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China: South of the Clouds (18 days)
Yunnan and Sichuan
Study the history of this beautiful remote region with Prof. Robert Thorp, Washington U. Traveling to two distinctive ethnic and cultural areas, Dali and Lijiang, we will visit traditional villages and temples famed for their frescoes. In Sichuan, touring includes fine museums, Chengdu, Imperial tombs, Taoist temples, recently excavated sites, the Panda Reserve and Dazu's amazing Buddhist grottoes rich in sculpture. The tour ends with the fabulous museum in Shanghai.

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Visit Sicily with Prof. Myres McDonnell, Baruch College, CUNY. We will sail to the Agadian Islands to view the cave paintings from Sicily’s earliest settlements and to the Aeolian Islands to visit Neolithic villages and Greek colonies on Lipari and Panarea. We will visit the Greek and Roman sites in Agrigento, the amazing mosaics at the Villa Imperiale, Akrai and Solunto, one of Sicily's three Punic cities. We will also study the extraordinary Baroque architecture found mainly in the southeastern towns of Noto and the UNESCO World Heritage Cities of Modica and Ragusa Ibla.

Malta, Sardinia & Corsica
(18 Days)
Explore these gorgeous islands, each unique in its ancient monuments, and physical beauty with Prof. Robert R. Stieglitz, Rutgers U. Highlights include Malta's immense megalithic temples, Sardinia's amazing nuraghes and the mysterious cult sites and enigmatic menhirs set amidst Corsica's wild mountain scenery. Along the way we visit Phoenicians ports and cities built by Romans, Greeks and Crusader knights, fine museums and historic villages.

Classical Greece (16 days)
Discover the major Mycenaean, Classical and Byzantine sites of mainland Greece with Prof. Gerald Schaus, Wilfrid Laurier U. Starting in Athens, highlights include the Acropolis, Panhellenic Olympia, Byzantine Mistra, the great healing center at Epidaurus and Tyrryns and Mycenae. Traveling north, we tour mystical Delphi, the monasteries at Meteora, Pella's mosaics, the treasures in Thessaloniki's museum and many monuments associated with Philip and Alexander.

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American Archaeology

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Cover: Numerous historic-period sites have yielded the kind of exquisite marine shell ornaments seen here. A recent study purports to have solved the longstanding mystery of who made them.

Credit: Permission of National Museum of the American Indian, Smithsonian Institution (Cat. 199792 and 041543), Rochester Museum & Science Center (AR18596), and on loan to Rochester Museum & Science Center, courtesy of the Rock Foundation (RFC 11668/237). Photos by Duane Esarey.
Lay of the Land

Combining Research and Preservation

When The Archaeological Conservancy acquires an important site, we turn that site into a permanent archaeological research preserve. The two key words are “permanent” and “research.” Following the principles of conservation archaeology, a doctrine first outlined by Washington State University professor and Conservancy board member William Lipe in 1974, the Conservancy believes that future scholars will be able to learn many new things using new and improved technology that we cannot even imagine today. Since archaeological excavations alter or destroy the materials being worked, it is critical to preserve undisturbed portions of each site forever.

This does not mean the Conservancy is against research. On the contrary, we promote scientific research on our preserves. (See “Ready For Research,” page 38.) Our general research guidelines set parameters for conducting many different kinds of explorations—some invasive, some not. Researchers apply to us for a permit. We review the application along with a committee of peers and offer suggestions before a final version is accepted. In our 33 years of operations we have approved every request for research, save one.

As we protect more and more important sites, research will be a bigger part of the Conservancy’s mission. With such a large variety of archaeological sites, we have a responsibility to encourage research that will both provide us with answers to many vital questions and preserve this irreplaceable resource. That way future scholars with new and improved tools will have undamaged places to work.

Mark Michel, President

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Mark Michel, President
Fascinated by Chunkey

I was thrilled when I opened the winter issue 2013-14 and read “The Games People Played.” I anticipated there would be mention of chunkey stones, and I was excited. I have been an archaeology volunteer for the U.S. Forest Service in the PIT program since 1996 and a participant in the Arkansas Archaeological Society summer program since 2005.

I was working at the Eaker site in Arkansas on June 18, 2006 when I heard that wonderful, glorious, clink on my trowel. I excavated a round stone, and I didn’t have a clue what it was until someone told me it was a chunkey stone, and only the third one found in Arkansas. They estimated it was produced circa a.d. 1200. It was in excellent condition, with only a small chip on one edge.

Since then I have had a profound interest in chunkey stones and was delighted to read your article. Thank you for enlightening me further about the chunkey game and all the other games ancient people played.

Joann Benedetto
Columbus, Indiana

Editor’s Corner

History is fraught with tales of conflict and conquest. In the case of American colonial history, the dominant theme is that of Europeans arriving in the New World, gaining a toehold, and then gradually, inexorably, expanding across the vast landscape to claim it. Their conquest of what is now the U.S. wasn’t easy, and, as we well know, it was hardly peaceful.

But European-Native American interactions were also far too complex to be defined by hostility. For instance, take our cover story (“An Examination of Historic Trade,” page 20). This is a tale of early capitalism, of two parties engaging in mutually beneficial and satisfying trade. The natives had furs the Europeans wanted, and the Europeans reciprocated with shell ornaments that the natives prized.

According to archaeologist Duane Esarey, who has studied the shell ornament-for-fur trade, it was an example of how to keep your customers satisfied. As this trade evolved, the Europeans—Esarey believes it was the Dutch in this case—were intent on keeping the natives happy. That required upgrading their product line of what he calls SMS (standardized marine shell ornaments) by fashioning them into shapes that had cosmological significance to Native Americans.

Esarey thinks that he’s solved the longstanding mystery of who made the SMS and why. He’s also shown that, while history is rife with conflict, there’s also the occasional story of customer service.

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Sending Letters to American Archaeology

American Archaeology welcomes your letters.

Write to us at 1717 Girard Blvd. NE, Albuquerque, NM 87106, or send us e-mail at tacmag@nm.net.

We reserve the right to edit and publish letters in the magazine’s Letters department as space permits. Please include your name, address, and telephone number with all correspondence, including e-mail messages.
Why Save Archaeological Sites?
The ancient people of North America left virtually no written records of their cultures. Clues that might someday solve the mysteries of prehistoric America are still missing, and when a ruin is destroyed by looters, or leveled for a shopping center, precious information is lost. By permanently preserving endangered ruins, we make sure they will be here for future generations to study and enjoy.

How We Raise Funds:
Funds for the Conservancy come from membership dues, individual contributions, corporations, and foundations. Gifts and bequests of money, land, and securities are fully tax deductible under section 501(c)(3) of the Internal Revenue Code. Planned giving provides donors of 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

McClung Museum of Natural History & Culture
University of Tennessee, Knoxville—The new exhibition "Brightly Beaded: North American Indian Glass Beadwork" presents exemplary selections of beadwork, primarily from four culture areas—the Plains, Great Lakes, Subarctic, and Northeast—and explores the techniques, as well as the functional and cultural significance of these pieces. This art form served as a highly visible expression of ethnic identity and pride that continues today. (865) 974-2144, http://mcclungmuseum.utk.edu/exhibits (Through June 1, 2014)

Arizona State Museum
University of Arizona, Tucson—"Curtis Reframed: The Arizona Portfolios" explores the work of Edward S. Curtis, famed photographer of the American West, who created iconic images of native peoples at the start of the 20th century. The exhibit explores Curtis’ work with 13 Arizona tribes from 1903 to 1928, featuring photogravures from the museum’s permanent collection and copper plates from the collections of The Center for Creative Photography. (520) 621-6302, www.statemuseum.arizona.edu (Through July 2015)

University of Pennsylvania Museum of Archaeology and Anthropology
Philadelphia, Pa.—In "Native American Voices: The People—Here and Now," a new long-term interactive exhibit, remarkable objects, and contemporary native voices combine to offer visitors a new understanding of America’s first inhabitants. Set against the backdrop of more than 250 objects from the museum’s expansive collections, the exhibit challenges stereotypes and tells powerful stories of Native American successes. Exhibit highlights include Lenape objects from the Delaware Valley region, war bonnets and regalia, intricately woven baskets, contemporary Native American art, and famous stone tools from Clovis, New Mexico, among the oldest objects in the collection. Over the next five years, nearly 300 objects representing 85 tribes will be rotated for display. (215) 898-4000, www.upenn.museum (Opens March 1, 2014)

Fort Worth Museum of Science and History
Fort Worth, Tex.—Experience the adventure of field archaeology through the unique, interactive exhibition "Indiana Jones and the Adventure of Archaeology: The Exhibition." Presented by the National Geographic Society in collaboration with a team of specialists to ensure its accuracy, the exhibit will immerse you in the science and history of field archaeology as you walk in the footsteps of beloved film hero Indiana Jones. On display are some of the world’s most impressive artifacts from the collections of the University of Pennsylvania Museum of Archaeology and Anthropology and the National Geographic archives. An interactive game lets children of all ages test their skills and explore the exhibit in a fun, innovative way. (817) 255-9300, www.fwhmuseum.org or www.indianajonestheexhibition.com (March 8-August 10, 2014)
**CONFERENCES, LECTURES & FESTIVALS**

**Tulane Maya Symposium & Workshop**
March 20-23, Middle American Research Institute, Tulane University, New Orleans, La. This year’s symposium, titled “On the Maya Trail: Ancient Travelers, Epic Voyages,” will explore the many ways the ancient Maya moved across their landscape, whether for the sake of diplomacy, conquest, commerce, migration, or pilgrimage, with an emphasis on the importance of long-distance communication. (504) 865-3101, tms@tulane.edu, http://tulane.edu/TMS

**Society for California Archaeology Annual Meeting**
March 20-23, Visalia Convention Center, Visalia, Calif. This year’s theme is “In the Shadow of Giants,” which focuses on how we move through the shadows of the archaeologists, ethnographers, preservationists, and Native Californians who came before us, and how this struggle from the first discovery to assessment and action leads to greater perception and insight, and ultimately a greater understanding of the past. Symposia, workshops, paper, and poster presentations will be held Friday and Saturday. Doug Bird, Senior Research Scientist in Stanford University’s Department of Anthropology, is the keynote speaker at Saturday evening’s awards banquet. Sunday tours will be led to local sites, including The Archaeological Conservancy’s Rocky Hill Preserve in Exeter, which includes some of the most spectacular examples of southern Sierra-style Native American paintings in California. www.scahome.org

**Flint Hills Archaeological Conference**
March 21-22, Fort Osage Education Center, Sibley, Mo. The conference includes a Friday evening reception, presentations, posters, book sales, and a Saturday afternoon fieldtrip to the Civil War battlefield in Lexington. Attendees can tour the museum, education center, and Fort Osage, which was built by William Clark on a bluff adjacent to the Missouri River. Contact John Peterson at (816) 650-3452 x3, JPeterson@jacksongov.org, or www.flinthillsarchconf.info

**Caddo and East Texas Archaeological Conference**
March 27-29, University of Texas, Tyler, Tex. The joint annual meeting of the Caddo Conference and the East Texas Archaeological Conference focuses on the archaeology, history, and culture of the Caddo Indians and the archaeology of east Texas. A reception will be held Thursday night. Paper presentations, book sales, and a silent auction will take place on Friday and Saturday. Contact Thomas Guderjan at (817) 831-9011, tguderjan@uttyler.edu, or www.caddoconference.org

**Museum of Indian Arts & Culture**
Santa Fe, N.M.—The new exhibit “Turquoise, Water, Sky: The Stone and Its Meaning” highlights the museum’s extensive collection of Southwestern turquoise jewelry and presents all aspects of the stone, from geology, mining and history, to questions of authenticity and value. People in the Southwest have used turquoise for jewelry and ceremonial purposes and traded valuable stones both within and outside the region for over a thousand years. The exhibition presents hundreds of necklaces, bracelets, belts, rings, earrings, silver boxes, and other objects illustrating how the stone was used and its deep significance to the people of the region. (505) 476-1250, www.indianartsandculture.org (Opens April 13)

**Arizona Archaeology Expo & Heritage Month**
March 29, Catalina State Park, Tucson, Ariz. This free annual expo features cultural and historical demonstrations, talks by archaeologists, and interactive activities. Tours of local rock art and ancient pueblo sites help bring the past to life. (602) 542-4174, http://azstateparks.com/archy

**Archaeological Society of New Mexico Annual Meeting**
April 11-13, Murray Hotel, Silver City, N.M. Hosted by the Grant County Archaeological Society and held at the newly renovated historic Murray Hotel, the theme for this year’s meeting is “Mimbres Connections—Then and Now.” There will be a Friday evening gathering, paper and poster presentations all day Friday and Saturday, and trips to local sites on Sunday. www.newmexico-archaeology.org

**Prehistory Day at the Blackwater Draw Site**
May 2, Blackwater Draw National Landmark, on Hwy 467 between Clovis and Portales, N.M. In conjunction with New Mexico’s Cultural Heritage Month, the Blackwater Draw National Landmark (also known as the Clovis site) hosts a free open house with activities for the whole family. Staff, students, and archaeologists conduct demonstrations and give talks emphasizing the fascinating prehistory of the eastern New Mexico region from the earliest times through Spanish contact. This annual event provides a glimpse of life on the plains for the first 12 millennia. www.theclovissite.wordpress.com
Rare Maya Mural Discovered

Only a few murals have been found in the Maya region, and they’ve offered scholars valuable information.

