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American Archaeology

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Cover: A Native American holds an elaborate pipe in this mid-19th century illustration by the noted artist Karl Bodmer.

Credit: Rare Books Division, The New York Public Library.
More Reasons for Conservation Archaeology

In this issue, we take a hard look at tobacco, and its long-time use by Native Americans that may stretch back 4,500 years, or even much further. (See “Holy Smoke,” page 12.) Today, we know tobacco as a $35 billion industry and the world’s leading cause of preventable death, but to ancient people it was an essential part of their ceremonial life. Throughout the Americas, researchers have found smoking pipes in an archaeological context. They are often very elaborate in design, like the Hopewell platform pipes from Ohio that are beautifully carved. In one mound in southern Ohio, some 150 pipestone pipes were found, many carved in the shapes of bears, wolves, dogs, beavers, cougars, otters, turtles, cranes, owls, herons, and hawks.

On the Great Plains, pipes made of carved Catlinite and alabaster were very important to the ancient people who used them. But how do we know that these pipes were used for smoking tobacco? In the past few years scientists have discovered a very sensitive test that can identify tobacco in a tiny sample of pipe residue. There are hundreds of ancient pipes in museums, so it should be easy to obtain lots of samples to test for whatever was being smoked. Oh, if it were that easy. Almost all the pipes recovered by archaeologists have been cleaned. Likewise, most of the vessels that might have been used for chocolate, an important ceremonial beverage, have also been cleaned, and the telltale residues removed, making a similar test impossible.

There is a lesson here: conservation archaeology tells us that we can never anticipate every issue and every problem. Thus, we must permanently preserve archaeological sites so we will have undisturbed data that future generations can analyze using techniques our generation could never have foreseen. That’s why The Archaeological Conservancy exists.
A Few Observations

In the feature article “Revealing the Deep Past” (Spring 2014), the author refers to “Clovis people” or “Clovis culture” a number of times. Clovis is a lithic technology. It is a short-lived lithic tradition. It is not a people nor is it a culture.

As for the article “A Boy’s Life,” DNA is a valuable datum, but a single datum does not make a population. It is all too easy to grab a new point source as a case for reinterpreting or substantiating controversial theories. I suspect it will generate a plethora of academic papers of questionable long-term value until a data population is recovered with statistical validity.

Dr. Leland Gilsen
State Archaeologist of Oregon, 1978 - 2002

Refuting the Solutrean Hypothesis

DNA results of the Mal’ta boy in Siberia (“A Boy’s Life”) and Anzick infant prove beyond a doubt they are directly related to contemporary Native Americans. I wonder how proponents of the Solutrean Hypothesis, who believe early Americans came from the Iberian Peninsula in Europe, will respond if their final card, the Kennewick Man, also turns out to be Native American.

Dixie Dringman
Rock Island, Washington

Editor’s Corner

Who were the first Americans? This is one of the great unanswered questions in New World archaeology. As experts ponder that question, they might also consider another: were the first Americans artists?

David Whitley, an archaeologist and noted rock art researcher, believes that they were. He thinks Paleo-Indian scholars have largely ignored rock art, and in doing so they’ve deprived themselves of an important line of evidence. In our feature “Rock Art Revelations?” (see page 33), Whitley not only makes the case for Paleo-Indian—and even pre-Clovis—rock art, he also argues that the early Americans’ works serve as windows into their souls.

Whitley notes the stylistic variations in petroglyphs and pictographs that are 10,000 years and older. From this he concludes that Paleo-Indian peoples possessed greater cultural diversity than stone tools, the primary line of evidence for most first American researchers, suggest. In a paper published last year in the *Journal of Archaeology*, he wrote that “by at least 10,000 to 11,000 years ago, substantial iconographic, stylistic, and technical differences existed in North and South American rock art.” However, “this diversity has been archaeologically masked by the geographically widespread occurrence of a few diagnostic projectile point types, and the fluting technology that they exhibit.”

The problem with Whitley’s argument, in the eyes of his skeptics, is the problem of dating rock art, which Whitley himself admits is difficult. And if he and other researchers can’t “prove” that a rock art image is of Paleo-Indian age, his argument falls apart.

But Whitley, and at least some other experts, are convinced that the sophisticated techniques they’re using are producing valid dates. And so, though he can’t say who the first Americans were, he is confident they were artists, and he thinks Paleo-Indian scholars should be mindful that “rock art promises to be an increasingly valuable line of evidence for studying the peopling of the Americas.”

Michael Barayga
he 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 470 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.

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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.

How to Say Hello: By mail:
The Archaeological Conservancy, 1717 Girard Boulevard NE, Albuquerque, NM 87106; by phone: (505) 266-1540; by e-mail: tacmag@nm.net; or visit our Web site: www.americanarchaeology.org
You can also follow us on Facebook.
NEW EXHIBITS

Arizona State Museum

University of Arizona, Tucson—Adriel Heisey’s stunning, large-format aerial images of the Southwest’s cultural landscapes are featured in the traveling exhibit “From Above: Images of a Storied Land.” This outstanding exhibition invites viewers to consider anew the wonder and fragility of the region’s storied places. (520) 621-6302, www.statemuseum.arizona.edu (Through September 20)

Government House Museum

St. Augustine, Fla.—Discover the first colony of St. Augustine, founded in 1565, through archaeology, history, and the stories of people who lived there in the hands-on, interactive exhibition “First Colony: Our Spanish Origins.” On loan from the University of Florida Museum of Natural History, the exhibit includes 3-D gaming software that allows visitors to fly through the first settlement and hear stories of its residents while viewing what the colony looked like from above. (904) 823-2212, www.flmnh.ufl.edu/firstcolony/overview (Through 2015)

Anchorage Museum

Anchorage, Alaska—in the first arrangement of its kind, the Smithsonian Institution has loaned more than 600 Alaska native artifacts to their place of origin, where they are on exhibit in the Smithsonian Arctic Studies Center. The center’s main exhibition is “Living Our Cultures, Sharing Our Heritage: The First Peoples of Alaska,” which features more than 600 objects from the Smithsonian’s collections that were selected and interpreted with help from Alaska native advisers. In addition to its gallery space, the 10,000-square-foot center encourages research about Alaska Native culture through an archaeology laboratory and a space where elders, artists, and scholars can study heritage objects. (907) 929-9200, www.anchoragemuseum.org (New permanent gallery)

Peabody Museum of Archaeology and Ethnology

Harvard University, Cambridge, Mass.—Explore the enduring importance of rivers and canoes in Penobscot tribal life and relationships between the tribe and non-Indians through the new installation “The Legacy of Penobscot Canoes: A View from the River.” The exhibit features a rarely seen, full-size birch bark canoe purchased from Penobscot Indian Francis Sebattis in 1912, as well as stone tools collected by Henry David Thoreau, who described the Penobscot and their canoes in The Maine Woods. (617) 496-1027, www.peabody.harvard.edu/exhibits (New long-term exhibit)
University of Michigan Museum of Natural History
Ann Arbor, Mich.—“Archaeology” examines the methods and tools that archaeologists use to uncover ancient cultures, focusing on the work of University of Michigan archaeologists. The exhibit features topics that include the underwater archaeology of Lake Huron, the earliest inland European fort in the U.S., and Inca beer. (734) 764-0478, wwwlsa.umich.edu/ummnhs/exhibits/temporaryexhibits
(Long-term exhibit)

CONFERENCES, LECTURES & FESTIVALS

Conference on Archaeoastronomy of the American Southwest
June 6-8, Arizona State University, School of Earth and Space Exploration, Marston Exploration Theatre, Tempe, Ariz. This year’s conference theme is “Charting a Formal Methodology for Cultural Astronomy Research.” A pre-conference workshop will be held on June 6 to explore the basic formulae, common pitfalls, and wealth of computer-based resources available to contemporary cultural astronomy researchers. Paper and poster presentations will take place June 7, followed by a banquet dinner at the Sheraton Four Points Hotel. A variety of tours to local sites are scheduled throughout the conference. (602) 568-6277, http://azsionзвervation.com

Mid-South Archaeological Conference
June 21, Johnson Hall Auditorium, University of Memphis, Memphis, Tenn. The 31st annual meeting includes paper and poster presentations highlighting current research in the Mid-South and Lower Mississippi River Valley. For more information, contact midsoutharchaeology@gmail.com

Plains Indian Museum Powwow
June 21 - 22, Buffalo Bill Historical Center of the West, Cody, Wyo. Join the annual powwow, a cultural celebration and competitive dance competition. Dancers, drum groups, and artists from Northern Plains tribes gather to celebrate their vibrant cultural traditions and histories. Men, women, teens, and children compete in various age groups for more than $25,000 in prizes. The Learning Tipi is a popular educational program that invites visitors to discover the traditions of powwow. Contact Nancy McClure at (307) 578-4102 or visit www.centerofthewest.org.

Museum of Northern Arizona
Summer Native Festivals of Arts and Culture
July 6-7, Hopi Festival of Arts and Culture; August 2-3, Navajo Festival of Arts and Culture, Flagstaff, Ariz. At the Hopi Festival, award-winning Hopi artists sell their unique handmade arts. Enjoy cultural presentations, storytelling, music, and dances. Watch Hopi pottery being shaped, painted, and traditionally fired. Walk the museum’s Rio de Flag Nature Trail with a Hopi medicine woman and learn about Hopi clans and clan migration, and how the tribe is working to preserve language and agricultural traditions. At the Navajo Festival, more than 100 of the finest Diné artists display and demonstrate their traditional art forms. Meet award winning painters and renowned weavers, enjoy hoop and social dances, and traditional and modern native music with the Pollen Trail Dancers and Blackfire. Learn from cultural experts about customs and practices families are using to keep traditions strong. (928) 774-5213, www.musnaz.org

Santa Fe Indian Market
August 23-24, historic plaza, Santa Fe, N.M. This 92-year-old native art market is the largest and most prestigious in the world and the largest cultural event in the Southwest. Over 1,100 native artists from the U.S. and Canada sell their artwork, attracting 150,000 visitors from all over the world. The market is a rare opportunity to purchase artwork directly from professional native artists and learn about contemporary Indian arts and cultures. (505) 983-5220, info@swaia.org, or visit www.swaia.org/Indian_Bazaar

Los Angeles County Museum
Los Angeles, Calif.—The exhibition “The Painted City: Art from Teotihuacán” features 14 painted tripod vessels from the ancient city of Teotihuacán, one of the largest collections of such vessels in the U.S., as well as a mural fragment on loan from the Natural History Museum of Los Angeles County. As the largest metropolis in Mesoamerica and the sixth largest in the world by A.D. 500, Teotihuacan attracted artists and merchants from across the region and became a place where ideas and technologies were readily traded. Sprawling, brightly painted apartment complexes were erected to accommodate a fast-growing middle class, depicted in an 18-foot mural included in the exhibit. Teotihuacanos developed a pictorial writing system based on a shared system of signs. Painted ceramics provide one of the most important avenues for understanding Teotihuacan’s visual language and attest to the principal role that painting played in the city’s artistic tradition. (213) 857-6000, www.lacma.org/art/exhibitions/installations
(Through December 7)
Archaeologists recently discovered the remains of 9,000-year-old caribou hunting structures deep in Lake Huron, about 35 miles southeast of Alpena, Michigan. The structures, which are some of the oldest of their type to be discovered, provide evidence of the seasonal hunting strategies and social cooperation of early people in the Great Lakes Region, according to John O’Shea, an archaeologist with the University of Michigan who directed the research.

The structures are located on the Alpena-Amberley Ridge that formed a land bridge between Michigan and Ontario, Canada 10,000 to 7,000 years ago. Researchers said the ridge would have been a natural route for caribou during their spring and fall migrations before it was submerged. One of the structures, called the Drop 45 Drive Lane, consists of two parallel lines of stones, roughly 300-feet long and 90-feet wide, that were used to funnel the caribou into a kill zone.

Three circular stone blinds, from which hunters could take aim on their prey, were built into the lines. Pieces of chipped chert and evidence of tool repair have been found near the blind sites, said archaeologist Ashley Lemke, a graduate student working on the project. The archaeologists dated the structures by radiocarbon testing associated wood. Although similar structures are still used to hunt caribou in the Arctic, they rarely survive intact in temperate climates, Lemke said.

