

Philadelphia: Artistry and Industry in the 19th Century

# ARCHAEOLOGY

archaeology.org

A publication of the Archaeological Institute of America

March/April 2017

## Kings of Ancient Mexico

The First  
American  
Revolution

Bronze Age  
Urban  
Planning

Rome's  
Frontier  
Strategy

**PLUS:**  
**Digging Digital Music,**  
**Shakespeare's New Stage,**  
**Montezuma Castle Under Siege,**  
**Hiding from Henry VIII**



OVER 120  
TOURS  
DEPARTING  
IN 2017 —  
STARTING  
FROM JUST  
\$970

## DON'T DO TYPICAL GROUP TOURS? NEITHER DO WE.

For over 30 years, Andante Travels has been a leading provider of cultural travel. Our tours are designed with the history lover in mind, with special access to sites and museums all over the world, expert guides, and intimate small groups of like-minded travelers. Book your place on one of our tours today, and join us to discover some of the most fascinating sites on Earth in 2017.

### KAZAKHSTAN

An epic journey through the majestic wild landscapes and glorious cities of this Silk Road land.  
*11th – 24th May | \$5,290*



### CRETE & SANTORINI

Marvel at Bronze Age Minoan palaces and world-class contemporary museums in the Aegean.  
*Throughout 2017 | \$3,495*



### LATIUM: THE ROMAN RICH

Explore picturesque hills and plains, once home to retreats for the great and good of Imperial Rome.  
*21st – 28th May | \$3,580*



### POMPEII

Walk the streets of eerily well-preserved Roman towns in the beautiful Bay of Naples.  
*Throughout 2017 | \$2,765*



### HIDDEN BERLIN

Enjoy unique, little-known experiences far beyond the usual tourist hotspots of this iconic capital city.  
*5th – 10th June | \$3,995*



### CLASSICAL SICILY

Get to know sunny Sicily's many ancient occupiers — Norman, Roman, Greek and Phoenician alike.  
*Throughout 2017 | \$3,790*



GET IN TOUCH: CALL, EMAIL OR VISIT US ONLINE TO FIND OUT MORE ABOUT OUR TOURS

- FROM AS LITTLE AS \$970 | EXPERT-LED | SMALL GROUPS | SPECIAL ACCESS -

FULL 2017 PROGRAM OUT NOW, CONTACT US FOR A CATALOG

TOLL-FREE 1-888-331-3476 | [tours@andantetravels.com](mailto:tours@andantetravels.com) | [www.andantetravels.com](http://www.andantetravels.com)



# CONTENTS



## FEATURES

### 26 KINGS OF COOPERATION

The Olmec city of Tres Zapotes may have owed its longevity to a new form of government

**BY LIZZIE WADE**

### 30 TOWN BENEATH THE WAVES

In a chance find just off Greece's Peloponnese, archaeologists have discovered the remains of a once-thriving Early Bronze Age settlement

**BY DANIEL WEISS**

### 32 THE ROAD ALMOST TAKEN

An ancient city in Germany tells a different story of the Roman conquest

**BY ANDREW CURRY**

### 38 MEMENTO MORI

A cemetery used for centuries is an expression of the enduring relationship between the living and the dead

**BY JARRETT A. LOBELL**

### 42 THE FIRST AMERICAN REVOLUTION

Exploring the legacy of the New World's most successful native rebellion

**BY ERIC A. POWELL**

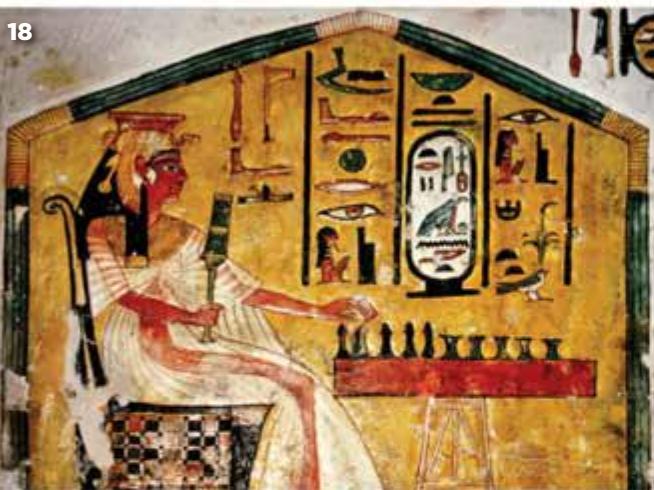
### 48 HIDDEN FROM VIEW

One of Cappadocia's underground cities may yet yield clues about its history

**BY BILL DONAHUE**

**COVER:** A colossal Olmec head from the Mexican site of San Lorenzo dates to between 1200 and 900 B.C. and is more than nine feet tall.

**PHOTO:** Getty Images/Danny Lehman



## DEPARTMENTS

4 EDITOR'S LETTER

6 FROM THE PRESIDENT

8 LETTERS

Clan of the cave bear, remembering Pearl Harbor, and the language of *Star Trek*

9 FROM THE TRENCHES

Cracking Alan Turing's musical code, a church for Norse raiders, Roman spa treatment, Neanderthals at home, and setting the stage for Shakespeare

24 WORLD ROUNDUP

Following the whale diet, climate change in ancient Tanzania, domesticating turkeys, Kazakhstan's cult complex, and kangaroo jewelry



17



20

55 LETTER FROM PHILADELPHIA

An unusual industrial history emerges from some of the city's hippest neighborhoods

BY MARGARET SHAKESPEARE

68 ARTIFACT

Self-expression in the Bronze Age

## ARCHAEOLOGY.ORG

■ MORE FROM THE ISSUE To hear Alan Turing's early computer-generated music go to [archaeology.org/turing](http://archaeology.org/turing)

■ ARCHAEOLOGICAL NEWS Daily headlines from around the world. And sign up for our e-Update.

■ FOLLOW US [f](#) [t](#) [i](#)

■ INTERACTIVE DIGS Track ongoing work at Zominthos in Crete, Johnson's Island—a Civil War site in Ohio, and Achill Island in Ireland at [interactivedigs.com](http://interactivedigs.com)

# Own the "Gem of the Century"



Incredibly rare find is now available to the public for **ONLY \$59!**

For centuries, the "Big Four"—diamonds, rubies, emeralds and sapphires—ruled the gem world. When tanzanite debuted in 1967, it was a sensation. Unlike those other stones, which are mined all over the world, tanzanite can be found in only one place on Earth: in the remote Merelani Hills in the shadow of Mt. Kilimanjaro in Tanzania, Africa.

**HUGE SAVINGS**  
TAKE 85% OFF THE  
**KARATU TANZANITE RING**  
WHEN YOU USE YOUR OFFER CODE

**Gem of the century meets deal of the century.** With its remarkable rarity and unique gemstone qualities, it's no wonder that experts have dubbed it, "the gemstone of the 20th century." In recent years, top-quality tanzanite gems have fetched higher prices at auction than rubies, emeralds or diamonds! But because we buy direct and use our own designers, we are able to offer you this rare beauty for **ONLY \$59!**

**What makes tanzanite so irresistible to jewelers and gem experts?** Part of its appeal is the beautiful violet blue color. Tanzanite is also trichroic—which means that three different colors are visible when the stone is viewed from different angles.

"*This ring is unbelievable. I've owned some spectacular high-dollar gemstones in my life and this ring will compete with any of them!*" —Katharine, Shreveport, LA

*Henry Platt, past president and chairman of Tiffany & Company, called Tanzanite "The most important gemstone discovery in over 2,000 years."*

A gemstone found only one place on earth, means supply is extremely limited. Get your hands on the *Karatu Tanzanite Ring* before they're gone!

**Your satisfaction is 100% guaranteed.** Experience the rare beauty of the *Karatu Tanzanite Ring* for two months. If you're not completely awestruck, simply send it back within 60 days for a complete refund of the sale price. We want you to feel like you got the deal of the century!

*With over 4,000 sold, we currently have less than 2,000 in stock!*

**Karatu Tanzanite Ring** ~~\$399\*~~

Offer Code Price Only \$59 + S&P Save \$340!

You must use the insider offer code to get our special price.

**1-800-333-2045**

**Your Offer Code: KTR254-02**

Please use this code when you order to receive your discount.

**Stauer®**

14101 Southcross Drive W., Dept. KTR254-02,  
Burnsville, Minnesota 55337 [www.stauer.com](http://www.stauer.com)



Rating of A+



\* Special price only for customers using the offer code versus the price on [Stauer.com](http://Stauer.com) without your offer code.

1 1/5 carats of genuine tanzanite • Lab-created white DiamondAura accents • .925 sterling silver setting • Whole ring sizes 5-10

Smart Luxuries—Surprising Prices™

## EDITOR'S LETTER

# HUMAN WHYS AND WHEREFORES

Often in archaeology, excavations overturn long-held assumptions. "The Road Almost Taken" (page 32), by contributing editor Andrew Curry, covers just such a shift in thinking, brought about by unexpected discoveries such as a magnificent bronze horse head found at a site called Waldgirmes in Germany. The story has much to tell about the true nature of the Roman Empire's expansion into the area. Rome, it seems, may have had more on its mind than conquest.



19th-century glass

drove Spanish colonists from New Mexico in an attack known as the Pueblo Revolt. The Spanish returned 12 years later, and historians have portrayed the revolt as futile. But archaeologists now believe that the Pueblo resistance was, in its way, successful. "The First American Revolution" (page 42), by online editor Eric A. Powell, details fieldwork being conducted at the Pueblo stronghold of Black Mesa, what the research tells us about the battle, and the implications of this history for native practices even today.

Cappadocia in central Turkey is the site of numerous ancient underground cities, some which are believed to have been used as refuges during dangerous times. Residents of the modern city of Nevşehir have lived alongside such a settlement for centuries, but its story may be slightly different from that of the others. Journalist Bill Donahue, in "Hidden from View" (page 48), tells of his visit to Nevşehir and its winding, underground corridors, living spaces, food preparation areas, and a church graced with frescoes dating to the first millennium. The site, in the very early stages of exploration, may help shed light on the region's complex history.

Our attachment to place is perhaps expressed most strongly in the persistence of certain locations where we bury our dead. "Memento Mori" (page 38), by executive editor Jarrett A. Lobell, reports on work at a recently excavated fifth-century church in Nîmes, France. The interments there stretch from the Roman period through the early Middle Ages, and archaeologists are learning much about the evolution of burial rituals through time and massive cultural change.

And do not miss "Letter from Philadelphia" (page 55), about an enterprising apothecary with a grand plan.

Claudia Valentino

*Editor in Chief*

# ARCHAEOLOGY

## Editor in Chief

Claudia Valentino

## Executive Editor

Jarrett A. Lobell

## Deputy Editor

Samir S. Patel

## Online Editor

Eric A. Powell

## Senior Editor

Daniel Weiss

## Editorial Assistant

Malin Grunberg Banyasz

## Creative Director

Richard Bleiweiss

## Contributing Editors

Roger Atwood, Paul Bahn, Bob Brier, Andrew Curry, Blake Edgar, Brian Fagan, David Freidel, Tom Gidwitz, Andrew Lawler, Stephen H. Lekson, Jerald T. Milanich, Heather Pringle, Neil Asher Silberman, Julian Smith, Nikhil Swaminathan, Jason Urbanus, Zach Zorich

## Correspondents

Athens: Yannis N. Stavrakakis  
Bangkok: Karen Coates  
Islamabad: Massoud Ansari  
Israel: Mati Milstein  
Naples: Marco Merola  
Paris: Bernadette Arnaud  
Rome: Roberto Bartoloni, Giovanni Lattanzi  
Washington, D.C.: Sandra Scham

## Publisher

Kevin Quinlan

## Director of Circulation and Fulfillment

Kevin Mullen

## Director of Integrated Sales

Gerry Moss

## Account Manager

Karina Casines

## Advertising Assistant

Kiesha Graham

## Account Manager

Jeff Posner

## PRI Communications Inc.

Jeff@pricommunicationsinc.com  
516-594-2820 x11

## Circulation Consultant

Greg Wolfe, Circulation Specialists, Inc.

## Newsstand Consultant

T.J. Montilli

## Pro Circ Retail Solutions

## Office Manager

Malin Grunberg Banyasz

For production questions

contact production@archaeology.org

## Editorial Advisory Board

James P. Delgado, Ellen Herscher, Ronald Hicks, Jean-Jacques Hublin, Mark Lehner, Roderick J. McIntosh, Susan Pollock, Kenneth B. Tankersley

## ARCHAEOLOGY MAGAZINE

36-36 33rd Street, Long Island City, NY 11106  
tel 718-472-3050 • fax 718-472-3051

Subscription questions and address changes should be sent to Archaeology, Subscription Services, P.O. Box 433091 Palm Coast, FL 32143 toll free (877) ARKY-SUB (275-9782) or subscriptions@archaeology.org

# Cats Leave Paw Prints On Our Hearts

Inspired by the  
artistry of

BLAKE JENSEN

ASPCA®



Shown larger than approximate  
size of 4 1/4" wide

Like us on  
Facebook

09-05417-001-BD1

## Cats are gifts from Heaven above!

Loved for their playful spirit, warm cuddles and tender devotion, a cat is more than just a pet — it's part of our family. Now, in an exclusive Hamilton figurine debut, artist Blake Jensen cradles our furry friends in an angel's wings ... to protect them here on Earth ... and to keep them in our hearts even after they've gone.

***Handcrafted with a heavenly sparkle.***

Working from Blake's original sketches, artisans craft and paint "Cats Leave Paw Prints On Our Hearts" entirely by hand. And while holding this sweetly slumbering kitty in a gentle heart shape, the glittery, etched "feather" angel wings sparkle as bright as your love for your pet!

***Money -back guarantee!***

***This figurine has been exclusively commissioned by The Hamilton Collection in its efforts to show its support of the ASPCA's mission.*** Each limited edition is hand-numbered and includes a Certificate of Authenticity. Satisfaction is guaranteed or your money back. Celebrate your "four-legged blessing" and reply now!

[HamiltonCollection.com/CatHeart](http://HamiltonCollection.com/CatHeart)

©2016 HC. All Rights Reserved.  
©2016 ASPCA. All rights reserved.

MAIL TO:

**The Hamilton Collection**  
9204 Center For The Arts Drive, Niles, Illinois 60714-1300

**SEND NO MONEY NOW!**

**YES!** Please accept my order for "Cats Leave Paw Prints On Our Hearts" for the low issue price of just \$29.99\*. **I need send no money now.** I will be billed with shipment.

Name \_\_\_\_\_  
(Please print clearly.)

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Email (Optional) \_\_\_\_\_

Signature \_\_\_\_\_

**MAIL TODAY!**

09-05417-001-E98001

\*Add \$8.99 for shipping and service. Deliveries to FL and IL will be billed appropriate sales tax. All orders are subject to product availability and credit approval. Edition size limited to 95 casting days. Allow 6 to 8 weeks for shipment.

## FROM THE PRESIDENT

# BY WAY OF INTRODUCTION

**A**s the new president of the Archaeological Institute of America (AIA), I will have the pleasure of communicating with you in each issue of *ARCHAEOLOGY*, and I'd like to begin by introducing myself. I was born in Philadelphia, and when I was 12 we moved to Miami, Florida. By that time, thanks in part to my seventh-grade history teacher, who acquainted me with the ancient world—particularly classical Greece—I had decided to become an archaeologist. My interest has never waned.

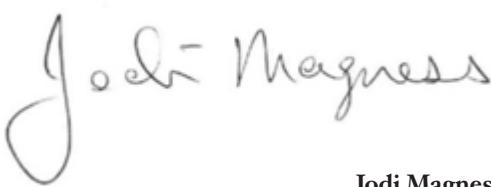


AIA president Jodi Magness

At the age of 16, I moved to Israel on my own. I completed high school there and went on to earn a B.A. in archaeology and history at the Hebrew University of Jerusalem. For three years after graduation, I worked as a field guide and naturalist at the Ein Gedi Field School near the Dead Sea. In 1980, I returned to the United States and the following year enrolled in the Ph.D. program in classical archaeology at the University of Pennsylvania. Becoming an archaeologist requires many years of education and, after graduation, I was awarded a two-year Mellon postdoctoral fellowship in Syro-Palestinian archaeology at Brown University. I then taught classical and Near Eastern archaeology for 10 years in the Departments of Classics and Art History at Tufts University. Since 2002, I have been the Kenan Distinguished Professor for Teaching Excellence in Early Judaism in the Department of Religious Studies at the University of North Carolina at Chapel Hill. My teaching career has been vitally important to me, even as I continued to conduct archaeological fieldwork in Israel. My current excavation project at Huqoq in Galilee has been a rewarding experience in so many ways and I look forward to sharing more on this in the future as field seasons progress.

I feel extremely fortunate to have been able to pursue my lifelong passion for archaeology. Archaeology departments are almost non-existent in American academia, except as part of other departments, such as classics or anthropology, making the career path a challenging one. The support of family, friends, mentors, colleagues, academic institutions, and professional organizations has been essential. Over the years I have benefited greatly from being a member of the Archaeological Institute of America, first as a graduate student, and later as an archaeologist. The importance of the AIA mission to support the discipline of archaeology—and archaeologists—cannot be overstated.

I begin this first year of my three-year term grateful for the chance to give back and to serve as AIA president. I look forward to being in touch with all of you as my term progresses.



Jodi Magness  
President, Archaeological Institute of America

ARCHAEOLOGICAL  
INSTITUTE of AMERICA  
Located at Boston University



## OFFICERS

- President**  
Jodi Magness  
**First Vice President**  
Laetitia La Follette  
**Vice President for Outreach and Education**  
Deborah Gangloff  
**Vice President for Research and Academic Affairs**  
Bonna Wescoat  
**Vice President for Cultural Heritage**  
Elizabeth S. Greene  
**Treasurer**  
David Ackert  
**Vice President for Societies**  
Ann Santen  
**Executive Director**  
Ann Benbow  
**Chief Operating Officer**  
Kevin Quinlan

## GOVERNING BOARD

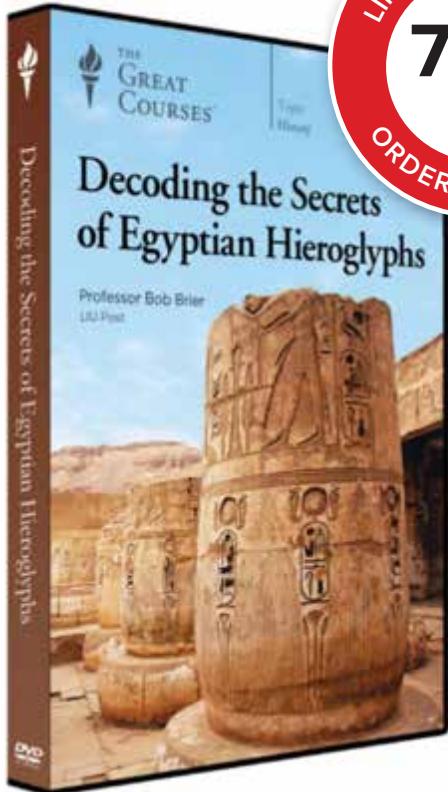
- Elie Abemayor  
David Adam  
Deborah Arnold  
Andrea Berlin  
David Boochever  
Bruce Campbell  
Jane Carter, ex officio  
Arthur Cassanos  
Derek Counts  
Julie Herzog Desnick  
Ronald Greenberg  
Michael Hoff  
James Jansson  
Lisa Kealhofer  
Mark Lawall  
Deborah Lehr  
Thomas Levy  
Kathleen Lynch  
Bruce McEver  
Barbara Meyer  
Meg Morden  
Sarah Parcak  
J. Theodore Peña  
Kevin Quinlan, ex officio  
Robert Rothberg  
Ethel Scully  
David Seigle  
Monica L. Smith  
Charles Steinmetz  
Claudio Valentino, ex officio  
P. Gregory Warden  
Michael Wiseman  
John Yarmick

- Past President**  
Andrew Moore

- Trustees Emeriti**  
Brian Heidtke  
Norma Kershaw  
Charles S. La Follette

- Legal Counsel**  
Mitchell Eitel, Esq.  
Sullivan & Cromwell, LLP

ARCHAEOLOGICAL INSTITUTE of AMERICA  
656 Beacon Street • Boston, MA 02215-2006  
[www.archaeological.org](http://www.archaeological.org)



## Decipher the Language of Ancient Egypt

To the novice, hieroglyphs look like a random scattering of stylized symbols. But to Egyptologists like Professor Bob Brier—a noted public educator known as “Mr. Mummy”—hieroglyphs are the closest we can get to truly resurrecting the lives of ancient Egyptians.

In *Decoding the Secrets of Egyptian Hieroglyphs*, Dr. Brier offers you the key to unlocking the mysteries of this ancient language. You’ll cover the basics of reading, writing, and translating hieroglyphs. Deciphering symbols and text is a fun and intellectual puzzle for lifelong learners of all ages, which makes learning this new language enjoyable and exciting! You’ll be surprised at just how quickly translating these curious symbols becomes second nature, and delight in the stories and insight into history they reveal. Opening up new worlds of discovery, these 24 lectures will bring you closer than ever to a civilization that’s captivated us for millennia.