Researchers working at a Maya site in Belize have revealed a plastered, vaulted room with a rare polychrome mural. Located in the middle of a working cattle ranch in northwestern Belize, the Early Classic (a.d. 200-600) Maya site known as Tulix Mul has been the focus of investigations led by archaeologist Thomas Guderjan with the University of Texas at Tyler’s Maya Research Program (MRP) since 2012.

Last year, as the archaeologists worked to excavate the building, they discovered that the vaulted room was intact and had been filled in by the Maya. After carefully removing the fill, the researchers revealed a mural behind the plastered wall. While still only partially exposed, the Tulix Mul mural appears to have been rendered in generally the same style as a mural found years before at San Bartolo in Guatemala. Only a few other Maya murals are known in Central America, and each has provided a wealth of information about Maya art, religion, trade, interaction, and other details, making researchers eager to view the Tulix Mul mural in its entirety.

“It remains to be seen just how important this mural will be, but we will know in the early summer of 2014,” says Guderjan. “It is also very possible that more will be found in the unexcavated buildings at the site.”

In order to preserve Tulix Mul, MRP has taken the unusual step of negotiating with the landowners to purchase it, and it has already acquired Grey Fox, a nearby endangered Maya site where the crew has been working. MRP has also established a permanent outreach program to encourage the local community to help preserve Tulix Mul.

In December 2013, the Archaeological Institute of America (AIA) awarded a generous site preservation grant to the project, stating: “The grant will protect fragile and rare Maya murals found at the site and establish a permanent outreach program that will involve the local community in the site’s history and preservation.”

This summer Guderjan’s team will carefully remove the plaster overcoating from the mural, digitally record, document, and interpret it, and work to uncover the other vaulted room and record any additional mural found there. The team plans to build a door to protect the room. They’re also planning lectures, workshops, and a tour guide training program to engage the local community. —Tamara Stewart
For decades, some scientists have argued that mammoths, mastodons, and other megafauna in North America were hunted to extinction by Paleo-Indians sometime around 13,000 years ago. But a new study by Matthew Boulanger and Lee Lyman, archaeologists at the University of Missouri, suggests these animals were already in decline before humans arrived in Northeastern North America.

The study, which was recently published in *Quaternary Science Reviews*, suggests that the extinction process began in the Northeast about 1,000 years before humans arrived, according to Lyman. The findings are based on radiocarbon dates from megafauna specimens and Paleo-Indian sites in New York, New Jersey, Pennsylvania, Maine, Massachusetts, Ontario, and Quebec.

According to the study, megafauna in the Northeast experienced two peak periods of decline. The first period occurred about 14,100 years ago, when the climate was extremely arid. That was followed by a period of recovery about 500 years later. The population plummeted again about 12,700 years ago, coinciding with documented temperature and vegetation changes that could have led to deaths caused by dietary stress.

The second decline also roughly coincides with the arrival of humans. But, according to the study, 75 to 90 percent of the Northeastern megafauna were gone before humans arrived. “If people had a hand in their extinction, then it was a *coup de grace,*” Lyman says.

One advocate of the overkill theory, Gary Haynes, an archaeologist at the University of Nevada, Reno, argues that the researchers “haven’t proven that overkill did not happen.” He says the study indicates that some megafauna recovered from environmental changes before humans arrived, but not after.

Boulanger and Lyman compiled the radiocarbon dates from 57 megafaunal samples taken from 47 different locations. The samples represent six genera, and the researchers assume that genera not represented were either absent—meaning they didn’t live in this region, or had already gone extinct—or rare in the Northeast. The researchers also compiled 25 dates from 22 separate Paleo-Indian sites.

Lyman says a sample size of 33 or more is considered sufficient for this study, and though the megafaunal sample is more than adequate, he acknowledges that the Paleo-Indian sample is small. “Nevertheless, the probable accuracy of the sample is corroborated by the complete absence of archaeological evidence that local Paleo-Indians hunted megafauna,” he says, noting that there were no indicators of killing and butchering, such as cuts on bones.

The researchers stress that their findings apply only to the Northeastern region and do not speak to extinction processes elsewhere on the continent that may or may not have been the result of human hunters. —Paula Neely
New Technology Used In Rock Art Analysis

Recent study revealing charcoal in Lower Pecos River pictographs could help in dating the region’s rock art.

With the help of a new technology, researchers analyzing rock art in the Lower Pecos River canyonlands of west Texas have determined that the ancient artists used charcoal to produce the black pigment used in some of the paintings they examined. It was previously thought that all black pigment in the area was derived from manganese. Rock art is usually difficult to date, and the identification of charcoal, a material that’s commonly radiocarbon dated, could help researchers establish a reliable chronology for the pictographs of this region.

The research team, led by University of Central Arkansas chemistry professor Karen Steelman, used a nondestructive technology known as portable X-ray fluorescence spectroscopy, or pXRF. “The pXRF instrument emits and detects X-rays,” says Steelman. “As these X-rays interact with the atoms of the pigment, the instrument is able to identify which elements are present.” This technology was first developed for the mining industry, and was first applied to rock art research in the U.S. in 2005.

Utilizing pXRF, Steelman and her colleagues conducted elemental analysis of pictographs at 10 sites in the area, reporting their results in a recent issue of the journal *Archaeometry*. They found that manganese and iron minerals were the main elements of black and red paints used in the area’s Pecos River Style pictographs. The researchers found that charcoal was used in another style of pictographs, known as Red Linear, which are in the same rockshelters as the Pecos River Style paintings.

“This raises several questions: Do the two styles and use of different pigments represent different cultural groups?” Steelman asks. “Or are they different functions of art within the same society?” New dating of one of the manganese pictographs also gave interesting results, leading to more questions regarding the dates of the earliest known Pecos River Style rock art in the region. Generally thought to be 3,000 - 4,000 years old, one pictograph in this style was recently radiocarbon dated to about A.D. 500, suggesting the style could have endured much longer than previously thought. Thus far the researchers have dated only one painting with charcoal, which is approximately 1,200 years old, but the nature and condition of the painting are such that it’s unclear which style it belongs to. —Tamara Stewart
Archaeologists in Oklahoma recently discovered the site of a 250-year-old Plains Indian fort with unique subterranean apartments and a dry moat. Located in the south-central part of the state, the oval stockade was built in the 1750s by the Taovaya, a subgroup of the Wichita Indians, within their village on the north bank of the Red River. It was used as a refuge from attacks by the Spanish, the Apache, and the Osage Indians.

According to historical accounts, there were four subterranean apartments within the fort that sheltered women, children, and old men during attacks and were used to store supplies. The shelters are highly unusual, according to Richard Drass, an archaeologist at the University of Oklahoma who directed the excavation. He knows of only one other similar structure in North America, which is located at a Wichita site in Northern Oklahoma.

In the process of unearthing and identifying features of the fort, the researchers also confirmed the location of an unsuccessful Spanish attack on the Taovaya in 1759 in retaliation for their attack on the San Saba mission. According to Drass, it’s the only site that matches historical descriptions of the battle setting. Previously, some historians thought the battle occurred at a different village on the other side of the river in Texas.

The 40-acre village served as an important trading center during the 1700s, primarily for Europeans who exchanged goods for horses, bison hides, and other items. But attacks continued and the Taovaya eventually moved away. By the 1850s, the tribe had been decimated by conflict and disease. The remains of the village site were identified and partially excavated in the 1960s by Robert Bell of the University of Oklahoma.

Led by Drass, archaeologists used Bell’s research, historical accounts, ground-penetrating radar, and magnetic imaging to locate the fort site and the apartments. “There are four continuous chambers that appear to encircle the interior of the fort about 10 to 15 meters away from the wall,” says Drass. The team excavated two of the apartments. Both were about four-feet deep and 23-feet wide, with flat floors and earthen benches, or steps. Postholes and pieces of burned wooden beams associated with the rooms indicated that the beams supported roofs that were likely made of thatch.

“Very few artifacts were found inside the fort—most were outside in the moat. That suggests that the fort was not really occupied, but was used primarily as a refuge during attacks,” he says. Flintlock gun parts, glass trade beads, arrow points, pottery, bison bones, and flint flakes were among the artifacts that were unearthed. —Paula Neely
Against a backdrop of skyscrapers in downtown Miami, a team of archaeologists is excavating the remains of a Tequesta village that dates to around A.D. 600. Found at the confluence of the Miami River and Biscayne Bay, the site is located at the heart of a multi-million dollar development known as the Metropolitan Miami complex.

The Spanish documented the town of Tequesta, which was located on the north bank of the Miami River, in the 1500s. Archaeologist John Goggin rediscovered part of the village in 1949 when he undertook Florida’s first archaeological inventory. Between 2002 and 2006, Bob Carr of the Archaeological and Historical Conservancy, Inc. directed work at the site, surveying three lots slated for development on the river’s north bank. The archaeologists resumed work on the final, undeveloped lot, known as Met Square, in 2012, discovering eight circular features and dozens of linear alignments of postholes that likely supported wooden platforms and walkways connecting the structures.

“The village is far more elaborate and complex than any of us had expected,” says Carr. “It is clearly planned and engineered, with perfectly straight lines and perfect circles—some 36 to 41 feet in diameter, some containing as many as five rings of holes.” Faunal bones recovered from the site include shark, sea turtle, monk seal, deer, and fish, which is typical for a midden of this age in this area. Conch and whelk shells are also abundant, as well as fishing sinkers made of shell, bone, and non-local stone material. The Miami Circle, a previously discovered Tequesta ceremonial site, is just 600 feet away across the river.

The Tequesta tribe lived in the area for about 2,000 years and was one of the first native groups encountered by Spanish explorer Ponce de Leon in 1513. The last of the tribe escaped to Cuba in 1763 when Spain ceded Florida to Great Britain. Carr and his team plan to finish creating a 3-D laser map of the site this spring, followed by an extensive multidisciplinary analysis of recovered artifacts and floral and faunal remains, to be undertaken over the next several years. The fate of the site, which is a topic of intense discussion by the city’s historic preservation board and the project developers, remains uncertain. —Tamara Stewart
The 2011 Las Conchas wildfire damaged archaeological sites at Bandelier National Monument in New Mexico. In addition to burning building stones and artifacts at this site, the fire also destroyed the surrounding vegetation, which led to erosion that further damaged the archaeological remains.
In the far corner of northwestern Alaska, archaeological deposits containing a record of 5,000 years of human habitation—ancient campsites of the Inupiaq people that have been preserved in the undulating beach ridges of Cape Krusenstern National Monument—are being washed away by the rising waters of the Chukchi Sea.

In central Florida, episodic droughts and falling water levels in shallow interior lakes are uncovering the soggy remains of hundreds of prehistoric dugout canoes, exposing them to the sun and other elements.

In New Mexico forest fires, magnified by drought and counterproductive forest management practices, threaten cultural resources as diverse as historic gold mining cabins in the Gila National Forest and prehistoric pueblos in the Santa Fe National Forest.

In central Texas, frequent region-wide droughts have dropped water levels in man-made reservoirs along the lower Colorado River, and left hundreds of once-submerged archaeological sites high, dry, and easy prey for artifact hunters.

Climates are always changing. But as evidence mounts...
that the pace of change has accelerated, myriad archaeological sites are endangered. Along the Mississippi Delta south of New Orleans, prehistoric shell middens—some dating back 4,000 years—are disappearing. Due to the rising sea level and subsiding land, Louisiana has lost 200 square miles of land to the Gulf of Mexico in the last half century.

“There are 500 to 1,000 significant archaeological sites in coastal Louisiana, and I would say we have lost 20 to 30 per cent of them in the last 50 years,” says Richard Weinstein, an archaeologist with Coastal Environments Inc. in Baton Rouge. “It’s a real tragedy. These sites are chock full of ecological data that could tell us something about past climate change.”

Weinstein says many of the clues about the ancient human occupation of North America are already underwater. At the height of the last ice age some 20,000 years ago, the sea level was 400 feet lower than it is now, and consequently large areas of what was then the Gulf, Atlantic, and Pacific coasts are now submerged. Several years ago, researchers dredged up the remains of an ancient shell midden off the coast of Texas in an area known as the Sabine Valley. The site was 12 miles offshore, covered by 20 feet of water and 20 feet of marine sediment that had accumulated since humans last used it 8,000 years ago.

The rate of climate change today, and its underlying causes, remain a highly charged political issue. But the United Nations’ Intergovernmental Panel on Climate Change (IPCC) says the direction of the trend is “unequivocal, and since the 1950s many of the observed changes are unprecedented over decades to millennia.”

Beyond that consensus, however, scientists differ about the rate and consequences of the change: Sea levels will rise a foot and a half by the end of the century. Or, in the worst case, significantly more than that. Warmer seas will fuel more hurricanes. Or maybe fewer, but more powerful, ones. Droughts will become more persistent. Forest fires will be more intense. Deserts will expand. Or perhaps “extreme” rainfall events will bring more flooding. Summers will be longer. Or possibly just hotter.