“This site and its associated artifacts, along with environmental and simulation studies, suggest that Late Paleo-Indian/Early Archaic caribou hunters employed distinctly different seasonal approaches,” O’Shea said. For example, the Drop 45 Drive Lane was used in the spring when the caribou were migrating north. Lemke said it would have taken about 10 to 12 people to channel the caribou into the lane and toward the hunters stationed along the route.

Several V-shaped blinds discovered upslope from the drive lane were used when the caribou were migrating south during the fall. They could have been operated by smaller groups who relied on the natural shape of the landform to channel caribou toward them. The discoveries provide evidence of what the people knew about animal behavior and their environment, Lemke said. “It’s a snapshot of what it was like 9,000 years ago.”

Due to the depth of the site, which is 121 feet beneath the surface, the archaeologists employed sonar and a remote operated vehicle in their investigation. Their findings were published in the April issue of The Proceedings of the Academy of Science.

—Paula Neely
Chili peppers, the world’s most widely grown spice crop, were probably first domesticated in central-east Mexico, according to a recent study led by Paul Gepts, a plant scientist from the University of California, Davis. “The transition from hunter-gatherer to agriculture is a major milestone in human evolution. It’s on a par with the use of fire,” Gepts said. “By tracing back the ancestry of any domesticated plant, we can better understand the genetic evolution of that species and the origin of agriculture.”

Published in April in the Proceedings of the National Academy of Sciences, the study used a novel approach that considered paleo-biolinguistics and ecological evidence in addition to archaeobotanical data and genetics to trace the origin of the plant. “This is the first research ever to integrate multiple lines of evidence in attempts to pinpoint where, when, under what ecological conditions, and by whom a major global spice plant was domesticated,” said coauthor Gary Nabhan, a biologist at the University of Arizona.

The researchers concluded that domesticated peppers probably originated at least 6,500 years ago in the region that extends from southern Puebla and northern Oaxaca to southeastern Veracruz, which is farther south than they previously thought. The oldest chili pepper remains in the New World have been discovered at the Coxcacatlan Cave in the Valley of Tehuacán, located in the central-east region, and in the Romero Cave in Tamaulipas in northeastern Mexico. Both specimens were found with evidence of maize and squash that date to about 5,600 to 6,400 years ago.

Gepts said the central-east region of Mexico is also the homeland for the Proto-Otomanguean language, which was spoken at least 6,500 years ago. According to the team’s historical linguistic research, it’s the oldest New World language that includes a word meaning pepper. The team also employed paleo-climate research to identify the area that was most suitable to the development of wild chili peppers, assuming that domestication took place in a region where wild peppers grew.

The combined evidence supported the central-east region as the area of origin, although the genetic evidence seemed to point more to northeastern Mexico as the chili pepper’s area of domestication.

Gepts noted that the study also suggests that agriculture developed in different areas at different times, as it did in China and Southwest Asia. For example, he said beans and corn were first domesticated in different regions in western Mexico. The staples and spices were eventually brought together to form an integrated Mesoamerican cuisine, according to Nabhan. —Paula Neely
Haiti Shipwreck Could Be Columbus’ Santa Maria

Archaeologist believes the evidence is promising.

This May, underwater explorer Barry Clifford discovered what could be the wreck of Christopher Columbus’ flagship the Santa Maria off the northern coast of Haiti near Cap-Haïtien. The discovery includes a ballast pile near the area where Columbus wrote of running aground early Christmas morning in 1492.

Charles Beeker, the director of the Office of Underwater Science and Academic Diving at Indiana University, is examining the evidence to determine if the wreck is indeed the Santa Maria. “The evidence looks very compelling, and Indiana University will conduct a full investigation to determine whether this is the Santa Maria, hopefully as early as this summer,” he said.

During an earlier 2003 investigation of the shipwreck site, Clifford photographed a 15th-century wrought-iron cannon that has since been looted. In May, Clifford returned to the wreck with a group of experts who measured and photographed the ship remains and found a ballast pile nearby. Columbus’ crew and the local Taino Indians salvaged much of the shipwreck, and the materials were used to build a garrison that housed 39 crew members. They remained there until the following year, when they returned to Spain with Columbus on the ships Niña and Pinta. According to Geoffrey Conrad, a colleague of Beeker’s at Indiana University, the location of Clifford’s find matches the location where Columbus recorded running aground in his logbook.

“It’s the best candidate yet for the Santa Maria,” said Conrad.

Beeker’s upcoming investigation will include a scientific diving expedition and underwater archaeological excavation to determine if the shipwreck’s materials match those of a late 15th-century sailing vessel. The next phase of investigation will focus on recovery of diagnostic artifacts with minimal impact to the site. If this indicates that the shipwreck probably is the Santa Maria, a full excavation will be undertaken under the auspices of the Haitian government.

“We are very excited about the potential of this discovery and very pleased to help protect sites such as the Santa Maria for future generations as Living Museums in the Sea,” Beeker said. Beeker was instrumental in establishing the USAID-sponsored Living Museums in the Sea National System of the Dominican Republic to preserve submerged cultural resources and the associated biodiversity through sustainable tourism. He intends to couple archaeological and historical investigation of the Santa Maria with the establishment of a corresponding Living Museum in the Sea Special Protected Area in Haiti. —Tamara Stewart
To the dismay of numerous California archaeologists, every item from a 4,500-year-old Coastal Miwok Indian cemetery and village site was removed and secretly reburied during the past two years. The site contained nearly 600 prehistoric human burials, a ceremonial California condor burial, and a variety of artifacts ranging from stone and bone tools to beads and game pieces. There were also thousands of bones from bears, waterfowl, deer, sea otters, and bat rays.

The site was uncovered during a cultural resource survey that, in accordance with the California Environmental Quality Act (CEQA), was done in advance of the construction of a residential community. The Federated Indians of Graton Rancheria tribe, which claims cultural affiliation to the site, monitored the excavation, which was done by Holman & Associates Archaeological Consultants. According to Miley Holman, the owner of the firm, the tribe signed an agreement with the City of Larkspur, which served as the lead agency enforcing CEQA, allowing the tribe to control the archaeological work.

Archaeologist Al Schwitalla, who worked on the project for a year and a half, said the tribe “stepped over the line” in dictating how the project should be conducted. “They were infringing on archaeological protocols that have to do with how we collect information from the site.”

Photography wasn’t permitted, so the artifacts and features had to be drawn. The tribe allowed a limited number of samples to be dated, but other forms of analysis were prohibited, even with artifacts that were not associated with the burials. Archaeologists had only 60 days to study artifacts once they were removed. Usually they have at least a year, especially on a site of this magnitude, Schwitalla said. All remains, artifacts, and features were reburied; nothing was saved for future study.

“It’s extremely disturbing and sad that we didn’t get to learn what we could have,” said Jelmer Eerkens, a professor of archaeology at the University of California, Davis, who visited the site. “For a site this large, that almost nothing was done is unprecedented,” he said. Ideally, there should have been more interaction between the archaeologists, the tribe and the public, instead of doing what just one party wanted to do, he said.

The work was conducted under a confidentiality agreement to protect the site, the burials and the artifacts, Holman said. Representatives of the tribe didn’t respond to requests for interviews. In an article that appeared in the San Francisco Chronicle, Greg Saris, chairman of the 1,300 member tribe, said, “It is nobody else’s business, how the tribe chooses to handle the remains and belongings of its ancestors.” — Paula Neely

Workers excavate the 4,500-year-old site that contained hundreds of ancient human burials and numerous artifacts
Researchers using unmanned aerial vehicles (UAVs), better known as drones, equipped with cameras that use infrared sensing to project thermal images, recently identified hidden structures in an 1,000-year-old village in northwestern New Mexico near Chaco Canyon. Jesse Casana and Adam Weiwel of the University of Arkansas, John Kanter of the University of North Florida, and Jackson Cothren of University of Arkansas’ Department of Geosciences, published the results of their work in an article in the May issue of the Journal of Archaeological Science.

First identified in the 1970s, the Blue J settlement was thought to be unlike neighboring, contemporaneous sites due to its apparent lack of monumental architecture and kivas, both hallmarks of Chaco-era Pueblo sites. The drone’s thermal images revealed what appear to be a large kiva and other structures. This indicates the site is much bigger than it seemed, and that it was likely part of the Chaco network.

Subsurface archaeological features such as stone structures retain and emit heat differently than the surrounding sterile soil, enabling the creation of thermal images that can provide outlines of the buried features. Until recently, the cost and difficulty of obtaining high-resolution thermal images of archaeological sites has been prohibitive. “Our easily replicable methodology produces data that rivals traditional archaeological geophysics in terms of feature visibility, but which can be collected very rapidly, over large areas, with minimal cost and processing requirements,” the researchers wrote in their article.

In addition to aerial thermography, archaeologists are attaching video cameras, GPS devices, magnetometers, and barometers onto drones to help them with their work. In southern Utah, a recent drone flyover revealed a concentration of 20 stunning petroglyphs that were previously unknown. The petroglyphs, which were filmed by a Colorado resident, are high on an inaccessible ledge of a steep canyon wall. They’re thought to have been made by the Basketmaker people some 2,500 years ago.

“This work illustrates the very important role that UAVs have for scientific research,” said Casana who, through funding by the National Endowment of the Humanities, has been studying aerial thermographic imaging and investigating archaeological sites with an eight-rotor CineStar 8 remote-controlled copter he and his team at the University of Arkansas’s Center for Advanced Spatial Technologies built from a kit a two years ago.

A lack of government regulations for UAVs in the U.S., as well as frequent copter crashes and software malfunctions, have made implementation of the technology challenging, but researchers hope to see greater scientific use of it in the future. —Tamara Stewart
When Christopher Columbus landed on the island of Cuba during his first voyage to the New World in 1492, he and his shipmates saw something that baffled them. Many of the native people—probably members of the Taíno tribe—smoked like chimneys. Men and women were “always with a firebrand” made of dried plants that produced pungent trails of smoke, Columbus reported in his diary. They “take in with their breath that smoke which dulls their flesh and as it were intoxicates.” And they had a special name for the smoldering bundles: “Tobacos.”

Columbus’ entry is likely the earliest historical account of Native Americans smoking tobacco, a habit then unknown to Europeans. And it marked the beginnings of a worldwide love-hate relationship with this intoxicating, addictive, and deadly plant. Within decades, tobacco cultivation and use spread from the Americas to Europe and far beyond. Today, the leaf is the basis of a $35 billion industry, and the world’s leading cause of preventable death.

How ancient Native Americans came to use and grow tobacco, however, has been something of a puzzle. The most popular varieties evolved in South America, but scholars have long debated exactly when early Americans began exploiting them, and how the plants spread to North America. Adding to the enigma is the difficulty of finding archaeological evidence of tobacco plants, which decay easily and produce tiny, almost invisible seeds. “It also doesn’t help that often the whole point of tobacco is that you burn it, which doesn’t leave much behind to work with,” said archaeologist Sean Rafferty of the University at Albany in New York.

In recent years, however, technological advances and new finds have begun to help clear the haze. Researchers have learned to detect minute quantities of nicotine, one of tobacco’s most potent and distinctive chemical constituents, in ash smudges on prehistoric pipes and even in residue on the hair of mummies. That’s helped them push back the confirmed use of tobacco by centuries. Working with botanists, they’ve also identified a bouquet of wild and domesticated tobacco species used by ancient Native Americans, and dozens of other plants they also smoked. By studying pipe designs and materials, they’ve tracked trade routes and charted cultural connections. They’ve used artwork and oral histories to document tobacco’s widespread role as a sacred offering that could cement alliances, induce ghostly visions, and open the door to a spirit world. Some are even drawing on what they’ve learned about tobacco’s past to help tribes resurrect traditional uses, and reduce present health threats posed by modern commercial tobacco (see “Reframing Smoking Cessation” sidebar, page 18.)

“Tobacco is a very powerful plant that has a fascinating history, and it is still very important to many Native Americans today,” said archaeologist Shannon Tushingham of Washington State University in Pullman. “But we’re just beginning to learn the whole story.”

Tobacco has played an important role in Native American culture for millennia. Researchers have recently begun to examine the details of that role.

By David Malakoff
An unidentified Native American smokes a cigarette in this picture taken in 1908 by Fred Harvey.
For many Native Americans, that story starts at the beginning of time. The Navajo, for example, believe the universe could not be created until Sky Father and Earth Mother smoked sacred tobacco. And the plant plays a similarly central role in the rituals and origin stories of many other tribes, the late anthropologist Joseph Winter noted in what is perhaps the most detailed book on the topic, *Tobacco Use by Native Americans: Sacred Smoke and Silent Killer*.