**Offer expires 04/30/17**

**THEGREATCOURSES.COM/4AR**  
**1-800-832-2412**

## Decoding the Secrets of Egyptian Hieroglyphs

Taught by Professor Bob Brier  
LIU POST

### LECTURE TITLES

1. Why Egypt Needed Hieroglyphs
2. The Ancient Egyptian Alphabet
3. How a Language Becomes Lost
4. Napoleon in Egypt
5. Early Attempts to Decipher the Rosetta Stone
6. William Bankes and the Keys to Decipherment
7. Jean-François Champollion Cracks the Code
8. Suffix Pronouns and the Hieroglyphs of Ptah
9. The Immortal Scribe
10. Hieroglyphs and the Bible
11. Dependent Pronouns and the Passive Voice
12. Past Tense and Adjectives
13. New Ideograms Related to the Gods
14. Names of the Pharaohs
15. Ancient Egyptian Numbers
16. The Egyptian Calendar
17. Names of the Gods
18. Negation in Ancient Egyptian Sentences
19. Reading Hieroglyphic Jewelry
20. Palimpsests: When Scribes Make Mistakes
21. An Ancient Egyptian Prayer for the Dead
22. Translating the Tomb of Perneb
23. Translating Tutankhamen’s Tomb
24. King Tut’s Magic Mirror and Sarcophagus

**Decoding the Secrets of Egyptian Hieroglyphs**  
Course no. 3541 | 24 lectures (30 minutes/lecture)

**SAVE \$190**

**DVD ~~\$269.95~~ NOW \$79.95**  
+\$10 Shipping, Processing, and Lifetime Satisfaction Guarantee  
Priority Code: 139988

For over 25 years, The Great Courses has brought the world's foremost educators to millions who want to go deeper into the subjects that matter most. No exams. No homework. Just a world of knowledge available anytime, anywhere. Download or stream to your laptop or PC, or use our free apps for iPad, iPhone, Android, Kindle Fire, or Roku. Over 600 courses available at [www.TheGreatCourses.com](http://www.TheGreatCourses.com).

## LETTERS

# FROM OUR READERS

### PAST MEETS PRESENT

Thank you for the fine article on the Viking hoards ("Hoards of the Vikings," January/February 2017). *Star Trek* fans will recognize the Gotland word for slaves—*thralls*—from the episode "The Gamesters of Triskelion," but not the source of the word. As a teacher of art history, I often use popular culture references to lead into a topic. A good one about Viking-Arab trade is the film *The 13th Warrior*. Thanks to your article, the film, partly based on an Arab's *ribla* ("travel tale"), is now all the more believable.

Marleen Hoover  
San Antonio, TX

### HEARTH AND HOME

I have been an avid fan of ARCHAEOLOGY magazine for years and enjoy every issue. The January/February 2017 issue just published is no exception. When I viewed the photo of the circles accompanying "Early Man Cave," I was fascinated. The ring-shaped structures match exactly Jean Auel's description of "hearths" in her 1980 novel, *The Clan of the Cave Bear*. The clan in the story lived in caves and built these hearths for

ARCHAEOLOGY welcomes mail from readers. Please address your comments to ARCHAEOLOGY, 36-36 33rd Street, Long Island City, NY 11106, fax 718-472-3051, or e-mail letters@archaeology.org. The editors reserve the right to edit submitted material. Volume precludes our acknowledging individual letters.

individual family groups. Auel conducted intensive research for her novels and the books are chock-full of interesting theories of how early humans lived. Auel identified the circles as living quarters. Keep up the good work. I look forward to every issue.

Dorothy Spyro  
Monroe Township, NJ

### WATER WORLD

Regarding "Fire in the Fens" (January/February 2017) by Jason Urbanus, I agree with the statement that the burning of the site could have been part of an elaborate cleansing ritual. I can see how a local shaman or religious leader concerned about the rising water gathered the community together and proposed a sacrifice to a water god.

Donald Killmeyer  
Pittsburgh, PA

### AN INFAMOUS DAY REMEMBERED

My uncle and grampa were at Pearl Harbor ("December 7, 1941," January/February 2017), and once while I was enjoying pizza with them, they filled me in on what happened that day. My uncle was a proud Pearl Harbor survivor with 16 battle stars whom everyone called Skipper. He got blasted off a ship, ears ringing. Another ship picked him out of the water, but it got hit and started going down too, so he said "Hell with it!" and jumped into the harbor and swam across

all the oil and fires to shore while the battle unfolded around him. My grampa had an even more sobering story. He was a Navy engineer who flew on blacked-out planes working on top-secret radar systems on ships around the world. After the attack, the Navy scrambled all the engineers they had, including my grampa, and flew him in right away to try to help. He said for days he could hear sailors underwater beating on the hulls of ships, and that every hole they cut in the ships to help them would end up killing them faster because the ships would fill up with water. He said that every day the sounds lessened. Rest in peace, boys.

Michael Morgan  
Benton City, WA

### NEW YORK STORY

It was great to see "Off The Grid" (January/February 2017) feature Rogers Island, one of the very many historical sites in my area. From the period of the French and Indian War, Lake George not only offers Fort William Henry, but several other sites of significance. Fort George is adjacent to Fort William Henry. The Sunken Fleet of 1758 is an underwater site displaying seven French and Indian War bateaux that were sunk for the winter and never raised the following spring, as well as the sunken *radeau*, [meant to be used as a] gun battery, named the *Land Tortoise*.

Pat Boomhower  
Halfmoon, NY



ARCHAEOLOGY (ISSN 0003-8113) is published bimonthly for \$23.95 by the Archaeological Institute of America, 36-36 33rd Street, Long Island City, NY 11106. Periodicals postage paid at Long Island City, NY, and additional mailing offices. POSTMASTER: Send address changes to Archaeology, P.O. 433091, Palm Coast, FL 32143.

Subscriptions should be addressed to Archaeology, Subscription Services, P.O. 433091, Palm Coast, FL 32143, toll-free (877) ARKY-SUB (275-9782), subscription@archaeology.org. \$23.95 per volume. Single numbers, \$5.99. Foreign



and Canadian subscriptions, \$38.95; includes all government taxes (130277692-RT). Canadian Publication Agreement #1373161. Allow six weeks for processing new subscriptions. Send manuscripts and books for review to 36-36 33rd Street, Long Island City, NY 11106 or editorial@archaeology.org. All manuscripts are reviewed by experts. Advertisements should be sent to the Advertising Director, 36-36 33rd Street, Long Island City, NY 11106, (718) 472-3050, advertising@archaeology.org. We are not responsible for unsolicited manuscripts and photographs. For subscription problems please call (877) 275-9782; AIA members with subscription problems should call the membership office at (617) 353-9361. All rights reserved. Printed in USA. The views and opinions expressed do not necessarily reflect the policy of the AIA or ARCHAEOLOGY.

©2017 The Archaeological Institute of America

## DIGGING UP DIGITAL MUSIC



Alan Turing (right) using the Mark II computer

Archeologists think of stone tools in terms of “technologies”—the particular ways that they were made and used—that help us understand the cultures that produced them. Today we have our own technologies, but they come and go at a vastly different pace. Their life spans are measured not in thousands of years, but in months and even days. To modern digital technology, 65 years is an eon.

The late 1940s and early 1950s saw the birth of the computer age, and one of its nurseries was the Computing Machine Laboratory in Manchester, England, led by logician and cryptanalyst Alan Turing. Lesser known among the many innovations to come out of the lab—including “Baby,” the first stored-program computer—are the first melodies generated by computer, the most distant ancestor of modern electronic music. Recently, a philosopher and a composer collaborated to analyze and restore the earliest known recording of these melodies—a founding artifact of the age of digital music.

According to Jack Copeland, philosopher and director of the Turing Archive for the History of Computing at the University of Canterbury in Christchurch, New Zealand, Turing’s Mark I computer generated its first “notes” in 1948. The machine had a hooter to provide auditory feedback, a middle C-sharp that Copeland describes as “like a cello playing underwater,” which could produce different notes when activated in different patterns. In 1951, a schoolteacher named Christopher Strachey convinced Turing to let him program the lab’s

next machine, the Mark II. Strachey, who became one of the world’s foremost programmers, coaxed it to play “God Save the King,” England’s national anthem. Turing’s response: “Good show.” (A computer in Melbourne was doing similar work around this time as well.)

The same year, the British Broadcasting Corporation (BBC) recorded three melodies from the machine: the anthem, “Baa Baa Black Sheep,” and Glenn Miller’s “In the Mood.” The analog recording charmingly captures the voices of people in the room: “The machine’s obviously not in the mood,” a woman jokes during the Miller tune. The BBC likely destroyed its copy, but Frank Cooper, an engineer at the lab, asked for a souvenir version—a black, 12-inch acetate record that survives in private hands. “They knew how priceless this disc was,” says Copeland, “so they held onto it.”

A digital copy of the record was later made by the British Library, and Copeland and composer and musician Jason Long analyzed it. In studying the frequencies on the record-

## FROM THE TRENCHES



Original recording of Mark II melodies

ing, they found some notes that the computer would not have been able to produce. Copeland and Long thought

about what might have created these “impossible notes,” including errors in the speed of the BBC’s portable disc cutter. The researchers wrote a simple program and found that, sped up just a few percent, the recording perfectly matched the notes the computer could produce. With a little more cleaning up, the machine’s original voice emerged. “It just sounded right for the first time,” says Copeland. “We never knew it sounded wrong until we heard it right. We were able to dig up the original sound.” Although it is only sound, it is a compelling reflection of its time.

Today, early artifacts of the digital age—chips, computers, equipment, dia-

grams, technical documents, even programs—are important historical records of developments that shape modern life, and they are at risk of being forgotten or destroyed. “The digital world moves so fast, it’s constantly refreshing itself to such a degree that it is creating all kinds of opportunities for archaeology,” says Christopher Witmore, an archaeologist at Texas Tech University who both works on ancient sites in Greece and writes about the archaeology of the more recent past. “Archaeology is rich enough to encompass all of these things.”

To hear the restored recording of Turing’s Mark II, visit [archaeology.org/turing](http://archaeology.org/turing).

—SAMIR S. PATEL

## OFF THE GRID

POINTE-À-CALLIÈRE, MONTRÉAL

*Pointe-à-Callière, Montréal Archaeology and History Complex, in Old Montreal, Quebec, sits right on top of the city’s birthplace. This location is the site of more than 1,000 years of human activity, beginning when indigenous peoples made camp here between the Little Saint Pierre and the Saint Lawrence Rivers. The first French settlement on the site, Fort Ville-Marie, was created in 1642 as the home for some 50 settlers, including founders Paul de Chomedey de Maisonneuve and Jeanne Mance. The museum, which was built in 1992 as part of the celebration to mark Montréal’s 350th anniversary, has both permanent and temporary exhibits, including traveling displays from all over the world. Pointe-à-Callière Project Manager Louise Pothier says, “Pointe-à-Callière is a site museum unlike any other in Canada. It combines a number of archaeological sites illustrating the city’s growth over the years: Fort Ville-Marie, the first Catholic cemetery, the first public marketplace, and even Canada’s first stone collector sewer, which was laid in the bed of the Little Saint Pierre River in 1832, and which is now open for visitors to walk through. Few large cities in the world have the privilege of being able to exhibit strata from their past in this way. Montrealers are very proud to preserve this rich heritage and share it with visitors.”*

### THE SITE

In order to protect the remains of Fort Ville-Marie, a pavilion is being built that will open in May 2017. An exhibition there, *Where Montréal Was Founded*, will honor Montreal’s founders. The installation will remember the first Mass held at the establishment of Fort Ville-Marie.



Visitors will be able to walk across a glass floor overlooking the remains of the fort, as well as a fire pit predating the city, a seventeenth-century well, the basement

of what may have been a guardhouse, several of the fort’s palisades, and the foundations of a metalworking shop. Numerous artifacts will be on display, including

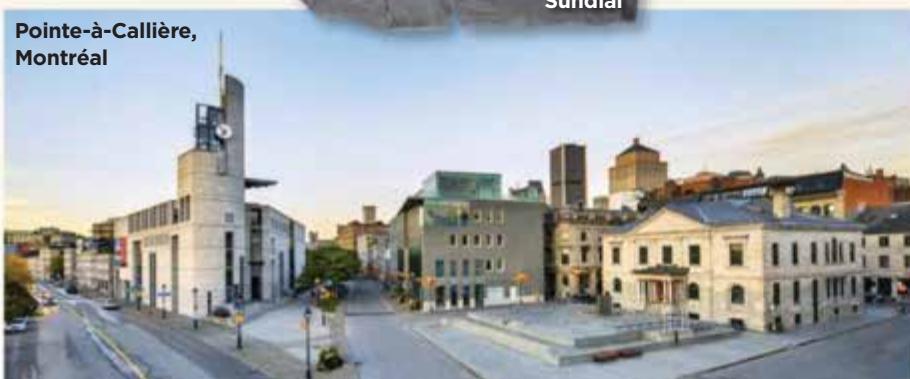
a slate sundial thought to be the oldest in North America, objects reflecting religious practices and everyday life, munitions and gun parts, and trade items.

### WHILE YOU'RE THERE

The Pointe-à-Callière museum is the best place to begin a visit to Montréal if you want to understand its beginnings, and Old Montreal still has an antique flavor, with its horse-drawn carriages and cobblestone streets. Other notable locations such as the Notre-Dame Basilica, the Hôtel de Ville (City Hall), the Old Port, and the Bonsecours Market are just a few of the things to see in the city. After taking in the sights, be sure to enjoy one of many sidewalk cafes overlooking the Saint Lawrence River.

—MALIN GRUNBERG BANYASZ

Pointe-à-Callière,  
Montréal



ALL-NEW  
Bigger  
Buttons

# “My friends all hate their cell phones... I love mine!”

## Here's why.



No  
Contracts

Say good-bye to everything you hate about cell phones. Say hello to the ALL-NEW Jitterbug Flip.

**“Cell phones have gotten so small, I can barely dial mine.”** Not the new Jitterbug® Flip. It features a larger keypad for easier dialing. It even has a larger display so you can actually see it.

**“I had to get my son to program it.”** Your Jitterbug Flip set-up process is simple. We'll even program it with your favorite numbers.

**“I tried my sister's cell phone... I couldn't hear it.”** The Jitterbug Flip is designed with a powerful speaker and is hearing aid compatible. Plus, there's an adjustable volume control.

**“I don't need stock quotes, Internet sites or games on my phone. I just want to talk with my family and friends.”** Life is complicated enough... The Jitterbug Flip is simple.

**“What if I don't remember a number?”** Friendly, helpful Operators are available 24 hours a day and will even greet you by name when you call.

**“My cell phone company wants to lock me in a two-year contract!”** Not with the Jitterbug Flip. There are no contracts to sign and no penalty if you discontinue your service.



Monthly Plan	\$14.99/mo	\$19.99/mo
Monthly Minutes	200	600
Operator Assistance	24/7	24/7
Long Distance Calls	No add'l charge	No add'l charge
Voice Dial	FREE	FREE
Nationwide Coverage	YES	YES
Friendly Return Policy <sup>1</sup>	30 days	30 days

More minute plans available. Ask your Jitterbug expert for details.

**“I'd like a cell phone to use in an emergency, but I don't want a high monthly bill.”** The Jitterbug Flip has a plan to fit your needs... and your budget.



**“Many phones have features that are rarely needed and hard to use!”** The Jitterbug Flip contains easy-to-use features that are meaningful to you. A newly designed built-in camera makes it easy and fun for you to capture and share your favorite memories. And a new flashlight with a built-in magnifier helps you see in dimly lit areas, the Jitterbug Flip has all the features you need.

**Enough talk.** Isn't it time you found out more about the cell phone that's changing all the rules? Call now, Jitterbug product experts are standing by.

Available in  
Red and Graphite.

**Order now** and receive a  
**FREE Car Charger** for your Jitterbug Flip –  
a \$25 value. Call now!

jitterbug  
flip

firstSTREET  
for Boomers and Beyond<sup>®</sup>  
1998 Ruffin Mill Road  
Colonial Heights, VA 23834



**NEW Jitterbug Flip Cell Phone**

Call toll-free to get your Jitterbug Flip.

Please mention promotional code 105348.

**1-888-789-3141**

[www.jitterbugdirect.com](http://www.jitterbugdirect.com)

We proudly accept the following credit cards:



**IMPORTANT CONSUMER INFORMATION:** Jitterbug is owned by GreatCall, Inc. Your invoices will come from GreatCall. Plans and Services require purchase of a Jitterbug phone and a one-time setup fee of \$35. Monthly fees do not include government taxes or assessment surcharges and are subject to change. Coverage is not available everywhere. 5Star or 9-1-1 calls can only be made when cellular service is available.<sup>1</sup> We will refund the full price of the Jitterbug phone and the activation fee (or setup fee) if it is returned within 30 days of purchase in like-new condition. We will also refund your first monthly service charge if you have less than 30 minutes of usage. If you have more than 30 minutes of usage, a per minute charge of 35 cents will be deducted from your refund for each minute over 30 minutes. You will be charged a \$10 restocking fee. The shipping charges are not refundable. There are no additional fees to call GreatCall's U.S.-based customer service. However, for calls to a GreatCall Operator in which a service is completed, you will be charged 99 cents per call, and minutes will be deducted from your monthly rate plan balance equal to the length of the call and any call connected by the Operator. Jitterbug and GreatCall are registered trademarks of GreatCall, Inc. ©2017 GreatCall, Inc. ©2017 firstSTREET for Boomers and Beyond, Inc.

## FROM THE TRENCHES

# REVISITING MONTEZUMA CASTLE

**A**t Montezuma Castle National Monument in central Arizona, a village composed of two cliff dwellings was abandoned sometime in the fourteenth century. Archaeologists who dug the dwellings in the 1930s found evidence for a destructive fire, but concluded that the village burned long after it was vacated. This interpretation clashed with Native American accounts. Hopi people with strong ties to the site recount that their ancestors were attacked and forced to flee, while local Apache oral history holds that ancestral Apaches and their allies stormed the village and set it ablaze.

National Park Service archaeologist Matthew Guebard recently collected new data at one of the dwellings, and reviewed the original excavation reports in an effort to reconcile the conflicting accounts. Dating of charred plaster walls determined that the fire occurred sometime between 1375 and 1395, and analysis of pottery demonstrates that



Montezuma Castle, Arizona

some of the ceramics found there had been made during this period. That led Guebard to believe that the village had been occupied until the time it was destroyed. His reexamination of the remains of four people unearthed in the 1930s shows they have skull fractures, cuts, and singe marks that indicate they

were likely killed during an attack that coincided with a catastrophic fire. "The abandonment of the site was inextricably tied to a violent event," says Guebard, who believes the archaeological evidence supports the Native American version of the ancient village's demise.

—ERIC A. POWELL

## SECRET SPACES

**T**o rid himself of his first wife, Catherine of Aragon, and to (attempt to) fulfill his quest for a son and heir, King Henry VIII needed a divorce. But for a Roman Catholic, this wasn't an option, so the frustrated monarch forced the hand of the Archbishop of Canterbury and was granted his

wish. This decision would have lasting consequences.

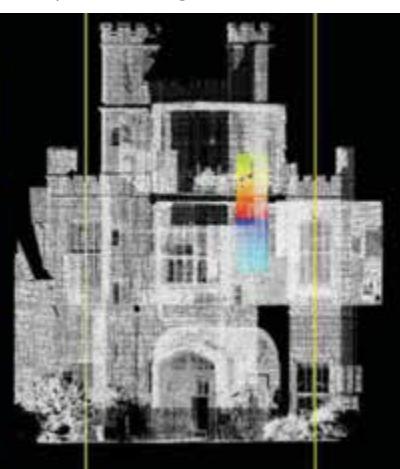
The ties that once bound England to the papacy were severed, the English monarch became the head of the new church, and monasteries across the country were dissolved, their riches and land confiscated. Many Catholic priests were forced into

hiding to avoid persecution and even execution, and to protect them, some Catholic loyalists fashioned hiding places called "priest holes" in their country homes. At the Throckmorton family's Coughton Court in Warwickshire, one of these priest holes has now been brought out of hiding through 3-D imaging. Says Christopher King of the University of Nottingham, the work at Coughton "allowed us to create the first accurate record of the priest hole with high-resolution data. More importantly, by scanning the priest hole alongside the rest of the structure, and putting the two scans together, we can demonstrate how it has been fitted inside this complex structure—hidden in a former stair-turret and located between two floor-levels, helping to conceal it."