As part of a comprehensive effort to understand how climate change threatens the country’s cultural resources, the National Park Service (NPS) has published a document titled “Climate Change Action Plan 2012-2014.” As stated in its executive summary, the purpose of this action plan is to provide “guidance to help park managers and staff effectively plan for and respond to climate change today and in the years ahead.” The action plan also “articulates a set of high-priority no-regrets actions the NPS is currently undertaking, or is committed to undertake, in the next one to two years.”

One of those actions is taking place at Cape Canaveral National Seashore in Florida, where NPS is collaborating with Central Florida University to build a “living shoreline” of spartina grass and oyster beds to help protect the eroding shoreline around Turtle Mound, a 1,200-year-old Timucuan site that is the largest shell midden in the country. In Wrangell-St. Elias National Park in Alaska, the receding...
ice has exposed villages and hunting camps of the Athabascan people as well as other indigenous cultures. To save the archaeological windfall before it is lost, NPS has partnered with researchers and Native Americans in an urgent program of “ice patch archaeology.” Their discoveries include stone points, well preserved baskets, painted wooden arrows complete with feather fletching, and faunal samples that are more than 7,000 years old.

“Cultural resources have always been subject to environmental forces” says Marcy Rockman, the climate change adaptation co-coordinator for NPS. “What’s new is the accelerated pace of those forces.” For an agency already struggling to fulfill its legal obligation to “protect, stabilize, and restore” the nation’s cultural treasures in perpetuity, climate change adds a daunting new dimension to the task. With more than 400 national parks, monuments, and historic sites, NPS is ahead of most agencies in developing a strategy to cope with climate change.

“NPS has integrated cultural resources into the method of scenario planning for climate change,” Rockman says, which is helping park administrators to “think creatively and broadly about what climate change trends will mean for specific park resources, and identify in advance appropriate management actions.” But with a 15 percent cut in its operating budget over the last three years, NPS hasn’t been able to do as much as it would like to combat the problem. Hard choices lie ahead. As sea level rises in the future, we are going to have to make some difficult decisions,” says Rockman.

One of those difficult decisions is Fort Jefferson, a massive Civil War-era fortress built on a low-lying archipelago 60 miles out in the Gulf of Mexico from Key West. Hailed as the Gibraltar of the Gulf when it was built in the 1860s, the fort’s iron and brick walls are deteriorating from frequent exposure to seawater spray, and the latest round of repairs cost $13 million. Though the walls’ deterioration may be unrelated to climate change, NPS officials have to wrestle with the question of how much more money they should spend on Fort Jefferson “given what can be projected about the sea level rise and storm forces that are likely” to affect the fort in the coming decades and beyond, she says.

Rising sea levels will also threaten sites such as Jamestown National Historic Site in Virginia, Acadia National Park in Maine, and other NPS properties. “Our ability to repair damage is not unlimited,” says Rockman. “There are going to be some situations where we will have to learn to say goodbye to resources we can’t protect.”

Drought, too, has been a force to reckon with throughout human history. In the last two decades, however, much of the western third of the United States has been parched by multi-year droughts. California is currently in the throes of the worst drought in at least a century. At the start of 2014, portions of 11 states from Nevada to Texas were suffering from long-term...
drought that has left rivers and reservoirs near record lows.

Dan Prikryl, an archaeologist for the Lower Colorado Reservoir Authority, says central Texas has been in a drought since 2008. “Every time the water level in our reservoirs drops, it exposes sites ranging in age from 11,000 years ago right up to historic times.” At Lake Buchanan, North of Austin, Prikryl has counted 167 archaeological sites in the zone exposed by the reservoir’s low water—including the historic town of Bluffton, which was covered when the reservoir was filled in 1937.

“In some ways, the drought has provided us with an opportunity to document sites we might not otherwise know about,” says Pat Mercado-Allinger, state archaeologist for the Texas Historical Commission. But the opportunities are mixed blessings. “The funds to investigate these sites have to come from somewhere. We have limited resources and no additional funds have been allotted,” she says.

“There are so many sites emerging that we don’t have the time or resources to really investigate all of them,” says Prikryl. “And once something is uncovered, erosion exposes some of the artifacts and makes the site a magnet for vandals and looters.”

Archaeologists face similar dilemmas beyond parched central Texas. The foundations of Woodville, Oklahoma, were submerged long ago in Lake Texoma, which was formed when the Red River was dammed. Now Woodville’s ruins have reemerged as Lake Texoma declines due to drought. Along the Rio Grande, the ruins of a century-old church have been uncovered by the shrinking Falcon Lake. And in Lake Mead, where water levels now stand more than 100 feet below “full,” the once thriving town of St. Thomas, Nevada, settled by Mormons in 1865 and flooded by Hoover Dam in the 1930s, reemerged from the depths in 2002. It is now a minor tourist attraction.

In Florida, repeated drying of the state’s lakes has archaeologists scrambling to deal with numerous discoveries. In 2000, a total of 101 dugout canoes—some of them 5,000 years old—were found in the drying sediments of Newnans Lake near Gainesville. Recurring droughts in subsequent years have revealed dozens more.

“With the succession of droughts, it has gotten harder and harder to keep up,” says University of Florida archaeologist Donna Ruhl, who is compiling a database of the discoveries with colleagues in Tallahassee. She says the state does not have the “time, money, or space,” to excavate and conserve all of the waterlogged remains, so most of the discoveries are reburied. Even so, measurements, radiocarbon dating, and other analysis are yielding a trove of information. “Taken together, the information we have gathered has given us some valuable insight into the history of the people who lived in Florida thousands of years ago and used Florida’s rivers and lakes as their highways,” says Ruhl.

The storm surge from Hurricane Sandy exposed part of a previously unknown gun battery at Fort Wadsworth on the northeastern shore of Staten Island in New York City. Fort Wadsworth is one of the oldest military installations in the country, and it played a role in the Revolutionary War, the War of 1812, and the Civil War.
Elsewhere, the problem has been too much water. Although no single act of nature can be directly tied to climate change, the record-breaking 13½ inches of rain over two days that swamped Nashville, Tennessee, and sent the Cumberland River over its banks in May 2010 is the sort of event that many climatologists believe will be more common in the future. When the water receded, “in some locations up to 16 feet of bank line had disappeared,” says Aaron Deter-Wolf, of the Tennessee Division of Archaeology. “This is an incredibly rich archaeological area. Of 128 recorded riverbank sites in the vicinity of Nashville, about a third disappeared or suffered significant damage during the May, 2010 flood. Many of the prehistoric sites that survived soon fell victim to looters who were quick to spot what the flooding exposed.”

An extensive array of sandstone inscriptions—some of them more than 900 years old—at El Morro National Monument in New Mexico are threatened by heavy rain. The loss of more than a dozen of the 2,500 inscriptions has already been linked to a period of unusually high rainfall in the 1970s, and because moisture in the soft rock known as Zuni Sandstone promotes flaking and delamination, authorities fear that a recent increase in heavy rain could accelerate the losses.

Like downpours and floods, forest fires are not always a symptom of climate change. In the last three years, however, wildfires have burned more than 22 million acres in the U.S. and a new study, authored by University of Utah geographer Phillip Dennison, warns that a hotter, drier climate is fueling

Fire fighters covered an historic-period mining cabin in the Gila National Forest in southwest New Mexico with a fire-retardant material called Aluminized Structure Protection Wrap. This material helped the cabin survive the Whitewater-Baldy Fire.

Archaeologists assess the damage done by the Whitewater-Baldy Fire to the remains of a small prehistoric pueblo in the summer of 2012.
a trend toward larger, hotter, and more frequent forest fires.

Many of the most destructive blazes in recent years have occurred in archaeologically rich regions of the Southwest, a phenomenon that has prompted fire-fighting teams to incorporate cultural resource considerations in both fighting and preventing fires. In 2011, New Mexico’s Las Conchas fire, started by a tree falling on a power line in the Jemez Mountains, burned over 150,000 acres, including more than 50 per cent of Bandelier National Monument, which contains sites as old as 11,000 years.

“Before it was out, the fire had burned through more than 3,000 archaeological sites, including small habitations, large villages, and obsidian quarries and workshops” says Jennifer Dyer, a district archaeologist for the Santa Fe National Forest. At the height of the fire, 20 archaeologists were working to identify sensitive sites so they could be protected.

When fire threatened to destroy historic gold mining cabins in the Gila National Forest in New Mexico, archaeologists there wrapped some of the buildings in fire-retardant fiberglass fabric to protect them from the flames. Although most large fires are eventually extinguished by rain, the rains themselves often pose a threat, eroding newly exposed sites in the charred forest landscape.

As fires increase in size and intensity, archaeologists also worry that the heavy equipment used to fight them can...
damage sites. “During the Whitewater-Baldy fire in 2012, we had a bulldozer cutting a fire line that hit the corner of a Mimbres pueblo roomblock,” says Bob Schiowitz, an archaeologist at the Gila National Forest. He notes that intense fire can also damage the innumerable small sites that litter the landscape—ones in which a scatter of stone tools reflect short-term use by prehistoric hunters or toolmakers.

Previous forest management practices, which aimed to prevent fires, allowed flammable material to accumulate for years, setting the stage for larger, more intense conflagrations. As a result, Dyer says Santa Fe foresters are now systematically thinning large areas—by hand where important cultural resources are at risk, and with controlled burns elsewhere—to assure that future fires are smaller and less intense. “Fire is inevitable in these mountains,” she says. “But we want to have a say about how it goes across the landscape and give archaeological resources a fighting chance.”

Federal and state authorities are not the only ones worried about the impact of climate change on cultural resources. For some Native American communities, it is a dilemma that threatens their whole cultural landscape. In California, where coastal erosion is eating away at the villages and burial grounds that lie within Point Reyes National Seashore, the tribes are struggling with this threat. “Bits and pieces of our heritage have been washing away ever since the last ice age,” says Nick Tipon, vice chairman of sacred sites protection committee for the Graton Rancheria, a federation of the Coastal Miwok and Southern Pomo. “Until recently, we often let it go. It was just nature reclaiming it.”

But now that man-made activities are at least partly to blame for the pace of climate change, the tribe is feeling the need to be more proactive. Its members are aiding university and federal scientists in surveying Point Reyes and studying how best to protect cultural sites. “It was one thing when nature was doing it,” says Tipon. “But knowing that some of this is caused by man is more disturbing. We can’t just stand by and let it happen.”

“It is a matter of concern for all of the coastal tribes of California,” says Sonoma State University archaeologist Mike Newland, who has been advising tribes on what climate change could mean to their cultures. “Some predictions are calling for a six-foot sea level rise during the next century,” he says. “So it is not just the coastal tribes of California that we are talking about. If everything less than six feet above sea level is at risk, you are talking about the archaeological record of the launching points of the maritime history of the world, and we are about to lose it all at once.”

Mike Toner is a Pulitzer-Prize-winning writer in Atlanta, Georgia. His article “Life In the World’s Largest Prison Camp” appeared in the Winter 2013-14 issue of American Archaeology.
An Examination of Historic Trade

By Julian Smith
Photos by Duane Esarey

This necklace of standardized two-hole crescent beads and wampum was used by the Seneca.
For decades archaeologists were uncertain as to who made the elaborate marine shell ornaments found at numerous 17th- and 18th-century sites. A recent study concluded that they were produced by Dutch colonists, who applied their manufacturing and marketing savvy to keep their Native American customers satisfied.

The story of how Native Americans sold Manhattan to Dutch colonists for a pittance in 1626 is famous, but the details are debatable. At the very least, the 60 guilders’ worth of trade goods the natives took in exchange would be valued at much more than just $24 today. What is certain is that the Dutch knew that, by having land where native groups would trade valuable furs for everyday items such as metal tools and glass and shell beads, they got a good deal.

Native North Americans had been using shell items for ornamental and ceremonial purposes for thousands of years before the Europeans arrived. In the late 16th and early 17th centuries, before European colonies sprang up along the East Coast, the metal tools received from traders in ships allowed coastal Indians to begin manufacture of large numbers of white and purple beads known as wampum from local marine shells. These wampum beads soon took on deeply symbolic meanings and came to be greatly desired by powerful tribes further inland, such as the Five Nations of the Iroquois and the Susquehannock. In return the inland tribes provided furs the coastal peoples could barter to the Europeans. When the first colonists arrived in New Netherland, the Dutch colonial province that extended from Delaware to Connecticut, they quickly found ways to insert themselves as middlemen into this trade.
Circular disks with fine holes in their edges, as seen in this necklace, were popular ornaments.

A little over a decade ago, Duane Esarey of the Illinois State Archaeological Survey took note of elaborate marine shell ornaments in recurring geometric and animal shapes at numerous sites. Esarey was intrigued to learn that, despite all the research on wampum, next to nothing was known about these standardized marine shell (SMS) ornaments, as he came to call them. Even though archaeologists had been aware of them for over a century, there was virtually no mention of the ornaments in colonial documents, and no production sites had been found.

So Esarey conducted the first comprehensive survey and analysis of the SMS industry and its role in the trade between Europeans and Native Americans during the colonial settlement of the Northeast. He did a comprehensive literature search that turned up over 1,600 artifacts in archaeological reports dating back to 1851. In preparation for a dissertation at the University of North Carolina - Chapel Hill, he combed through collections from 18 states or provinces and visited 11 repositories including the Smithsonian’s National Museum of the American Indian, the Rochester Museum and Science Center, and the state museums of Pennsylvania and New York.