Those stories and rituals reflect a history of human tobacco use that stretches back many thousands of years, suggested Winter, a longtime academic at the University of New Mexico who died in 2010. The oldest archaeological evidence for tobacco—plant remains discovered in association with ancient settlements on the north coast of Peru—dates back 3,700 to 4,500 years ago. But Winter and others have theorized that the relationship began much earlier, as North America’s first immigrants spread south from the Arctic after arriving from Asia. Somewhere along the way they encountered wild tobacco plants, which can be rich in nicotine and other psychoactive chemicals that can cause addiction, hallucinations, and, in extreme cases, blindness and death. Researchers have found wild varieties that have nicotine levels approaching 20 percent, for instance, compared to one to three percent for modern commercial varieties.

Already familiar with other mind-altering plants, the Paleo-Indians likely experimented, and tobacco’s “powers were easily recognized,” Winter wrote. Eventually, “it was added to the Indians’ rich pharmacopeia” and “became a constant, elemental force” in community life. Indeed, tobacco’s attraction and ritual importance was so great that it “may have been the first plant to be domesticated in the New World,” Winter speculated, though there’s no archaeological evidence to support this.

Overall, researchers now believe early Americans used at least seven of the nearly 100 known tobacco species in the genus *Nicotiana*. Five occur in the wild, including “coyote tobacco” (*N. trigonophylla*), an elegant, relatively diminutive tobacco that is considered a sacred plant by many tribes in the American Southwest. Two were ultimately domesticated, most likely in South America, and then carried north. (This journey could have been happenstance, as tobacco’s miniscule, sticky seeds easily adhere to footwear, clothes and objects.) One, *N. tabacum*, is likely the species that Columbus encountered, and now serves as commercial tobacco. The other is *N. rustica*, sometimes called “Indian tobacco,” which became the species most commonly associated with Native Americans who lived in what is now the Eastern and Midwestern United States.

Exactly how and when tobacco use became widespread isn’t clear. In South America, the archaeological evidence is scarce and scattered, but tobacco appears to have become a central part of tribal life in many areas some 2,500 years ago. Researchers reported last year in the *Journal of Archaeological Science* that 2,100-year-old mummies in northern Chile have nicotine residues on their hair. And in northwestern Argentina, scientists have found the trichomes, or hairs, of tobacco plants in pipes that may date to as early as 650 B.C. Archaeologists have also recovered numerous pipes and pipe shards at sites dating back as far as 2130 B.C., but tests of their burned residues have identified the remains of plants other than tobacco.

In North America, the tobacco record is more

![This raccoon effigy pipe was found in Tremper Mound, a Hopewell site in southern Ohio. It’s thought to be between 1,600 – 2,100 years old. The smoker would have been looking into the eyes of the raccoon, which may have been the spirit animal of the smoker.](image)
substantial, said Rafferty, who has spent years studying the issue. Researchers have found evidence of the plant, including seeds and pollen, at more than 100 sites. Most are in the Midwest and Great Lakes regions, and although some date to the Middle Woodland period, about A.D. 1 to 500, most are younger than A.D. 1000. In New Mexico, researchers have reported finding seeds at an older site, the High Rolls Cave, which dates to about 1040 B.C., but it is not clear if the plant was associated with human use.

As in South America, however, North American researchers have found pipes and pipe fragments at even older sites dating back to about 2000 B.C. But until recently, they couldn’t say with confidence whether the pipes were used to smoke tobacco, or some of the nearly 100 other plants that Native Americans are known to have smoked. That changed in the mid-2000s, when archaeologists began to harness a sensitive forensic technique known as coupled gas chromatography/mass spectrometry (GC/MS), which can precisely identify the molecules present in even tiny samples. Intrigued by the possibility of using GC/MS to shed light on early smoking, Rafferty began testing hundreds of prehistoric pipes from the Eastern U.S. that “had been sitting on museum shelves for decades.” Unfortunately, just a few still contained burn residues. “Most had been nicely cleaned,” he recalled ruefully. “So now when I give talks, I implore people: ‘If you find a pipe, do not wash it!’”

Luckily, one of the rare dirty pipes yielded a dramatic discovery. The simple stone tube had been found years before in Vermont, in a human burial from the well-documented Boucher site near Lake Champlain, which studies suggest was occupied from about 1036 to 49 B.C. The pipe itself came from a feature radiocarbon dated to about 300 B.C., and in a 2006 Journal of Archaeological Science paper, Rafferty reported it contained nicotine residues. That made
the pipe the earliest confirmed evidence of tobacco use in North America by some 500 years. It was, he said, “a nice result.”

Other archaeologists have also made significant discoveries. In 2003 Tushingham found an intact pipe while excavating an 1,100-year-old plank house at a site in northwestern California associated with the Tolowa tribe. The pipe was probably used for ceremonial purposes by Athabascan people. Once again, the question was whether the pipe had actually been used to smoke tobacco, particularly since the Pacific Northwest’s tribes were known to have smoked dozens of different plants, especially bearberry or kinnikinnick.

Tushingham’s team went to great lengths to find the answer. Before analyzing the pipe and 15 other pipe fragments found during associated digs, they ran a lengthy battery of tests to create a robust database of GC/MS signatures from a wide array of plants. To create it, they burned 22 different kinds of plants in cheap clay pipes originally designed for use by Civil War reenactors. To simulate a smoker, they taped a syringe to a pipe’s mouthpiece, and then pulled the plunger to imitate nice, long draws. Finally, they sliced the used pipes into 11 pieces and analyzed

Shannon Tushingham found an intact pipe while excavating an 1,100-year-old plank house at the Red Elderberry site in northwestern California.

The face on this 300-year-old human effigy pipe is turned toward the smoker, which could suggest smoking was a private, rather than communal, activity.
residues from six. It was tedious and sometimes dangerous work. "I got really nauseous once from accidentally breathing in tree tobacco," Tushingham said. "You had to be careful."

The work paid off, however, and they reported last year in the _Journal of Archaeological Science_ that six of the 16 artifacts turned out to contain telltale nicotine, including the intact pipe, which dated to A.D. 863. That date made the pipe by far the earliest confirmed evidence of tobacco smoking in the Pacific Northwest.

Such discoveries are giving scholars food for thought about past cultural practices. The plank house pipe, for example, suggests that although the hunter-gatherers who used it may not have been full-time farmers, "they may have been managing plants like tobacco, manipulating them, and not just acting as passive consumers or collectors," said Tushingham. Wild tobacco does not typically grow in the coastal rainforest where the pipe was found, she noted, so it is plausible villagers played a role in spreading and maintaining it, planting it in kitchen gardens or clearings in the woods.

Ethnographers are combing through oral traditions and early artwork to document the numerous ways in which native groups used tobacco. In addition to smoking the leaf or burning it as incense, they chewed it, snorted it as snuff, and turned it into drinks and juice that they smeared on their skin. Many tribes used raw leaves as offerings or gifts, or folded dried tobacco into ceremonial bundles and talismans.

Some tribes burned a pinch of tobacco when beginning a hunt; others blew tobacco smoke into a child’s mouth to cure colic, into the ear to ease earaches, or into a cup of water for stomachaches.

Analyzing ancient art may also offer clues as to whether a tribe was using tobacco, or some other psychoactive plant, for ritual practices. For example, doctors know that extreme nicotine intoxication can block the color receptors in the eye, anthropologist Christine VanPool of the University of Missouri noted in a 2009 study published by the _Journal of Anthropological Archaeology_. That explains why shamans and others who inhale copious quantities of tobacco smoke report seeing only white, yellow, and black, and that people appear ghost-like.

In contrast, other hallucinogenic plants used in ritual, such as peyote cactus, produce vivid, colorful visions. Given that context, it is interesting to note, VanPool wrote, that some pottery from the Medio period (A.D. 1200–1450) found at the Casas Grandes complex in northwestern Mexico features black-and-white motifs. "This is odd," she wrote, "given that the majority (98 percent) of Casas Grandes Medio Period pottery... [has] visually striking red and black interlocking designs." The monochrome art, combined with an analysis of the images themselves, suggest shamans at Casa Grande were using tobacco, VanPool concluded.

Pipe designs and materials can also offer insights into...
cultural changes and trade. Archaeologists have uncovered pipes made from a wide range of material, most commonly stone, bone, and clay, but also wood, reeds, and even lobster claws. The earliest pipes tend to be simple stone tubes, but "once you see the introduction of clay as a pipe material, there is an explosion of forms," said Rafferty. Even stone, however, could be carved into complex forms. Ancestors of the now familiar elbow-shaped pipe, for example, appear in the Mound Building cultures of the Ohio and Mississippi river valleys some 2,000 years ago. Later, the Hopewell culture, which flourished in roughly the same region from about 300 B.C. to A.D. 700, produced distinctive "platform pipes," in which the bowl rests on a rectangular base. Perhaps the best-known native pipes are the ornate calumets, or "peace pipes" made by Great Plains tribes; "calumet" is a French word for reed, and it describes the long, graceful stems that characterize these showy ceremonial pipes.

There is little doubt that pipes were important cultural objects. Many are ornately carved with human or animal figures, and are often found carefully placed in burials or ceremonial settings. They also appear to have been important trade goods; early pipes made of Midwestern stone have been found throughout eastern North America, for example, enabling researchers to map connections between sometimes far-flung cultural groups. "Pipes are as much about the spread of ideas as smoking behavior," said Rafferty. "A whole set of beliefs can be associated with a pipe."

Pipe design and decoration can also offer clues to social arrangements. Some pipes display outward facing figures, for instance, suggesting they were designed for communal or ceremonial settings. Others have figures that face the smoker, perhaps signaling a shift to tobacco use as a more personal experience. In a 2012 study of clay pipes found at Antrex, the site of a 13th-century Iroquois village in southern Ontario, archaeologist Gregory Braun of the University of Toronto detected signs of a change from earlier ritual practices of their ancestors in which tobacco smoking was a community ritual controlled by powerful shamans or religious specialists. These communities, in those earlier times, consisted of mobile extended family groups.

Analyzing nearly 1,500 pottery and pipe fragments, he found that Iroquois pottery appeared to have been crafted by a small number of skilled individuals who shared their work with the community. The pipes, in contrast, appeared to have been made by a large number of individuals for their personal use, and they varied widely in their raw materials and manufacturing quality. Unlike their ancestors, the 13th-century Iroquois were sedentary, and their villages consisted of families unrelated by blood. "Private" smoking, Braun theorized in the *Journal of Archaeological Science*, could have increased social cohesion among these people. "I suggest that pipes were made by the people that used them, using their own family traditions of pipe making," he said. "Smoking tobacco mixtures was seen as a way of connecting and communicating with one's ancestors, and by avoiding rituals that involved publicly elevating the ancestors of a specific family, friction between competing family groups might have been suppressed, preserving the fragile balance in a new social system that was only a few generations old."

Such intriguing ideas are still in their infancy, tobacco researchers noted; the field is still hobbled by a lack of funding and a relative scarcity of artifacts. "We need to recognize that the use of tobacco and other intoxicants by early cultures is an important archaeological question," said Rafferty. But mostly, he added, "we need more people looking for pipes and evidence of tobacco. We know it is out there."

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From the ancient Maya, to the Caddo of southwest Arkansas, to the Southwestern tribes of the past and present, salt has been a valuable commodity to the peoples of the Americas for centuries. The need for salt became more pronounced once their diets changed from hunted and gathered foods, in which they obtained salt from eating meat, to an agriculturally-based diet high in plant foods and low in naturally occurring salt. Since ancient times Native peoples mined and otherwise acquired salt for use in their food, for trade, and for its association with rain. Salt is the source of shared mythologies and traditions surrounding the native Southwest deity Salt Woman.

The Verde Valley of central Arizona was once filled with a freshwater lake that flooded and receded repeatedly over millennia, leaving behind startling blue halite crystals (a mineral form of salt) and other mineral evaporites as the water receded and eventually dried up. Early valley settlers, ranchers, and the military knew of the salt deposit near Camp Verde, using it primarily for their livestock. Because of its remote location, it wasn’t until the 1920s that the Western Chemical Company began commercial mining there. During its peak, the Verde Salt Mine yielded as much as 100 tons of thenadite, also known as ‘salt cake,’ a day.