—JARRETT A. LOBELL



Coughton Court, England



# Meet the Beauty in the Beast

*Discover this spectacular 6½-carat green treasure from Mount St. Helens!*

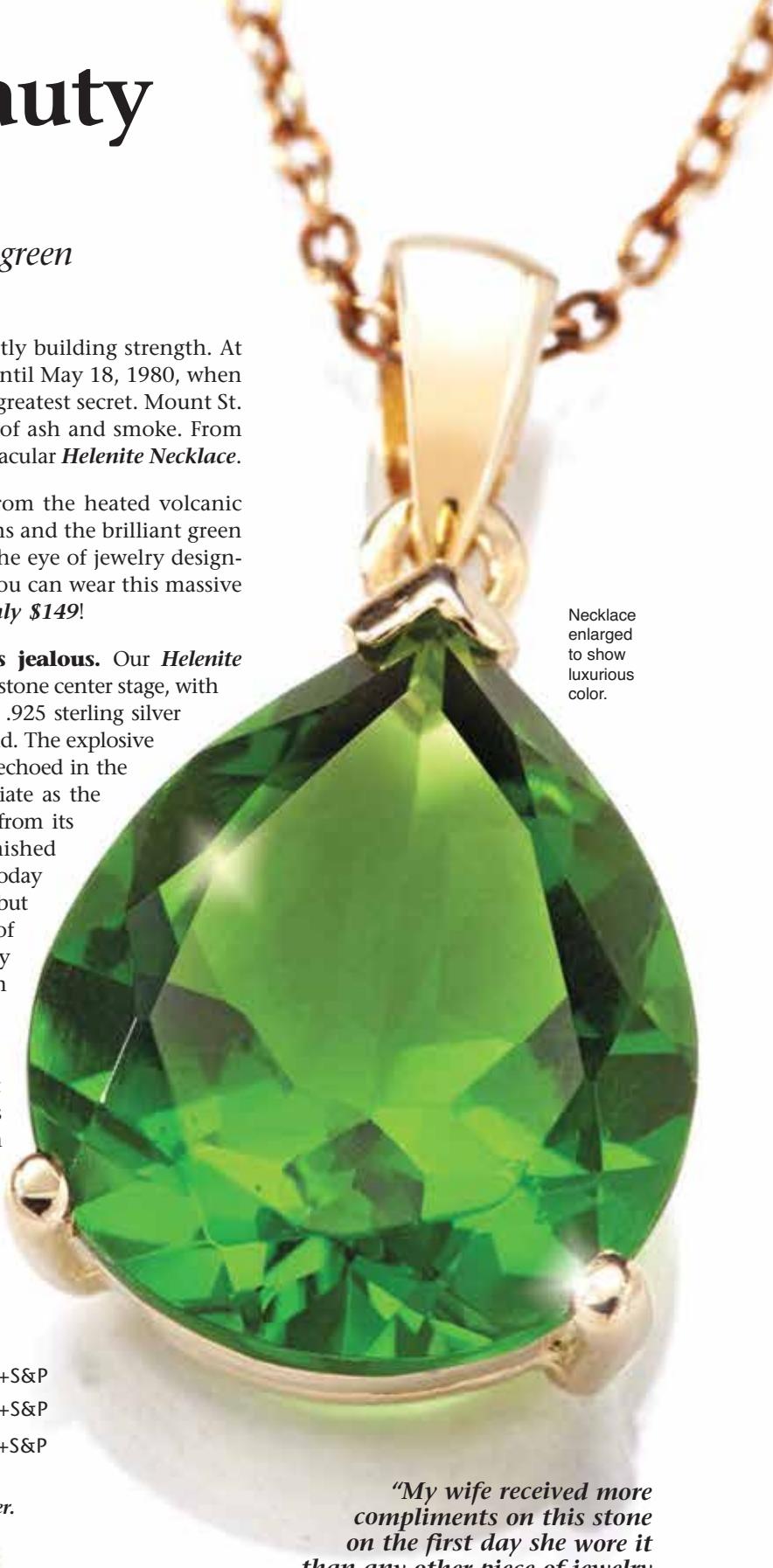
For almost a hundred years it lay dormant. Silently building strength. At 10,000 feet high, it was truly a sleeping giant. Until May 18, 1980, when the beast awoke with violent force and revealed its greatest secret. Mount St. Helens erupted, sending up a 80,000-foot column of ash and smoke. From that chaos, something beautiful emerged... our spectacular **Helenite Necklace**.

**EXCLUSIVE  
FREE**  
Helenite Earrings  
**-a \$129 value-**  
with purchase of  
Helenite Necklace



Helenite is produced from the heated volcanic rock of Mount St. Helens and the brilliant green creation has captured the eye of jewelry designers worldwide. Today you can wear this massive 6½-carat stunner for **only \$149**!

**Make your emeralds jealous.** Our **Helenite Necklace** puts the green stone center stage, with a faceted pear-cut set in .925 sterling silver finished in luxurious gold. The explosive origins of the stone are echoed in the flashes of light that radiate as the piece swings gracefully from its 18" luxurious gold-finished sterling silver chain. Today the volcano sits quiet, but this unique piece of American natural history continues to erupt with gorgeous green fire.



Necklace enlarged to show luxurious color.

**Your satisfaction is guaranteed.** Bring home the **Helenite Necklace** and see for yourself. If you are not completely blown away by the rare beauty of this exceptional stone, simply return the necklace within 30 days for a full refund of your purchase price.

**JEWELRY SPECS:**

- 6 ½ ctw Helenite in gold-finished sterling silver setting
- 18" gold-finished sterling silver chain

**Limited to the first 2200 orders  
from this ad only**

Helenite Necklace (6 ½ ctw).....**Only \$149** +S&P

Helenite Stud Earrings (1 ctw) .....**\$129** +S&P

**Helenite Set \$278...Call-in price only \$149** +S&P

(Set includes necklace and earrings)

*Call now to take advantage of this extremely limited offer.*

**1-800-333-2045**

Promotional Code **HEL864-04**

Please mention this code when you call.



Rating of A+

**Stauer®** 14101 Southcross Drive W., Dept. HEL864-04,  
Burnsville, Minnesota 55337 [www.stauer.com](http://www.stauer.com)

*"My wife received more compliments on this stone on the first day she wore it than any other piece of jewelry I've ever given her."*

**- J. from Orlando, FL  
Stauer Client**

*Smart Luxuries—Surprising Prices™*

## FROM THE TRENCHES



Reconstructed helmet



Enamel brooch



## SOMETHING NEW FOR SUTTON HOO

Even after almost eight decades, the Sutton Hoo ship burial is still providing researchers with new information that continues to underscore the wealth, reach, and prestige of East Anglia's Anglo-Saxon kings. When the seventh-century grave was first excavated in 1939, archaeologists discovered a treasure trove of material: gold and garnet jewelry, ceremonial armor, silverware, and other exotic goods. Among the hundreds of objects collected at the time were several clumps of a black organic substance. For decades experts believed that this was a tar-like compound that was used in the waterproofing and maintenance of ancient ships.

However, a research team from the British Museum and the University of Aberdeen recently reanalyzed this material using modern technology including mass spectrometry and infrared spectroscopy. They determined that the black clumps were

not pine tar, but actually bitumen, a semisolid form of petroleum. Furthermore, the geochemical signature of the bitumen indicates that it is from a Middle Eastern source, most likely Syria. In the ancient world, bitumen was highly valuable and had various uses, from medicine to waterproofing to use as an adhesive. At this point archaeologists are not quite sure why the bitumen was included in the burial, but its presence there demonstrates that the kings of East Anglia had access to an array of luxury items from widespread trade markets. British Museum researcher Rebecca Stacey says, "This new finding reinforces what we know about the intercontinental connections of East Anglia in the seventh century, and forces a reconsideration of the significance of this material in the burial assemblage."

—JASON URBANUS

# ADVANCED HEARING AID TECHNOLOGY

## For Less Than \$200

*"I was amazed! Sounds I hadn't heard in years came back to me!"*

— Don, January 2016

**How can a hearing aid that costs less than \$200 when you buy a pair, be every bit as good as one that sells for \$2,500 or more?**

**The answer:**

Although tremendous strides have been made in Advanced Hearing Aid Technology, those cost reductions have not been passed on to you. **Until now...**

The **MDHearingAid PRO®** uses the same kind of Advanced Hearing Aid Technology incorporated into hearing aids that cost thousands more at a small fraction of the price.

Over 75,000 satisfied **PRO** customers agree: High quality FDA registered hearing aids don't have to cost a fortune. The fact is, you don't need to spend thousands for a medical-grade hearing aid. **MDHearingAid PRO®** gives you a sophisticated high-performance hearing aid that works right out of the box with no time-consuming "adjustment" appointments. You can contact a hearing specialist conveniently on-line or by phone—even after sale at no cost. No other company provides such extensive support.

**Now that you know... why pay more?**



**TAKE ADVANTAGE OF OUR  
45-DAY RISK-FREE TRIAL!**

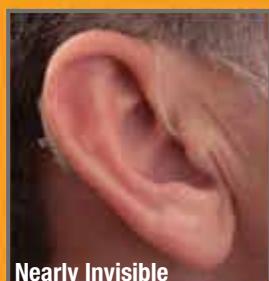
Hearing is believing and we invite you to try this nearly invisible hearing aid with no annoying whistling or background noise for yourself. If you are not completely satisfied, simply return it within that time period for a

**100% refund of your purchase price.**

**For the Lowest Price Call**

**800-714-3187**

**GetMDHearingAid.com**



Nearly Invisible

**BIG SOUND.  
TINY PRICE.**

**BATTERIES  
INCLUDED!  
READY TO USE RIGHT  
OUT OF THE BOX!**

Use Code **CX46** and get **FREE Batteries for 1 Year**  
**Plus FREE Shipping**

**MDHearingAid®** 

DOCTOR DESIGNED | AUDIOLOGIST TESTED | FDA REGISTERED

## FROM THE TRENCHES

# A SURPRISE CITY IN THESSALY



**A**rchaeologists have identified the unexpected remains of a large, 2,500-year-old Greek settlement in western Thessaly. The existence of the hilltop site, near the modern village of Vlochos, had been known for more than two centuries, but had

never been systematically investigated. Although large defensive walls were visible in some places, experts had long believed that the ancient settlement was fairly insignificant. This opinion changed when a Greek-Swedish team recently discovered the existence of a complex

urban center. The team was stunned when the results of their geophysical survey indicated that the ancient site is spread across 100 acres and boasts



an organized, orthogonal, or gridded street plan. Scholars believe that the town flourished in the fourth and third centuries B.C. before being abandoned. "The work at Vlochos gives a rare insight into the development and outline of a typical Thessalian city," says University of Gothenburg archaeologist Robin Rönnlund. "It shows that even midsize settlements of this region were quite sophisticated in their spatial outline."

—JASON URBANUS

## ZINC ZONE

**I**n central China's Hunan Province, archaeologists have uncovered evidence of a zinc production site dating to the late Ming Dynasty (1368–1644). The finds include large smelting furnaces as well as zinc slag, the by-product of the conversion of zinc ores to pure zinc. Along with India, China was one of the major production center for zinc between the twelfth and eighteenth centuries, after which the material began to be produced on a larger scale in Europe.

—JARRETT A. LOBELL



# BEHIND THE CURTAIN

One of London's earliest Elizabethan theaters has surprised archaeologists and Shakespearean scholars alike with its rectangular-shaped stage, a unique departure from the polygonal style of more famous playhouses such as the Globe. Researchers from Museum of London Archaeology (MOLA) made the discovery while excavating the Curtain Theatre in Shoreditch, East London, on a site set to house a commercial and residential complex, where the theater's remains will be preserved *in situ*.

The Curtain, which opened in 1577 and served as the main venue for Shakespeare's plays from 1597 to 1599, was only the second theater in London built specifically to host performances. Previously, plays had been performed in public houses, inn yards, patrons' private residences, and even open spaces. MOLA's excavation shows that the Curtain featured a hidden passageway under the stage where actors could move undetected. Its distinctive architecture has prompted speculation about the Bard's work from that period. "So many big research questions emerge," says Heather Knight, MOLA senior archaeologist. "Are people like Shakespeare and his contemporaries writing plays specifically for this kind of stage? Does it lend itself to battle scenes, does it lend itself to having more people on stage, does it affect how they interact?"

Enthusiasm for the Curtain Theatre discovery is sure to cross disciplines too. "Many think of Shakespeare's era as 'wrapped up,' with few new insights likely to change the way we think about Shakespeare the playwright or



Curtain Theatre, London

his plays," adds author and Shakespeare authority Leslie Dunton-Downer. "The recent archaeological work in Shoreditch demonstrates that plenty remains to be discovered about the Bard and how his plays were performed and attended."

In addition to the secret tunnel fea-

ture, the excavation also produced dramatical artifacts such as glass beads and pins—perhaps from costumes—as well as fragments of drinking vessels and clay pipes likely belonging to revelers in the audience and backstage.

—MARLEY BROWN

## EXPERIENCE THE HISTORIC TREASURES OF EUROPE AND THE MEDITERRANEAN



### Voyages to Antiquity cruises include:

- Pre- and post-cruise hotels in fascinating ports of call
- Expert-led shore excursions and extended stays in port
- Guest lecture series featuring global scholars
- All meals on board with choice of restaurants
- Wine with dinner on board (*beer or soft drinks if preferred*)
- Onboard gratuities

Call today for details about special savings offers for Archaeology Magazine Readers!

**877-398-1460**

[info@voyagestoantiquity.com](mailto:info@voyagestoantiquity.com)

Featured  
Cruise

### Seville, Morocco & Canary Islands

NOVEMBER 8, 2017 • 13 DAYS, MALAGA TO TENERIFE

*Voyage to the best of the Iberian Peninsula on this 2017 cruise-tour, beginning with the unforgettable experience of sailing the Guadalquivir River. Next, explore the sites of old Cadiz, iconic Casablanca and the walled city of Taroudant. The unique flora of the Canary Islands is the perfect end to this exceptional journey.*

**VOYAGES TO ANTIQUITY**

Visit [www.voyagestoantiquity.com](http://www.voyagestoantiquity.com) to see all special offers

Offers are capacity controlled, based on availability and may be withdrawn at any time. Ship's Registry: Panama.

## FROM THE TRENCHES

### ROYAL GAMS



Tomb painting depicting Nefertari

The tomb of Egypt's Queen Nefertari, the favorite wife of Ramesses II (r. 1279–1213 B.C.), in the Valley of the Queens, was ransacked in antiquity and her mummy torn apart by robbers. Now, a multidisciplinary team has analyzed a pair of legs found in the tomb to determine whether they were hers. Measurements and X-rays of the legs, displayed at the Egyptian Museum in Turin, Italy, have established that they belonged to a woman who was at least 40 years old and stood around five feet six inches tall. In addition, materials used to embalm the legs are consistent with mummification traditions of Nefertari's time. While radiocarbon dating returned results predating her presumed lifespan by 200 years, Michael Habicht of the University of Zurich notes that this could be due to a broader challenge facing scholars attempting to radiocarbon date samples from Egypt's New Kingdom. Although the identification is far from definitive, he says, the legs most likely did belong to Nefertari.

—DANIEL WEISS

### A MIX OF FAITHS

A unique assemblage of circular artifacts embodying both traditional African spiritual symbols and biblical iconography was unearthed by archaeologists Elizabeth Pruitt and Benjamin A. Skolnik on the grounds of a former plantation where abolitionist Frederick Douglass once lived. Excavations beneath a nineteenth-century tenant farmer's home at Wye House produced objects depicting an African cosmogram—an X inside a circle—and another that is believed to be a representation of Ezekiel's wheel. Since both symbols signify life and the universe, enslaved Africans may have drawn connections between the two when they were first introduced to Christianity. "West African religion, which features the cosmogram, is transformed through song, visions, and preaching in early black churches," says University of Maryland archaeologist and project director Mark Leone. "The hypothesis we operate on is that the cosmogram, the circle, and the singing of songs such as *Ezekiel Saw the Wheel* are all movements to and direct experiences of the divine."

—JASON URBANUS



Wye House excavation, Maryland

## NEOLITHIC FACETIME

Forensic experts have reconstructed the face of a man who lived around 9,500 years ago in Jericho, near the Jordan River in the West Bank. The reconstruction was based on a micro-CT scan of his skull, which had been covered in plaster and has clamshells for eyes. Alexandra Fletcher of the British Museum, where the skull is housed, believes it and others like it were created as part of an ancestor cult.

The scan reveals that the skull belonged to a man who died after the age of 40 and had a broken nose that healed during his lifetime. In addition, his skull had been tightly bound from early infancy, changing its shape. "This person lived a very long time ago," says Fletcher, "but he could go out shopping in London today, and nobody would turn a hair. He's a modern human, just like you or me."

—DANIEL WEISS

Jericho skull



Facial reconstruction



**CROW CANYON  
ARCHAEOLOGICAL CENTER**

**Archaeology  
RESEARCH PROGRAM**

June, September, October 2017

**The Northern Chaco  
Outliers Project**

Excavate with our archaeologists!

**Cultural  
EXPLORATIONS**

June 1–4; June 18–21;  
August 31–September 3

**Chaco Landscapes**

The perfect pre- or post-trip extension to our Archaeology Research Program!

Scholars: Steve Lekson, Ph.D. & Lyle Balenquah (Hopi)  
Cathy Cameron, Ph.D. & Patrick Cruz (Ohkay Owingeh)  
Jonathan Till, M.A. & Anthony Lovato (Kewa)

CST 2059347-50

[crowcanyon.org](http://crowcanyon.org) | Cortez, CO | 800.422.8975



**CROW CANYON  
ARCHAEOLOGICAL CENTER**

**What will you  
discover?**



Field trips and summer camps  
for teens and school groups

800.422.8975, ext. 455 | Cortez, CO  
[crowcanyon.org](http://crowcanyon.org)



**American Revolution  
MUSEUM AT YORKTOWN**

**PARTY  
LIKE IT'S  
1781**

Join us for a party of Revolutionary proportions at the grand opening celebration of the new **American Revolution Museum at Yorktown**.

Get the details at  
**HISTORYISFUN.ORG/  
GRANDOPENING**

**MARCH 23-APRIL 4**



## FROM THE TRENCHES

# BATHING, ANCIENT ROMAN STYLE

**A**t a construction site in Langrolay-sur-Rance, in northwestern France, archaeologists from the National Institute for Preventive Archaeological Research have uncovered a vast ancient Roman estate, including the remains of its well-preserved bathhouse. The large property, with its main house, gardens, colonnaded walkways, heated floors, attached stables, and stunning view across the Rance River, likely would have been the country retreat for a wealthy family from the city of Fanum Martis, some eight miles away.

The most exceptional remains excavated there are those of the luxurious bathhouse that sprawls across more than 4,000 square feet. Each stage of the standard Roman bathing routine could be followed at the villa, as one proceeded from the room for undressing, to the footbaths, the cold and hot pools, the heated room called the *caldarium* with its hot-water bath and sauna, and finally the heated massage room and a bracing cold plunge.

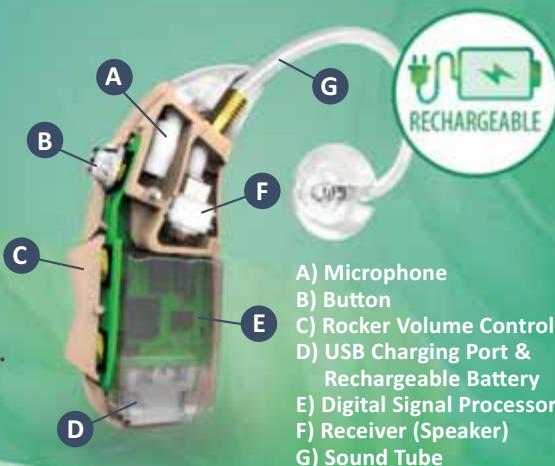
—JARRETT A. LOBELL



# NEW Rechargeable Digital Hearing Aid Technology Only \$179!\*

(\*Each when you buy a pair)

Rechargeable is now affordable. The new HearClear™ HCRC **eco-friendly** hearing aid combines advanced technology with a low price.



## The Rechargeable HCRC!

- Digital sound processing chip provides **crystal clear sound and makes speech easier to understand** with less feedback than old analog technology
- Never worry about replacing batteries again! **2 Hour Charge Gives 16 Hours of Use!**
- Micro USB Cable** (included) charges your hearing aid in the car, with a computer or plugged in the wall!
- Easy On / Off Button**
- Automatic Noise Reduction and Feedback Canceler
- 100% Money Back Guarantee**

## Rechargeable Digital Hearing Aid - For Only \$179!\*

The new HearClear™ HCRC Rechargeable Digital Hearing Aids are now available to you for an unbelievable price! This quality digital hearing aid has the same key elements that all high end digital hearing aids share, but is also rechargeable. The **microphone** picks up the sound and sends an electrical signal to the **digital signal processor** which is the “brains” of the hearing aid. The sound is then adjusted to amplify important speech sounds as well as filtering out unwanted noise. Once the digital processor has amplified the sound, it is passed to the **receiver** (also known as the speaker) which emits a corrected and amplified sound through the **sound tube** into your ear.

Most importantly, your new HearClear HCRC hearing aids work at a **fraction of the cost** of name-brand hearing aids, and you don't have to keep changing the batteries! You will also love the comfortable, lightweight Open-fit design.



You can spend thousands for an expensive hearing aid or you can spend **just \$189** for a hearing aid that just plain works (**only \$179 each when you buy a pair**). We are so sure you will love our product, that we offer a **100% Money Back Guarantee - Risk Free** if you are not satisfied for any reason.