He identified a total of 4,845 individual SMS ornaments from 158 sites, most of which were occupied during the 17th and early 18th centuries. Over 70 percent of these ornaments were not mentioned in the archaeological literature. The majority of them were found in the sites of Native

Like wampum, SMS ornaments were made from marine shell, either white whelk or purple quahog. Esarey divided the items into 42 categories, from abstract shapes to detailed zoomorphic figures. All have perfectly cylindrical holes made by metal drills. Many of them were strung together into elaborate necklaces.

Unfortunately, many of the items came with little identifying data beyond the sites in which they were found. To tease out the industry’s development, Esarey used a statistical procedure he called “span factored annual percentages” (SFAP), deriving the artifacts’ production and distribution timelines from the dates of the sites where they were found. It helped that new SMS forms came and went quickly over time, and that the occupation dates of these sites are well established.

A picture emerged of a short-lived but thriving industry whose development echoed the changing political and economic situations in the early colonial Northeast. SMS production started with a series of simple shapes first made around 1635, only about a decade after the tiny Dutch colony of New Netherland began. The settlement was founded on the trade for furs, especially beaver and otter. Its roughly 500 people came from various European nations and included some African slaves.

The New Netherlanders traded wampum, which they obtained from the coastal natives in exchange for various European goods, to the fur-rich tribes of the interior. Some of the coastal wampum makers were also conquered and forced to give the wampum to the Dutch as tribute. Esarey thinks some colonists began making SMS beads as a specialty shell product of their own, and they began to supplant the coastal natives in wampum manufacture.

Starting in the 1650s, SMS production made great strides in quantity, variety, and craftsmanship. This was the beginning of what Esarey refers to as the “classic” period of SMS production, which lasted till the 1680s. Clearly symbolic forms such as masks, animals, and birds began to appear, along with tube-like “pipe beads” and large medallions. There were also more refined geometric shapes like triangles, rectangles, and pyramids.

Historical accounts note that there was a glut of wampum in the 1650s, which resulted in its devaluation. This is the very time SMS production skyrocketed. From these two events Esarey surmises that, as the value of wampum declined, the Dutch turned to SMS ornament manufacture to sustain their fur trade. The ornaments came to be highly valued by the inland native groups, thus incentivizing the Dutch to create far more of them. “I suspect the 1650s’ bead makers added new SMS forms as increasingly popular specialty items,” Esarey says.

There is also evidence that the wants of the natives determined the forms of these ornaments. The producers and consumers were in close contact, which created a feedback loop between the two parties. Because of that connection, Esarey believes that the Dutch were successful in fulfilling
their customers’ desire for “cosmological content.” As colonial bead-makers became more familiar with the mindset and preferences of the native market, they offered new designs and increasingly elaborate symbolic forms, including celestial and mythical figures, to satisfy those preferences.

What made SMS ornaments unique wasn’t just their diverse and elaborate designs, Esarey says, but how these designs were standardized. He found matched sets of necklace ornaments, some made in graduated sizes that were surprisingly similar from site to site, regardless of tribal affiliation and location. This degree of consistency hadn’t been recorded before in native material culture, he says. “When I kept seeing the same necklaces in different places, I started thinking of SMS as a production format quite specifically aimed at crafting component parts for a necklace industry.”

Because the beads start as abstract forms and then take the shapes of native symbols, Esarey thinks this was a commercial venture initiated by the New Netherlanders, an enterprise that combined European technology and market strategies with a sense of native value and meaning. The Dutch were master capitalists who recognized the natives’ demand for shell ornaments, created standardized products and marketed them to different groups through a trade network they had established to exchange other goods, and then moved on when the market changed. “The mere fact that over 4,800 hand-shaped ornaments can be categorized into a few dozen forms reflects the degree of standardization,” he says.

After the classic period, fewer forms were produced, and in much lower numbers. These later ornaments became much more elaborately decorated, however, including fish, bird, and animal forms, and pelt-shaped effigies. New forms also appeared, including so-called birdman pendants with legs and wings and tiny bird head images with long beaks. By about 1710 SMS production, with a few exceptions, had stopped.

Assuming Esarey is correct, the changes in the SMS industry also reflected a larger shift in colonial cultural dynamics. Early on, the balance of economic and political power favored native groups. At first European colonists were few and vulnerable and the interior tribes numerous and powerful. The Europeans were competing among themselves to acquire furs in this unfamiliar land. This gave them a strong incentive to perceive and meet their native customers’ desires, which they did in part by shaping SMS ornaments with the help of a constant stream of consumer feedback.

As the European colonies became more established toward the end of the 17th century, native tribes were simultaneously being subdued or dispersed, stripped of land and political power. In fact, of all the powerful native groups with which the Dutch originally traded SMS ornaments, only the Iroquois in upstate New York maintained their political and economic power in the 18th century.

“The shoe came to be on the other foot, economically,” Esarey says. “After 1710 or so, many of the [original] client groups had been destroyed and the others could no longer...
get furs and came to be far less powerful. There were now far more Europeans, and their situations were more secure. The limited choices of SMS forms after this time seem to reflect this. Colonists in New York and New Jersey still made shell ornaments, and the fur trade was alive and well, but it shifted west to tribes near the Great Lakes. Esarey believes the distance between the two parties probably reduced the effectiveness of the consumer feedback loop and a desire for ornaments made of other materials (red stone and silver) supplanted that for the elaborate SMS ornaments. Shell ornaments became simpler and fewer as a result.

**Richard Veit**, an archaeologist at Monmouth University, calls Esarey’s work a “landmark” study grounded in archaeological data. “Duane’s work makes a convincing case that these ornaments were produced by colonists using metal tools, drills, and compasses specifically for trade with the Native Americans,” he says.

Penelope Drooker of the New York State Museum calls the reconstruction of intercultural relations based on changing SMS forms an “important and useful insight.” She adds, “I agree with his conclusions, which would not have been possible without the admirably extensive and comprehensive body of data he has brought together.”

George Hamell is the curator of the Rock Foundation Collection, which is on loan to the Rochester Museum and Science Center. Many of the items Esarey studied belong to this collection. Hamell says the study has reshaped some of his thinking about the movement of trade goods in the Great Lakes region in the early 18th century. He questions the idea that SMS were made exclusively by the Dutch, however. “The increasing elaborateness of some of these things would hint at increasing European involvement in their manufacture, but not necessarily” prove it, he says. “Indians had access to the same tools as well.”

James Bradley of the New York State Museum thinks an equally strong argument can be made that the SMS industry was established by natives, or a combination of natives and colonists. Europeans didn’t have a monopoly on the concept of standardization, he says: native North Americans were already standardizing marine shell ornaments long before the Dutch arrived, with wampum being a prime example. “One problem is there’s no archaeological residue, no sites known where these artifacts were being produced,” he says. A more careful analysis of site assemblages might shed light on who was making SMS ornaments, and where, says Bradley. “I think it’s a combination of Indians and Europeans, [but] you can only figure that out if you find some evidence of manufacture. The sites may be long gone.”

Esarey admits his case for Dutch colonial manufacture is
circumstantial, but there is considerable evidence to support it. He suggests the industry may have started in a small number of workshops near Manhattan and then later migrated to northern New Jersey, where cottage industries making several shell ornament forms for far western Plains Indian groups are documented in the early 19th century.

“All the evidence should not be gone, but then again, most would be in areas now converted to urban and industrial use,” he says. “I would expect that some of the 17th-century workshops’ material remains are possibly preserved, perhaps buried under deep near-shore urban [or] industrial fills. The waste debris of these workshops would be unmistakable.”

Even if no manufacturing sites turn up, one idea Esarey would still like to investigate is the origin of the raw marine shells. He wonders if large-scale importation of tropical marine shells from the Caribbean powered the explosion of SMS ornaments, and marine shell ornaments in general, in the Northeast after 1630. Cylindrical pipe beads, the most common form of SMS artifacts, were often four to six inches long, with diameters too large to have been made from Atlantic Coast marine shell. It’s likely, he says, that they were fashioned from whelks or conchs imported from the West Indies, but only testing will tell for sure.

Esarey also says his SFAP technique could be used to reconstruct the circulation of other artifact forms spread across accurately dated short-term sites. The Northeast colonial period had other little-known industries that would make good candidates, he says, including red stone ornaments, pewter effigy pipes, elaborate bone combs, and native-made tobacco pipes. “We tend to assume that we know a great deal about this place and time and these various peoples,” he says. “And we do. But there are whole chapters of the story still unwritten.”

JULIAN SMITH, a contributing editor at Archaeology magazine, is currently working on a book about smokejumpers. His article “New Thinking about Poverty Point” appeared in the Summer 2013 issue of American Archaeology.
Ultimately, archaeologists may thank a Siberian farmer for helping settle a long and often contentious debate over where the first Americans came from.

In the late 1920s, the farmer—identified as Saveliev by some historians—was digging a cellar in the village of Mal’ta, some 100 miles northwest of Lake Baikal in Siberia. His shovel hit a huge animal bone locked in the icy soil. With little fanfare, he tossed the annoying obstacle into a yard, where some delighted kids began playing with it. Eventually, word of the curiosity reached a museum in the city of Irkutsk, some 50 miles away. On a frigid February day in 1928, it dispatched a young scholar to investigate.

Mikhail Mikhaylovich Gerasimov was just 20, but he had already been excavating archaeological sites in the region for nearly a decade, publishing his first technical paper at 17. What the whiz kid found in Mal’ta amazed him, remaking not only his career but also our understanding of early human cultures. Over the next 30 years, research teams would uncover a spectacular trove of art, tools, dwellings, and graves. They were created by people who lived along

DNA extracted from the remains of a 24,000-year-old boy found in Russia links modern Native Americans to Eurasian populations.

By David Malakoff
the banks of the Belaya River starting some 25,000 years ago, near the end of the Paleolithic Period. The especially notable finds included about 30 female figurines carved from mammoth ivory—previously known only from similarly-aged sites in Europe. In addition, there was an elaborately adorned grave holding two children beneath a stone slab. Gerasimov’s discoveries were “revolutionary,” scholars said at the time, because they shattered the conventional belief that the late Paleolithic cultures of Central and East Asia had lagged far behind those of Europe.

Now, nearly a century after their discovery, the Mal’ta treasures are once again shaking up our perceptions of human history. This time, a landmark analysis of the DNA contained in one of the Mal’ta skeletons—a boy buried 24,000 years ago—shows that he is genetically related to modern-day Native Americans. That’s powerful evidence that the earliest immigrants to North and South America came from Asia, according to the authors of the November 2013 study, which appeared in the journal *Nature*. The boy’s DNA revealed that he is also related to people living in Eastern Europe and Western Asia, who derive from a genetic group that some researchers have dubbed “Eurasian.” The genetic similarity suggests that, 24,000 years ago, the prehistoric ancestors of these western Eurasians spread farther northeast into modern-day Siberia than “commonly believed,” the authors wrote in *Nature*.

The Mal’ta boy’s connection to Europeans via a common ancestor could help resolve some other puzzles surrounding the First Americans. Those include the question of why some Native Americans carry genetic markers typically found in European populations, and why some ancient skeletons discovered in North America appear to have Eurasian features.

The researchers add, however, that their work refutes, rather than corroborates, the Solutrean hypothesis, which posits that some 20,000 years ago people from the Iberian Peninsula in Western Europe, known as Solutreans, crossed the Atlantic and settled in the Americas. The Mal’ta data mean “you don’t need very extreme or complicated scenarios,” such as ancient voyages across an icy Atlantic Ocean from Europe, “to explain the early origins of First Americans,” says geneticist Eske Willerslev of the Natural History Museum of Denmark and the University of Copenhagen, a leader of the study. “This gives us a clearer picture of how [migrations from Asia] could result in the Native American groups you see today.”

Some researchers remain skeptical that the study rules out a founding migration from Europe. “The geneticists are making a leap of faith” that ignores alternative scenarios and physical archaeological evidence, says Dennis Stanford, an archaeologist at the Smithsonian National Museum of Natural History in Washington, D.C., and a leading proponent of the Solutrean hypothesis. (See “Iberia, Not Siberia?” *American Archaeology*, Summer 2012.) The “genetic materials shared by Mal’ta boy and ancient Native Americans may be explained in a number of ways,” adds archaeologist Bruce Bradley of the University of Exeter in the United Kingdom, a Stanford ally.

Even the skeptics, however, call the Mal’ta study a remarkable and groundbreaking accomplishment. It marks the oldest human genome yet sequenced and highlights the increasing importance of powerful techniques for analyzing ancient DNA. The growing library of fossil DNA data “is giving us a lot to talk about,” says anthropological geneticist Theodore Schurr of the University of Pennsylvania. “Any human skeleton over 8,000 or 10,000 years old [that yields DNA] is going to reveal some very interesting and probably surprising insights.”