In 1926, the mining, which had already uncovered an abundance of prehistoric stone tools and other artifacts, revealed the partial remains of a headless human and two
other adults preserved deep in the salt mine. The company contacted the American Museum of Natural History (AMNH) in New York, which sent archaeologist Earl Morris to investigate. Byron Cummings, director of the Arizona State Museum (ASM), also visited the mine. Artifacts recovered from the ancient mine include grooved stone picks, wooden pick handles, bark torches, brooms, salt encrusted woven-fiber sandals, a large Sinagua jar sherd, and woven cotton textiles, one found wrapped around the head of a man buried in one of the mine’s prehistoric tunnels.

There was evidence of extensive prehistoric tunneling into the mine to retrieve the salt crystals. Morris identified four tunnels, the longest of which was 200-feet long and 100-feet below the surface. After examining the artifacts, mapping the tunnels, and visiting nearby archaeological sites to try to date the prehistoric use of the mine, Morris estimated that it was worked in the A.D. 1300-1400s, when nearby sites were at their height. He surmised that the mummified body was that of an ancient miner trapped in a collapsed tunnel. Morris brought artifacts and the remains back to the AMNH, and he published a detailed report of his investigation in 1928. Cummings produced no report but, wanting to keep some of the items in Arizona, he took artifacts, as well as two additional sets of mummified human remains that were subsequently found, to the ASM.

It wasn’t until the late 1980s that the Verde mine artifacts were examined again, this time by State University of New York archaeology student Nancy Jo Chabot for her master’s thesis. Chabot re-analyzed the artifacts from both institutions, obtaining radiocarbon dates on five wooden pick handles and a cedar bark torch that dated the mine between A.D. 1150 and 1350, during the Tuzigoot phase of the local Southern Sinagua culture. By this time the human remains held at the museums had been disposed of.

“My graduate school advisor suggested the Verde Salt Mine site as a thesis topic because it was at that time undated and culturally undetermined,” recalled Chabot, now curator of the Mt. Kearsarge Indian Museum in Warner, New Hampshire. “It interested me for a different reason, however. My interests, then and now, are in the care of native objects held in museum collections. At the time of my thesis, the collections had never been analyzed together, much less fully studied at either institution. My thesis became an opportunity to marry the two sets of artifacts to tell a more complete story than could have been told by studying either collection on its own.”

Chabot’s re-analysis of the Verde Salt mine artifacts caused her to question Morris’ interpretation of the human remains and associated artifacts. After considering evidence from four other prehistoric Southwest salt deposits that

An artist’s depiction of a Hopi pilgrimage to Zuni Salt Lake. Springs and campsites are shown, as well as animals the Zuni encountered along the way. At the top of the mural, men are shown collecting salt in the lake. The trail home leads past Zuni Pueblo, seen in the upper left corner. In the center of the mural Hopi women prepare a feast to welcome home their fathers and brothers.
all have spiritual traditions associated with their use, she suggested that some of what Morris considered to be mining implements might actually be spiritual offerings left in exchange for the salt.

Inspired by Chabot’s investigation of the Verde Salt Mine, Todd Bostwick decided to update and expand on her thesis. Bostwick, the director of the Verde Valley Archaeology Center, has been examining ritualistic behavior associated with ancient salt mining in the Southwest, particularly at the Verde mine. “Salt procurement in the Southwest often involved dangerous journeys and was closely associated with ritual activities and sacred landscapes,” he said. In 2011 he began a detailed study of Morris and Cummings’ 1920s’ investigations of the site, reanalyzing the artifacts housed at the ASM as well as 20 additional artifacts he located at the Museum of Northern Arizona.

Bostwick also compared the Verde Salt Mine artifacts with those recovered in the 1920s from the Nevada Salt Mine, the only other prehistoric underground salt mine in the Southwest, and he reviewed the ethnographic literature regarding ritual salt procurement by historic tribes in the Southwest, including the traditions surrounding the sacred Zuni Salt Lake, home of the Salt Woman deity known to the Zuni as Ma’lokyyattsik’i.

Glistening crystalline white against the stark, volcanic landscape, Zuni Salt Lake is a rare high-desert lake in a volcanic crater in a remote area of northwest New Mexico. Saline water flows upward into the mile-wide crater, creating the shallow lake that, during the dry season, evaporates to reveal glittering, high quality salt flats. Archaic period artifacts found in the area indicate early and persistent use by mobile groups of hunter-gatherers, probably following game that was attracted to the area’s salt as well as the water that then filled the region’s numerous playas. When Juan de Oñate’s expedition passed through the area in 1598, he sent Marcos Farfán to explore Zuni Salt Lake. Farfán reported that the lake was “a marvelous thing; the entire surface was encrusted with salt, except for a place in the center where water bubbled up; a person could easily walk on it without breaking through.” He declared it the finest saline in the world, stating that “not even the King of Spain enjoyed salt of such excellent grain.”

For centuries the peoples of the Southwest, including the Zuni, Acoma, Laguna, Hopi, as well as Mescalero Apache and Navajo groups, have made pilgrimages to Zuni Salt Lake, known as Ma’k’yayanne, to pray for rain and harvest salt for culinary and ritual uses. Ancient trails radiate out from the lake in the directions of Acoma and Hopi pueblos, as well as major ancestral settlements such as Chaco Canyon. Zuni Tribal Council member David Wyaco, Sr. has compared the trails to umbilical cords tying the villages to their source of life, and tying the sacred salt lake to the tribes’ other holy

An aerial view of Zuni Salt Lake. The lake is a sacred place and the home of the Salt Woman deity.
places. The ancient Acoma Salt Pilgrimage Trail leads southwest from Acoma Pueblo to the lake. Two major trails connect Hopi Pueblo with Zuni Salt Lake, one leading directly to the lake, the other passing through Zuni Pueblo.

Each tribe has its own traditions surrounding Salt Woman, with several common themes. For Acoma and Laguna pueblos, Salt Woman is known as Mina Koya, and at Hopi she is Öng.wùuti. According to Zuni oral traditions, Salt Woman undertook a long journey during which she lived near each of the tribes, providing them with salt for many years. But she was displeased with some tribal members’ disrespectful behavior toward her, wasting salt and gathering it without making proper offerings, so she left in search of a new home. She flew south, eventually landing at Zuni Salt Lake, where she continues to reside today, according to Zuni oral traditions.

The pueblos began making pilgrimages to the lake to pay homage to Salt Woman and to collect her salt. For the Zuni, salt pilgrimages are one of the ways young boys are taught the cultural knowledge needed to become men. Prayer sticks must be made and left as offerings, Salt Woman must be shown respect, and the collected salt must be shared with relatives and friends. Likewise for the Hopi, the pilgrimage is the culmination of the Wuutsim ceremony, when boys become men through initiation into one of four religious societies. Because it’s a sacred site, the Hopi also made the pilgrimages to pray for rain during droughts. Fourteenth-century pottery found near one of the Hopi trails to the lake suggests they were making pilgrimages at least 700 years ago. Early 20th-century accounts of Hopi salt pilgrimages describe pack trains with burros leaving the pueblo loaded with pottery and other items to be sold at the trading posts and given to friends at Zuni Pueblo on the way. The pilgrims returned loaded with salt.

According to Navajo tradition, Salt Woman was conceived from the merging of the male Little Colorado River and the female Colorado River at the bottom of the Grand Canyon. She then emerged from a hole in the middle of a nearby hogan-shaped hill. After offerings are made, salt is taken home and dissolved in water. Traditional rain songs are sung while the salt water is thrown into the air for moisture. Salt is also offered to the skies with songs to calm lightning.

Containing hundreds of burials, shrines, and more than 5,000 archaeological sites, the 185,000-acre area surrounding Zuni Salt Lake known as “The Sanctuary” has traditionally been held by Southwestern tribes as a neutral zone where
warring tribal members could come together peacefully to collect salt and conduct rituals. Hunting was traditionally forbidden in this area. In Geronimo’s *Story of His Life*, the famous Apache chief recalled, “When visiting this lake our people were not allowed to even kill game or attack an enemy. All creatures were free to go and come without molestation.” Although Zuni Pueblo acts as the guardian of the salt lake, all tribal members with traditions involving the lake have a right to visit it.

Informed by this ethnographic evidence, Chabot and Bostwick’s reanalysis of the Verde Salt Mine artifacts resulted in an alternate explanation for the ancient artifacts and human remains found preserved in the mine. Though they acknowledged that many of the artifacts were likely used for mining, they argued that some of the items, and the human remains, that Morris believed were mining-related tools and casualties were likely ceremonial offerings and intentional burials with associated grave goods. In a paper they submitted to the *Journal of Arizona Archaeology*, Chabot and Bostwick wrote, “Among the artifacts recovered from the Verde Salt Mine are a number of materials that do not appear to have been part of a miner’s tool kit. These include the weaving batten and pointed stick, several carefully made prayer sticks, two basketry plaques that may have held offerings, fine human hair cordage, a used ceremonial cane cigarette, and finely-made and decorated cloth wrapped around the
head of at least one of the mummified human remains. These latter items are typically found in the Southwest accompanying intentionally buried humans.”

They also noted that Morris and Cummings arrived at their interpretations without seeing the burials in situ, and that during his investigation of the nearby Clear Creek ruins, Morris found the remains of an intentionally buried person that was accompanied by some of the same items that were found with the Verde mine remains.

“With its beautiful blue-colored halite crystals, the mine was probably considered a powerful place, a sacred location protected by deities such as Salt Woman of the Pueblo people,” Chabot and Bostwick concluded. “Burying a person inside the salt mine may have been an act of reverence for that person; perhaps they were salt miners who died of natural causes and were then buried inside the salt mine.”

The Sinagua likely traded the salt for shell jewelry, turquoise, and pottery, items found in settlements up and down the Verde Valley. After the Sinagua left the region, Hopi, Yavapai, and Apache groups are said to have collected salt from the mine. The Arizona Chemical Company continued to mine salt after Morris and Cummings’ visits, and for a time Verde became the largest salt producer in the U.S. But competition forced the mine to close in 1933, and the Prescott National Forest now manages the 80-acre Verde Salt Mine property.

Steven Ayers, economic development director for the Town of Camp Verde and a long-time researcher of the Verde mine, has formed a partnership with the Prescott National Forest and Verde Valley Archaeology Center to develop the mine for public interpretation, with signage, a trail that leads partway into the mine, and a parking lot. James McKie, an archaeologist with Prescott National Forest, is enthusiastic about opening the site to the public. “It’s been my desire for a long time, it just took the right people to come together to make it happen,” he said. “There is still a lot that needs to happen, but hopefully we’ll be up and running within the not-too-distant future.” The Forest Service will consult with tribes affiliated with the area about the project, and McKie hopes to include tribal interpretations in the signage.

Natives continue to make the pilgrimage to Zuni Salt Lake, with men taking the sacred journey to the lake to pay respect to Salt Woman in traditional ceremonies, to ritually bathe themselves in the lake, and to collect her sacred flesh, leaving offerings in exchange.

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Summer Travel Special

On the Trail of Florida’s Indian Heritage

By Susan Ladika

Amid the theme parks and interstates, beachfront hotels and strip malls, remnants of ancient Florida remain. Native Americans lived in Florida as far back as 12,000 to 15,000 years ago, millennia before the first Spanish explorers arrived in the 1500s. By following a stretch of the Trail of Florida’s Indian Heritage, you’ll get a sense of...
what life was like along the Gulf Coast centuries ago.

You can begin your 200-mile journey in Tampa, the largest city on Florida’s west coast. The first known white settlers arrived in the early 1820s, and the U.S. Army established Fort Brooke to protect the strategic harbor of Tampa Bay. That area now is the heart of a thriving city of nearly 350,000 residents. Located near the site of that long-ago fort is the Tampa Bay History Center, which is perched along Garrison Channel, providing a stunning view of downtown Tampa.

As you enter the museum, you’ll find artifacts and reproductions of tools, weapons, and pottery from the Tocobaga and Calusa Indians. The Tocobaga lived in small villages at the northern end of Tampa Bay from the A.D. 900s to 1500s, while the Calusa dominated southwest Florida for centuries. The film “The Winds of Change” recounts the Tocobagas’ initial encounter with Spanish explorers, led by Pánfilo de Narváez, in 1528, and the violence that erupted. Following their clashes with the Spanish, the Tocobaga captured four explorers, and their chief, Hirrihiagua, ordered them put to death. His daughter, Ulele, begged her father to spare the life of one of them, an 18-year-old named Juan Ortiz. Ortiz was spared as a result, and he lived among the Indians before being rescued by Hernando de Soto, who landed near Tampa in 1539. Ortiz then served as de Soto’s guide and interpreter.