### \*MONEY SAVING OFFER!

Use Coupon Code: **A73**

**1-877-704-3751**

**BUY A PAIR AND SAVE \$20!**

(Coupon Code & Price Valid For A Limited Time Only)



 **Advanced Affordable Hearing™**  
Affordable Quality Since 1996!



**FDA**  
REGISTERED

Visit and Save: [www.AdvancedHearing.com/A73](http://www.AdvancedHearing.com/A73)

## FROM THE TRENCHES

# THE CHURCH THAT TRANSFORMED NORWAY



Saint Clements  
Church, Norway

When King Olaf Haraldsson gave up the old Viking gods to become Norway's first Christian ruler, he fundamentally changed his society. Part of that legacy is the church he built in his capital city of Nidaros (now known as Trondheim), which was recently discovered at the construction

site of a new office building. The church's stone foundation is remarkably intact. According to Anna Petersén of the Norwegian Institute for Cultural Heritage Research, the nave, choir, entrances, and foundation of the altar are still in place. The church was dedicated to Saint Clements the patron of slaves and seafarers and a popular figure among observant Norse raiders. A series of radiocarbon dates shows that the church was built in the early eleventh century, which affirms historical descriptions.

Researchers also found a construction behind the altar that they are calling the "Pall," the place where they believe Haraldsson was laid to rest after he was martyred in the Battle of Stiklestad in 1030. Petersén says the church became such a popular pilgrimage site that the king's coffin was later

removed to a larger cathedral. The discovery of Haraldsson's old church gives the research team an opportunity to reconstruct the royal compound and the city's religious landscape at a time of profound spiritual change.

—ZACH ZORICH

## SIBERIAN WILLIAM TELL

In the Siberian Altai region, two local residents recently discovered the burial of a medieval man in a cliff-face crevice. They reported the find to local museum officials and turned over a number of artifacts interred with the man, including an intricately decorated birch-bark quiver and iron-tipped arrows, which are now being studied and conserved by a team led by archaeologist Nikita Konstantinov of Gorno-Altaisk State University. Konstantinov believes that the archer lived sometime between the thirteenth and fifteenth centuries, a period when the Mongolian Empire's Golden Horde ruled the area. "Here in the Altai we have very few sites dating to this era," says Konstantinov. "This burial is well preserved, so it should help us to better understand the Mongolian period." His team will fully investigate the site during the upcoming field season.

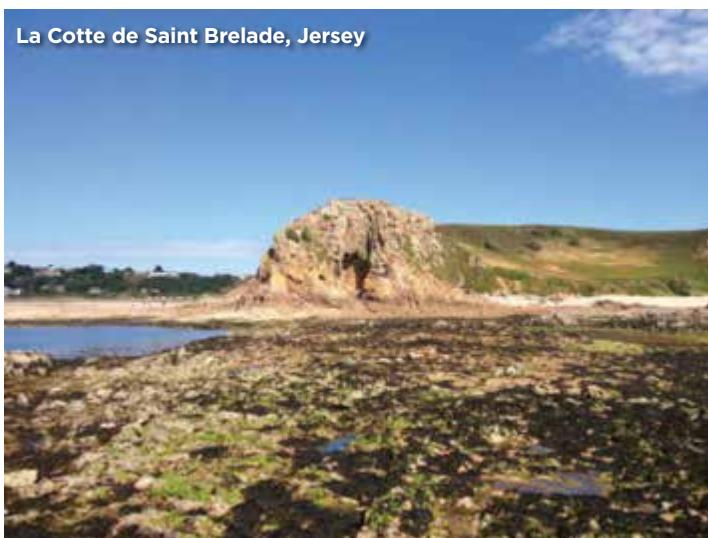
—ERIC A. POWELL



# A TRADITIONAL NEANDERTHAL HOME

Rising out of the English Channel on the island of Jersey is one of the longest-occupied Neanderthal sites in the world. "La Cotte de Saint Brelade is this mega-site, a massive, deeply ravined granite headland on the far corner of northwest Europe providing a record spanning more than 200,000 years," says Matthew Pope, a geoarchaeologist at University College London. The question that Pope and the Crossing the Threshold project research team is asking is what makes a site like La Cotte a "persistent" place? Why was this location occupied across millennia, even as the environmental conditions changed? There are several

La Cotte de Saint Brelade, Jersey

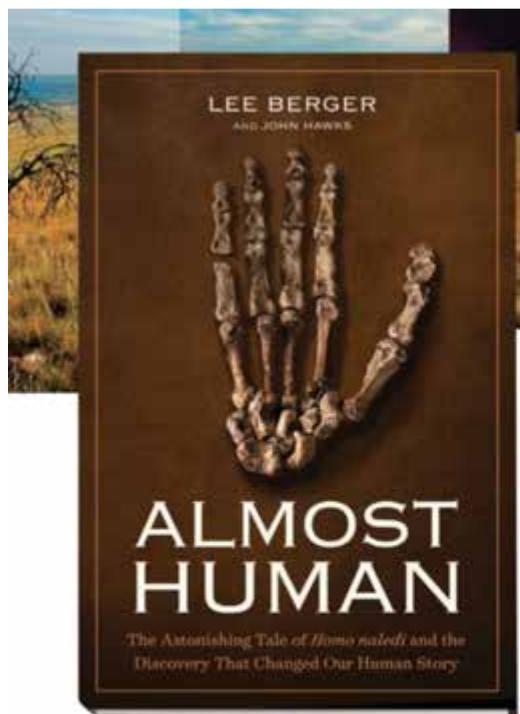


possible answers the team is investigating.

When Neanderthals lived at the site, between 240,000 and 40,000 years ago, the English Channel was dry land and the granite rock formation may have been an important landmark. According to Pope, around this time, hominins started to use fire regularly and innovated new tool technologies and hunting practices. This may have pushed Neanderthals to start thinking differently about how they used the resources of the land-

scapes around them and changed how they thought about the places they called home.

—ZACH ZORICH



## A NEW ANCESTOR SHAKES UP OUR FAMILY TREE

Almost Human is the story of paleoanthropologist and explorer Lee Berger and how his discoveries transform our understanding of human evolution. In this book, Berger recounts how he and fellow explorers found fossils representing *Homo naledi* and *Australopithecus sediba*, two new species on the human family tree.

AVAILABLE MARCH 7, 2017 WHEREVER BOOKS ARE SOLD  
AND AT [NATIONALGEOGRAPHIC.COM/BOOKS](http://NATIONALGEOGRAPHIC.COM/BOOKS)

NATGEOBOOKS

@NATGEOBOOKS

NATIONAL  
GEOGRAPHIC

© 2017 National Geographic Partners, LLC.

## WORLD ROUNDUP BY JASON URBANUS



**CANADA:** A zinc deficiency caused by malnutrition—and not lead poisoning as previously theorized—may have led to the deaths of the Franklin Expedition crew. All 129 men were lost between 1845 and 1848 when their ships became trapped in ice while seeking the Northwest Passage. Recent laboratory analysis of the nails of crewman John Hartnell, who was buried on Beechey Island, indicate that a lack of fresh red meat severely compromised his immune system, making him susceptible to the tuberculosis that eventually killed him.



**MEXICO:** Today, in parts of southern Mexico, turkeys are

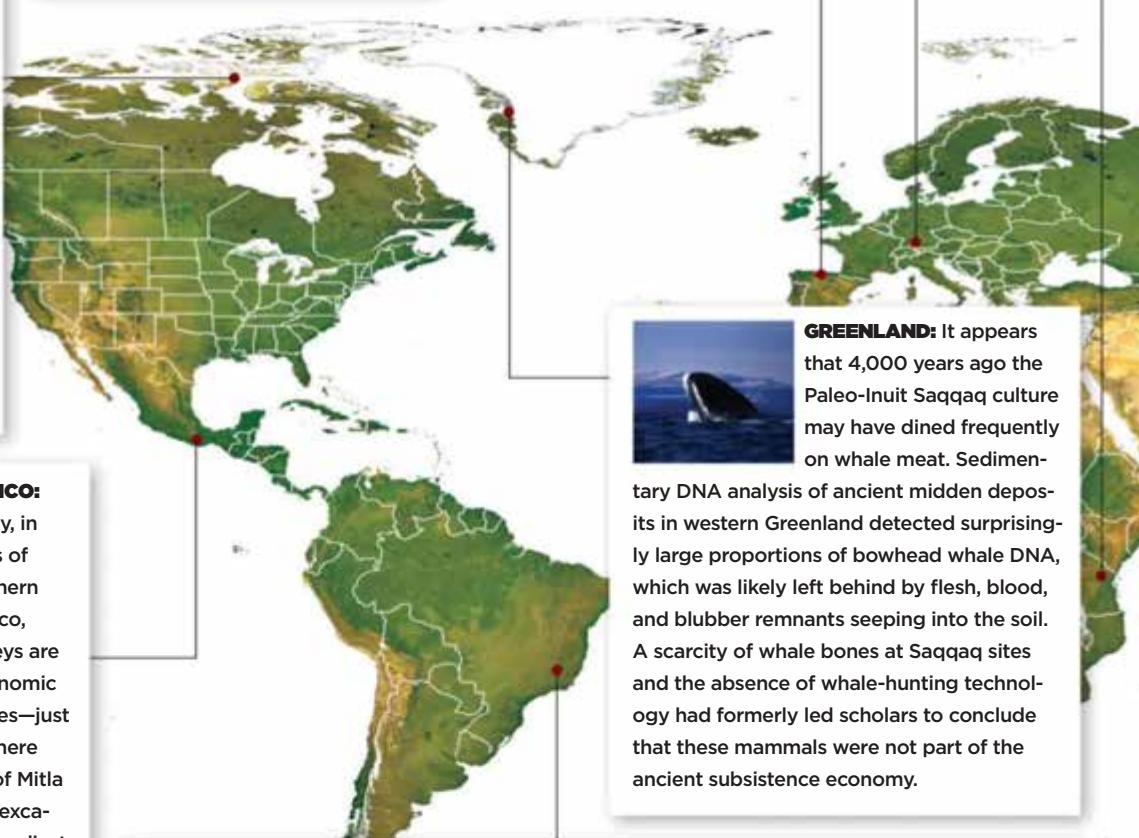
a major part of the socioeconomic structure of local communities—just as they were to the culture there 1,500 years ago. At the site of Mitla Fortress in Oaxaca, recently excavated houses contained the earliest and most comprehensive evidence of ancient Zapotec turkey domestication, dating to between A.D. 400 and 600. The abundance of turkey bones and eggshells suggests the birds were raised for food, trade, and use in ritual activities.



**SPAIN:** Proof that Paleolithic humans systematically hunted the Eurasian cave lion may have been found deep within the La Garma cave site in northern Spain. Nine lion phalanx bones, located in the paws, that were uncovered there have been shown to be the remains of a pelt that was spread across the cave floor 16,000 years ago. The precise cut marks on the bones show that humans were adept at removing an animal's skin while keeping the claws attached, implying that this was a common activity.



**GERMANY:** Ceramic vessels in an Iron Age burial mound near the Heuneburg hillfort held unusual contents. An examination of microscopic protein residues on potsherds reveals traces of Crimean-Congo hemorrhagic fever, a tick-borne disease not endemic to the region, as well as the presence of human tissue. The interred individual likely caught, and died from, the disease outside Germany, and in order to preserve the body for transportation home, the organs were removed and shipped back with the corpse in several jars.



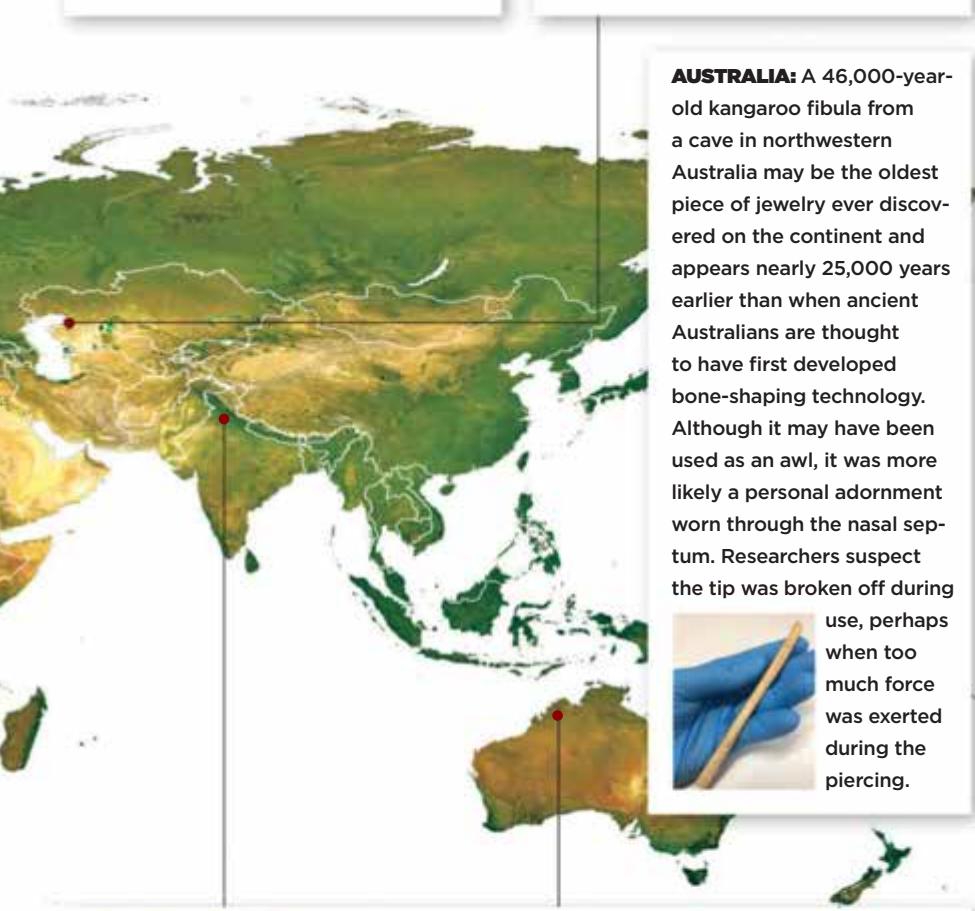
**BRAZIL:** The oldest evidence of humans performing elaborate funerary rituals has been discovered at the cave site of Lapa do Santo in South America. Twenty-six burials, dating back 10,000 years, provide evidence that the bodies were altered before burial: heads were cut off, limbs detached, teeth removed, and flesh scraped from the bone. Despite its seeming brutality, researchers believe this behavior demonstrates a level of cultural complexity and sophistication previously unknown for this time.



**TANZANIA:** Nearly 1,200 years of the environmental history of the Eastern Arc Mountains have recently been revealed in a core sample taken from a peat bog. Pollen, charcoal, and other organic materials trapped in the sediments show how both human presence and climate change affected the region's ecosystem over the past millennium. Most significant was the establishment of the ivory trade in the 19th century, which led to both the introduction of foreign plant species and large-scale deforestation.



**KAZAKHSTAN:** An amateur metal detectorist who found pieces of decorated silver near the eastern shore of the Caspian Sea led authorities to a previously unknown complex of massive ancient stone enclosures. The silver plating, adorned with animal motifs, was once attached to a wooden saddle that was ritually buried in the 5th or 6th century A.D.. Archaeologists are still unsure who built the cultic or funerary complex but believe it was linked to the movement of nomadic tribes or Huns through the area.



**AUSTRALIA:** A 46,000-year-old kangaroo fibula from a cave in northwestern Australia may be the oldest piece of jewelry ever discovered on the continent and appears nearly 25,000 years earlier than when ancient Australians are thought to have first developed bone-shaping technology. Although it may have been used as an awl, it was more likely a personal adornment worn through the nasal septum. Researchers suspect the tip was broken off during use, perhaps when too much force was exerted during the piercing.



**INDIA:** The theory that domesticated rice was originally introduced from China to the ancient Indus civilization is being challenged. Fieldwork at several sites in northwest India seems to confirm that Indus Valley communities did not rely solely on wild rice, but instead developed their own domesticated rice agriculture around 4,000 years ago. This process occurred independently from rice domestication in China and at least 400 years before the appearance of Chinese rice in the region.

## JOURNEY INTO THE HEART OF HISTORY

*Since 1983, Far Horizons has been designing unique trips led by renowned PhD scholars for small groups of sophisticated travelers who desire a deeper knowledge of both the past and living cultures.*

### ROME & SOUTHERN ITALY

May 21 – 31, 2017

### CENTRAL MEXICO

June 2 – 12, 2017

### PERU

June 9 – 24, 2017

### SRI LANKA

July 29 – August 15, 2017

### GREEK ISLANDS By Private Yacht

August 26 – Sept. 7, 2017

### AMERICAN SOUTHWEST

September 2 – 11, 2017

### CROATIA

Sept 22 – Oct 6, 2017

### SICILY

September 5 – 19, 2017

### BULGARIA

September 8 – 25, 2017

### ETHIOPIA

Sept 23 – Oct 7, 2017

### SPAIN & MOROCCO

September 23 – October 8, 2017

### GUATEMALA'S MAYA

Oct 21 – Nov 2, 2017

### SOUTH INDIA

November 4 – 20, 2017

### CHRISTMAS IN OAXACA

December 20 – 28, 2017

### ...AND MUCH MORE!

Bolivia • Myanmar • Egypt  
China's Silk Road • England • Ireland  
Romania, Georgia and Armenia  
Cambodia and Laos • Belize • Sudan  
Jordan • Iran • Central Asia  
Gujarat & Rajasthan • Easter Island

**Far Horizons**  
Archaeological & Cultural Trips, Inc.

1-800-552-4575  
[www.farhorizons.com](http://www.farhorizons.com)



Olmec colossal heads,  
such as this one unearthed  
in the 19th century at the  
site of Tres Zapotes, are  
thought to be portraits of  
all-powerful kings.

# KINGS OF COOPERATION

**The Olmec city of Tres Zapotes may have owed its longevity to a new form of government**

by LIZZIE WADE

**O**N A SWELTERING DAY in 1862 at the foot of the Tuxtla Mountains in the Mexican state of Veracruz, a farmworker was clearing a cornfield when he hit something hard and smooth lodged in the earth. He thought it was the rounded base of an iron cauldron buried upside down, and, it being the 1860s, he reported the find to the owner of the hacienda where he worked. The farmworker's boss told him to dig up the cauldron immediately and bring it to him. As the farmworker labored to uncover the object, he realized he had found not a large iron bowl, but a gargantuan stone sculpture with a pair of glaring eyes, a broad nose, and a downturned mouth. What had appeared to be the base of a cauldron was actually the top of a helmet worn by the glowering figure. What the farmworker had unearthed was a colossal Olmec head, one of the first clues to the existence of that ancient culture.

Over the next century and a half, archaeologists would uncover many more of these heads along the Mexican Gulf Coast and discover the ancient cities where they were carved. The site of that first fateful discovery became known as Tres Zapotes, after a type of fruit tree common in the area. Along with the sites of San Lorenzo and La Venta, Tres Zapotes was one of the great capitals of the Olmec culture, which emerged by 1200 B.C. as one of the first societies in Mesoamerica organized into a complex social and political hierarchy.

The key to the Olmecs' rise appears to have been a strong, centralized monarchy. The colossal heads, each one depicting a particular individual, are likely portraits of the Olmec kings who ruled from ornate palaces at San Lorenzo and La Venta. Even though Tres Zapotes yielded the earliest evidence for Olmec kingship, 20 years of survey and excavations there suggest that, at its height, the city adopted a very different form of government, one in which power was shared among multiple factions. Further, while other Olmec capitals lasted between 300 and 500 years, Tres Zapotes managed to survive for nearly two millennia. The city, therefore, may have weathered intense cultural and political shifts not by doubling down on traditional Olmec monarchy, but by distributing power among several groups that learned to work together. According to University of Kentucky archaeologist Christopher Pool, who has spent his career excavating the city, that cooperative rule may have helped Tres Zapotes endure for centuries after the rest of Olmec society collapsed.

**W**HEN POOL ARRIVED at Tres Zapotes in 1996, he was the first archaeologist in over 40 years to take a serious interest in the site. Tres Zapotes had been recognized as an important Olmec center since shortly after the discovery of the colossal head, and in the decades to follow it had yielded a plethora of intricate figurines and stone monuments,

including another colossal head. But important details of the site's history remained unknown, including its size and how long it had been occupied. Pool set out to map the full extent of the ancient city, survey the ceramics he found scattered across the ground, and excavate the most compelling areas.

Battling dense fields of sugarcane, swarms of mosquitoes, and the occasional poisonous snake, Pool painstakingly reconstructed the layout of Tres Zapotes and how it had changed over time, and began to be able to compare it to the other great Olmec capitals. Between 1000 and 400 B.C., in a period called the Middle Formative, Tres Zapotes was a minor regional center covering around



This mound is what remains of a temple pyramid, one of four erected at Tres Zapotes.



**Early in the city's history, offerings such as ceramic vessels (above) were buried with the rich and powerful. Elite Olmec sculptures, such as a greenstone monument (below) were later used by Tres Zapotes' collective government as symbols of power.**

200 acres. At the time, La Venta and its all-powerful king dominated the Olmec heartland. Like its predecessor San Lorenzo, which flourished between 1200 and 900 B.C., La Venta was organized around a single dominant plaza featuring administrative buildings, elaborate monuments, and elite residences. The kings whose likenesses are memorialized by the colossal heads lived in palaces that brimmed with precious exotic goods, such as greenstone imported from Guatemala and polished iron-ore mirrors from Oaxaca and Chiapas. Their subjects, meanwhile, lived in modest households arrayed around the central plaza. The concentration of wealth and power in the center of the city, as well as art that glorified individual rulers, suggests that “the Olmecs had a cult of the ruler,” says Barbara Stark, an archaeologist at Arizona State University who works on the Gulf Coast of Mexico.