Given such accolades, it is ironic that, at first, the Mal’ta DNA study appeared to be a miserable failure. The effort got its start in 2009, after Kelly Graf, now an archaeologist at Texas A&M University, approached Willerslev with the idea of trying to extract DNA from one of the Mal’ta skeletons. Graf was studying...
The analysis of the Mal’ta boy’s DNA indicates modern Native Americans have a dual ancestry. The Mal’ta boy was a member of a genetic population that resided in the salmon-colored regions. They migrated to Beringia, and as a result nearly one-third of Native American ancestry is derived from them. The mauve-colored area is where the East Asian genetic population is thought to have resided. They also migrated to Beringia, and consequently at least two-thirds of Native American ancestry is derived from them. The stem of the purple arrows reflects the meeting of the two populations in Asian Beringia, and the divergent purple arrows represent two plausible routes of their migration to the Americas.

possible links between ancient cultures in Siberia and North America, and she had seen some of the famous remains at Russia’s Hermitage Museum in St. Petersburg. “Mal’ta is the queen site of the Upper Paleolithic in Siberia, and I thought it would be fascinating to learn more about who these people were,” she says. Willerslev was already a noted scientist, celebrated for his pioneering work in extracting ancient DNA from bones and fossils. Working together with Russian researchers, the pair ultimately obtained a DNA sample from the upper right arm bone of one of the Mal’ta skeletons, a boy who was three or four years old.

When Willerslev saw the preliminary gene sequences, however, he wasn’t impressed. It appeared that the ancient DNA had been contaminated by modern genetic material, perhaps from one of the many researchers who handled the skeleton since its discovery. As a result, “the study went on a very low priority in the lab for more than a year,” he says. Eventually, however, further sequencing revealed that
“the contamination problem was actually very small—we could deal with it.” (The study’s lead author, postdoctoral researcher Maanasa Raghavan, even completely sequenced herself in order to rule out her own DNA as a source of contamination.)

The genetic sequencing revealed, among other things, that the remains were that of a boy. But the more exciting insights came as Willerslev’s team began comparing the boy’s genomic sequence to those of other old skeletons and modern humans, including Native American groups, around the world. There was “a surprising genetic affinity,” says Willerslev. Indeed, statistical analyses showed that the Mal’ta boy was part of a population that appears to have contributed from 14 to 38 percent of the DNA found in the genomes of modern Native Americans. What the researchers didn’t find was also interesting. The Mal’ta boy showed little genetic similarity to East Asian populations, a group that also appears to have made a major contribution—perhaps 62 to 86 percent, according to the Nature study—to modern Native American genomes.

Taken together, the findings strongly suggest that two distinct ancient groups, one related to modern-day western Eurasians and another related to eastern Eurasians, merged to form the ancestral population from which the first Americans derived. Exactly when and where this contact occurred, however, isn’t clarified by the Nature study, Graf emphasizes. The two groups may have started interbreeding in northeastern Asia not long after the Mal’ta boy died, with their descendants ultimately moving east across the Bering land bridge that connected Asia and North America thousands of years ago. “There is still a lot we don’t understand about the timing and dynamics” of the earliest migration into North America, says Graf.

But the Mal’ta results do shed light on some other mysteries, the researchers believe. One is why some Native Americans carry a maternal genetic lineage known as haplogroup X, which is associated with western Eurasians, but not East Asians. Some researchers, such as Bradley and Stanford, have cited haplogroup X as evidence that the earliest North Americans migrated from Europe, not across Beringia from Asia. The Mal’ta results—showing that the boy shared a common Eurasian ancestor with modern Europeans—could explain how haplogroup X moved east across the Pacific, and not west across the Atlantic. The team’s analyses also all but rule out the idea that the presence of the European genes are purely the result of Native Americans interbreeding with Europeans who arrived in the late 1400s. “Now we have a much cleaner explanation, I think,” says Willerslev.

The Mal’ta boy’s genetic link to western Eurasia could also explain why some researchers see Eurasian features
in some ancient skulls found in North America. The initial studies of the approximately 9,400-year-old Kennewick Man skeleton discovered in Washington State in 1996, for instance, identified “Caucasoid” features. (Subsequent studies indicated a connection between Kennewick Man and northeast Asian and possibly Polynesian populations, not Caucasians.) The Mal’ta results could explain such “Paleo-Indian skeletons with… traits atypical of modern-day Native Americans,” Graf notes in a press statement.

The boy’s Eurasian connection wasn’t a total surprise, she says: In the early 1980s, the late archaeologist Christy Turner had concluded from dental studies that the Mal’ta skeletons were closely related to western Eurasian groups. But other researchers had come to different conclusions based on physical studies, so the new DNA evidence “was quite interesting, given just how far to the east this individual was located,” says Willerslev.

Still, Willerslev emphasizes that the Mal’ta results “don’t mean you can say Native Americans came from Europeans, or that [the Mal’ta boy] was a European. Rather, he represents an ancient population that contributed genes to both modern Eurasians and Native Americans.” And Graf observes that “so far, we have just this one skeleton, so our understanding may change as we get more [ancient] DNA sequences.”

For some archaeologists the Mal’ta data provides more compelling evidence that the First Americans came out of Asia, not Europe. “It confirms a scenario I’ve thought made sense for at least 10 years now,” says archaeologist Stuart Fiedel of the Louis Berger Group in Richmond, Virginia. “There are a lot of other indications in the physical archaeological record that there was some kind of linkage of prehistoric populations across Asia that connects Europe to Beringia and North America.”

Backers of alternative scenarios, however, aren’t convinced. The Mal’ta results “by no means… prove that [Eurasian genetic markers] came via Beringia,” says Bradley. One problem is that “the results don’t agree with the [physical] archaeology very well,” adds Michael Collins of Texas State University in San Marcos. Archaeologists have discovered settlements and Solutrean-style artifacts in the Eastern United States, for instance, that appear to pre-date the Beringian migration, raising the possibility that European immigrants came first. “An equally plausible scenario is that Mal’ta could be the northeastern edge” of a proto-European population that ultimately moved west across the Atlantic, he says.

One of the best ways to sort it all out, researchers on all sides agree, is to get more ancient DNA from skeletons found in North America. Mal’ta is “good work and we need more of it,” said Bradley. “If only we can get some really old DNA from the Americas.”

That task, however, is sensitive, as many Native American groups have concerns about collaborating with DNA researchers, and have even gone to court to block genetic studies. (See “Revealing the Past Through DNA,” American Archaeology, Winter 2011-12.) Still, archaeologists are hopeful that more ancient skeletons soon will have their DNA revealed. An excellent case is the recent study of the Anzick child, who was found at a Clovis site in Montana. DNA extracted from the remains shows the child was a member of a group that is ancestral to all Native Americans. The Anzick child also has ties to the Mal’ta child and his Siberian population. Studies of additional ancient skeletons “could really help clarify the genetic map of early human migrations,” says Fiedel.

That’s a challenge that energizes Willerslev. “There is so much to do,” he says. “It’s exciting; this really is the golden age of ancient genomic research.” That’s something the Siberian peasant who stumbled across the Mal’ta site almost certainly never imagined.

DAVID MALAKOFF is a deputy news editor at Science magazine in Washington, D.C. His article “A History Inscribed On Trees” appeared in the Summer 2013 issue of American Archaeology.
Blackwater Draw is one of the most significant sites in the New World. Archaeologists have been working there for decades to uncover the details of life thousands of years ago.

By Tamara Stewart

Researchers work at Isequilla’s Pit last summer.
We peer into the corner of the large, square pit as archaeologist David Kilby and his students excitedly show us their latest find—a bison carpal (toe bone), the first intact element so far encountered in this 9,000-year-old level of Isequilla’s Pit. This partially excavated pit is found at Blackwater Draw Locality No. 1, also known as the Clovis site. It was deeply buried and remained damp enough to be preserved, but the bone had not fossilized and was therefore extremely fragile and had to be excavated with wooden tools.

The bone is especially heavy, suggesting it may be intact enough to contain bone collagen, allowing for direct dating. “These bones are so old, there’s usually not much collagen left, but some are better preserved, so we can possibly get a bone collagen date,” explains Kilby, an archaeologist at Eastern New Mexico University (ENMU) who is directing a field school at the site.

An amazing amount of research has been done at Blackwater Draw. During this, the 81st field season at the site, students from ENMU are busily working along what was the south bank of a now dry ancient lake. Given the large number of students and volunteers this year, they are working in two separate areas: the South Bank Interpretive Area and Isequilla’s Pit, named for the archaeologist Alberto Isequilla, who dug the pit between 1967 and 1969, leaving few field notes and no published report. ENMU has managed this portion of the site since the early 1970s, running field schools here in 2009, 2010, and now in 2013.

In order to better understand the exact location, extent, and details of Isequilla’s abruptly abandoned excavation, ENMU students successfully relocated and mapped his excavation grid during the summers of 2009 and 2010, excavated Late Paleo-Indian and Folsom-age units, and recovered more than 500 faunal specimens and stone artifacts. “The extent and nature of the pit was previously poorly understood, but we’re getting a handle on it now,” said Kilby.

In addition to better understanding Isequilla’s previous work here, the students are expanding, mapping, and sampling the 26-foot-long stratigraphic profile of the northeast wall of the pit. The researchers erected a sand dam and concrete blocks to protect the pit from filling with floodwaters in the event of an intense storm, a recurrent problem several years ago.

“We want to understand the shape of this part of the basin, which reflects the shape of the ancient lake and helps us better understand the site’s stratigraphy,” Kilby says of the site’s south bank. “This is such a cool field school, we really feel like we hit the jackpot here, being able to work at such a famous, significant site” adds one of the students.

Blackwater Draw is world-renowned because it’s the first site to clearly demonstrate that humans hunted Isequilla’s Pit, named after the archaeologist Alberto Isequilla, was first excavated in the late 1960s.
now-extinct megafauna some 13,500 years ago in the New World. Due to the excellent preservation, the site offers a nearly continuous record of prehistoric changes in climate, flora and fauna, and human occupation that’s considered one of the best in North America.

A 2011 grant from the National Science Foundation (NSF) provided ENMU undergraduate students with the opportunity to participate in interdisciplinary research on climate change and water resources in eastern New Mexico. “This is a great site for paleoenvironmental research, since it’s flat, there’s no volcanic activity, and it’s almost a basin, with no drainage or land movement, so things preserve in situ,” says site director George Crawford, who has been working here for nine years. The students compiled pollen, phytolith, diatom, ostracod, mollusk, and stable carbon isotope data as well as dates and stratigraphy from the pit and other locales within the site and adjacent areas to better understand the effects of climate change on the water resources and ecology of this region. One of the sampled areas, known as Locality X, is a recently discovered late prehistoric campsite adjacent to the Pleistocene springs and lake.

“As the last Ice Age was coming to an end, there were profound changes in the environment,” says Kilby, who is studying the ancient climate of the region and the ways people adapted to these changing conditions. During that time, small, highly mobile hunter-gatherer groups roaming the Southern High Plains encountered an oasis at Blackwater Draw. The site’s spring-fed lake was a watering hole for Columbian mammoth, ancient bison, and other Pleistocene fauna large and small beginning about 22,000 years ago. Thus the location became a popular hunting ground and campsite for early Americans.

Now a National Historic Landmark located between the modern towns of Clovis and Portales in eastern New Mexico, the site was first identified by teenager James Ridgely Whiteman of Clovis in 1929. Whiteman had long hiked the area, noting the abundant bones and artifacts, when he decided to send a stone spear point from Blackwater Draw to the Smithsonian Institution. This prompted...
vertebrate paleontologist Charles Gilmore to tour the site. After an hour-long visit, Gilmore, who had seen only bison bones and a mammoth tooth but no human artifacts, declared that the area did not contain enough significant materials to warrant excavation.

Meanwhile, paleontologist Edgar B. Howard of the Academy of Natural Sciences of Philadelphia, who had heard about the site, came for a visit in 1932. He quickly assessed its significance and began excavations the following summer, hiring Whiteman as a field hand. Wind erosion and gravel quarrying had exposed the remains of extinct animals, and Howard, accompanied by John Cotter of the University of Pennsylvania Museum of Archaeology and Anthropology, Chester Stock of the California Institute of Technology, who studied the vertebrate fossils, and Ernst Antevs of the Carnegie Institute, who investigated the area’s geology, excavated the site between 1933 and 1937, undertaking one of the first interdisciplinary projects in North America.

The researchers uncovered the remains of two mammoths associated with human artifacts dating to around 13,000 years ago, which was thousands of years earlier than people were believed to have been in North America. The discovery changed scientific theories about the human past and the peopling of the New World. Additionally, the discovery of slightly younger Folsom artifacts with extinct bison remains at the Clovis site verified the earlier 1927 finds at the Folsom site in eastern New Mexico upon which the human occupation of late Pleistocene North America was first based.

Investigations in the 1940s by Elias Sellards with the Texas Memorial Museum demonstrated the site’s extensive stratigraphic record, establishing the sequence of early archaeological cultures in the Southern Plains and the Southwest. “Blackwater Draw is one of only a handful of archaeological sites with well-preserved, stratigraphically discrete remains of multiple Paleo-Indian occupations,” says Kilby.

The discovery of extinct mammoth and bison bones in association with man-made tools at Blackwater Draw resulted in the identification of the Clovis culture, and it became the Clovis type-site. (A type-site is a place that’s considered an excellent example of, and also gives name to, a particular archaeological culture. In this case the name comes from the nearby town of Clovis.) Evidence of ‘caching’ behavior by Clovis people has also been found in two different locations at Blackwater Draw, a distinctive component of the Clovis culture that is becoming better documented through ongoing discoveries of artifact caches—stashes of Clovis period tools, often exquisitely made of exotic materials—found across North America.