A second set of exhibits focuses on the Seminole Indians. These were generally Creeks who migrated to North Florida in the 1700s as Europeans moved into Alabama and Georgia. They were joined by members of other tribes and runaway slaves. Seminoles ran cattle ranches in those early days. “In Florida, our cowboys were Indians,” said Rodney Kite-Powell, curator of history at the Tampa Bay History Center. Conflicts with settlers led in 1817 to the first of three U.S. wars against the Seminoles in what was then Spanish territory. The war, led by General Andrew Jackson, pushed the Seminoles farther south.

Spain ceded the land to the United States in 1821, and the U.S. government tried to force the Seminoles to relocate to Indian Territory in present-day Oklahoma. Some Seminoles agreed to move, while others remained firmly entrenched, leading to the Second Seminole War, with less than 3,000 warriors staying off more than 30,000 U.S. troops. A multimedia presentation at the history center, with mannequins giving it a Disneyesque touch, presents “Coacoochee’s Story.” It draws on the diaries of army officer John T. Sprague, who was stationed at Fort Brooke, to tell the tale of Coacoochee, the son of a Seminole chief who fought the Americans but eventually agreed to resettlement in Arkansas with some of the Seminoles.

After the Third Seminole War a few hundred Indians escaped to the swamps of South Florida, where they eked out a living as hunters, guides, and workers in the tourist trade. You’ll see a replica of a typical Seminole structure, known as a chickee hut, as well as dolls, cooking implements,
Trees and other vegetation cover 1,200-year-old Portavant Temple Mound, the largest Native American mound in the Tampa Bay area.

baskets, weapons, and the patchwork patterns used in Seminole clothing.

When it’s time to depart the history center, head down Bayshore Boulevard, with its miles-long sidewalk along Hillsborough Bay. You’ll see plenty of bicyclists, joggers, and walkers, and if you stop for a stroll, you might be lucky enough to see dolphins or waterfowl. Then follow Gandy Boulevard across Tampa Bay to reach Weedon Island Preserve Cultural and Natural History Center in St. Petersburg.

This 3,700-acre nature preserve was home to four prehistoric cultures. The best known is the Weeden Island culture, which created distinctive pottery featuring incised and punctated designs. Many pieces were shaped like animals or people. A number of reproductions are on display, as much of the original pottery was sent to the Smithsonian’s Museum of Natural History.

The area came to the attention of the Smithsonian in the 1920s, when one Eugene Elliott contacted the museum after purchasing the land and planting artifacts in mounds on the site. The Smithsonian’s archaeologists immediately spotted the fraud, but they also recognized the importance of the site and began excavations, uncovering pottery and hundreds of skeletons.

In 2001, a resident came across a dugout canoe buried in the sand. At 40-feet long and about 12-inches across at its widest point, it’s the longest prehistoric canoe found in Florida and dates back about 1,100 years. The canoe was

This vessel, which dates to between 200 B.C. and A.D. 300, was found on Weedon Island.
removed from the sand in 2011, and now is undergoing conservation so it can be displayed by the summer of 2015.

In addition to these exhibits there are trails and boardwalks that wind around the preserve from which you can view the flora and fauna. You also can rent kayaks and canoes and paddle through the mangroves and across seagrass flats.

From Weedon drive west on Gandy Boulevard to Interstate 275 going south, and you'll cross the magnificent Sunshine Skyway Bridge, the world's longest cable-stayed bridge, that arcs over Tampa Bay. Past the skyway, I-275 runs into I-75, and you'll continue south to U.S. 301 and head west through Palmetto. You'll come to Emerson Point Preserve, located where the Manatee River empties into Lower Tampa Bay. There you'll find the roughly 1,300-year-old Portavant Temple Mound, the largest Native American mound in the Tampa Bay area. In times past the mound overlooked a natural cove, which has since been filled in, and a building that might have been a longhouse once crowned it.

From there, go east along U.S. 301 to Business U.S. 41. This section of the state is interlaced with waterways, and you'll cross the Green Bridge over the Manatee River into Bradenton, and then travel west to the De Soto National Memorial, which commemorates the landing of de Soto's expedition in 1539. This was the starting point of a four-year, 4,000-mile journey to find gold, establish colonies, and Christianize the Native Americans.

The memorial has walking trails and boardwalks, with life-size cutouts of Indians and Spanish explorers tucked into the scrub along the pathways. It also has remnants of 11 shell middens. The visitor's center shows a film on de Soto's journey through the South, and during the busy tourist season from December to April guides in period attire offer living history demonstrations that describe the lives of the Spanish explorers and the Indians they encountered in the Tampa Bay area. When de Soto died in 1542 his men abandoned their efforts and fled to Mexico.
To reach your next destination, the **South Florida Museum**, drive east on State Road 64 to downtown Bradenton. The museum features the Tallant Collection, an extensive array of Native American artifacts unearthed by Montague Tallant in the 1930s. He visited approximately 170 sites, recovering an estimated 5,000 items, including pottery, tools, jewelry, metal objects, and even Venetian glass beads. Some of these items came from trade with Northern tribes, as well as tribes from Central and South America, and Europeans.

The museum also has fossils of the state’s ancient mammals and marine life, and it’s home to Snooty, who, at 65, is the world’s oldest manatee. The museum’s website has a live Snooty Cam that allows you to follow him throughout the day.

The next stop is **Historic Spanish Point**, which is south on U.S. 41 along Little Sarasota Bay in Osprey. Here you’ll have the rare opportunity to step inside a shell midden. In the 1920s, workers cut into the Shell Ridge midden so a local resident, who was unaware of the midden’s historical value, could park his car there. Decades later the property became a museum, and the midden was excavated by a team of archaeologists and volunteers. Within the midden you can see shells, bone, and other debris behind glass walls. The midden is about 15-feet high and dates back 1,000 years. A multimedia presentation gives you information about this remarkable feature.

Historic Spanish Point also has another large shell midden that you can’t enter, as well as a burial mound where the remains of more than 400 people, along with four dogs and an alligator, were uncovered during excavations in the late 1950s and early ’60s. The remains were transferred to the Florida Museum of Natural History. A tram tour takes you around the site, which includes a 1901 home, a packing house, chapel, and extensive gardens.

When you leave Historic Spanish Point, take I-75 south to State Road 78 and then go west to Pine Island. En route you’ll pass brightly colored buildings housing shops and restaurants in the tiny town of Matlacha. On Pine Island you’ll find the **Calusa Heritage Trail** at the Randell Research Center, which is part of the Florida Museum of Natural History.

The Calusa were the most powerful Indians in South Florida when the Spanish arrived. They were a thriving, complex culture, and, having their own religion, they resisted Spanish attempts to Christianize them. One of the three largest Calusa towns was located on the island, and the site is dotted with middens, the oldest of which dates to A.D. 100. You can take a self-guided walk along the trail, or a guided walk during the tourist season.

There are traces of a canal the Calusa dug across the island, and a massive sand burial mound sits just outside the research center’s boundaries. It once reached 25-feet high and was ringed by water, but in the early 1900s part of it was destroyed to serve as fill. The Indians lived on the island till the 1700s, when the British in North Florida sent mercenaries and members of other tribes to remove them. A few of the Calusa who avoided death or enslavement made their way to Cuba.

From Pine Island, go back the way you came and then follow U.S. 41 south to Fort Myers and the **Southwest Tallant Collection, South Florida Museum, photo by Ashley Hamon**

This incised bowl was made by the Fort Walton people, who inhabited northwest Florida during the late prehistoric period.
Florida Museum of History.
The museum is housed in the former Atlantic Coastline Railroad depot, and it offers reproductions of Calusa and Seminole artifacts, including shell tools, masks, weapons, and a dugout canoe. You'll learn about Seminole leaders, such as Billy Bowlegs, who was paid by the U.S. government to relocate with members of his tribe to Indian Territory in Arkansas. There are also replica skeletons of a giant sloth, saber-tooth cat, and other beasts that once roamed the area at the end of the last major Ice Age.

From there, drive south on U.S. 41 and follow the signs to Fort Myers Beach, crossing the towering Mantanzas Pass Bridge and heading down Estero Boulevard to Mound House, which sits at the site of a former Calusa village. A house built here in 1906 was expanded and modernized over the years, and in the 1950s the owners dug into a shell mound to clear an area for a swimming pool. The city of Fort Myers Beach acquired the property and removed the pool in 2000.

You can now step inside the Mound House offers visitors the unusual experience of seeing the wall of an exposed shell midden (right, behind glass), as well as an open excavation area below the shell midden. To the left is a mural of an ancient Calusa village.
excavated area and see the layers of shell behind glass. Radiocarbon dating indicates the oldest layers are 1,500 to 2,000 years old, and that the site was abandoned around 1,000 years ago. You’ll see shells, shell tools, and pottery sherds jutting out of the layers. A multimedia presentation explains the history of Mound House and its swimming pool, as well as the various archaeological finds. The house itself is now undergoing renovation and is scheduled to reopen in October.

To crown your trip, head further southeast on Estero Boulevard to Mound Key Archaeological State Park, located off Fort Myers Beach. Mound Key is thought to have been the center of cultural life for the Calusa when the Spanish landed in Florida. At one time it was probably nothing more than an oyster bar peeking out of Estero Bay. But as the population of the Calusa, who lived on the surrounding land, grew, the oyster shells and other food remains they discarded accumulated into piles that grew and eventually formed Mound Key.

To reach the key’s mangrove-lined shores you’ll need to rent a boat, kayak, or canoe and put in from Lovers Key State Park on the Fort Myers Beach side, or Koreshan State Historic Site on the mainland. The key has seven mounds, with the tallest reaching 30 feet. You can now barely glimpse the Gulf of Mexico through the vegetation, but in the days of the Calusa “you would have seen anyone coming for miles,” said park manager Robert Brooks. The Spanish wrote of a Calusa building on Mound Key that could hold 2,000 people.

The Spanish built a mission on the key in 1567, but abandoned it after two years following violent clashes with the Indians. Later, Cuban fishermen and American settlers moved to Mound Key. Today, the only residents are the wildlife and a group of goats that belong to a family that owns a small portion of the key. One of those residents is a gopher tortoise, which was burrowing into the main mound. “It’s a dilemma: an endangered gopher tortoise digging into a protected Indian mound,” Brooks joked.

Once you’re back in your boat, you’ll leave the quiet of Mound Key and return to Fort Myers Beach, with its throngs of residents and tourists—a scene so different from the days when the Calusa were the area’s sole inhabitants.

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1. Tampa Bay History Center
801 Old Water St., Tampa
(813) 228-0097
www.tampabayhistorycenter.org

2. Weedon Island Preserve Cultural and Natural History Center
1800 Weedon Drive N.E., St. Petersburg
727-453-6500
www.weedonislandpreserve.org

3. Portavant Temple Mound
5801 17th St. W., Palmetto
(941) 721-6885
www.mymanatee.org/home/government/departments/parks-and-recreation/natural-resources/preserves/emerson-point

4. De Soto National Memorial
8300 De Soto Memorial Highway, Bradenton
(941) 792-0458
www.nps.gov/deso/index.htm

5. South Florida Museum
201 10th St. W., Bradenton
(941) 746-4131
www.southfloridamuseum.org

6. Historic Spanish Point
337 N Tamiami Trail, Osprey
(941) 966-5214
www.historicspanishpoint.org

7. Calusa Heritage Trail
13810 Waterfront Dr., Pineland
(239) 283-2062
www.flmnh.ufl.edu/rrc

8. Southwest Florida Museum of History
2031 Jackson St., Fort Myers
(239) 321-7430
www.museumofhistory.org

9. Mound House
451 Connecticut St., Fort Myers Beach
(239) 765-0865
www.moundhouse.org

10. Mound Key Archaeological State Park
Estero
(239) 992-0311
http://www.floridastateparks.org/moundkey/

The Trail of Florida’s Indian Heritage features a total of 67 destinations throughout the state. To learn more about the other destinations, contact Trail of Florida’s Indian Heritage at 1-877-847-7278, trailfl@comcast.net, www.trailoffloridasindianheritage.org.
When Larry Loendorf decided to hunt for ancient rock art on the southern Great Plains, he went about it methodically. Loendorf, an archaeologist with Sacred Sites Research in Albuquerque, New Mexico, made a list of sites containing lots of projectile points and other Paleo-Indian artifacts dating back many thousands of years. Then he narrowed the locations to those containing outcrops of basalt, a hard black volcanic rock that can withstand weathering and thus preserve images that were carved or pecked into it. That put Loendorf along the Colorado-New Mexico border, near the towns of Trinidad and Raton. Finally, he hiked through the rocks, looking for images of mammoths and other Pleistocene beasts.