During La Venta’s height, Tres Zapotes operated under a similar model. As the nineteenth-century farmworker was the first to discover, it too had rulers represented by colossal stone heads. Despite being a relatively small city, it was also organized around a dominant central plaza. Elite burials discovered by Pool were filled with grave goods such as ceramic goblets and jade beads fashioned into jewelry. Another burial Pool uncovered contained no objects at all, hinting at possible social or class differences within the city’s population at that time. While Pool doubts that Tres Zapotes was under La Venta’s direct control during the Middle Formative period, it was clearly part of the same cultural and political tradition.

Around 400 B.C., La Venta abruptly collapsed. Archaeologists still aren’t sure why, but they have found evidence that traders stopped bringing luxury goods into the city. “A lot of [the Olmec rulers’] authority was supported by great displays of exotic wealth,” Pool says. When access to those goods was cut off, the resulting loss of status could have destabilized the monarchy’s control. Evidence shows that the city was quickly abandoned, and, absent any mass graves or other signs of violence, it seems that people likely poured out of the once-grand capital, looking for a new place to call home.



Researchers believe that it’s possible many of them moved to Tres Zapotes, 60 miles to the west. The city quickly expanded, covering 1,200 acres by the beginning of the Late Formative, shortly after 400 B.C. As he mapped the site’s growth, Pool discovered that the newly dominant Tres Zapotes didn’t look much like its predecessors, San Lorenzo and La Venta. They had both been organized around one outsized and opulent central plaza. In Tres Zapotes, however, Pool identified four separate plazas evenly spaced throughout the city, each about half a mile apart and ranging from about four to nine acres in size. “No one of these plaza groups is dramatically larger than the others,” Pool says. He also discovered that their layouts are nearly identical. Each has a temple pyramid on its west side, a long platform along its north edge, and a low platform set on an east-west line through its middle. According to John Clark, an archaeologist at Brigham Young University who studies the Formative period, “The site pattern is completely different from anything else I know for an Olmec site.” It’s so different, in fact, that archaeologists have dubbed the Late Formative culture at Tres Zapotes “epi-Olmec.”

Pool wondered if the seat of power in Tres Zapotes had moved from plaza to plaza over time, perhaps as the various groups jockeyed for control. But when he radiocarbon dated material from middens behind each plaza’s long mound, he discovered that they had all been occupied at the same time, from about 400 B.C. to A.D. 1. The ceramics Pool recovered from the different plazas were similar in style and technique, providing more evidence that they were occupied simultaneously—and that no one group dominated the others. Pool realized he wasn’t looking at signs of political conflict. He was looking at signs of political cooperation. “There was a change in political organization from one that was very centralized, very focused on the ruler,” he says, “to one that shared power among several factions.”

Pool is careful to point out that Tres Zapotes wasn’t a democracy as we think of it today. “I’m not saying that everybody in this society was getting together and agreeing on things,” he says. “It may have been more like an oligarchy.” But there

are signs that Tres Zapotes may have been more equitable than traditional Olmec capitals. For instance, the elites in the plazas and the commoners who lived outside of them all used similar styles of pottery. "Everyone pretty much has the same range of stuff," says Pool. He has discovered that, unlike at La Venta and San Lorenzo, the leaders of Tres Zapotes didn't import exotic goods, and so weren't reliant on trade networks. Craft workshops attached to the plazas show that the people at Tres Zapotes made ceramics and obsidian tools locally. "All that," says Pool, "suggests a more flattened kind of sociopolitical hierarchy than you see elsewhere."

"With the declining importance of the nobility and other kinds of elites, you get more economic equality," says Richard Blanton, an anthropologist at Purdue University who was among the first to propose that such societies may have existed in Mesoamerica. Cooperative governments also tend to produce different kinds of art than monarchies, Blanton says. Rather than monuments and tombs that glorify individual rulers, polities with shared power tend to separate the idea of authority from any particular person. That's what Pool sees at Tres Zapotes. The most elaborate monument he's found from the Late Formative period shows a ruler emerging out of the cleft brow of a monster to connect the underworld, the earth, and the sky. "This reasonably represents the ruler as the axis mundi, or the central axis of the earth," says Pool. This is a common theme in Olmec iconography. But unlike earlier Olmec art, including the colossal heads, the carving is not naturalistic and doesn't seem to represent a particular ruler. "The focus seems to be less on the person than it does on the office," Pool says. At Tres Zapotes, the idea of rulership, rather than an actual monarch, was what mattered.

**P**OOL CAN'T SAY exactly why the people of Tres Zapotes first decided to experiment with a shared power model. Perhaps the collapse of trade routes doomed the monarchy at La Venta and undermined that form of authority. Or maybe the mass migration into the city that researchers have posited required that the factions cooperate to build a new, stable home. But whatever the cause, Pool says, this unprecedented level of cooperation in an Olmec city helped it outlast every other outpost of its culture. "What Tres Zapotes has shown is that even though there were Olmec centers that collapsed, Olmec culture also evolved," Pool says. Archaeologists today may define this change as epi-Olmec, but for the people living through it, the transition was smooth and continuous. "The Olmec culture didn't just vanish overnight," Clark agrees.

At Tres Zapotes, he says, "They're hanging on and modifying it and trying to save it."

Even as Tres Zapotes tried out a new form of government, it made room for symbols of the past: Two colossal heads, as well as other pieces of older, more authoritarian Olmec art, occupied prominent places in plazas throughout the city's height. "There are aspects of their culture that [the epi-Olmecs] are trying to hold onto," Pool says. The older heads "are essentially royal ancestors that provide a legitimate claim to authority"—even though that authority was now shared among several different groups.

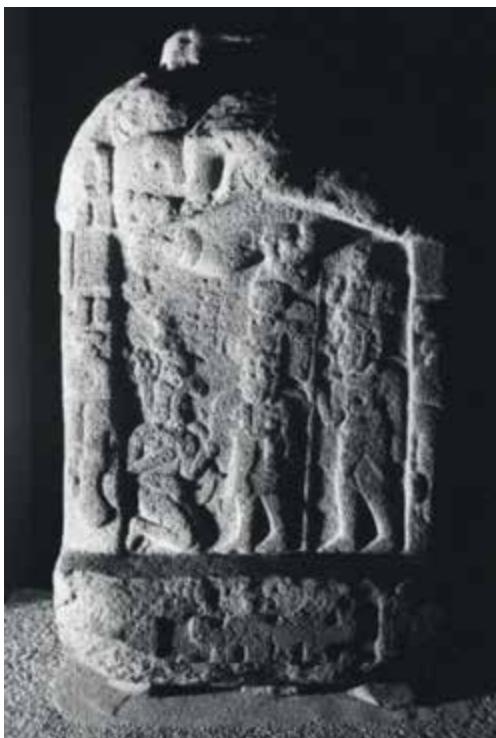
This system of cooperative government worked for a long time—about 700 years. "But eventually," Pool says, "it just falls apart." Between A.D. 1 and 300, shared power slowly gave way to individual rule again. The once-standardized plazas were built over with new architectural styles and layouts, each taking on a discrete form and asserting its individuality rather than projecting harmony and cooperation. Carved stone monuments dating to around the first century A.D. found just outside Tres Zapotes show a standing figure with another person sitting in front of him, a resurgence of the artistic themes of individual ruler and subject. Over the next several centuries, Tres Zapotes slowly declined and the Gulf Coast's cultural center of gravity shifted toward sites in central Veracruz. Meanwhile, the monarchy-obsessed Maya rose to dominate lands farther south. After 2,000 years of adaptation and survival, Tres Zapotes slowly faded into obscurity and was eventually abandoned.

Pool still doesn't know why the city gave up on its experiment in shared governance. He does speculate that it's possible that Tres Zapotes' power model splintered as its regional dominance declined. Pool is sure, however,

that the transition wasn't sudden, as with San Lorenzo or La Venta. According to Pool, when the end came for Tres Zapotes, it was "a soft landing."

The surprising thing is not that Tres Zapotes' era of shared power came to an end, says Blanton. It's that it survived for as long as it did. "It is very difficult to build and sustain these more cooperative kinds of polities," he says. "Autocracy is always an alternative." Tres Zapotes may have ended as it began: with a king. But for nearly 700 years in between, it tried something different. Monarchy gave way to cooperation, wealth became more evenly distributed, and an entire culture, for a time, redefined what government and leadership could mean. ■

Lizzie Wade is a journalist based in Mexico City.



**This monument shows a person (lower left) kneeling before a standing figure, suggesting a return to monarchy. It was carved in the Tres Zapotes region around the time when the city's shared power model began to break down.**

**I**N THE SUMMER OF 2013, Julien Beck, an archaeologist from the University of Geneva, was swimming in the Bay of Kiladha, off the east coast of the Peloponnese in Greece, when he spotted something unusual. "I started seeing lines of stones underwater," he says. "I really could not believe what I was seeing." A closer look the next summer revealed potsherds as well. His interest piqued, Beck and his team devoted much of their 2015 and 2016 seasons to investigating what they now regard as the underwater remains of a third-millennium B.C. site that was inhabited by Early Bronze Age people whose building projects demonstrated great ambition. "Even on the seafloor, you can see that you have many different structures and what seems to be part of a fortification system," says Beck. "It is clear we are dealing with a submerged settlement of some importance."

The remains are just off a section of the shore known as Lambayanna Beach, and lie beneath three to 10 feet of water. Beck and his team donned snorkel equipment to survey the shallowest sections, while the deeper areas required scuba gear. From

what they have found so far, Beck sees Lambayanna as similar to other nearby sites from the same period, such as Lerna, Tiryns, and Asine. Like them, it featured a range of circular, rectangular, and bullet-shaped buildings surrounded by an outer fortification wall that was up to seven feet wide and of indeterminate height. There are also three horseshoe-shaped structures, measuring 60 by 33 feet each, attached to the outer wall at Lambayanna, which Beck believes were likely the bases of defensive towers. Evidence of similar fortifications has been found at contemporaneous locations, including Lerna, but these are just a third the size of those at Lambayanna. Beck proposes that the massive towers might have been put in place to protect valuable trade goods or to impress outsiders. "The point may be to say, 'Look at my city, see what wonderful towers we are able to build,'" he says.

Based on what is known of historical sea levels, Lambayanna would have been right at the edge of the bay in its time and is now at least partially underwater due to tectonic activity that has caused the land to gradually sink. Beck thinks that it was likely part of a network of coastal sites from the same period, a

# Town Beneath the Waves

**In a chance find just off Greece's Peloponnese, archaeologists have discovered the remains of a once-thriving Early Bronze Age settlement**

by DANIEL WEISS



**Stones from the foundations of buildings dating to around 2500 B.C. are visible beneath the water just off the shore of Lambayanna Beach on the east coast of Greece's Peloponnese.**

conclusion buttressed by the recovery of a broken stone anchor at the settlement's edge. "We are discovering more and more of these coastal towns," he says. "There seems to have been a lot of trading activity, with many ships going from port to port." In all, the researchers have collected around 6,000 ceramic and stone objects from the seafloor, providing evidence of an array of economic activities at Lambayanna. Its residents appear to have woven textiles, ground grain, and knapped obsidian blades using cores imported from the island of Milos. While these activities are all typical of the period, Beck has identified another feature that is unusual: two rows of flat stones, each about 10 feet wide, that he believes were roads. The rows are parallel to each other, suggesting early urban planning. "You would not have parallel streets by chance," he says.

A small trench dug into the seafloor last summer exposed pottery indicating that occupation of the site dates at least to the early third millennium B.C. Other ceramics found lying on the seafloor provide clues about the town's end. Based on the large number of these sherds, the homogeneity of their style,



An archaeologist (top) investigates the foundations of a fortification wall. The wall (above) once measured around seven feet wide and surrounded the Early Bronze Age settlement at Lambayanna.

and the large size of many of the fragments, including entire preserved bowls, Beck speculates that the settlement was abruptly abandoned around 2500 B.C. and never reoccupied. "It could be due to many reasons—anything from an attack to a tsunami," he says, "but it seems clear that there was quite a surprise, followed by a rapid abandonment of the site."

The visible remains of Lambayanna cover around three acres of the seafloor. Geophysical testing seems to indicate that they continue under the beach, and Beck suspects more may lie under present-day agricultural fields. Ultimately, he hopes to undertake a simultaneous land and sea dig. "The dream would be to have two types of excavation on the same site," he says, "an underwater excavation off the beach and a land excavation in the field behind the beach." ■

---

Daniel Weiss is a senior editor at ARCHAEOLOGY.



# The Road Almost

**T**HE OFT-TOLD TALE of the Roman Empire's expansion is one of violent conquest—its ever-widening borders pushed forward at sword point by Roman legions. Some of the bloodiest military engagements pitted Rome against the inhabitants of Germania, who are described by contemporary sources of the time as a loose

confederation of uncivilized, quarrelsome, warlike, ferocious tribes to the north. The conventional wisdom goes that after a decades-long attempt to conquer the region east of the Rhine River finally failed in A.D. 9, Rome gave up on the Germans entirely. But what if there's more to it than that?

In the 1980s, the chance discovery of sherds of Roman-style pottery on a farm in the Lahn Valley near Frankfurt led archae-



A gilded bronze horse head formed part of a life-size statue of a mounted emperor that once overlooked the forum at the center of Waldgirmes, a Roman settlement near Frankfurt.

# Taken

An ancient city in Germany tells a different story of the Roman conquest

by ANDREW CURRY

ologists and historians at the German Archaeological Institute's Romano-Germanic Commission to begin excavations. What they uncovered was a Roman site they call Waldgirmes, after a nearby modern town. The ancient name is unknown. When German Archaeological Institute archaeologist Gabriele Rasbach started working at the site in 1993, she and her colleagues assumed they had found a military installation.

Ground-penetrating radar surveys revealed carefully planned streets, the foundations of wooden buildings, and postholes that are evidence of 10-foot-tall timber walls. "It was clearly just like a Roman military camp," says archaeologist Siegmar von Schnurbein, who was the director of the commission during the Waldgirmes excavation.

Although the discoveries were exciting, they were not nec-

essarily surprising. The Roman army, fresh from its conquest of Gaul and bent on further dominion, had been active all across Germany, and the distinctive straight lines of Roman military camps are familiar to German archaeologists. “The military interpretation here is so strong that at first we didn’t think it could be anything else,” Rasbach says. As the Waldgirmes excavations progressed, though, archaeologists began to question their initial assumptions. “We found buildings that had nothing to do with the military,” says von Schnurbein, “and we still haven’t found anything resembling a barracks.”

The excavators began to realize that the site might be something else entirely. As they dug over the course of nearly 15 years, they uncovered specialty workshops for ceramics and smithing, and administrative buildings made of local stone and timber from the thick forests nearby. They found evidence of some Roman-style residences with open porticos in front, unlike the longhouse-style buildings preferred by the locals, as well as other hallmarks of a typical Roman town, including a central

ologists have been able to establish precise dates using dendrochronology, which uses tree rings as a time stamp. They determined that construction at Waldgirmes began around 4 B.C., not long after Roman troops reached the Elbe River, pushing the empire’s range deep into Germany. Waldgirmes’ architecture and the absence of a military presence suggest a relationship between Romans and Germans that runs against both the ancient and modern versions of the accepted story. “The fact that a city was founded in the Lahn Valley without a major military presence means there was a different political situation in the region,” von Schnurbein says—that is, different from what most historians have assumed. He concludes, “The Romans thought the Germans were loyal enough that they could build a civilian settlement here.”

The Romans’ motivation in establishing Waldgirmes, at least at first, may have been trade. Ample pottery fragments provide evidence of relationships with provinces of the Roman Empire. The majority of the pottery is turned on potter’s wheels in the



Artifacts (left to right) such as a chalcedony cameo depicting the god Dionysus, and a glass gem showing a wounded child of the mortal Niobe, a glass bead with an image of a sacred bull, probably made in Egypt, and an enameled silver fibula are evidence of Waldgirmes’ relationships with distant parts of the Roman Empire.

public space, or forum, and a large administrative building called a basilica. “There’s actually not a single military building inside the walls,” says Rasbach. What they had uncovered was a carefully planned civilian settlement.

Artifacts from the site further reinforced the identification of Waldgirmes as a town. Of the hundreds of objects archaeologists have excavated, just five are military in nature, including a few broken spear points and shield nails that could be associated with the army. When taken together, the artifacts and structures persuaded researchers that they were dealing with an entirely novel phenomenon: a new Roman city established from scratch in the middle of a potential province. From the forum to workshops, houses, and water and sewage systems—from which sections of lead pipe have been recovered—to its sturdy outer walls enclosing 20 acres, Waldgirmes had everything a provincial capital needed. “It’s the first time we can see how Rome founded a city,” says von Schnurbein. “You can’t see that anywhere else.”

Because the site was built predominantly of wood, archae-

Roman style, and was probably imported from Gaul or Roman settlements north of the Alps. But 18 percent of the broken pots were local German ware, suggesting that Waldgirmes’ residents also traded with their barbarian neighbors. Ordinarily, at Roman military sites in Germany, local pottery makes up a mere tenth of a percent of the total. In addition to ceramics, silver pins and glass beads uncovered at the site might have been sold by Roman merchants who brought them from home. But von Schnurbein believes relations might have encompassed more than trade. “There’s plenty of evidence Germans might have lived in Waldgirmes,” he says, citing typical German jewelry found there and variations in house foundation styles at the site, reflecting both Roman and German styles. “It’s not just trade goods and ceramics, but signs the locals were at home there, or lived right nearby and had intensive contact.”

According to Rasbach, the most intriguing finds were fragments of bronze that turned up as excavators dug deeper into the field. The first, just half an inch long, was discovered in 1994. Over the years, dozens more followed—some tiny and

some big enough to be recognizable as belonging to a large sculpture. "At first, we thought it was bronze recycled from somewhere else," Rasbach says, "but we kept finding parts of a statue—a fragment of a human foot, and then a section of horse armor." Eventually they had more than 160 pieces of metal, weighing 48.5 pounds in all. Most were tiny splinters, but the largest was the size of a small paperback book.

As the team excavated the settlement's forum, where the majority of the bronze was recovered, the truth behind the fragments began to become clearer. In the middle of this public square, they found the shattered remnants of five limestone pediments in corresponding nine-by-six-foot pits. The pediments' dimensions made them large enough to showcase life-size statues of mounted riders, and the stone had been prepared with the holes and sockets Romans sculptors usually used to mount such statuary.

The pediments were a logistical accomplishment in and of themselves. "The limestone was from France, brought to Waldgirmes by river," Rasbach says. Rasbach and her team thought the chances of recovering one of the statues intact were extremely slim. In the ancient world, metal was an especially valuable commodity. A large bronze statue would most likely have been smashed and recycled into weapons or armor.

**I**N 2009, THE TEAM decided to excavate a well that had been discovered in the center of the settlement. It was

to be the project's last major phase. The well's shaft was an estimated 20 feet deep, and, in order to prevent it from collapsing as they dug, they came at the structure from the side by creating a downward-slanting pit. When they reached what they thought was the bottom,



In order to keep a 33-foot-deep ancient well from collapsing during excavation (top), archaeologists constructed a ramp. At the bottom of the well (above), they uncovered a 265-gallon wooden wine cask. The entire depth of the well (right) is shown in profile.



A fragment of a sandaled human foot is one of the pieces of the bronze equestrian statue to have been uncovered.

it turned out the well was significantly deeper than they had envisaged. Working far into autumn, the team kept digging until, finally, nearly 33 feet below the surface, they found a 265-gallon, 63-by-39-inch wooden wine cask, placed there two millennia ago to hold the bottom of the well open. The barrel's wooden slats had been preserved by the cold, wet, anaerobic conditions below the surface.

The cask was packed like a junk shop, its contents a reflection of the settlement's last days. At the top was a bronze shoe, apparently a fragment of one of the mounted statues. Fence

posts, a shovel, an ox yoke, a well cover, wooden buckets, tool handles, and sticks had also been tossed into the well, along with eight heavy millstones. They, like the limestone pediments, had been imported from hundreds of miles away, this time from near modern-day Aachen to the northwest. "The millstones were virtually unused," says Rasbach, evidence of the settlement's short lifespan.

Rasbach and her team were astounded to find a life-size bronze horse's head wedged underneath the millstones. As excavators worked, the copper salts in the bronze reacted with air for the first time in nearly 2,000 years and briefly turned the metal purple. The head was barely dented, despite the millstones that had sat on top of it. "The well must have had water in it that let the millstones float down gently," Rasbach says. The head had probably been part of a life-size sculpture of a mounted emperor that stood as the centerpiece of the settlement's forum on top of one of the five limestone pedestals.

Based on the horse head's weight, archaeologists estimate the complete statue weighed nearly 900 pounds. Subsequent restoration work revealed that it was entirely covered in gold leaf, which must have made a tremendous impression on anyone who saw it. According to von Schnurbein, the presence of such imposing statues is another clue to the settlement's intended role as a provincial capital. To the Romans, images, particularly imperial ones, were more than symbols. "A picture or image of the emperor meant something very different than it would today. It meant he was actually there, actually present," says von Schnurbein. "It shows Rome was willing to go all out to demonstrate that Rome rules here. Augustus, who was emperor at the time, rules here."



