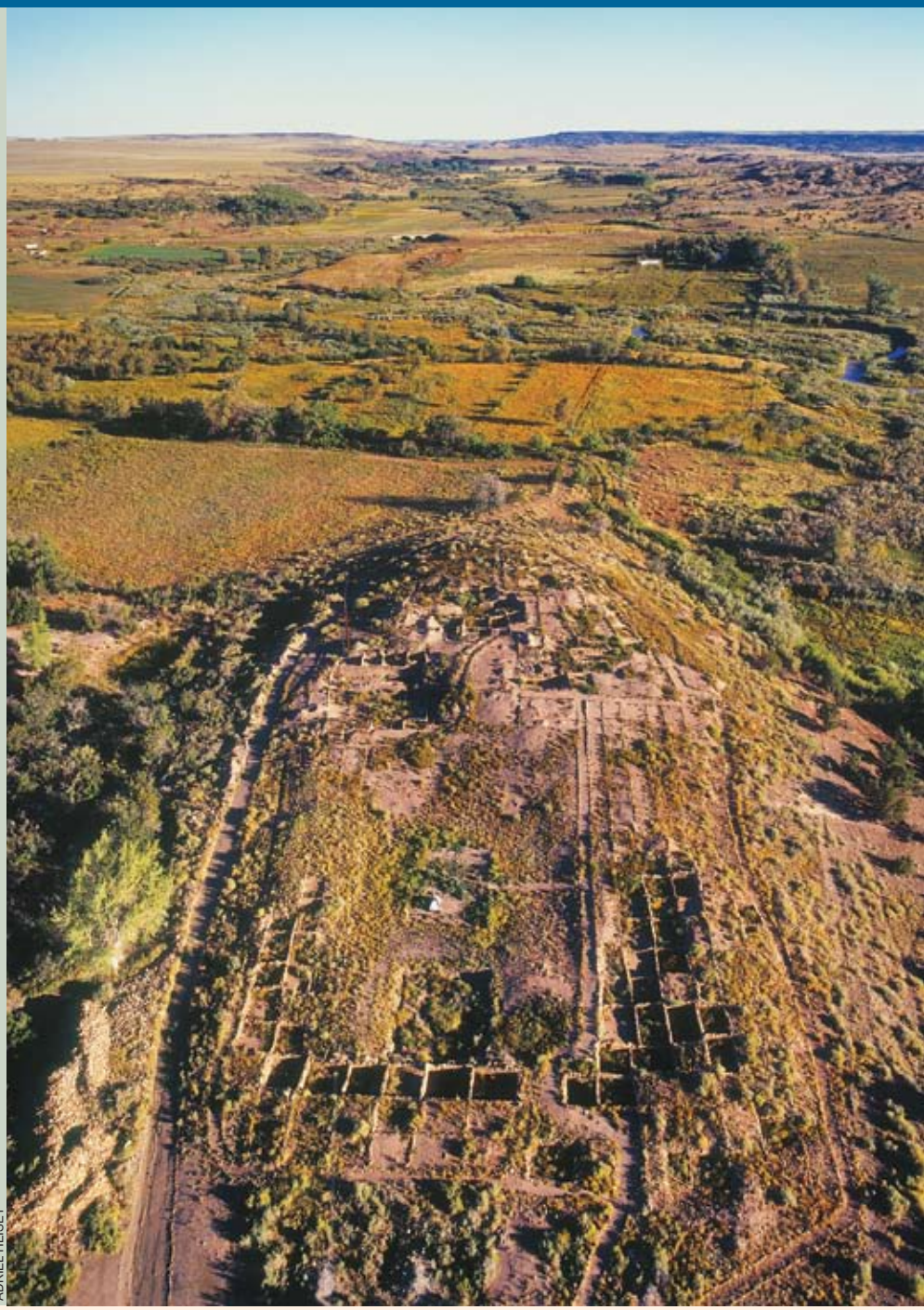

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