Loendorf never found any mammoth art, but in 2006, at the Piñon Canyon Maneuver site in southeastern Colorado, his team discovered several petroglyphs that were so heavily...
coated with a substance known as rock varnish that they were nearly as black as the basalt itself. That suggested the images, having been exposed to the elements for a long time, were very old.

The blackened petroglyphs seemed to have been pecked into the rock over an even older artwork consisting of incised lines, zigzags, and other abstract designs. "I've found it in more places now, not just southeastern Colorado, and it's always the oldest, everywhere I find it on the rocks," said Loendorf. "I don't know what they are, and I don't know why they aren't mammoths."

The incised patterns remind him of geometric designs carved into more than 120 small cobbles from the Gault site in central Texas. Some of the Gault stones come from sediments dated to more than 13,000 years ago. That makes them possibly the oldest undisputed art in North America.

Just a few decades ago, it would have been unthinkable to suggest that American art could be older than about 13,000 years. That's the time when Clovis-style projectile points began to appear across the landscape, evidence of what was once thought to be the initial peopling of the Americas. But as other evidence has been discovered that indicates humans arrived on the continent earlier than that, some archaeologists are looking beyond stone points and tools to better understand the first Americans.

There are at least a few experts who are convinced that works of rock art manifesting several different styles are 10,000 years or older, even though, given that accurately dating rock art is a major challenge, the evidence to support this contention is limited. The styles include geometric shapes, such as those on the Gault cobbles and the Piñon Canyon rocks, and intricately rendered representations of animals such as bighorn sheep in the Mojave Desert. The diversity of rock art styles, these experts believe, indicates the first Americans showed greater cultural variation than stone artifacts, the line of evidence that most archaeologists focus on due to their durability, suggest.

To David Whitley, a rock art researcher in Tehachapi, California, such discoveries represent a renaissance for a field long overlooked. "Art is both symbolic and not something you can easily excavate, and so it really has been ignored," said Whitley, who works for the archaeological consulting firm ASM Affiliates. "That's starting to change."

THERE’S MORE OF an emphasis on rock art in Old World archaeology, in large part because of spectacular cave paintings such as at the Lascaux and Chauvet caves in France. Images of bulls, horses, bison, and other creatures vividly decorate the walls and ceilings of these Paleolithic caves. Scientists marveled at the paintings’ dramatic artistry, and they used radiocarbon dating to estimate the age of the paint, and
thus the paintings. In the case of Chauvet, that art is approximately 35,000 years old.

“Our rock art tradition was different from the start than the rest of the world,” said Whitley. In part that’s because petroglyphs, the most common type of early American rock art, are not as spectacular as the Old World cave paintings. But it’s also because of dating controversies—accusations of manipulation and even fraud by one dating specialist—have plagued the field. “There’s no question, dating has been a major, major technical problem,” he said.

Petroglyphs are carved onto the surface of rocks, typically by chiseling away the dark rock varnish that forms naturally over time to expose the lighter surface underneath. The carved portion then begins accumulating its own coating of varnish. The only way to date the art is to figure out how long the carved part of the surface has been exposed to the atmosphere. It’s like trying to determine how long something has been missing, rather than how long it’s been around.

Several techniques for dating rock varnish have come from the laboratory of Ronald Dorn, a geographer at Arizona State University in Tempe and expert on the weathering of surfaces. Some of these techniques have been tainted by a scandal that developed in the late 1990s, involving accusations of fraud concerning one that involved the radiocarbon dating of tiny particles of organic matter within the rock varnish. In theory, that allowed him to date altered surfaces such as petroglyphs.

But in 1998, a group of researchers published an article in Science reporting that some of Dorn’s samples could have had charcoal mixed in with them. The presence of charcoal would have thrown off the radiocarbon dates; the implication was that Dorn was analyzing contaminated samples. This resulted in three investigations, two of which were carried out by Arizona State University and the other by the National Science Foundation. In the end, Dorn was exonerated.

The technique of radiocarbon dating organic matter trapped in rock varnish is no longer used, but the scandal also cast doubts on two other dating techniques developed by Dorn’s lab. One of them, known as cation-ratio, measures the amount of time it takes for trace elements such as potassium, calcium, and titanium to leach out of the rock varnish.

The other, referred to as varnish microlamination, examines tiny layers in rock varnish that form with climate changes such as transitions from wet to dry periods, and correlates them with existing data about when those climate changes occurred.

Both techniques must be calibrated against other environmental factors to come up with an age estimate, and some scientists are skeptical as to their reliability. “I just don’t think those techniques are there yet,” said Loendorf. “It’s still too experimental right now to be making claims that we can trust.”

Other researchers, however, do trust the techniques. Tanzhuo Liu, a geoarchaeologist at Columbia University in Palisades, New York, said that the varnish-layer method is

Two independent chronometric techniques indicate that this bighorn sheep petroglyph, from the Coso Range in California, is 11,200 years old. Like many of the early petroglyphs, this motif is heavily revarnished and difficult to see.
useful in rock art studies. He has worked to establish its reliability by dating petroglyphs and other stone and weathering artifacts across the arid Western states. By compiling enough varnish-layer dates from a wide enough geographical area, he said, researchers can develop a regional picture to help them understand when a particular piece of rock art was made.

Alice Tratebas, an archaeologist with the Bureau of Land Management in Wyoming, said these dating techniques “are potentially valuable to future research, and need further development and refinement.” She employed both techniques to estimate the ages of petroglyphs in the Black Hills of northeastern Wyoming to roughly the end of the Late Pleistocene. “What I’ve found in conversations with people is they haven’t read the literature,” she said of those who dismiss the techniques.

ONE OF THE biggest collections of early American petroglyphs lies in the Mojave Desert of California, in the Coso Range east of the Sierra Nevada Mountains. The Cosos contain thousands of petroglyphs, including geometric shapes such as spirals and dots as well as representations of animals. The most commonly depicted animal is the bighorn sheep, which may have been important to early Americans because sheep sometimes move in concert with changing weather patterns, according to Whitley.

A believer in the cation-ratio and varnish microlamination techniques, Whitley has worked for years trying to date the Cosos’ rock art. “The most conservative estimate is that we’ve got things in the 11,000-year range, pretty darn good evidence for 12,000 years, and significant hints that we may have 15,000 years,” he said.

“It’s not unreasonable,” said Michael Collins, a Paleo-Indian specialist at Texas State University, “it’s just not independently supportable with present evidence. I think some of that art may be surprisingly old, if only there were an objective way to learn that.” Several other experts said it was possible, or even likely, that the Paleo-Indians made rock art, but they added that they were doubtful of, or unfamiliar with, the dating techniques.

Collins has led more than 15 years of excavations at the Gault site in central Texas, including careful dating of each stratigraphic layer and the tools and artifacts within those layers. The small, incised cobbles are found throughout the site’s sediments that date to between 3,000 to more than 13,000 years ago. It’s not clear what the markings mean, but the fact that the stones are portable suggests some kind of importance in everyday life.

Geometric patterns of this sort appear on stones across North America, most of which are not as securely dated as the stones at Gault. One possible interpretation is that the designs represent a visual apparition seen by shamans in a trance state. Loendorf has found similar geometric incisions not only beneath the Colorado petroglyphs, but also painted on the ceilings of caves in southern New Mexico.
Other types of abstract designs are found in the northern Great Basin where Oregon, California, and Nevada come together. A distinct pattern known as the Great Basin Carved Abstract style appears most spectacularly near Long Lake, in southern Oregon. These carvings are notable for being deeply incised a half-inch or more into the rock surface, and for the density of their curvilinear lines, circles, and dots. Two particular panels at Long Lake were partly buried by the eruption of Mount Mazama, the volcano that created today’s Crater Lake. Ash from that eruption has been dated to about 7,700 years ago, meaning the Long Lake carvings must be at least that old. Because that eruption is so well understood, these carvings are perhaps the oldest well-dated stationary rock art in North America.

Researchers have recently determined that a number of Great Basin Carved Abstract-style petroglyphs found in a dry lakebed near Reno, Nevada, are roughly 10,500 to 14,800 years old. The team, led by Larry Benson, a researcher at the University of Colorado Boulder, radiocarbon dated a layer of carbonate underlying the petroglyphs to arrive at the maximum age.

To find the youngest possible age, they also studied a sediment core drilled nearby, which preserved a record of when the area was covered in water and when it was exposed to air. The sediment cores revealed the lake formed some 10,500 years ago and submerged the boulders, which are in the now-dry lakebed. Therefore the youngest the petroglyphs could be is 10,500 years. That age range would make the Nevada petroglyphs some of the oldest on the continent; however some experts, like Loendorf, question the dating.

Various archaeologists have argued for various sites in South America that may contain art dating back 10,000 to 11,000 years ago. Those include early cave paintings, such as those at Caverna da Pedra Pintada in Brazil, and a petroglyph possibly shaped like a human at Lapa do Santo, also in Brazil. These two examples, according to Whitley, are the best-dated Paleo-Indian rock art in the Americas. Their ages are derived from radiocarbon and optically stimulated luminescence dating, as well as associated evidence from excavations. “I’m not aware of any controversy over these studies, and certainly not over these dating techniques,” he said.

All this ancient art suggests that archaeologists need to be looking beyond stone tools to better understand ancient cultures, said Whitley. He believes that early Americans were more culturally diverse than archaeologists, who have largely focused on lithic evidence, have appreciated.

In some places, abstract designs like Loendorf’s incised patterns seem to appear first. In others, like the Mojave, early designs also include naturalistic imagery like animals. Altogether, Whitley argued, the discoveries show that different cultures were producing different sorts of cultural material across the Americas very early on. That kind of broad insight into cultural variation can only come from looking beyond stone tools and into what rock art can reveal. “We’ve got this very diverse groundswell of information,” he said. “And that’s important.”

It’s especially important if there is more ancient art out there waiting to be found, as Whitley, Loendorf, and others believe. Perhaps an even richer trove of information awaits archaeologists who are willing to look for art. “I don’t think we’ve found the earliest art,” Whitley said, “by any means.”

ALEXANDRA WITZE is a science journalist based in Boulder, Colorado. She is co-author of the new book Island on Fire: the extraordinary story of Laki, the volcano that turned 18th-century Europe dark. Her article “The Games People Played” appeared in the Winter 2013-14 issue of American Archaeology.
The Hero Twins in the Mimbres Region

Representations of the Mesoamerican creation saga are seen on Mimbres pottery.

By Marc Thompson, Patricia A. Gilman, and Kristina C. Wyckoff
Illustrations by Kristina C. Wyckoff

From A.D. 1000 to 1130, people in the Mimbres region of southwestern New Mexico painted fantastic images of humans and animals on their bowls. These paintings, which date to the Mimbres Classic period, are very popular today, appearing in and on everything from museum exhibits to refrigerator magnets. Archaeologists have often assumed that these images were simple representations of animals or activities, but several researchers have noted parallels between some of the images and the characters and narratives in the creation story, known as the Hero Twins saga, written in the Popol Vuh, a source of ancient Mesoamerican cosmology. These Mimbres motifs are thematically similar to depictions on Late Classic Maya ceramics (A.D. 600-900) and other Mesoamerican media from A.D. 1 to 1500.

Earlier this year the three of us published a paper in American Antiquity, a prestigious journal covering North American archaeology, in which we argued that knowledge of the Hero Twins creation story was brought to the Mimbres region in the A.D. 1000s. This was the same time that scarlet macaws from Mesoamerica also appeared in the Mimbres region, and it’s possible that the twins’ story was associated with the macaws. This was also after the demise of the great kivas, most of which were burned in the 900s. Though the people had burned their great kivas before, this was the first time that new kivas were not built to replace them. This could indicate that the people stopped conducting the rituals that took place within the kivas, and we suggested that the scarlet macaws and the Hero Twins saga supplanted, or at least augmented, the religion the people had previously practiced.