The horse's bridle is decorated with images of Victoria (left) and Mars, the Roman god of war, at rest (right), appropriate symbols for a Roman emperor to display in his newly annexed province.

A coin found deep in the well portrays the emperor Augustus and the letters "VAR" for the vanquished Roman general Quintilius Varus.



The situation in Waldgirmes must have seemed quite stable, says archaeologist Salvatore Ortisi of the University of Osnabrück. "You can see the area was on its way to becoming a regular Roman province," he says. "The Romans must have felt in control of the area to build something like this settlement." Cooperation and diplomacy must have seemed the right road to take.

**W**HATEVER SENSE OF security and first steps toward peaceful relations with the German tribes the Romans may have felt they achieved when they settled Waldgirmes, that state of affairs was short-lived, their sense of control badly misplaced. Evidence suggests that something significant happened at Waldgirmes in the fall or winter of A.D. 9, a date that coincides with a German battle fought 155 miles to the north. Now known as the Battle of the Teutoburg Forest, the clash was the Roman Empire's most humiliating defeat.

In response to raids by rebellious German tribes, the ambitious and arrogant Roman general Quintilius Varus, fresh from crushing a rebellion in Judea, led three legions north to the forests of Germany. An ambush by well-organized German warriors resulted in the total annihilation of Varus' forces in a swamp near the modern city of Osnabrück. The 15,000-strong army's shocking defeat at the hands of barbarians threw the empire into a crisis of confidence. It also seems to have marked the beginning of the end for Waldgirmes. Tree-ring analysis of a ladder found tossed in the well, for example, shows that it was made in the fall or winter of A.D. 9. Says Rasbach, "That we can discuss, almost to the month, when all this happened is amazing."

Rasbach thinks the settlement's final days might have gone something like this: After word of the Teutoburg slaughter reached Waldgirmes, the hundreds of Romans there, who were mostly craftsmen, traders, and administrators, rather than armed legionaries, realized Germany was no longer friendly territory.

What happened next is murky and a number of interpretations are possible. One thing, however, is quite clear—the forum's magnificent statues were pulled from their pedestals and violently dismantled, the emperor's image smashed, and the horse's head tossed into the well. Rasbach and her collaborators think, because bits of bronze statue were found underneath later construction, that the destruction of the statues might have been a dramatic effort to placate Waldgirmes' German neighbors and allow the settlement to survive deep in suddenly hostile territory. Von Schnurbein, on the other hand, thinks that the horse head may have been spared because of its symbolic importance to the locals. "In Germanic areas, there's evidence for horse sacrifices, especially in bogs,"



he says. "The destruction was a major symbolic act—30 pounds of valuable bronze was tossed in the water, and then covered with millstones." The golden horse, in other words, may have stood in for a real horse in a ritual water sacrifice.

**T**HE TEUTOBURG slaughter sealed the settlement's fate. Archaeologists have found no coins dated after A.D. 9, and within a few years after the battle, Waldgirmes' Roman residents seem to have packed up and left, abandoning the city, its forum, and its shattered statues. "There are no mass graves or signs of fighting in the streets," says Ortisi. "From what we can tell, the evacuation was planned."

Ultimately, Waldgirmes was put to the torch. Rasbach thinks the departing Romans incinerated the settlement in order to leave nothing behind for vengeful German tribesmen. "In the final fire, everything was wiped out, ground down to the earth," Rasbach says. "You can see burning along the entire wall."

**T**HE GERMAN VICTORY over Varus ended Roman expansion east of the Rhine for good. After the battle, the Romans abandoned the region, pulling troops back to the Rhine and Danube Rivers. The Battle of the Teutoburg Forest and its aftermath are amply documented. Even the reaction of the emperor Augustus, said to have cried "Varus, give me back my legions!" when he received news of the defeat, is recorded in the ancient Roman historian Suetonius' *Lives of the Caesars*. Yet there are no direct mentions of Waldgirmes in Roman histories. Perhaps the failure to make Germania a new province was such a political embarrassment that all mention of the settlement was wiped from the history books. Or maybe written records of the outpost were lost, leaving historians a far more martial impression of Rome's attitude toward its barbarian neighbors to the north.

Von Schnurbein, however, says careful readers of the classics might see a hint of Waldgirmes' existence in the works of Cassius Dio, a Greek chronicler who wrote around A.D. 200: "The Romans were holding portions of [Germania]...and soldiers of theirs were wintering there and cities were being founded. The barbarians were adapting themselves to Roman ways, were becoming accustomed to hold markets, and were meeting in peaceful assemblages."

As German archaeologists excavated military camp after military camp in the twentieth century, Cassius Dio's version of events—particularly the idea that cities were being founded—was dismissed as wishful thinking or anti-Varus propaganda designed to place all the blame for the loss of a once-promising province at the general's feet. "Everyone assumed Cassius Dio was exaggerating," von Schnurbein says, "but Waldgirmes shows that, despite what the historical sources say, the Romans were building cities in Germania." ■

Andrew Curry is a contributing editor at ARCHAEOLOGY.

**Under the apse of  
a newly discovered  
5th-century church  
in Nîmes, France,  
archaeologists have  
uncovered burials  
dating from the Roman  
period through the  
early Middle Ages.**





# MEMENTO MORI

**A cemetery used for centuries is an expression of the enduring relationship between the living and the dead**

by JARRETT A. LOBELL

ONE OF ARCHAEOLOGY'S paradoxes is that in order to comprehend ancient people's lives, often the best place to look is not through the broken sherds of the pots they used to cook their family dinners, or at what may be left of their homes after hundreds or even thousands of years, but in their graves. How people are buried, the things they are buried with, and their physical remains can reveal much about those who might otherwise be lost to history. Are their graves filled with valuable items that mark them as wealthy, or with only a few small treasured possessions? Or were they interred with nothing at all and simply consigned to the earth? Did they succumb to a common disease, or were they casualties of war? Do their bones show the passage of many years, or did they die young?

Burials can also illuminate cultural circumstances and values. "People's bodies can tell us a great deal about them as biological individuals," says mortuary archaeologist Kate Emery of the George Eastman Museum in Rochester, "but bones also have a lot to say about them as social individuals." The materials available, the types of coffins chosen, the inclusion of provisions for the afterlife, and even the position of the deceased's body are testimony to economic realities and to belief systems that can be difficult to detect in the writings of ancient authors. "Excavating the dead is actually very humanizing compared to a text," says Emery. "For the most part we don't know anything about who they were or many details about them, so studying their bodies and what they chose—or what mourners chose—to put around them in death adds a richness to the story of the past that is missing. Text allows us to remove ourselves from people in some way, but when you are actually looking at their bodies and considering who they were, it's very intimate."



**Three of the eight rare, expensive lead coffins discovered at the site, originally found with their lids still in place, predate the church by two centuries and are evidence of a wealthy community.**

**R**ARELY DO ARCHAEOLOGISTS have the opportunity to examine as many graves representing as many different burial customs as a team from the French National Institute for Preventive Archaeological Research (INRAP) has had at a cemetery in the French city of Nîmes. There, next to a newly discovered fifth-century church, the earliest in the city, archaeologist Marie Rochette has uncovered 130 burials that span some six or seven hundred years, dating from late antiquity to the early Middle Ages.

Both under and inside the church, and in the crowded cemetery outside its walls, burials of various styles and periods lie side by side and even overlap. The challenge of excavating the entire site and dating so many graves was immense, especially given the limited time available to the team—just four months—before construction of a private house began on the site. Mortuary archaeology, explains Emery, is a delicate process of teasing apart the different eras in evidence. She stresses that respect for

the individuals is also paramount. “We are very sensitive to the fact that these are people, and that we are not just excavating the graves for knowledge’s sake, but to better understand historical periods for which we may have few texts or little information from other sources.” The majority of this kind of work is done in advance of building projects that will destroy both the bones and their archaeological contexts, thus eliminating the chance to learn what the dead might be able to divulge about major cultural changes, such as the gradual transition from paganism to Christianity, and also more local concerns such as conditions of diet, health, and disease.



**T**HE OLDEST OF the Nîmes burials are eight lead coffins dating to the third century A.D., most of which contain some jewelry and other valuable objects. Lead would have been a

**A ceramic amphora uncovered in the cemetery outside the church dates to the early medieval period and holds a small child's bones.**

very expensive material, says Rochette, and these coffins indicate that an affluent population lived there before the church was built. Rochette's team found other types of graves from the same era, including a stone-and-wood coffin belonging to a young woman interred with jewelry made of seashells, jet, and a sapphire that likely came from Asia. Dating to the later periods are many simpler coffins made of stone, wood, and ceramic tiles. There are also several children buried in amphoras. In these later years, grave goods are scarce, limited to such items as small pottery jars for perfumed oils imported from North Africa, indicating, perhaps, a change in the community's economic circumstances or the introduction of new beliefs in the post-Roman, Christian world.

Some of the most interesting of the Nîmes tombs are made of reclaimed materials, or *spolia*, from the ruins of an older Roman necropolis that once lined a main road south of the city. Stone columns, stairs, pieces of coffered ceilings, marble moldings and veneers, and even inscriptions from older funerary monuments were all used to create these early Christian graves. "These elements have great symbolic value," says Rochette. "They are high-quality materials, yes, but the reuse of still-legible funerary inscriptions probably serves as a way to remember the dead."

Yet it is not just the reuse of materials, but also of space itself that is significant. Emery believes that cemeteries used for long spans of time, even when the nature of the commu-

**Grave goods are rare in the cemetery's early Christian burials, and are limited to small perfume bottles such as these, which may have come from North Africa.**



nity has changed, demonstrate the importance of connecting to older generations. "I find it fascinating to look at it from an alternative viewpoint," she says. "Rather than each burial displaying the individual's own personality, what is most important is being in this space and being close to and connected with their ancestors." Rochette agrees: "In this cemetery, as in other sites of the same period, there is no break between the end of antiquity and the Middle Ages in terms of the use of these funerary locations. In fact, usually the dead are buried in the very same areas, and it preserves the memory of the place."

FOR ROCHETTE AND the team of INRAP scientists, the fieldwork in Nîmes is complete, but the analysis of what they have removed from the cemetery—lead and wood coffins, stone slabs, small artifacts, physical remains—has only just started. Now the lives of 130 people who have been dead for more than 1,000 years can begin to be reconstructed, and their identities, to whatever extent possible, recovered. "What captivates me about mortuary archaeology is that it allows you to put people back into history and see everyone across the social spectrum," says Emery. "You don't only get to see the 'great men' who are the focus of many histories, but you can also see the average person, minority groups, children, women. In death everyone is on an equal level—it's very democratic—because whether king or slave, everyone ends up as bones." ■



**A child's tomb is one of several graves at the site made of inscribed stone slabs taken from grave monuments belonging to an earlier Roman necropolis nearby.**

Jarrett A. Lobell is executive editor at ARCHAEOLOGY.

# The First American Revolution

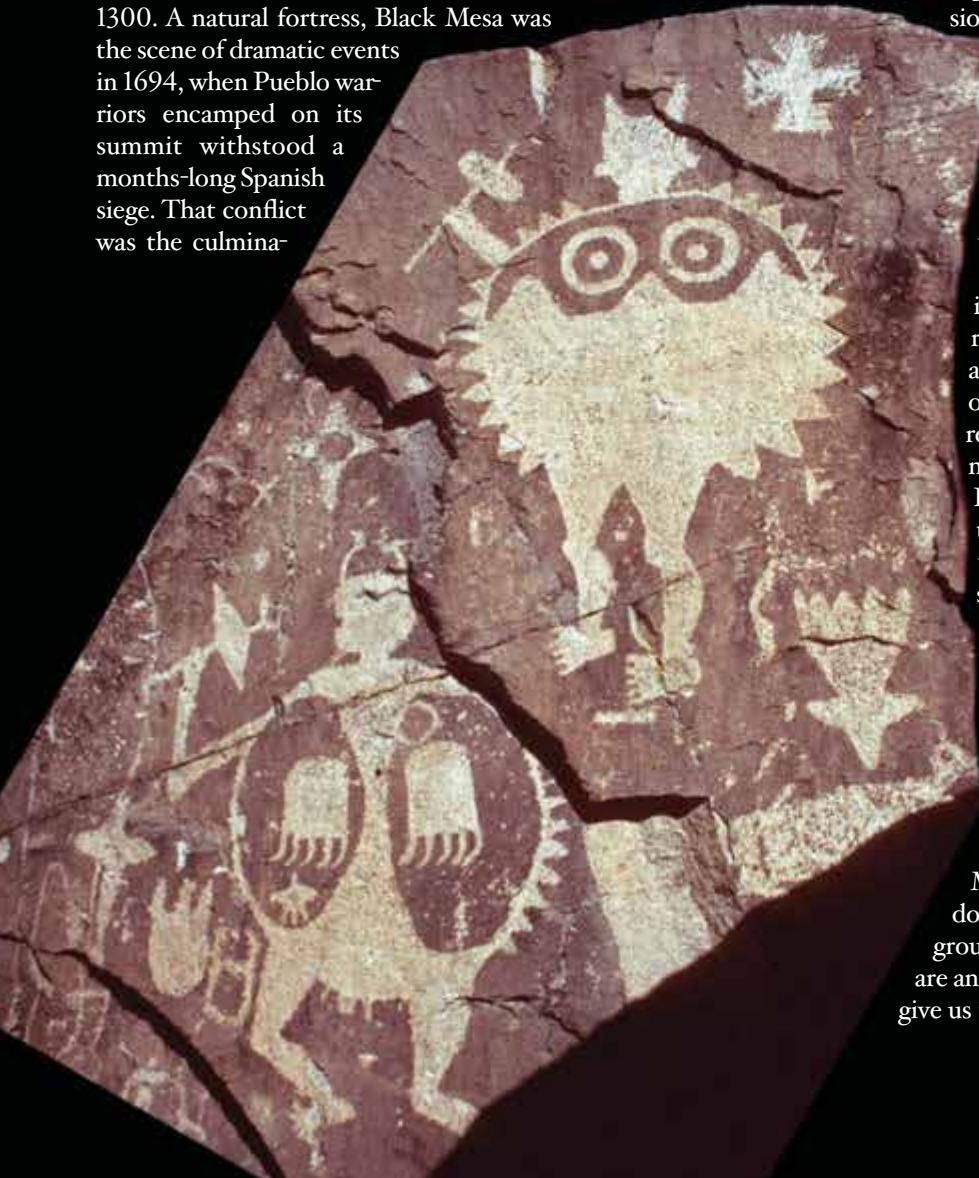
**Exploring the legacy of the New World's most successful native rebellion**

by ERIC A. POWELL

**A**N ISOLATED VOLCANIC outcropping, Black Mesa rises high above the floodplain of northern New Mexico's Rio Grande Valley. The land it's on belongs to the people of San Ildefonso Pueblo, whose ancestors have farmed near the base of the mesa since at least A.D. 1300. A natural fortress, Black Mesa was the scene of dramatic events in 1694, when Pueblo warriors encamped on its summit withstood a months-long Spanish siege. That conflict was the culmina-

tion of what is known today as the Pueblo Revolt, an indigenous uprising that began on August 10, 1680. On that date, Pueblo warriors from 19 separate villages carried out a coordinated attack on Spanish missionaries and colonists across New Mexico. Within a few days, they had driven virtually all Spaniards out of the province. For the next decade, apart from occasional Spanish military expeditions, the Native American peoples of New Mexico enjoyed total independence. "The Revolt period is still so important to Pueblo identity," says University of Pennsylvania archaeologist Joseph Aguilar, a member of San Ildefonso Pueblo. "In many ways it shaped the world we live in today."

Historians have relied primarily on Spanish accounts to understand the period, but recently, archaeologists have begun to uncover a richer picture of Pueblo life in the aftermath of what some scholars call the "first American revolution." Working closely with Pueblo communities to study sites established after the Revolt, archaeologists have found evidence for tremendous change in Pueblo society as well as widespread revival of traditions that had been suppressed by the Spanish. A major focus of this recent research has been on defensive villages built on mesa tops during the 14 years of Pueblo independence. Aguilar is the latest archaeologist to explore one of these sites and is now working at Black Mesa, mapping the Revolt-era settlement there and seeking to understand the role the site played when Spanish forces eventually returned to New Mexico. "We're finding the Spanish accounts don't always match up with what we see on the ground," says Aguilar. "The historical documents are an important resource, but archaeology can help give us the native perspective on what happened."



A wide-angle photograph of a massive, flat-topped mesa rising from a dry, scrub-covered plain. The mesa's surface is a light tan color, showing signs of erosion and weathering. The sky above is a deep blue, filled with wispy, white clouds. In the upper right corner of the image, there is a block of text.

A rock art panel in New Mexico (opposite page) likely depicts two Pueblo warriors carrying shields and brandishing weapons. In 1694, warriors from a number of Pueblo villages in northern New Mexico occupied the summit of Black Mesa (shown here) and withstood a months-long Spanish siege.

**T**HE PUEBLO REVOLT came after nearly 100 years of Spanish rule in the Southwest. Spaniards first colonized New Mexico in 1591, when a group led by Governor Juan de Oñate established settlements among the Pueblo farmers living in the northern Rio Grande Valley. The Pueblo peoples shared an agricultural way of life, but were linguistically and culturally diverse. They inhabited upward of 90 villages, known as pueblos.

In New Mexico, as they did elsewhere in the New World, Spanish authorities introduced the *encomienda* and *repartimiento* systems, in which Native Americans paid heavy taxes to the government and were obligated to work for Spanish colonists. Franciscan missionaries were among those who initially settled the province, and they cracked down on traditional religious practices, ordering the Pueblo people to build churches in their villages and installing bells that became a hated symbol of colonialism. Their presence was intended to impose a Spanish and Christian conception of time. In some cases natives were also forced into new villages that were organized into European-style grids, rather than the contiguous groupings of rooms known as room blocks of a traditional pueblo.

As the colony's European population grew, the number of indigenous people began to decline, in part because of a series of epidemics and famines. Exact figures are hard to come by, but recent estimates put the native population of the Pueblo world at the onset of Spanish rule at around 100,000. By 1680, that number was down to 30,000, and the Spanish population stood at 4,000. Discontent grew among the Pueblo, and in 1678, a group of some 70 religious practitioners from a number of native villages went to the capital of Santa Fe to petition

the governor to loosen restrictions. He reacted by jailing them all and hanging the leaders. Some committed suicide while in jail, though most were eventually released. One of those was a man known to history as Popé, an important leader from Ohkay Owingeh Pueblo. After his release, Popé fled to Taos, the northernmost Pueblo village, where he worked with other Pueblo leaders to plot a rebellion against the Spanish.

On Popé's orders, messengers were sent out to all the Pueblo villages carrying cords with knots in them that were meant to count down the days until the uprising. When two of those messengers were caught south of Santa Fe and executed on August 9, 1680, Pueblo leaders decided to begin the rebellion ahead of schedule. Across the Pueblo world warriors attacked Spanish missions and ranches. In all, 21 priests and 401 Spanish settlers were killed. The survivors fled south to El Paso del Norte, today the Mexican city of Juárez.

During the next 12 years, the Pueblo world changed profoundly. Popé and other leaders tried to stamp out all vestiges of Spanish life, and urged people to return to their traditional ways. Many villages were abandoned, and there was a great deal of movement among communities. According to Spanish sources, violence broke out between those who supported the rebellion and native converts who remained loyal to the Catholic Church.

When a Spanish force returned to New Mexico temporarily in 1692, it did not encounter overt hostilities. The future governor of New Mexico, Diego de Vargas, made a tour of the Pueblo villages and reclaimed the province for the king of Spain before returning south to Mexico, an episode known as the "Bloodless Reconquest." But when Vargas came back to New Mexico in 1694 with a larger army and a group of



The ruins of the Pueblo Revolt-era village of Hanat Kotyiti show that it was organized around two plazas. This traditional practice had been discouraged by the Spanish. A wildfire recently exposed sections of the site.



The ancestors of today's Jemez people built the village of Astialakwa on a defensible mesa in just a few months after they learned the Spanish would return.

colonists, he found that many of the Pueblo living in new villages on defensible mesas still resisted Spanish rule, and the reconquest became anything but bloodless.

THE FIRST ARCHAEOLOGISTS to work in the Southwest in the late nineteenth and early twentieth centuries concentrated on the ruins of Spanish missions. "Those early archaeologists actually excavated a number of sites important to understanding the Pueblo Revolt," says Brown University archaeologist Robert Preucel, "but they were more interested in prehistoric sites, and the Revolt was never an explicit focus of research." That period remained the province of historians until the early 1990s, when greater cooperation between Native Americans and archaeologists made work at sensitive sites such as the mesa-top villages possible. At Zuni Pueblo in western New Mexico, University of Arizona archaeologist T.J. Ferguson was the first to apply modern archaeological techniques to a Pueblo Revolt-era site. With the permission of the Zuni, he surveyed a village on Dowa Yalanne, or "Corn Mountain," a mesa on the Zuni reservation.

Before the Revolt, the Zuni were spread out among as many as six villages. Afterward, all the Zuni moved into newly constructed homes on Dowa Yalanne, which would have been nearly impregnable. Ferguson found that the arrangement of dwellings on the mesa top departed significantly from earlier villages. While those villages were typically made up of just a few room blocks, on Dowa Yalanne there were two large room blocks and multiple medium and small room blocks, likely to accommodate

After the Revolt, the Jemez people stopped producing pottery that the Spanish had used as vessels, such as chalices (right), and instead began making ceramics (far right) bearing ancient motifs.