The Clovis people entered the Americas around 13,500 years ago, apparently migrating from Siberia across the Bering Land Bridge as they pursued herds of mammoth, bison,
and other animals. Megafauna such as the Columbian mammoth went extinct at about the same time Clovis hunters were becoming established in North America, fueling a debate regarding whether the animals’ extinction was due to human hunting, climate change, or a combination of both. Though Kilby and Crawford aren’t trying to answer the megafaunal extinction question, their paleoenvironmental reconstructions indicate that the Pleistocene was not only colder than today, but also wetter, as evidenced by the lake that existed between 10,000 and 13,000 years ago. Then, after about 10,000 years ago, it became increasingly arid, with a huge drop in evergreen pollen, and a decline in microfaunal species diversity.

“So far our paleoenvironmental reconstruction reflects relatively abrupt changes that accompanied the transition from a comparatively cooler, wetter, and less seasonal Pleistocene climate to the warmer, drier, seasonally variable environment we know today,” says Kilby. The effect of these changes on water resources is recorded in the site’s buried stratigraphic layers, such as evidence of the ancient lake that, as time passed, was reduced to a pond, and then a marsh, before going dry sometime between 6,000 and 8,000 years ago.

“As the Pleistocene-Holocene transition represents the most recent analog to modern global warming, a better understanding of its effects stands to provide information relevant to understanding and anticipating changes to New Mexico water resources as a result of contemporary climate change,” the researchers wrote in their NSF grant proposal.

Twenty hand-dug wells, dating from the Clovis through Archaic periods and considered to be the earliest water-control system in the New World, have also been documented at the site. Most of the wells were dug during the Archaic period, when the climate became more arid. Antler picks and scoops made of turtle shells were found near the wells, which were dug closer to the center of the lake as the water level receded over time. The changing well locations give a clear indication of the evaporating lake and lowering water table.

A small herd of deer, still attracted to the area, runs across the site’s grassy slopes. Stacey Bennett, a graduate student at ENMU, enthusiastically greets us and shows us the highlights of the small visitor center: the mammoth and bison bone displays and historic photographs of early researchers and excavations. A self-guided tour of Blackwater Draw allows visitors to hike along tree-lined dirt trails where periodic interpretive signs provide information about the site’s features.

Strata dating from 4,000 to nearly two million years ago are visible in the surrounding cliffs, exposed through years of gravel mining. The Clovis site has had a complex history of excavations from the 1930s to the present, with work often taking place just ahead of, or in the midst of, gravel mining operations that continued at the site until the 1970s, when ENMU acquired it. Despite years of mining, many faunal and cultural deposits remain well preserved.

Beyond the visitor center, along one of the trails, lies the South Bank Interpretive Area. Noted archaeologist and geologist C. Vance Haynes, now emeritus Regent’s professor at the University of Arizona, worked sporadically on the stratigraphy of the site’s south bank between the mid-1960s and the early 1980s, undertaking the most detailed and comprehensive treatment of the site’s stratigraphy to date. Haynes and
Smithsonian Institution archaeologist Dennis Stanford led excavations along the south bank between 1983 and 1984, revealing the full series of strata representing Paleo-Indian through Archaic period cultural sequences.

In 1997, ENMU developed the South Bank Interpretive Area, allowing visitors to view the work done in 1983-84 as well as subsequent excavations to expose more of the site’s ancient animal bones and associated artifacts. The area is carefully excavated in scaled grids with the bones left in place on pedestals of dirt so that viewers can see their condition when found and, in some cases, the associations of extinct animal bones with human weapons. Some bones that appear to still contain collagen might be sampled, but for the most part they are all left in place for the exhibit. Now that the ancient bones are exposed to fluctuating temperatures and humidity, the students stabilize them with PaleoBond, a super glue-like substance that penetrates their surfaces and protects them from further decay.

“The beauty of the interpretive building is that the excavation can be left open year-round,” Bennett says. “Although it’s tricky to excavate in this way, it does have its rewards.” Students have exposed an additional 20 square feet of the bone bed in the South Bank Interpretive Area this field season.

Portions of 28 mostly female Columbian mammoths of all ages have been found here over the years. The arroyo running through the area appears to have been used by ancient people to trap and kill animals. “We see the ancient use of geomorphic features to corral animals into confined areas,” explains Kilby. “Work at the site is helping to refine how paleo folks acted on the landscape.”

After this summer’s field session, the students backfilled Isequilla’s pit, creating a stable, sloping surface for the pit walls to ensure the stability of the underlying deposits. Detailed analysis of the recovered stone artifacts and faunal remains will continue in the ENMU lab throughout early 2014.

“Our paleoenvironmental analysis has allowed us to make some predictions concerning the effects of climate change on water resources in our area,” Kilby summarizes. “First, environmental change may not be evenly paced.” For example, some 13,000 years ago Blackwater Draw had a lake and wetlands. Then precipitation gradually decreased, with minor effects on the flora and fauna. But as time passed, a tipping point was reached. “After 10,000 years ago there was a crash in species diversity,” he says. “Certain plants and animals could no longer be sustained, leading to changes throughout the ecosystem of which they were a part.”

In the past, and perhaps in the future, environmental transformations might be centuries, or possibly only decades, in the making. However long it takes, once a tipping point is reached in one component of the environment, such as water resources, it can “lead to domino-like repercussions” in other components, such as the flora and fauna, he says.

“Our results indicate that profound environmental changes are to be expected, with foreseeable and perhaps some unforeseen ecological, demographic, and economic impacts,” says Kilby. Some changes will not be foreseen because “ecosystems are complex enough that it is not always possible to predict the effects that change in any one component may have on other components.” Be that as it may, one thing is certain: climate change, whether in the past, present, or future, is extremely complicated.

TAMARA STEWART is the assistant editor of American Archaeology and the Conservancy’s Southwest region projects coordinator.
One day in 2007, the owner of a field that covers part of the 1,000-year-old Carson Mounds group in northwest Mississippi began leveling the land to improve its drainage. As a result, as much as three feet of dirt was scraped off the tops of small mounds and a midden, and hundreds of human remains were exposed.

The next day a graduate student studying the site saw the bones, and he contacted John Connaway, an archaeologist with the Mississippi Department of Archives and History, who in turn contacted Jessica Crawford, the Southeast region director of The Archaeological Conservancy. “We ran out to the site and saw bones everywhere. To see all those remains destroyed as well as the information they held was heartbreaking,” Crawford says.

It’s illegal to dig up human remains, including ancient burials, on private property in Mississippi without a permit from the state. Plowing must stop until the state can remove the bones, or the site is mitigated in some fashion to...
preserve it. However, once the bones and associated artifacts are removed, there is nothing to stop the owner from plowing again. So Crawford negotiated an easement, a legal agreement that allows Connaway to excavate a three-acre portion of the field that has the highest concentration of burials and archaeological resources before plowing resumes. Without an easement the owner probably would have slowed down long enough for the bones to be recovered, she says. “All you would end up with is bags of bones and little else.” Plowing resumed on the rest of the 10-acre field.

Carson was built by the Mississippian people, and it once consisted of 89 mounds. The six largest mounds remain, and the Conservancy owns four of them. But most of the smaller mounds, including those in the field covered by the easement, have been destroyed by plowing during the past century.

Since Connaway began excavating the field six years ago, he has recorded the remains of about 250 men, women, children, and infants, who were buried in 65 pits. Each pit contained from one to 36 individuals, some buried three deep. “It’s unusual because of the density of burials,” he says. “It suggests that people from other villages were bringing their dead here to be processed and buried.”

Connaway’s excavation is the first at the Carson site in nearly 100 years. In addition to the cemetery, he’s identified the remains of 23 typical Mississippian wall and trench houses and several unique dwellings. These include two platform houses that were built on stilts, like the houses the Spanish explorer Hernando de Soto described in his journals, that stood 18 to 20 feet above the ground to avoid flooding. Only three other stilt houses have been found at Mississippian sites in the area.

Connaway also discovered the remains of four houses with sunken floors similar to dwellings used at Cahokia, which is nearly 400 miles away. Nothing like them has been found at any other site in Mississippi. Flakes of white chert, which comes from the Cahokia area, were all over the floors. There was very little trash other than these chert flakes, which suggests that the houses were not occupied for long. Connaway thinks they were built and used temporarily by Cahokia traders who arrived by way of the Mississippi River.

The extensive excavation of this portion of the Carson site, which is due to the threat of imminent destruction, is unusual for sites managed by the Conservancy, which advocates conservation archaeology and generally limits invasive research to an area no larger than five percent of the site. That ensures that future archaeologists will have largely undisturbed sites to study when more advanced technology is available.

The Conservancy also salvages archaeological information at sites threatened by erosion and other natural causes, according to Mark Michel, the Conservancy’s president. For example, Michel and Andy Stout, the organization’s Eastern region director, have encouraged archaeologists at the University of Maine to conduct research at the Waterside Shell Heap site in Frenchmen’s Bay, Maine, before it erodes into the Atlantic Ocean.

Stout says the site was excavated in the 1940s, and the work confirmed that the seafaring Red Paint People, who covered the bones of their dead with red ochre paint, occupied coastal Maine from 2500 to 1800 B.C. Although swordfish bills were found on the surface of the middens, there was no evidence of the smaller fish they consumed because
the archaeologists did not follow the now commonplace procedure of screening excavated dirt to recover tiny fish bones and other small artifacts. This information is important because it also speaks of the marine ecology during the late Holocene when the climate was changing. The University of Maine researchers recently took core samples from the middens to look for fish scales and other food remains.

More typically, researchers approach the Conservancy about projects they’d like to pursue on one of the organization’s more than 470 preserves. The Conservancy welcomes projects as long as there is a good research question, according to Michel, but getting the money to do the work can be challenging. “More projects would be underway if funding was available,” he says. Gordon Wilson, chairman of the Conservancy’s Board of Directors, notes that the board is talking about establishing a research assistance fund at some point.

The requirements for conducting research at a Conservancy preserve are as stringent as for projects funded by the National Endowment for the Humanities or the National Science Foundation. Applicants must be professional archaeologists affiliated with a university or institution, and they are required to use the most current technology, properly conserve and store artifacts, and file reports each year.”Research has no value if it’s not reported and collections are not properly curated,” says Michel.

Invasive procedures such as excavating must be vetted by a peer review committee that may offer suggestions to fine-tune projects. The president and the board of directors have final approval. Michel recalls only one request that has been denied since the Conservancy was founded in 1980. “The researcher wanted to excavate too much of a very small site,” he says.

Digging is more likely to be approved at large sites, or at sites where excavations were underway before the Conservancy acquired them. Such was the case with the Gault site, in central Texas, which has yielded evidence that’s contributing to our understanding of the first Americans. Lead investigator Michael Collins has been excavating Gault since 1991. Collins later purchased the site and donated it to the Conservancy in 2007 to prevent it from being a place where people could pay to dig, which one of its previous owners had allowed.

It’s the largest known Clovis site in North America, according to Collins, with deposits that date to about 13,000
years ago. Excavations have also unearthed a deep layer of pre-Clovis cultural material that dates to roughly 15,000 years ago. Artifacts unearthed at the site include projectile points, knives, and etched stones, as well as flakes from tool making.

“The way Clovis artisans made stone tools is unique on the face of earth,” Collins says. Clovis spear points are about six-inches long and lance shaped, with distinctive flaking patterns and flutes on both faces. “Everything was oversized—like muscle cars. It was overkill,” he says. In comparison, pre-Clovis projectile points are “little bitty points less than two-inches long with dinky stems and shoulders. They are completely different.”

Archaeologists have uncovered a seven-square-foot stone pavement with a thin scatter of stone artifacts on and around it as well as bones of large animals nearby. It is not known whether any kind of structure was erected over the pavement and, so far, it has not been possible to precisely date this feature. Using a technology known as optically stimulated luminescence, researchers have dated the pavement to nearly 14,000 years ago. Though this is a pre-Clovis date, the error factor of this technology is such that the pavement could in fact date to the earliest part of the Clovis period. Whatever its exact age, the people who used this pavement evidently intended to stay long enough to warrant the effort of building it.

The Conservancy’s Jim Walker stands by a monolith found at Yellow Jacket Pueblo, a preserve in Colorado. Some archaeoastronomers have speculated that the monoliths could have been used as solstice markers.

But more often the Conservancy encourages noninvasive research such as remote sensing, and mapping, as well as minimally invasive work like soil sampling. Ann Ramenofsky, professor emeritus at the University of New Mexico, has been using mostly noninvasive techniques to study Pueblo San Marcos, a 60-acre site the Conservancy acquired in 1998. She wants to know how the Native American population changed before and after contact with the Spanish.

Located between Albuquerque and Santa Fe in New Mexico’s Galisteo Basin, Pueblo San Marcos was first occupied around A.D. 1280. One of the largest pre-Columbian villages in the Southwest, it was a major trading center for distinctive glaze decorated pottery made at the pueblo and turquoise from the nearby Cerrillos Hills. After the Spanish arrived, it became a mission with a resident priest and church during the 1600s. The pueblo was permanently abandoned by its residents during the Pueblo Revolt in 1680.