Since then we have determined that the Mimbres painters depicted all parts of the twins’ saga. In the nine bowls illustrated here, the paintings show the birth of the younger twin, the twins’ trials and adventures, their deaths, and the twins’ rebirth as the sun and the moon. Many other Mimbres bowls not shown here represent other parts of the twins’ saga.

In the 1550s a Maya scribe literate in Mayan and Spanish recorded the Popol Vuh using Spanish letters to express Mayan words. Subsequently, a Dominican friar who spoke K’iche’ Mayan found the recording in Chichicastenango, Guatemala, and he translated the text into early 18th-century Spanish. The original Mayan-Spanish version, from which the friar made a copy, is lost. The Popol Vuh, which means “Book of Council,” is the most important post-contact Maya literary work and one of the greatest Native American compositions of mythology and religion. This ancient tale is replete with monsters, trials, adventures, births, deaths, resurrections, dualities, and multiple metaphors. As in other creation stories, the characters, events, and narratives are allegorical.

The tale begins with the gods creating the earth and, after three failed attempts, succeeding at making people from corn. The story then shifts to the Hero Twins saga. The Hero Twins father and uncle, who are themselves twins, are summoned to the watery Underworld, a journey synonymous with death. They are defeated at every turn by the Underworld gods, and the gods behead them in a ballcourt after the father and uncle lose a game. The father and uncle then become evening star and morning star, the dual aspects of Venus.

The Hero Twins are conceived when their father, whose head is hung in a tree, spits in the hand of an Underworld maiden, and she becomes pregnant. The first born is larger, right-handed, and masculine; he will be the sun. The younger twin is diminutive, left-handed, and slightly effeminate; he will be the moon.

The adventures of the Hero Twins begin on earth before they encounter the Underworld gods. Here, they defeat...
Seven Macaw, his wife, and two sons, monstrous creatures remaining from the last failed attempt to create humans. Then the twins are called to the Underworld. In a series of classic trickster tales, including trials in six underground chambers such as the House of Gloom, the Hero Twins best the Underworld gods who defeated their father and uncle. They then willingly suffer death by fire, only to reappear as catfish in the watery Underworld, then fishmen, and finally as ragged vagabonds.

Following this death and resurrection, the Twins entertain the Underworld gods by performing dances and miracles. The diminutive brother sacrifices his older brother, who is laid out as if dead, but then comes back to life. Seeing this miracle, the Underworld gods demand to be sacrificed and then brought back to life. The Twins comply with the first part of the request, but not the second, and thus they defeat death forever. The elder twin ascends into the sky as the sun, and the younger twin as the moon.

For a century or more, people in the Mimbres region embraced this new religion focused on the Hero Twins. But by A.D. 1130, at the end of the Classic period, the religion, at least as it was portrayed on Mimbres pottery, was no longer practiced. It continued, however, through prehistory and history in other parts of the Southwest, and it is part of Pueblo religion today, with the Hero Twins being analogs of the War Twins in Pueblo mythology.

**Resurrection**

Here the father of the twins is shown in a birthing posture. He wears leggings, associated with masculine attire, and has cross-hatching about his mouth that is seen on other depictions of males. The fish, a graphic metaphor for souls of the dead and passage through the Underworld, denotes his death. The Venus glyph above him represents his resurrection as evening star. The Venus glyph below him represents the resurrection of the twins’ uncle as morning star.
**BIRTH**

The mother of the twins is a virgin and the daughter of one of the gods of the Underworld. After an encounter with the twins’ father, she becomes pregnant. She then ascends to the earth’s surface and presents herself to the woman who will become the twins’ paternal grandmother. After she delivers the twins, she disappears from the saga. In this image she is shown in a birthing posture as the left-handed twin is born. Her waist sash and back fringe, which identify her as female, have been removed and are pictured to her left.

**REARING**

The twins’ grandmother is shown with breasts, waist sash and back fringe, walking stick, and the twins perched on an oversized burden basket. The larger, right-handed twin carries a sunflower, as he is destined to become the sun; the left-handed twin holds a moonflower, as he will become the moon. The scene is physically improbable, but the burden basket serves as a graphic metaphor for the grandmother’s burden, which is to raise the twins.
**Confrontation**

In their initial effort to bring down the monster named Seven Macaw, the twins wound him. He is pictured here as a long-tailed beast with human arms and legs. During the twins’ flight from the confrontation, the monster grasps one of the right-handed brother’s arms and tears it from his body. Now the twins must devise a plan to kill the monster and retrieve the arm.

**Trial**

Among the trials set forth by the gods of the Underworld, who defeated the twins’ father and uncle, was the task of smoking, but not consuming, tobacco. The twins were tricksters, imbued with a duality of both earthly and divine heritage. The larger, right-handed twin is depicted on the right. Both twins appear to smoke from tubes, but they confound the Underworld gods by attaching red feathers to the smoking tubes in the confines of the House of Gloom, giving the appearance of fire.
Recapitulation

In this portrait, the left-handed twin is on the left and has a larger head than that of his brother. This motif represents and recapitulates two of the twins' adventures: retrieving the lost arm and passage through the Underworld. As on the bowl with the twins' father, the fish is emblematic of death and passage through the watery Underworld, which the twins survive. Neither is depicted with inner arms, emphasizing the reattached left arm on the right-handed twin. He wears a typical white male sash tied in front.

Decapitation

Here the left-handed twin decapitates his brother to ultimately defeat the Underworld gods whom the twins dispatch in like manner. This beheading is a sleight of hand performance, as the right-handed brother's head remains attached to his body by a lifeline. The right-handed twin wears a typical white male sash tied in front. The left-handed twin wears a headdress depicting a horned serpent, an extremely rare element on Mimbres painted bowls and one thought to parallel feathered serpents in Mesoamerican iconography.
Rejuvenation

The left-handed, diminutive twin defeats death and ascends from the watery Underworld to become deified as the moon. His image is lateralized to the left like the rabbit in the moon. He is depicted with a crescent-shaped body, rabbit ears, and a rabbit tail. Like the twins’ grandmother, this twin’s celestial burden is metaphorically represented by a burden basket on his back. Burden baskets are primarily associated with females, as is the moon.

Reanimation

After losing his arm once and his head twice, the larger, right-handed twin defies death and ascends from the watery Underworld to become the sun. His lumen is represented by a deer, emblematic of the solar disk. Deer are associated with duality as they often produce twin offspring, and like rabbits, they have short tails, long ears, and a split upper lip. The deer head faces right, representing the elder twin, but the twin himself faces left, perhaps showing his duality.

MARC THOMPSON is a research affiliate at the University of New Mexico’s Maxwell Museum of Anthropology and an expert on the iconography of the Mimbres and Maya regions. PATRICIA GILMAN, an archaeologist at the University of Oklahoma, has done Mimbres fieldwork since 1974. KRISTINA WYCKOFF, who has studied scarlet macaws in the Mimbres region, is an archaeologist with the Oklahoma Department of Transportation.
The Junction Group is a complex of at least eight earthen enclosures that sprawls across about 20 acres of farmland just outside the city limits of Chillicothe, Ohio. The approximately 2,000 year-old earthwork complex has been known to archaeologists since the pioneering work of Ephraim Squier and Edwin Davis in 1848 and has seen intermittent study ever since.

The Conservancy became aware of the site during its first year of operation in 1980, when the preservation of Hopewell ceremonial centers in central Ohio was one of our major objectives. Over the years the Conservancy purchased the Hopewell site, the High Bank Works, Spruce Hill and several other sites in Ohio and neighboring states. But the Junction Group earthworks were on farmland owned...
by the Stark family, and until recently that land was not for sale.

Three weeks prior to the event, the Conservancy learned the Stark farm would be sold at public auction. The Junction Group complex was auctioned as a 90-acre farm field that has road frontage and utilities access, so it seemed very likely that the field would be converted to a residential development, destroying the site. The auction was the one chance to preserve the earthworks.

But in addition to the archaeology, the Stark Farm also had impressive natural resources, including old-growth woodlands and a portion of the Paint Creek stream corridor. As a result, a number of Ohio land-trusts and citizen-advocacy groups joined the effort to preserve the Junction Group. Nancy Stranahan, director of the Arc of Appalachia Preserve System, agreed to lead the online fund-raising and to package the Junction Group property with a nearby natural area that she was acquiring, thus making it possible to receive state funding through a 75 percent match from the Clean Ohio Fund program. The Conservancy made a $50,000 pledge. Aided by numerous groups including Rivers Unlimited, Heartlands Earthworks Conservancy, Friends of Serpent Mound, South Central Ohio Preservation Society, and about 800 individual donors, this preservation coalition was able to raise nearly $350,000 in pledges.

Bolstered by the pledges and the prospect of a Clean Ohio Fund match, the Conservancy entered the auction with cautious optimism. The first tract of land up for bid was the 90-acre field encompassing the earthworks, and Paul Gardner, our Midwest regional director, won it with a bid of $650,000. Our partners also succeeded in purchasing other tracts of land, and altogether the preservation coalition acquired 192 acres of field and forest at the cost of about $1.1 million.

The Conservancy intends to convert the field into a prairie and continue the geophysical survey to determine what other cultural resources are beneath the surface. We hope that at some future date the Junction Group site, like former Conservancy preserves Hopewell, High Bank, and Spruce Hill, will be transferred to Hopewell Culture National Historic Park for permanent preservation and public interpretation.—Paul Gardner

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**CONSERVANCY Plan of Action**

**SITE:** Junction Group Earthworks  
**CULTURE:** Hopewell (A.D. 1 - A.D. 500)  
**STATUS:** The Conservancy and a coalition of conservation organizations are purchasing the site by leveraging Clean Ohio Grant Funds. The Conservancy will hold title to the land.  
**ACQUISITION:** The Conservancy has pledged $50,000 towards the purchase of the land. Another $8,000 is needed to stabilize the site and install interpretive signage. We need to raise a total of $58,000 to complete the project.  
**HOW YOU CAN HELP:** Please send contributions to The Archaeological Conservancy, Attn: Junction Group Earthworks, 1717 Girard Blvd. NE, Albuquerque, NM 87106.
Jackson Flat Reservoir was constructed to store irrigation water for Kane County Water Conservancy users. Before the reservoir was built, archaeologists from HRA Inc. and other organizations excavated 10 prehistoric sites in the construction area, some of which were occupied by a group of the Anasazi called the Virgin Branch. The portions of the sites that were under the dam footprint and below the water line were completely excavated.

The Archaeological Conservancy worked with the Kane County Water Conservancy, the Army Corps of Engineers, the State of Utah School and Institutional Trust Lands Administration, and the Kaibab Band of Paiutes to protect two of the sites located above the reservoir’s water line. These sites will become permanent archaeological preserves owned by The Archaeological Conservancy.

The Conservancy’s sites have not been investigated, but it’s assumed that in some way they resemble the excavated sites. These were camps and villages that dated from the Archaic period about 6,000 years ago through what’s known in this region as the Post Puebloan period, which ended when the first Euro-Americans arrived in Kanab in 1776. Over the course of three years, the archaeological teams excavated more than 60 major pithouse and storage features and hundreds of small hearths, refuse deposits, and pits.

Grinding stones, hearths, and flaked-stone tools recovered from the oldest Archaic period sites suggest that they served as camps used to gather and process wild foods. One 5,000-year-old camp contained four houses, which are rarely found during this time period. Two of the structures were oval-shaped huts made of brush and poles, and all contained two or three hearths. Underneath one of these houses archaeologists found a slightly older and smaller...
The Virgin Branch Anasazi habitations, spanning the period from 3,300 to 1,000 years ago, contained large, deep storage structures, pithouses with antechambers, and extensive midden deposits. Over 40 houses and large slab-lined storage features, plus an oversized pit structure, were excavated at Eagle’s Watch, the largest of these sites, which is located under the footprint of the dam. Maize kernels collected from the hearth and floor pits of a pithouse with San Pedro projectile points were dated to more than 3,000 years ago. This is the oldest evidence of maize agriculture north of the Colorado River. The kernels, along with cob fragments and pollen from beans and squash, suggest that the site’s occupants were cultivating crops millennia ago. After A.D. 900 Eagle’s Watch and the other Virgin Branch Anasazi sites were abandoned. It’s likely the site’s occupants didn’t move too far away, given that Virgin Branch Anasazi sites are common in the region after A.D. 1000.