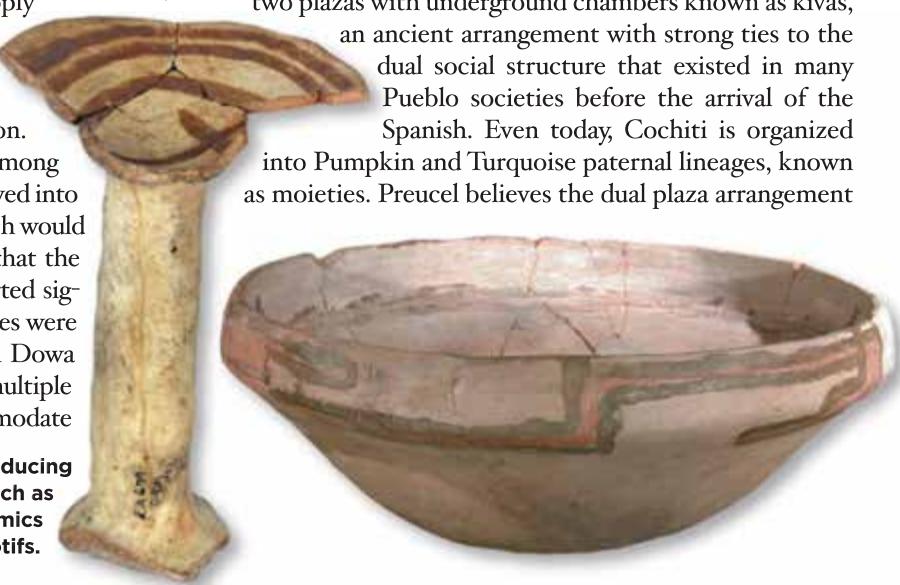
a number of groups occupying the mesa. While the different people lived in separate areas, Ferguson notes that the village was structured around open spaces that would have fostered communication among them. "This was a fundamental reorganization of their society," says Ferguson. "They had to unify households, clans, and priesthoods, so social interaction was important." Unlike other mesa-top villages constructed in the aftermath of the Pueblo Revolt, Dowa Yalanne was never besieged. Once the Spanish returned, the Zuni people moved off the mesa and occupied a single pre-Revolt village, now known as Zuni Pueblo.

Ferguson notes that each Pueblo group experienced the Revolt differently. At Zuni, the people treated the various sacred Christian objects such as chalices and bibles with respect. There is even a strong oral tradition that suggests they spared the life of the mission priest, known as Father Gray

Robe. At least 18 versions of the story have been recorded, and it seems likely the priest was adopted into the tribe and lived out the rest of his days with the Zuni.

IN 1996, PREUCEL BEGAN working with the people of Cochiti Pueblo, which is east of Zuni in the northern Rio Grande Valley. After the Revolt, their ancestors built a mesa-top village now known as Hanat Kotyiti, or "Old Cochiti." Preucel believes the structure of the village shows they moved there not just for defensive purposes, but to help reimagine their way of life. "The Pueblo leaders were proselytizing in the aftermath of the Revolt, trying to convince people that after kicking out Spanish authority, they needed to live by the laws of the ancestors," says Preucel. "So they left the mission villages, which were polluted, and built these mesa-top villages." Hanat Kotyiti, with six-foot-high walls, was organized around

two plazas with underground chambers known as kivas, an ancient arrangement with strong ties to the dual social structure that existed in many Pueblo societies before the arrival of the Spanish. Even today, Cochiti is organized into Pumpkin and Turquoise paternal lineages, known as moieties. Preucel believes the dual plaza arrangement





**On the summit of Black Mesa, the remains of walls built by Pueblo warriors in preparation for the Spanish siege are still visible.**

at Hanat Kotyiti expressed a return to this ancient form of social organization and reflected the mythical White House, an ancestral Cochiti village where people and the spirits known as *katsinam* (singular *katsina*) lived together in harmony.

In addition to surveying the village's architecture, Preucel and his colleagues studied pottery collected during early excavations of the site. Here, too, they found evidence of a return to ancient traditions. A double-headed key design element decorated much of the pottery collected from Hanat Kotyiti. This ancient motif, which is thought to represent harmony, may have been a strong visual signal of a return to tradition. New motifs and novel layouts of designs on other pottery may have signaled a break with the recent mission past. Preucel also found pottery made at pueblos farther north that historical sources maintain were at war with Cochiti during the Revolt era, suggesting there may have been close trading ties between the two groups, or that some of these other Pueblo may have even lived at Hanat Kotyiti. "In an extreme situation, people have to dig deep into larger social networks," says Preucel. "You could even have people from different linguistic groups living there. We sometimes fixate on villages being discrete peoples, but in fact, especially during this period, villages were probably more diverse than we think."

The experiment at Hanat Kotyiti came to a violent end. It was the first of the mesa-top villages to be seized by Vargas in 1694. After taking the village, Vargas set fire to stored corn, which destroyed the pueblo. "You can still see some rooms that are completely reddened by the flames," says Preucel. A recent wildfire

exposed sections of the site previously obscured by vegetation. Last summer, Preucel documented newly uncovered areas of the pueblo, including entryways that had been barricaded with stones. "That tells us they were likely trying to fortify it against the Spaniards during the final assault," says Preucel. In addition to killing 21 warriors, the Spaniards captured 342. The fall of Hanat Kotyiti was the beginning of the bloody reconquest.

**S**OME 30 MILES WEST of Cochiti is today's Jemez Pueblo, where Harvard archaeologist Matthew Liebmann has studied the remains of three Revolt-era villages. In contrast to the people of Zuni, the ancestors of today's Jemez people not only killed their priest and destroyed the mission church, but also burned their entire village. "People often ask why they would burn their own homes," says Liebmann. "The Jemez didn't see it as their home; it was Spanish." The Jemez people then built two new pueblos in the mountains west of the Rio Grande. In 2000, Liebmann began to work with the tribe to survey the sites and collect pottery from the surface.

Known as Patokwa and Boletsakwa, the Jemez pueblos show evidence of the same dual-plaza structure found at Hanat Kotyiti. "These iconic dual-plaza pueblos show they were leaving behind the Spanish forms and forging a continuity with a previous time," says Liebmann. Under the Spanish, the Jemez were famed for their black-and-white pottery, and were commissioned to make chalices and other ecclesiastical objects. Perhaps because of this association, Liebmann found virtually no black-and-white pottery at the new sites. Instead,

pottery with the double-headed key motif and other ancient designs predominated. The Jemez also began to use a simple red pottery that exploded in popularity among the Pueblo after the Revolt, perhaps signifying the formation of a pan-Pueblo identity that hadn't existed before.

In 1693, after Vargas visited the pueblos and informed the people of the Spaniards' imminent return, the Jemez left Patokwa and Boletsakwa and sought refuge on a higher mesa, where they built a village known as Astialakwa. Unlike its predecessors, the settlement had no overarching design. While Liebmann can discern three main units at the site, perhaps showing that the village was divided into two separate Jemez factions and a group of newcomers, the village consists of 190 haphazardly dispersed single-story rooms. "It evolved organically over an eight-month period," says Liebmann. "What we see there is individual households building new homes. The revitalization movement had dissipated, and no single leader was directing overall construction." By the time Vargas reached Astialakwa in 1694, there were 600 people living there.

As at Hanat Kotyiti, the village was unable to resist Spanish attack. In addition to burned plaster and charred material found throughout the site, chain mail and copper plating from Spanish armor provide physical evidence of a brutal battle that ended with 84 dead Pueblo warriors. After destroying the village, Vargas forced the Jemez to exhume the skeleton of the missionary killed during the uprising and then, perhaps most humiliating for the remaining warriors, ordered them to participate in the Spanish attack on Black Mesa, some 60 miles to the northeast.



A cache of stones on Black Mesa is one of dozens made during the siege to provide warriors with missiles to hurl at the Spanish.

LIKE ALL PRESENT-DAY members of San Ildefonso Pueblo, Aguilar grew up hearing tales of Black Mesa. According to one story, a giant lived in a cave on the mesa, and children in the pueblo are still told that if they won't behave, the giant will come for them. Many of the stories have to do with the months-long siege endured by the warriors of San Ildefonso and several other pueblos there in 1694. The fact that there was a Revolt-era settlement on the mesa top was widely known to historians and archaeologists, but until Aguilar began working at the site in 2007, no one had studied it.

Initially, Aguilar made an exhaustive survey of the mesa top, eventually identifying at least 90 caches of rocks that the warriors used as missiles to repel Vargas's soldiers. On the mesa top's southern edge, he also documented the remains of defensive fortifications erected during the siege. The remains of the Revolt-era village are harder to analyze, since they are severely eroded. "It's pretty different from the other mesa-top sites," says Aguilar. "There you have regular architecture, but at Black Mesa, it looks like you don't have room blocks, but shallow pits covered with some kind of temporary superstructure." New 3-D maps of the site created during a drone survey may clarify the picture in the future, but for now Aguilar believes the settlement at Black Mesa may have been more of a temporary battlefield camp than a village. He notes that oral tradition maintains that the pueblo's women and children didn't take refuge at Black Mesa, but at an older site to the west of San Ildefonso known as Nake'muu. "Vargas doesn't mention that in his journals," says Aguilar. "But we have a strong tradition that that's where they went."

According to the account left by Vargas in his journals, there were as many as 1,000 warriors on Black Mesa, but, after studying the site, Aguilar thinks that may have been an exaggeration. Vargas also maintained that he reached the summit of the mesa, but according to Aguilar, his description doesn't match the defensive alignments or the topography. "I read that and I think, 'Come on, Vargas, there's no way you made it to the summit.'" The Spanish governor may have had reason to exaggerate his feats, because, while he captured the other sites, he did not succeed at Black Mesa. In September of 1694, after months of protracted siege, the warriors came down from Black Mesa. "Vargas would say they surrendered, but I don't think of it that way," says Aguilar. "They came down on their own terms, after long negotiations."

Today, it's tempting to romanticize the rebellion as a noble failure, but Aguilar and others point out that the Pueblo Revolt had a tremendous impact. The threat of possible future revolts meant that the encomienda and repartimiento systems were never reinstated and the Spanish were forced to tolerate native religious practices. "I always wonder how the Pueblo would live today if there had been no Revolt," says Aguilar. "It's a scary thought, because if those colonial practices had played out over the course of another century, there's no telling what the state of my pueblo would be. We are living where we are and we are the people we are thanks in part to the Revolt." ■

Eric A. Powell is online editor at ARCHAEOLOGY.

# HIDDEN FROM

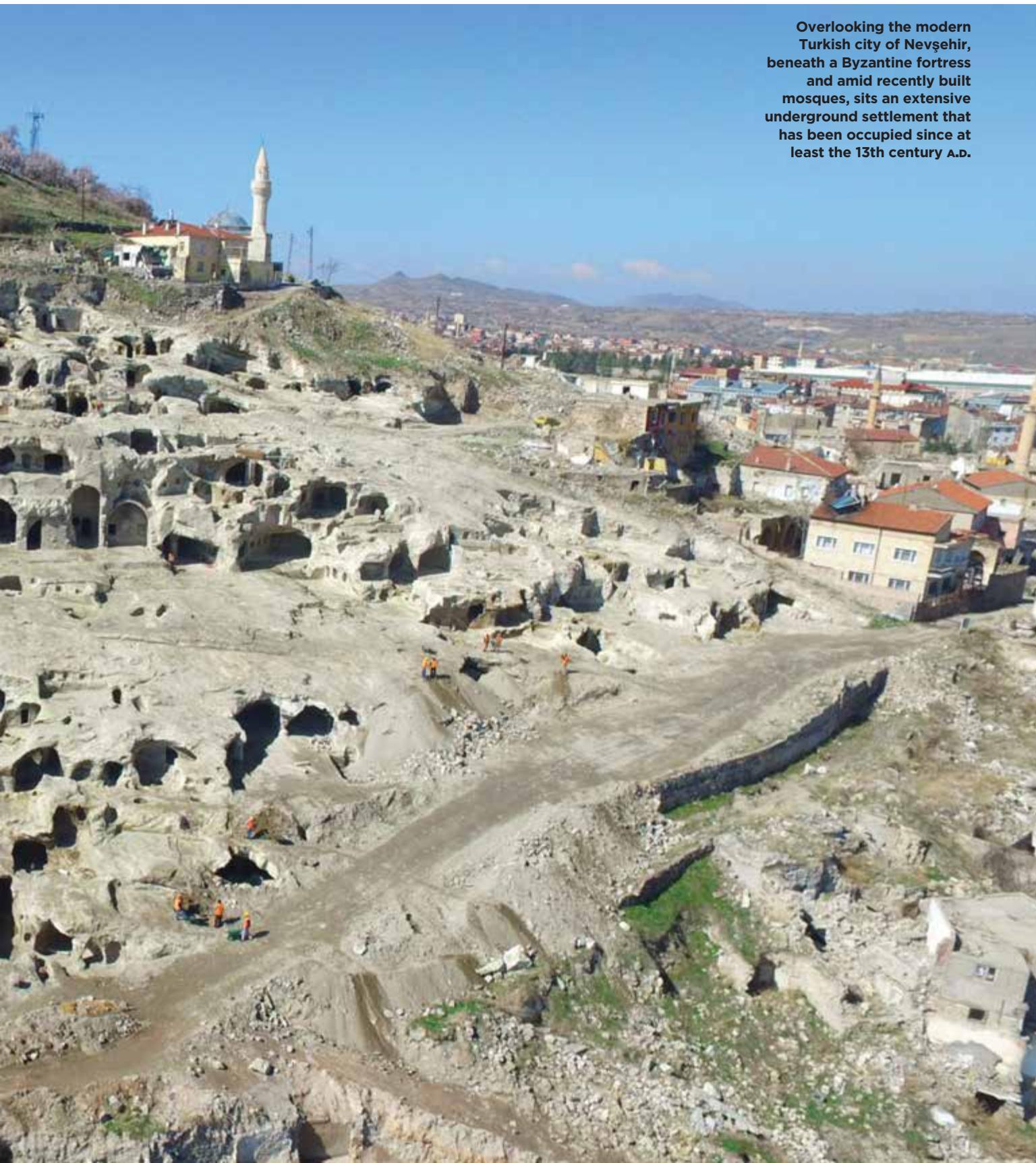


# VIEW

**One of Cappadocia's underground cities may yet yield clues about its history**

by BILL DONAHUE

Overlooking the modern Turkish city of Nevşehir, beneath a Byzantine fortress and amid recently built mosques, sits an extensive underground settlement that has been occupied since at least the 13th century A.D.





**M**ore than 400 underground rooms and galleries have thus far been identified in the Nevşehir settlement, many with their own entrances (above) and some with large millstones (right) that can be wheeled in front of the doorways to block access.

**T**HE LANDSCAPE OF Cappadocia in central Turkey is dry and jagged and strange. Winding roads look out onto mountain peaks rising to almost 13,000 feet, and vast canyons and cliff faces have been striped dark brown, rusty red, and sandy yellow over the epochs.

Pigeons, first introduced into the region by the Romans, wing by at eye level. Fantastical 40- to 50-foot-high “fairy chimneys”—spires of soft volcanic tuff—rise up from the desert floor. Carved into some of these hillsides are houses—some recently built and some centuries old—with rough wooden doors, small windows, and storage areas overhung by high shelves of stone. There are even rock-cut garages where drivers swoop into the dark and then cut their engines.

This picturesque region draws more than two million tourists a year, and everywhere there are road signs directing visitors to ancient settlements carved into the rock, such as Derinkuyu, a large underground city that plunges 280 feet into the earth. It dates to at least as far back as the Byzantine era, features stables, wineries, and churches, and may once have been home to tens of thousands of people. There is also Göreme, where an array of tombs and temples were carved directly into the hillside



starting in the eleventh century A.D. Another of these sites, an impressive honeycomb of rooms intended as a year-round rock settlement, overlooks the modern downtown of the provincial capital of Nevşehir, or “New City.”

Four years ago, in 2012, work crews began demolishing 3,000 modest houses on a Nevşehir hillside, most of them dating to the eighteenth century, to make way for modern apartment towers. Orthodox Christians once lived in these houses, which sit atop the ancient rock settlement, but amid the balkanization that both preceded and followed World War I, in 1923, Turkey forcibly relocated its Christians to Greece. Many of the houses were left vacant. Many crumbled. Others were torn down or vandalized, and the rubble was cast into the

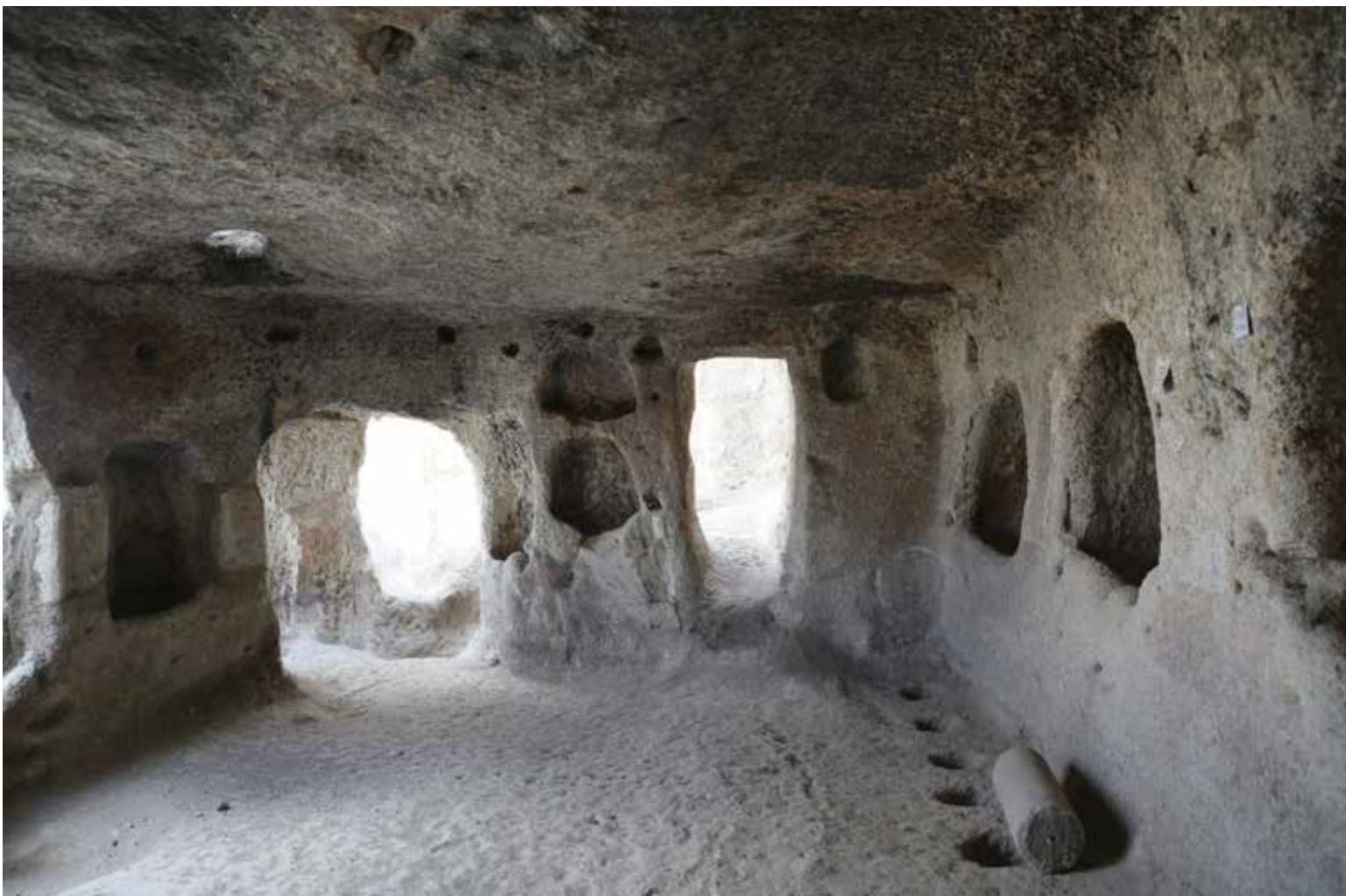


carved chambers below. Since early 2015, more than 100 city employees have been bailing out hundreds of tons of debris that clog the underground rooms. They will continue to clear the site until 2018 in order to ready it for archaeologists. Or, rather, they're readying a sliver of the site, about six acres.

During the course of this clearing work, it has been widely reported that Nevşehir's underground city was "discovered" by workers who unearthed a network of tunnels. But Nevşehir's residents have lived in and alongside the site for centuries. At least as far back as the thirteenth century, inhabitants of the hillside relied in some way on the carved chambers of the rock settlement. And until just a few years ago, children frolicked on the playground of a now-defunct elementary school right next to a door to this underground world.