Ramenofsky and her students have determined the chronology of occupation in the pueblo’s 43 roomblocks by collecting and dating over 7,000 glaze-paint pottery sherds and about 1,450 pieces of obsidian from 20 middens adjacent to the room blocks. This was done using a procedure called systematic surface collection and artifact analysis, in which the artifacts were collected, analyzed in a laboratory, and then many were returned to their original midden contexts.

Contrary to traditional thinking, the pueblo wasn’t continuously occupied by sedentary people, according to Ramenofsky, and the population in fact fluctuated dramatically. “People came and went,” she says. The population peaked at around 2,000 in the 1400s, declined after the Spanish arrived in the 1500s, and then increased in the 1600s, leading up to
the revolt. Ramenofsky attributes the last surge to an influx of immigrants from other communities that had dispersed.

Minimally invasive techniques are also being employed at White Potato Lake Garden Beds in northeast Wisconsin, where evidence is revealing that the Menominee Indians practiced sophisticated, sustainable farming in the same location from A.D. 900–1450. The project is led by David Overstreet, an archaeologist at the College of the Menominee Nation in Wisconsin, and is the first systematic, multidisciplinary study of prehistoric raised garden beds.

The gardens are located in the northernmost zone for growing corn, which needs 120 frost-free days from germination to harvest. Overstreet wants to understand how the gardens functioned not only at this northern limit, but also in the face of changing climate during the Little Ice Age of A.D. 1350-1850. Growing corn here during that time would have been unlikely, and he’s trying to understand how they did it.

The Menominee built up the soil into rows of ridges as much as two feet high to create beds in which they planted seeds. While it is assumed that the purpose of the beds was to create an improved microenvironment for growing plants, the actual function of the raised beds is not certain. It has been suggested that they served to drain water or frost and to increase soil temperature by absorbing additional solar radiation through the sides of the beds.

Analysis of phytoliths, which are microscopic material from decayed plants found in the soil, has shown that the Menominee were cultivating corn, squash, and possibly goosefoot. Studies have also shown that they improved the fertility and structure of the beds by adding silt and ash to the soil.

“I am stunned by the type of sophisticated agriculture we’re seeing. They managed moisture, chemistry, and the shape of the landscape. It was a lot more labor intensive than we thought,” he says. They were not “reluctant gardeners” and limited hunter-gatherers, as some historians have described them.

Some researchers are also using creative ways to minimize the impact of sampling. Rather than excavate Hotchkiss Mound, a site in west-central California, to obtain information about the diets of its prehistoric residents, Jelmer Eerkens of the University of California, Davis, is analyzing samples from piles of dirt that were dug by previous researchers. Those excavations weren’t as scientific as Eerkens might like, given that those “previous researchers” were gophers, but nonetheless he has been able to extract usable samples that shed light on the ecology of the California Delta at the time.

Archaeologists working at Conservancy preserves have on occasion discovered that the cultural resources are more significant than they originally thought. For instance, before the Conservancy acquired the Carhart Pueblo in southeast Utah, the property owners excavated a kiva looking for artifacts. According to Jim Walker, the Conservancy’s Southwest region director, they didn’t find much. But when a graduate student re-excavated the kiva, she discovered that it was built in a radial beam architectural style found in kivas at Chaco Canyon. A tree ring date from the beam indicates that it was built around A.D. 1017, which makes it one of the earliest known, northernmost Chacoan outliers in the area.

At the Jaketown site in west-central Mississippi, where three prehistoric mounds are visible, a graduate student taking core samples to examine the construction of the mounds discovered several more five- to six-foot-tall mounds below the surface that had been buried over the years by mud from floodwaters.
Researchers have also discovered that the Conservancy’s sites sometimes aren’t what they thought they were. At the Backusburg Mounds in Kentucky, a field school from Murray State University, led by Tony Ortman, discovered that one of the mounds wasn’t made by humans, but by Mother Nature. Referred to as a “look-out” mound for nearly 100 years, Ortman’s work demonstrated that one of the most prominent features of the archeological site is in fact a natural erosional remnant.

The Conservancy’s sites are also being used to teach research techniques to college students. At Fairmont Butte, a site in the Mojave Desert in southwestern California that was occupied over 4,000 years ago, students learn field techniques such as mapping with Darcy Wiewall, a professor of archaeology at Antelope Valley College. “It’s a win-win situation,” she says. “The students learn about archaeology in the field and the Conservancy gets updated site maps every year. The students also help clean up trash left by ATV enthusiasts and learn about being site stewards.

Cory Wilkins, the Conservancy’s Western region director, says the mapping helped define the boundaries of the site and verified information from earlier studies and excavations. Fairmont Butte has an extensive rhyolite quarry, rock art, temporary camps, and permanent villages. Wiewall hopes to excavate part of the site that was previously dug to obtain bone or charcoal samples that can be radiocarbon tested to get more accurate dates for that part of the site. Dating technology has improved dramatically, and as a result researchers like Wiewall are asking permission to obtain new samples from the Conservancy’s sites to get more precise dates. “I can’t imagine what technology will be like in the next 10 years,” Stout says.

The future will also bring new ideas and new questions. “The only way to test them is on an unexcavated site,” says Walker. “A major portion of every archaeological site should be left for future study.” Some archaeologists have erroneously assumed that the preserves are indefinitely mothballed, but in fact “we create archaeological preserves to make them available for research,” says Paul Gardner, the Conservancy’s Midwest region director. “It’s our raison d’etre.”

PAULA NEELY has written for nationalgeographic.com and DIG magazine. Her article “The Tales of Ancient Textiles” appeared in the Winter 2012-13 issue of American Archaeology.
During the summer of 2013 the Conservancy was informed by Rich Talbot, the director of the Office of Public Archaeology at Brigham Young University in Cedar City, Utah, that the Smith family was interested in preserving 196 acres of land that contains a significant rock art site. Reva, Blake, Marlin, Scott, and their families represent the third and fourth generations of Smiths to use the property, and they decided to donate it to the Conservancy.

A Remarkable Rock Art Site

The Adelbert Doyle Smith Family Archaeological Preserve contains hundreds of petroglyphs.

Roughly pecked geometric designs embellish one of the many boulders that line the cliff face at the Smith preserve. This design was likely made by striking the boulder with a stone, a technique that generally made for imprecise lines.
in honor of Adelbert Smith, who purchased the land in the 1950s.

In the fall of 2012, the Conservancy made arrangements with the Smith family to see the site. Blake Smith led Lane Richards from Brigham Young, rock art expert Charmaine Thompson of the U.S. Forest Service, and members of the Conservancy to one of Blake’s favorite petroglyphs, a human figure that appears to be donning an elaborate headdress. Other petroglyph styles included geometric shapes and animal forms, as well as abstract designs.

Three different techniques were used to make petroglyphs. One technique required the artist to scratch or incise lines with a handheld rock or stick. Another technique consisted of repeatedly striking a pointed hammerstone against the rock surface. In the third method, the artist used two stones—one serving as a hammer and the other a chisel—to form the image. The latter two techniques were used to etch the Smith petroglyphs.

The site has hundreds of the petroglyphs, and most of them are concentrated along a rock outcropping that forms two cliff faces that overlook the western shores of Lake Utah. In addition to the rock art along the outcropping, there are numerous pecked images on the boulders that have rolled downhill from the cliffs over the millennium. Based on their styles, Thompson thought that some of the petroglyphs could be as old as 6,000 years.

There are also two architectural features located near the shoreline that could be the remains of a habitation site. Other architectural features include three rock cairns and a short rock wall.

Future plans for the site include fencing the property, writing a management plan, and recording the petroglyphs and adding them to the database of rock art in the Provo area. This project will involve local historical and archaeological groups as well as experts from Brigham Young who have expressed an interest in the site.

—Chaz Evans
A Glimpse of Ancient Soapstone Production

The Conservancy acquires the largest prehistoric soapstone quarry in Virginia.

The Prince Edward Soapstone Quarry is located on 12 acres of land near Farmville, Virginia. More than 150 piles of soapstone (also known as steatite) boulders and preforms span the length of the site. It was first documented by Jim Jordan, an archaeologist at Longwood University who uncovered stone axes and possible soapstone vessel fragments there. One particularly striking artifact is a soapstone boulder that has been carved with an image that appears to be a snake. The boulder piles were later mapped, and their linear pattern suggests that they sit on a seam of soapstone that runs along a ravine.

Preforms are steatite boulders that humans formed into an ovoid shape in preparation for making them into bowls. Creating the preform is the first step in soapstone vessel production, as the stones were more easily handled after they had been shaped into oval forms.

The quarry dates to the Late Archaic period (ca. 3000–1000 B.C.), the end of which was characterized by the production of vessels and other objects carved from soapstone. The vessels were generally shallow and oblong or rectangular with lug handles for carrying. The piles likely represent resource stockpiling.

The Late Archaic was followed by the Early Woodland period, which was characterized by the introduction of ceramic pottery in the area. The raw materials for making clay vessels were more plentiful, and the finished products were lighter and could be transported more easily than stone. As a result, soapstone eventually fell out of favor, and this is likely why the quarry was abandoned.

According to the State Department of Historic Resources, Prince Edward is the largest and best preserved of Virginia’s approximately one dozen soapstone quarries dating to this period. Mining, looting, logging, and residential development have destroyed many other ancient quarries in the state, and Prince Edward is threatened by some of these same activities.

Hanna Brooks Burruss and her husband Hubert Whaley recognized the quarry’s significance, so they donated the land to the Conservancy. An avid archaeology and history buff, Burruss grew up in a household where these topics were commonplace. Her father, Robert Burruss, owned the Pamplin Pipe Factory that the Conservancy acquired in 2009.

Other than Jordan’s work, little research has been done at the site, consequently the Prince Edward Soapstone Quarry has great potential for research on prehistoric mining and steatite trade in the Mid-Atlantic and Southeast regions. —Kelley Berliner
The Portuguese Bench site is a prehistoric village nestled on the eastern edge of the Sierra Nevada Mountain Range in southeastern California. The site contains an extensive midden deposit that was excavated from 1983 to 1986 by a UCLA field school under the direction of David Whitley. Researchers have also found fire hearths, living surfaces, possible storage pits, a petroglyph panel, stone tools, and other artifacts.

Using obsidian hydration and diagnostic projectile points, researchers have concluded the village was occupied on and off from roughly 3,000 to 800 years ago. The site lies near Sugarloaf Mountain, an important obsidian quarry. The large quantities of manufacturing debris indicate the obsidian was brought to the site, where projectile points and knives were fashioned.

Analysis of the faunal and botanical remains show that Coso Shoshone people who lived here consumed large game, but smaller game, especially black-tailed jackrabbits, was a staple of their diet. The botanical material suggests both local and nonlocal plants and seeds were gathered and harvested.

The site also has a small petroglyph panel containing representations of bighorn sheep and hunters. These figures are common in the rock art made by the Coso Shoshone people who occupied the site. Coso rock art is found throughout the Coso Range region, an area that incorporates the northern Mojave Desert and the southwestern edge of the Great Basin. These depictions are one of the largest concentrations of petroglyphs in North America.

“This site, the only excavated village containing Coso petroglyphs, has been critical to resolving debate about the origin of this art,” says Whitley, a noted rock art expert. “Contrary to early speculation, the faunal remains provide no evidence for a bighorn sheep-hunting cult, indicating that the engravings were associated with other kinds of beliefs and practices. The size and richness of Portuguese Bench suggest that it has the potential to address many additional questions about Great Basin prehistory.”

The Conservancy is purchasing a 73-acre parcel that incorporates the main village location and petroglyph panel. The remaining portion of the site is protected by the Bureau of Land Management. —Deanna Commons
High Altitude Farming

The Paul–Bauman Pueblo could reveal why the Anasazi farmed at such high elevations.

The Paul-Bauman site is the latest addition to an important network of nine Anasazi sites owned by the Conservancy between Cortez, Colorado, and Monticello, Utah. The Paul–Bauman Pueblo was named after Teri Paul and her husband Kyle Bauman, the archaeologist who purchased this land in 2006.

The site came to the Conservancy's attention early last spring when an employee was informed by Madalyn Bills, the lead park ranger at the Edge of the Cedars Museum, that Paul, the museum’s director, had property for sale that contains significant archaeology. The site is located along a tributary of the San Juan River and may be part of a much larger prehistoric farming community. It has the potential to provide insight into the function of farmsteads along the San Juan’s tributaries. It may also contain information about how people farmed at such a high elevation, where an early frost or late snow could harm crops.

It’s thought that the development of farmsteads in the Four Corners region preceded the expansion of great houses at Chaco Canyon. The first great houses were in Chaco proper, and it took almost 100 years before they were built in the outlying farming districts. Some researchers believe these farmsteads are a manifestation of an increase in agricultural productivity between A.D. 800–1100 due to population growth, and the commensurate increase in demand for food, and an auspicious climate that helped to satisfy that demand.

As the number of great houses grew throughout the Southwest between 800 and 1100, storage space at farmsteads did not grow, however storage space grew exponentially at Chacoan great houses and regional population centers, suggesting that farmsteads were linked to these population centers through the production and distribution of their surplus crops. Consequently these farmsteads, which may have been controlled by Chaco, are considered by many researchers to be a crucial part of the agricultural economic system in the Southwest.