The findings are being analyzed with help from Bighorn Archaeological Consultants and Brigham Young University’s Office of Public Archaeology. The information from these analyses will help answer research questions regarding trade interactions, architecture, settlement patterns, and subsistence strategies in this area. One early discovery is that turquoise collected from Eagle’s Watch came from a prehistoric turquoise mine known as Halloran Springs, located near Baker, California. The project report will be published in its entirety online, and a book summarizing the findings is planned for publication through the University of Utah Press. —Heidi Roberts
A Time of Conflict

The Parkin phase of the Mississippian period was marked by warfare. Potter Mound could offer new insights into that troubled time.

Potter Mound is located on the Little River in northeast Arkansas. This area is dense with mound sites, most of which date to the Parkin Phase (approximately A.D. 1350 to 1560) of the Mississippian period. This phase takes its name from Parkin, the largest site of this type and an Arkansas State Archaeological Park that the Conservancy played a major role in preserving.

Parkin is believed to have been the capital of the province of Casqui, which was visited by Hernando de Soto when he explored the area in the mid-16th century. The people of the Parkin Phase practiced large-scale corn agriculture and lived in villages consisting of two or three mounds that were located on rivers. The rivers provided defense on one side of their

The Potter Mound site covers approximately eight acres. Part of the site is under a modern cemetery.
settlements, and they built palisades with moats to protect on the other three sides. Security was a major concern because tensions among competing groups resulted in endemic warfare.

Potter Mound is named for the family that used to have a house on it. The entire site is about eight acres and aerial photographs show dark depressions in the soil around the site where the palisade and moat may have been located. In 1974, when the Potter house was on the mound, the area between the two mounds was farmed, and deep plowing exposed at least 30 prehistoric burials. The burials are no longer being disturbed and the house has since been removed. Pieces of metal, brick and an occasional marble are the only traces of the house that remain, and they are mixed with much older sherds of Mississippian pottery, with their characteristic shell tempering.

Potter Mound stands about six-feet high and it’s covered with grass. The mound and surrounding area have been owned and protected by a local family for many years, but the family recently agreed to sell the mound and approximately five surrounding acres to the Conservancy. The remainder of the site is covered by a modern cemetery.

Jeffrey Mitchem, an Arkansas Archeological Survey researcher who has worked at the Parkin site for years, noted that the Conservancy’s ownership of the Potter Mound and surrounding area ensures that the site will be protected for future research.

—Jessica Crawford
Society for California Members Tour Rocky Hill

WEST—Last March the Society for California Archaeology (SCA) held its annual meeting in Visalia, California, and during the meeting the Conservancy hosted a tour of our nearby Rocky Hill preserve. More than 75 attendees visited the site over a two-day period. A normal size tour group at the site is 10 or less.

The Conservancy’s Rocky Hill site steward, Manuel Andrade, trained and coordinated volunteers from the SCA’s California Archaeological Site Steward Program and the Wuksachi Indian tribe, in order to handle the large number of visitors. Before the tour, Wuksachi tribal members and Hector “Lalo” Franco of the Santa Rosa Rancheria Tachi Yokut tribe offered prayers and insight into the cultural significance of the site to native peoples. Both tribes claim ancestry to the site, and they asked that the tour members treat the site with utmost respect.

During the tour the visitors viewed the incredible rock art scattered throughout the 22-acre preserve. Thanks mostly to Andrade’s preparation and the help of his volunteers, the tour was a success and the visitors found the site fascinating. The feedback on the site, the volunteers, and the Conservancy’s work to preserve sites like Rocky Hill was extremely positive.
Conservancy’s President Wins Preservation Award

Mark Michel, the Conservancy’s president, recently received the Society for American Archaeology’s (SAA) Award for Excellence in Cultural Resource Management. In presenting the award to Michel, the SAA stated that his “life’s work and accomplishments exemplify the contributions and special achievements that the SAA strives to recognize with the Award for Excellence in Cultural Resource Management. There are few individuals whose lives and careers have had such a broad and profound impact on archaeology at the national scale. Mark Michel’s efforts over the last 35 years in advocating for, and effecting, cultural heritage stewardship, conservation archaeology, policy and legislative implementation, and public outreach are unsurpassed and have forever changed the face of US archaeology.”

The SAA also lauded Michel for his “pioneering leadership,” noting that “The Archaeological Conservancy remains the only national nonprofit organization dedicated to the permanent protection and management—through site acquisition from private landowners—of America’s endangered archaeological sites. In creating a national system of archaeological preserves for future generations to study and enjoy, Michel has helped to ensure the survival of our irreplaceable cultural heritage—a lasting legacy for all.”

The Conservancy Redesigns Its Website

The Conservancy is pleased to announce the launch of its newly redesigned website. Beginning in June, the site will have an updated look and several new features, including a daily news page.

The website is intended to educate the public, promote the Conservancy’s events and preservation efforts, and showcase *American Archaeology* magazine. The new homepage contains streamlined menus, a search function making navigation and access to information effortless, and an expanded tours section. A monthly blog written by the Conservancy’s staff and leading archaeologists will encourage public participation and show the pivotal role archaeology plays in understanding the past.

The news page will provide comprehensive coverage of important events and issues in American archaeology. The site will be updated daily to keep our membership informed and to educate the public about archaeology and the critical need for cultural resource protection. The information will be drawn from various news sources, and will include updates about the Conservancy’s acquisitions.

With our redesigned site, the Conservancy hopes to become the primary source for information on the Internet about American archaeology and the importance of preserving sites.

To see the website, please visit: www.archaeological-conservancy.org.
Historical Archaeology of the Delaware Valley, 1600-1850
Edited by Richard Veit and David Orr
(University of Tennessee Press, 2014; 440 pgs., illus., $55 cloth; www.utpress.org)

The Delaware River Valley runs through the Mid-Atlantic states of Delaware, Pennsylvania, New Jersey, New York, and Maryland, with its center in Philadelphia. Its diverse population included a wide variety of European Americans, Native Americans, and enslaved African Americans that made it one of the cultural centers of America before the Civil War. In this volume the editors have assembled 15 essays on historical archaeology that span this 250-year period.

Indeed, it is a rich history that included the Quakers in Philadelphia and the city’s most illustrious citizen, Benjamin Franklin. An 18th-century shipwreck in Delaware Bay illustrates maritime archaeology and sheds new light on the colonial trading network. This collection of archaeological essays tells the stories of an emerging American nation through its formative years. It’s hard to imagine a more interesting subject, and the authors tell it quite well.

Caddo Connections: Cultural Interactions Within and Beyond the Caddo World
By Jeffrey S. Girard, Timothy K. Perttula, and Mary Beth Trubitt
(Rowman & Littlefield, 2014, 184 pgs., illus., $85 cloth or ebook; www.rowman.com)

The Caddo area of Texas, Oklahoma, Arkansas, and Louisiana was home to a diverse people and culture that had its origins in the A.D. 900s and continues today. It developed peripheral to the great Mississippian cultures that dominated the Southeast, and it had strong linkages to Cahokia, near St. Louis, the most important Mississippian center. Yet recent research suggests that Caddo-Mississippian connections were strongest in the 14th century, well after the decline of Cahokia.

Caddo Connections examines the evidence that linked the Caddo region to the Southeast, the southern plains, and the Southwest, revealing complex cultural and trading connections with all these neighboring areas. The authors see the Caddo area not as a homogeneous ethnographic region, but rather as a multifarious one inhabited by people who shared distinctive stylistic traits, settlement configurations, developmental sequences, and mortuary customs.

Throughout this volume the authors recount both old and new research that has resulted in an evolving view of the Caddo by archaeologists since World War II. The new research at a variety of sites has greatly expanded the view of the Caddo area and its people. The history of archaeological research is one of the most interesting aspects of this work.

The authors have succeeded in giving the reader the most up-to-date view of one of North America’s most interesting and complicated cultural areas. It will be a major reference work on the Caddo for many years to come.
Mesoamerican Plazas: Arenas of Community and Power
Edited by Kenichiro Tsukamoto and Takeshi Inomata
(University of Arizona Press, 2014; 280 pgs., illus., $65 cloth; www.uapress.arizona.edu)

In this fascinating volume, 16 scholars take a detailed look at the great plazas of prehistoric Mesoamerican cities including such magnificent examples as Teotihuacán, Palenque, and Monte Albán. Traditionally, archaeologists have studied in great detail the pyramids, temples and ballcourts that surround great plazas, but not the plaza themselves. Lacking abundant artifact assemblages and formal properties, plazas were considered almost sterile territory for investigation. This work takes that thinking to task and produces much knowledge on the purpose and history of the plaza.

Clearly the plazas of Mesoamerica were very important places. Many were precisely laid out with some clear purposes in mind, and many of the surrounding buildings had inscriptions and monuments that played an important role in the overall scheme of things. Clearly they were the focal points of public life. This applies to both small villages and huge cities. One of the most formal plazas at Teotihuacán could hold some 99,000 people.

In this volume, 11 chapters are organized around three central themes—plaza construction and public events, plazas in broader social contexts, and plazas and images. Plaza study remains challenging and serious excavations are still quite limited. But a picture is emerging of plazas as dynamic spaces for the creation and negotiation of social relations.

Mesoamerican Plazas is an introduction to a very important topic of research. Well illustrated and written, it successfully establishes the outline of current research as well as the challenges for a new generation of fieldwork.

Mammoths and Mastodons of the Ice Age
By Adrian Lister
(Firefly Books, 2014; 127 pgs., illus., $30 cloth; www.fireflybooks.com)

At the end of the last ice age, many large mammals went extinct. Among them were the mammoths and mastodons, which finally disappeared for good only 4,000 years ago. Closely related to modern elephants, the fate of mammoths and mastodons invokes spirited debate among both earth scientists and archaeologists, some of whom blame over hunting for their extinction.

In this volume, paleontologist Adrian Lister traces the species from their origins some 60 million years ago to their recent demise. Written for lay people and richly illustrated with numerous color drawings, photographs, and maps, this book provides a basic education on all aspects of these creatures’ lives. Lister also examines the various theories concerning their extinction and scrutinizes the role of climate change in the Ice Age as well as the spread of human hunters. Many well-preserved woolly mammoths have been found in the permafrost of the Arctic, and Lister explains how it may be possible to resurrect the species through cloning.

This book is an outstanding introduction for the general reader to the fascinating story of some of our most interesting large animals and their demise. —Mark Michel
French and Indian War Tour

When: September 6 – 13, 2014
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Peoples of the Mississippi Valley

When: October 11 – 18, 2014
Where: Tennessee, Arkansas, Louisiana, and Mississippi
How Much: $1,895 ($300 single supplement)

Beginning in Memphis and following the Mississippi River south to Natchez, our week-long journey covers more than 5,000 years of history, taking you from ancient earthen mounds to Civil War battlefields. The trip offers an exciting opportunity to learn more about the rich and complex mound-builder cultures that flourished along the Mississippi River Valley until the arrival of the Europeans. While taking in the charms of the Old South, we’ll visit many important sites, including Emerald Mound, the third largest Mississippian mound in the United States. We’ll also visit sites from historic times, including the Grand Village of the Natchez and the Civil War battlefield at Vicksburg. Several of the Conservancy’s preserves, such as Watson Brake Mounds, which may be the oldest mound site in North America, are also featured on the tour.
Patrons of Preservation

The Archaeological Conservancy would like to thank the following individuals, foundations, and corporations for their generous support during the period of February through April 2014. Their generosity, along with the generosity of the Conservancy’s other members, makes our work possible.

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Gifts of Distinction

The Anasazi Circle is an elite group of members who contribute $2,000 or more annually to the Conservancy’s ongoing efforts to permanently preserve America’s cultural treasures. Since its inception in 1993, participation in the Anasazi Circle has increased by over 267 percent.

Anasazi Circle member support is essential to the Conservancy’s ability to continually expand its preservation goals. It is crucial to preserve information regarding our nation’s past so we can better understand it. Cultural evidence is often destroyed before proper analysis can be done, and the knowledge is lost forever. The Conservancy uses donations to act quickly to protect sites and prevent significant information from being destroyed.

The benefits of Anasazi Circle membership include discounts on tours, recognition in American Archaeology, an award-winning magazine, and an invitation to an exclusive seminar weekend this October in Burbank, California where you’ll learn about the archaeology of the Coso Range region. By sending in your donation of $2,000 or more today, you can ensure your invitation to the Conservancy’s 2014 Anasazi Circle.
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