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

The site contains a large concentration of burnt mud or daub, devoid of stone building blocks. This could indicate the remains of an early pueblo where the adobe has melted away due to weathering over the past 1,300 years. Other artifacts surrounding the daub include a carved stone pendant, ceramics, a grinding stone, chipped stone debris, and a hoe. The hoe showed significant polish on the tip, presumably from striking the dirt, which would indicate that it was used for dry-land farming. Based on the ceramic styles, the age of the site is estimated to be between A.D. 700 and 1100.

These artifacts indicate that this was a habitation site, and at nearly 7,000 feet in elevation, it is particularly important because it represents a small high altitude farmstead, which is part of a prehistoric land-use pattern that is poorly understood within the region. It’s possible that the Anasazi resorted to farming at this height because the arable land at lower elevations was limited.

The Conservancy will build a perimeter fence around the site, and in conjunction with tribal groups, archaeologists, historians, and neighboring residents, will formulate a management plan for the property that will help to guide future research and visitation. —Chaz Evans

This pendant is one of the artifacts that suggest people lived at this site while farming it.
The Conservancy Backfills Elk Ridge

SOUTHWEST—Elk Ridge is a Mimbres Classic-phase site located in the northern portion of the Mimbres Valley in southwest New Mexico. It is one of the few relatively intact pueblos of this type left in the valley. Test excavations conducted by archaeologist William Russell in the late 1980s identified extensive cultural materials on the western portion of the site.

It appears to be a large, cobble-walled pueblo that was constructed around a central plaza. There is also a great kiva that likely served as a community and ceremonial center. After excavating, Russell, due to budget constraints, didn’t backfill the site. The Conservancy purchased the site from Russell in 2010, as well as an adjacent lot in 2011.

In September of 2013, with the help of Marilyn Markel and other volunteers from the Grant County Archaeological Society, the Conservancy cleared weeds, built check dams to control erosion, and laid down geotextile material over the archaeological features that were to be covered with fill material. The geotextile material allows for proper drainage and percolation of rainwater through the covered material, and when covered with dirt it stabilizes the architectural features.

If future excavation is conducted at the site, it will also act as a clear division between the fill and the natural deposits. In two days’ time the volunteers laid down over 400 feet of geotextile material, which was subsequently covered with over 640 cubic yards of fill material. The backfilling of Elk Ridge preserves this remarkable site for future generations.
The Fast Site is Surveyed

WEST—In 2011, during a partial survey of the Fast site in Lassen County in northeast California, researchers identified prehistoric habitation debris and a lithic scatter. It was assumed then that the 160-acre site contained additional cultural material. Recently Lowell Thomas, an archaeologist for Lassen National Forest and a graduate student at California State University, Chico, conducted a comprehensive survey of the site.

To date Thomas, with the help of Lassen National Forest employees and volunteers, has located a minimum of 10 discrete lithic scatters, three substantial residential sites that include several rock ring structures and other rock features, projectile points, cores, mortars, pestles, and petroglyphs. It’s estimated, based on the types and styles of the artifacts, that the Fast site was occupied from approximately 3,000 to 200 years ago.

“Survey efforts on and around the Fast Property have been, and continue to be, rewarding, as the sheer quantity and diversity of surface artifacts attest to the region’s rich prehistory and research potential,” says Thomas. “In particular, it is exciting to consider the project area has largely been spared from the developmental and recreational disturbances that so often plague the archaeological record elsewhere in the region.”

The survey is complete and Thomas is recording all of the cultural features. He developed this project for credit toward his master’s degree, and he would like to continue studying the Fast site and the surrounding area for his thesis project.

Lowell Thomas (left) and his father, Wes Thomas, pause while recording a petroglyph panel at the Fast site. Wes was one of the volunteers who assisted Lowell.

American Archaeology is Recognized in National Contest

The Spring 2013 issue of American Archaeology was recently recognized for editorial excellence by a panel of judges in Folio Magazine’s Eddie Awards. The issue was one of several finalists in the Technology/Computing/Telecom/Science category.

This is the fifth time American Archaeology has been recognized in Folio’s competition, which, according to its web site, "celebrates excellence in magazine editorial and design, and is the largest competition in the magazine industry. American Archaeology’s previous awards were for editing, writing, and design."
The Archaeology of French and Indian War Forts
Edited by Lawrence E. Babits and Stephanie Gandulla
(University Press of Florida, 2013; 320 pgs., illus., $80 cloth; www.upf.com)

The Seven Years War of 1756 to 1763 saw the great empires of France and Britain and all their allies fight for control of trade and colonies on four continents. Often called the first world war, it changed the course of history for many nations. Its North American component, the French and Indian War, was a defining moment in American history. For the first time, the British colonies acted together and learned that their interests were not necessarily the interests of the great powers. Colonial leaders like George Washington found that they could lead an army as well or better than the professional British officers, who had little knowledge of warfare on the frontier.

In America the war started early and initially focused on control of the upper Ohio Valley and its key outpost, Fort Duquesne at the forks of the Ohio River. From this base the French and their Indian allies conducted a devastating campaign against English frontier settlements in Virginia, Pennsylvania, and Maryland. As the conflict intensified, it spread south to the Carolinas and north to New York and the Great Lakes.

The response of the embattled colonists was to greatly expand a 1,000-mile string of frontier forts from South Carolina to Massachusetts, and even into the Ohio Valley. French Canadian settlers added their own forts. In this exceptional volume, the authors bring archaeology to the study of this key conflict. Fifteen noted scholars contribute important articles on a good sampling of these forts and the military strategy they represented. While each was unique, these forts represented the latest thinking in military engineering as adapted to the American frontier. From Fort Prince George in South Carolina to Fort Loudoun in Virginia to Fort Frontenac in Ontario and Fort de Chartes in Illinois, archaeologists are revealing the story of this important conflict.

Long overshadowed by the American Revolution, the 250th anniversary of the treaty ending the French and Indian War has prompted renewed interest as well as preservation efforts. This volume is an important contribution to a field of study that is just taking off. It sets the stage for new investigations of the dozens of frontier forts that remain unexplored.

Buried Beneath Us: Discovering the Ancient Cities of the Americas
By Anthony Aveni with illustrations by Katherine Roy
(Roaring Brook Press, 2013; 86 pgs., illus., $19 cloth; www.mackids.com)

This book for young people (age 10 and up) tells the story of the development of cities via an examination of four major ancient American ones—Cahokia, Tenochtitlan, Cuzco, and Copán. They are then compared to some modern cities like St. Louis and Mexico City. Along the way, common themes including military prowess, economic viability, and religion are examined. The importance of managing resources is a central theme. Richly illustrated, this work is a fascinating introduction to complex development in the Americas and its pitfalls.

Author Anthony Aveni is a distinguished professor of astronomy and archaeology at Colgate University, where he helped develop the field of archaeoastronomy. His depth of knowledge makes this much more than an ordinary children’s book. Parents and teachers will want to share this volume with their children to develop an interest in archaeology and human development.
The Archaeology of Hollywood: Traces of the Golden Age
By Paul G. Bahn
(Rowman & Littlefield, 2014; 256 pgs., illus., $37 cloth, $37 ebook; www.rowman.com)

The Archaeology of Hollywood is a light-hearted investigation of a magical era that is more a state of mind than a compact physical place. It is instead a group of five zones that reflect the material culture (that’s what archaeology is all about) of the film business from its Los Angeles origins in the early 20th century. There is the “industrial zone,” the studios where films are produced. The residential areas of Beverly Hills, Bel Air, etc. are where the wealth and power of the participants are on display. The “play areas” are for rest and recreation and include restaurants, bars, and nightclubs. “Ritual areas” include public relics of the movie cult, like sidewalk stars and footprints in cement. Lastly, there are the cemeteries where the graves provide clues to the status of the elite. Hollywood burial practices are a key element of the archaeological record.

Noted freelance British archaeologist Paul Bahn has assembled all of these themes in a very readable volume that examines the material remains of the film culture. Sadly, much of these remains are disappearing, and the author makes an urgent and poignant plea for preservation before it is too late.

Rock Art of the Grand Canyon Region
By Don D. Christensen, Jerry Dickey, and Steven M. Freers
(Sunbelt Publications, 2013; 272 pgs., illus., $25 paper; www.sunbeltbook.com)

Over the past 25 years, authors Don Christensen, Jerry Dickey, and Steven Freers have been recording and studying rock art at 450 sites in and around the Grand Canyon from the Mogollon Rim to the Utah state line. The results of this massive project are presented in some 425 photographs and 30 drawings that are a feast for the eye and the mind. These images cover a period from the Archaic to the near present, a continuous span of some 5,000 years.

The authors call themselves avocationalists, which is to say they lack formal training in archaeology, but rock art research defies scientific categorization. It is part art, part science, and part preservation. In recent years it has developed into a more formal discipline with generally accepted rules. The authors and their helpers reflect these developments, and this volume is an excellent example of what they can produce. In addition to everything else, this book contains how-to instructions for conducting rock art research.

Chapters cover the various aspects of investigation—research design, site classification, and rock art style. Research techniques are thoroughly explained, and the serious problem of dating rock art is discussed in depth. Lacking a practical and reliable scientific method of dating the art, researchers must rely on associated artifacts and recurring styles to approximate dates of execution. Every subtle clue is considered and recorded.

The chapter on rock art meaning is a fascinating discussion of the different theories and methods for interpreting the rock art subjects. Shamanism, astronomy, and memorials are just three popular explanations the authors consider without making a judgment. Lastly, they explore the problems of preservation. Rock art is fragile and it seems to attract an unusual number of vandals who like to paint on it, chip it off the stone walls, or just shoot it.

In addition to the stunning photographs, this volume is a valuable contribution to rock art research and the understanding of these enigmatic images. —Mark Michel
Yampa River

When: June 1–8, 2014  
Where: Colorado and Utah  
How Much: $1,995 ($175 single supplement)

Join us for a downriver adventure in Colorado and Utah, where we’ll float through Dinosaur National Monument and experience incredible scenery first described by explorer John Wesley Powell. We’ll visit remote archaeological sites, including Fremont culture rock art panels and prehistoric rock shelters, on this fascinating 70-mile journey down the Yampa and Green Rivers.

Effigy Mounds of the Upper Mississippi Valley

When: June 7–11, 2014  
Where: Wisconsin and Iowa  
How Much: $995 ($220 single supplement)

In what is now Wisconsin, prehistoric Native Americans constructed thousands of earthen mounds, more than in any other area of comparable size. We’ll visit the best surviving examples of these fascinating constructions with an emphasis on the sites of the Effigy Mound Culture, the characteristic mound builder culture of the upper Midwest. Some of the sites we’ll visit include Lizard Mounds Park, Effigy Mounds National Monument, and Aztalan State Park. The tour will begin and end in Milwaukee.

French and Indian War Tour

When: September 6–14, 2014  
Where: New York and Pennsylvania  
How Much: $1,695 per person ($295 single supplement)

Join us as we travel across New York and Pennsylvania to explore the rich history and archaeology of the French and Indian War. This epic struggle involving Native Americans, the English and French Empires, and Colonial forces was one of the first global conflicts and a defining moment in American history. On our journey we will meet with historians, archaeologists and native people at a variety of archaeological sites, museums, and interpretive centers. Some of the sites we will visit include Fort Niagara State Historic Site, Fort Ticonderoga, and Ganondagan State Historic Site. We’ll also stay overnight in picturesque Lake George, and stop at Niagara Falls.

The Yampa River offers breathtaking scenery.

Thirty-one of the 195 mounds in Effigy Mounds National Monument are effigies. These mounds are known as the Marching Bear Group.

Fort Stanwix National Monument in Rome, New York, is among the many highlights of the tour.
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. 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 featured on the tour.

Best of the Southwest

**When:** September 27–October 7, 2014  
**Where:** New Mexico, Arizona, and Colorado  
**How Much:** $2,595 per person ($395 single supplement)

The American Southwest is home to some of the best-preserved evidence of prehistoric civilizations in the New World. The magnificent ruins of Chaco Canyon and Mesa Verde are but two vivid reminders of the complex cultures that dominated the region between the 10th and 14th centuries. The Conservancy’s Best of the Southwest tour includes these two settlements as well as other prehistoric sites and modern pueblos where ancient traditions persist.

Oaxaca

**When:** October 24–November 3, 2014  
**Where:** Mexico  
**How Much:** $2,595 ($275 single supplement)

Join us in Oaxaca, Mexico, during one of the most unusual festivals anywhere—the Day of the Dead. On this day, people prepare home altars and cemeteries to welcome the dead, who are believed to return to enjoy the food and drink they indulged in during life. Rather than being a morbid occasion, it’s a celebratory one.

Our tour explores the Mixtecan and Zapotecan archaeological sites in the region, including Mitla, Monte Albán, San José Mogote, and Dainzu. You’ll have the opportunity to explore Oaxaca’s museums and markets as well as several crafts villages featuring weaving, pottery, carved animals, and other local art.

Emerald Mound, in southwest Mississippi, is 35-feet tall and covers eight acres.

Mesa Verde National Park offers approximately 600 cliff dwellings, including Cliff Palace.

Monte Albán is one of the oldest cities in Mesoamerica, dating to approximately 500 B.C.
Making Tax Time Less Taxing

As tax time approaches, you might be wondering if there are ways you can reduce the amount you owe to the IRS and increase what you give to charitable causes. One vehicle that many Conservancy members choose is a charitable gift annuity.

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Nevers site, New Hampshire

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