**N**EW GEOPHYSICAL STUDIES of Nevşehir conducted by Turkish archaeologist Murat Gulyaz, director of both the Nevşehir Museum and the archaeological inquiry, have shown that the ancient site sprawls over more than 100 acres. It is possible to get a flavor of what life may once have been like in underground Nevşehir by descending along one of the steep carved staircases, stooping to squeeze under the low ceilings. The site is a labyrinth. Many doorways are narrow

**The site is equipped with areas for the manufacture of agricultural products, such as wine (left), as well as cooking spaces with niches (below) for storing food.**







**Well-preserved frescoes depicting various Christian saints (left) in a low-ceilinged church situated deep within the subterranean settlement may have been created by the same small group of artists who painted the walls of a church (above) in nearby Tatlarin in 1215.**

slits, so visitors are compelled to wriggle through sideways, bent low. Others are equipped with large stone wheels that can be rolled snug against the entryway, blocking access. The settlement's various zones are staggered at nine different levels. More than 400 rooms and galleries have thus far been identified, and researchers have begun to suggest how they were used. For instance, there is a stone vintner's tub for stomping on grapes and little niches where cheese was likely stored. There are also ventilation shafts, ovens, and a stone mill where donkeys once trod in circles, grinding linseed into oil.

One of the most intriguing of Nevşehir's underground spaces is a small vaulted church, whose rock-hewn walls boast colorful frescoes of Christ, Saint Mary, and curly-haired Saint Eustace, a second-century Roman general who became a martyr. Nevşehir University art historian Tolga Uyar has visited the church and is interested in these centuries-old works and their possible similarity to other Christian paintings in Tatlarin, a village 20 miles from Nevşehir. "I could tell right away that those frescoes were done by the same workshop that painted the churches in Tatlarin, which were inscribed in the year 1215," Uyar says, referring to a group of two or three artists who traveled the region long ago. "The lettering is the same, and there's something about the shape of the hands and the ears, and the way they made shadows on the faces." Perhaps what's most interesting about

the frescoes, though, is that they were even produced. Overtly Christian in their imagery, they were made under the rule of the Seljuk Turks, who were Muslim. "There was freedom of religion at the time," Uyar says. Christians constituted a large percentage of the population, perhaps even the majority, in Cappadocia, and, according to Uyar, "Sometimes the painters even inscribed their work with the name of the ruling Byzantine emperor. It was a way for them to have a double identity. They were Greek Orthodox Christians who spoke Greek, and they were also Seljuk citizens. They weren't alienated. Many of the sultans' mothers were Christian."

With much further research, the hillside at Nevşehir could help archaeologists understand the region's complex history and how it is reflected in the city's underground chambers. At the moment, however, the archaeological work is at a preliminary stage and there are few answers to fundamental questions such as when the settlement was first constructed, who built it, and why. "When we finish cleaning the site next year," Gulyaz says, referring to the debris workers are shoveling out, "we can begin looking for artifacts. I think we can find agricultural tools, oil lamps, and ceramic fragments. Can we learn something about how this city functioned, about the daily lives of the people there? It's still too early to tell." ■

---

**Bill Donahue is a writer based in New Hampshire.**

# Choose Life Grow Young with HGH

From the landmark book *Grow Young with HGH* comes the most powerful, over-the-counter health supplement in the history of man. Human growth hormone was first discovered in 1920 and has long been thought by the medical community to be necessary only to stimulate the body to full adult size and therefore unnecessary past the age of 20. Recent studies, however, have overturned this notion completely, discovering instead that the natural decline of Human Growth Hormone (HGH), from ages 21 to 61 (the average age at which there is only a trace left in the body) and is the main reason why the body ages and fails to regenerate itself to its 25 year-old biological age.

Like a picked flower cut from the source, we gradually wilt physically and mentally and become vulnerable to a host of degenerative diseases, that we simply weren't susceptible to in our early adult years.

Modern medical science now regards aging as a disease that is treatable and preventable and that "aging", the disease, is actually a compilation of various diseases and pathologies, from everything, like a rise in blood glucose and pressure to diabetes, skin wrinkling and so on. All of these aging symptoms can be stopped and rolled back by maintaining Growth Hormone levels in

the blood at the same levels HGH existed in the blood when we were 25 years old.

There is a receptor site in almost every cell in the human body for HGH, so its regenerative and healing effects are very comprehensive.

Growth Hormone first synthesized in 1985 under the Reagan Orphan drug act, to treat dwarfism, was quickly recognized to stop aging in its tracks and reverse it to a remarkable degree. Since then, only the lucky and the rich have had access to it at the cost of \$10,000 US per year.

The next big breakthrough was to come in 1997 when a group of doctors and scientists, developed an all-natural source product which would cause your own natural HGH to be released again and do all the remarkable things it did for you in your 20's. Now available to every adult for about the price of a coffee and donut a day.



GHR now available in America, just in time for the aging Baby Boomers and everyone else from age 30 to 90 who doesn't want to age rapidly but would rather stay young, beautiful and healthy all of the time.

The new HGH releasers are winning converts from the synthetic HGH users as well, since GHR is just as effective, is oral instead of self-injectable and is very affordable.

GHR is a natural releaser, has no known side effects, unlike the synthetic version and has no known drug interactions. Progressive doctors admit that this is the direction medicine is seeking to go, to get the body to heal itself instead of employing drugs. GHR is truly a revolutionary paradigm shift in medicine and, like any modern leap frog advance, many others will be left in the dust holding their limited, or useless drugs and remedies.

It is now thought that HGH is so comprehensive in its healing and regenerative powers that it is today, where the computer industry was twenty years ago, that it will displace so many prescription and non-prescription drugs and health remedies that it is staggering to think of.

The president of BIE Health Products stated in a recent interview, I've been waiting for these products since the 70's. We knew they would come, if only we could stay healthy and live long enough to see them! If you want to stay on top of your game, physically and mentally as you age, this product is a boon, especially for the highly skilled professionals who have made large investments in their education, and experience. Also with the failure of Congress to honor our seniors with pharmaceutical coverage policy, it's more important than ever to take pro-active steps to safeguard your health. Continued use of GHR will make a radical difference in your health, HGH is particularly helpful to the elderly who, given a choice, would rather stay independent in their own home, strong, healthy and alert enough to manage their own affairs, exercise and stay involved in their communities. Frank, age 85, walks two miles a day, plays golf, belongs to a dance club for seniors, had a girl friend again and doesn't need Viagra, passed his drivers test and is hardly ever home when we call - GHR delivers.

New! Doctor Recommended

## The Reverse Aging Miracle

RELEASE YOUR OWN GROWTH HORMONE AND ENJOY:

- Improved sleep & emotional stability
- Increased energy & exercise endurance
- Loss of body fat
- Increased bone density
- Improved memory & mental alertness
- Increased muscle strength & size
- Reverse baldness & color restored
- Regenerates Immune System
- Strengthened heart muscle
- Controlled cholesterol
- Normalizes blood pressure
- Controlled mood swings
- Wrinkle disappearance
- Reverse many degenerative disease symptoms
- Heightened five senses awareness
- Increased skin thickness & texture

All Natural Formula

This program will make a radical difference in your health, appearance and outlook. In fact we are so confident of the difference GHR can make in your life we offer a 100% refund on unopened containers.

A Product of  
Global Health  
Products

**1-877-849-4777**

[www.biehealth.us](http://www.biehealth.us) | code: "ARCH"



BIE Health Products  
3840 East Robinson Road  
Box 139  
Amherst, NY14228

GHR

DIV 2037839 ON

HGH is known to relieve symptoms of Asthma, Angina, Chronic Fatigue, Constipation, Lower back pain and Sciatica, Cataracts and Macular Degeneration, Menopause, Fibromyalgia, Regular and Diabetic Neuropathy, Hepatitis, helps Kidney Dialysis and Heart and Stroke recovery.

For more information or to  
order call 877-849-4777  
[www.biehealth.us](http://www.biehealth.us)  
©copyright 2000



Excavations along the I-95 corridor in Philadelphia revealed the square foundations of annealing ovens used in the Dyottville Glass Works during the early nineteenth century.

## LETTER FROM PHILADELPHIA

# EMPIRE OF GLASS

**An unusual industrial history emerges from some of the city's hippest neighborhoods**

by MARGARET SHAKESPEARE

Thomas W. Dyott arrived in Philadelphia from England some time around 1803 with little besides a formula for bootblack and a few shillings in his pocket—and ambitious dreams in his head. He probably lacked the credentials for it, but that didn't stop him from setting up shop as an apothecary—the nineteenth-century equivalent of a pharmacist—at the corner of Race and Second Streets, referring to himself as "Dr. Dyott," and assuming all the airs that went with the honorific. "He was

into hyperbole for sure," says Ingrid Wuebber, a historian with the Cultural Resources Department of the engineering firm AECOM. "And he had to have been well-spoken because people believed him and sought his advice." It wasn't long before Dyott put his stamp on both the pharmaceutical trade and Philadelphia history. Though he is less well remembered today, he stands alongside William Penn, Benjamin Franklin, Betsy Ross, Rocky Balboa, and the 2008 Phillies—the real, apocryphal, fictitious, and heroic

characters of the city's history.

From his shop, Dyott formulated and produced a range of patent medicines, and eventually set up a distribution network across the United States. Wherever his pharmaceuticals were sold, he advertised. "He was an early ad man," says Wuebber, who has studied what few records there are of Dyott's life and found newspaper ads for a variety of his products. "He was an innovator and he saw [business] in an integrated way. His distribution and networking played out beyond pharma-

## LETTER FROM PHILADELPHIA



The Dyottville Glass Works, in an 1858 illustration (above), was named for Thomas W. Dyott, the apothecary who expanded and consolidated it in the 1830s. The factory supported Dyott's pharmaceutical business. An advertisement for his wares (right) appeared in the *Democratic Press* of Philadelphia in 1816.

ceuticals." Indeed, Dyott soon added glass manufacturing to his portfolio, which eliminated the need to purchase medicine bottles. Beginning around the turn of the nineteenth century, the area of present-day Kensington-Fishtown, today one of Philadelphia's hippest neighborhoods, became a center for the glass industry. It was there that Dyott established an empire of glass, which he called Dyottville.

For about a decade, the Pennsylvania Department of Transportation (PennDOT) has been engaged in a massive redevelopment of I-95 along the Delaware River in Philadelphia, including a three-mile stretch directly north of Center City through the neighborhoods of Kensington-Fishtown, Port Richmond, and Northern Liberties. The project came with a multiyear cultural resource effort, led by PennDOT project manager Elaine Elbich and archaeolo-

gist Catherine Spohn, along with AECOM archaeologists George Cress and Douglas Mooney. "Diggings I-95," the umbrella name adopted for the excavations, findings, pop-up exhibitions, website, and more, has yielded around a million artifacts that span nearly 6,000 years of human activity, from prehistory through the Industrial Revolution to World War I. In particular, the excavations have uncovered rich nineteenth-century deposits, with an especially massive quantity of early American glass from the Dyottville Glass Works and neighborhoods nearby where many glass factory workers lived.

"The focus on Philly has always been on downtown, but what we've found [in these neighborhoods] are extraordinary histories," says Mooney, who has worked on downtown digs such as the President's House in Independence National Historical Park. "This area is better preserved, even though there has been more than 300 years of development."



**Excavations at Dyottville uncovered a flask that depicts Thomas W. Dyott himself (with Benjamin Franklin on the reverse side).**

Dyott eased into glass manufacturing during the 1810s, when he became an agent for three New Jersey glass factories. Glass manufacturing had begun in northern Philadelphia in the eighteenth century, and around 1820 Dyott began to work directly with one of these factories, the Kensington Glass Works on



Gunner's Run Creek at Queen (now Richmond) Street. He took over the glassworks, which had been converted from a calico fabric printing and textile factory, in 1830. He found success with the enterprise and soon invested in neighboring properties. He eventually owned five factories, collectively renamed Dyottville. He only operated the glassworks until 1838, but it continued to produce glass under the same name, with different owners at various times, until the end of the century.

Curators at the Philadelphia Museum of Art and at leading glass collections, such as the Chrysler Museum in Norfolk, Virginia, have long included flasks and bottles from Dyottville among their American glass holdings. "Dyottville has been talked about for years among collectors and others," Cress says, "but until now there wasn't

# Do You Suffer From:

- Plantar Fasciitis
- Joint Pain
- Heel Pain
- Back/Knee Pain
- Bunions
- Heel Spurs
- Arthritis
- Neuropathy



Nicole S.

I have terrible plantar fasciitis—really painful stabbing pain. I got a pair of Gravity Defyers to try and to my amazement my foot either doesn't hurt or barely hurts when wearing them (major improvement from limping around all day long).

***These are just what I needed when I was feeling very desperate and like nothing was working!***

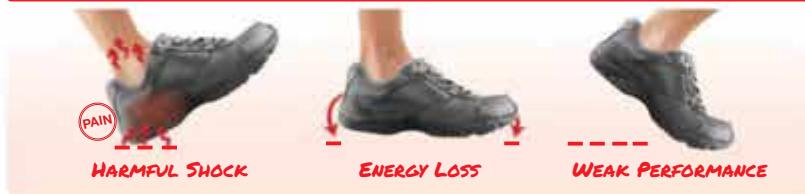


**VersoShock®**  
PATENTED TECHNOLOGY

X-ray view simulated.

Our patented VersoShock® technology provides the ultimate protection for the entire body in a way no other shoe can. It is designed to absorb harmful shock from the ground up, converting the shock into renewed positive energy for your next step. Having this kind of cushioning allows you to not only physically feel better, but improve your posture and be on your feet longer without any restrictions holding you back.

## WITHOUT GRAVITY DEFYERS...



## WITH GRAVITY DEFYERS...



**Don't Forget**  
to check out our other  
products to relieve  
discomfort:



Men's Dress  
Londonian \$170



Women's Sandals  
Rosemary \$89.95



G-Comfort Insoles  
TF501, TF502

VersoShock® U.S Patent #US8,555,526 B2. This product has not been evaluated by the FDA. Not intended to treat, cure or prevent any disease. Shoes must be returned within 30 days in like-new condition for full refund or exchange. Credit card authorization required. See website for complete details.



**WIDE WIDTH AVAILABLE**

### ION

Men Sizes 7.5-15

- Black/Red TB90022MRG
- Black TB9025MBB

Women Sizes 5-11

- Black/Blue TB9022FTL
- Aqua/Green TB9022FYU

**\$150 \$120<sup>00</sup>**

9% CA sales tax applies to orders in California.

**\$30<sup>00</sup> OFF**  
**Your Order**

**Free Exchanges • Free Returns**

**Promo Code: PJ8CJD5**

**Call 1(800) 429-0039**

[GravityDefyer.com/PJ8CJD5](http://GravityDefyer.com/PJ8CJD5)

Gravity Defyer Corp.

10643 Glenoaks Blvd. Pacoima, CA 91331

**gravity defyer®**  
COMFORT FOOTWEAR TECHNOLOGY



ACCREDITED  
BUSINESS

## LETTER FROM PHILADELPHIA

a building [to investigate].”

The excavations at Dyottville included portions of three buildings—a glass house, a sand house, and an office/storeroom—in a space of around 9,000 square feet. It is the barest sliver of the total Dyottville site, but the only part within the I-95 right-of-way. Over 10 months, PennDOT and AECOM revealed the history of the development and expansion of the glassworks, from the foundations of



**The annealing ovens and vaults for spent fuel swept out of furnaces (top) were sources of thousands of small glass fragments (above), mostly manufacturing debris, such as drips and sheared-off bits.**

the calico printing factory that preceded it, to the initial construction of the glassworks in 1816, to another building phase in the late nineteenth century. “When we excavated the factory site, we saw at least three layers of change,” Cress says. “The foundations were most interesting—how and where the building expanded from the calico

works, how the creek bed had been filled in when it became a glassworks. There were tunnels. Some had been sealed over.” There were vaults for the spent fuel swept out of furnaces, and the wood floor of the sand house, still covered in glass-making sand. The foundations of multiple rectangular annealing ovens in particular were full of interesting material. When new ones were built, old ovens were filled with coal ash and manufacturing debris—thousands of fragments of glass, which were useful for dating parts of the factory, Cress says. Of more than 160,000 artifacts recovered at Dyottville, more than 140,000 are glass. Most are drips, drops, and shards, but there are also many pieces of bottles and flasks decorated with portraits.

Perhaps most unexpected of all—and now most prized among the glass factory artifacts—were the half-dozen or so complete and partial wooden block molds discovered outside a tunnel used for cleaning out furnaces. “You never find these,” Cress says, because they disintegrate quickly if they are not kept wet. “But the water level is high there.” A block mold, which aided in preforming molten glass before blowing and manipulating it into its final shape, was usually made of a hardwood such as cherry or other tight-grained fruit wood. Keeping the mold wet kept the wood from igniting and created a layer of steam to keep the glass from sticking to the mold. “We’ve never seen a nineteenth-century block mold from an archaeological site,” says

managing editor of Archaeology magazine, Mary Mills, historic glass specialist for AECOM. “It was so amazing to find them intact.”

Not many specifics of Dyott’s life are known, but experts on the Digging I-95 project have sought out archives and other records to learn more. Research is ongoing, and new information about Dyott and the community he established continues to emerge. In 1830, Dyott set up his newly arrived brother Michael as superintendent of the glassworks, and the “doctor” turned his attention to a grander scheme. He had acquired or leased around 350 acres to make his entire operation self-sufficient agriculturally, domestically—and morally. He began to expand the Dyottville community, with a strong emphasis on creating a proper moral environment for his workers, in particular the factory’s young apprentices. The complex eventually included a 300-acre farm and some 50 buildings, among them a chapel, an infirmary, homes for married employees (often entire families worked in the business), and dormitories for single men and women. Field workers, butchers, bakers, cooks, carpenters, blacksmiths, laundresses, and teachers were all on the payroll. “He encouraged workers to take up a hobby, music, or sports,” says Mooney. Those who signed a contract to live in Dyottville agreed to certain rules, including regular attendance at Methodist services. “And no cussing, no drinking,” Mooney adds. The regulations were spelled out in a 39-page pamphlet published in 1833, “An Exposition of the System of Moral and Mental Labor, Established at the Glass Factory of Dyottville.”

Dyott’s experiment in welfare capitalism remains buried under private land near the site, but the full scope of the I-95 excavations includes a number of working-class neighborhoods,

(continued on page 62)



A STAR ALLIANCE MEMBER

SM

## • Explore Latin America

*Step on board the daily service to Santiago, Chile.*

**fly the friendly skies**

[united.com](http://united.com)

## CLASSIFIEDS

### BOOKS

#### LAST ASSAULT ON OAK ISLAND

by Jenn Rekka. Two museum representatives take on 200 years of mystery and theory. Rediscovered series on Amazon, Nook, iBook.

**THE PIRATE EMPRESS** by Deborah Cannon. "An intensely readable and well-done work of fantasy-infused historical fiction." - Historical Novel Society. Available from Amazon.

## Publish Your Book



- low up-front prices
- paperback & hardcover
- 20-day production
- 100 minimum order

### Request a FREE Kit

800-650-7888, ext. ARC3

[morrispublishing.com/ARC3](http://morrispublishing.com/ARC3)

### FIELD SCHOOL

**ArchaeoSpain:** International archaeology programs in Spain and Italy for pre and postgraduates. Special highschool and seniors programs. [archaeospain.com/](http://archaeospain.com/) [programs@archaeospain.com](mailto:programs@archaeospain.com) +1 866 932 0003

Want to be part of a great archaeological research team?

## Join us in Belize!

Four sessions from May to July.  
Space is limited - Sign up today!

**817-831-9011**  
[mayaresearchprogram.org](http://mayaresearchprogram.org)

# maya

RESEARCH PROGRAM

### TRAVEL & TOURS

#### ARCHAEOLOGICAL TOURS: Cahokia:

Explore phenomenal earthworks of Cahokia and central Mississippi/Illinois River Valleys. **Canada:** Explore the rich history and archaeology of Ontario and Quebec. [archaeologicalconservancy.org/tours](http://archaeologicalconservancy.org/tours) Archaeological Conservancy, Albuquerque, NM (505) 266-1540.

**MACHU PICCHU & CUZCO:** Explorations since 1992! Inca archaeology, Spanish colonial history, Quechua culture, Andean ecology. Amazon, Nazca, Titikaka extensions. (800)446-9660. [AdventuresofDiscovery.com](http://AdventuresofDiscovery.com)

**Tikal Connection Tour Operator** Petén, Guatemala Jungle Trails, Archaeological Tours. Tikal-Yaxhá-El Mirador-Ceibal-Aguateca-Usumacinta expeditions-Copán-Palenque [tikalcnx.com](http://tikalcnx.com) - okanchac@tikalcnx.com, 502+55754335

## Costa Rica

8-Day Tour \$1195<sup>+tax, fees</sup>

Volcanoes, Rainforests, and Beaches. Includes all hotels, all meals, all activities. Fully guided from start to finish.

#### Costa Rica Itinerary:

- Day 1. Tour starts in San José, Costa Rica.
- Day 2. Explore the active Poás Volcano.
- Day 3. Soak in volcanic hot springs.
- Day 4. Hike the Hanging Bridges.
- Day 5. Free time at your beach resort.
- Day 6. Cruise on the Tarcoles River.
- Day 7. Explore Manuel Antonio Park.
- Day 8. Return with wonderful memories.

*Detailed Itinerary at Caravan.com.*

#### "Brilliant, Affordable Pricing"

—Arthur Frommer, Travel Editor

The #1  
In Value



FREE Info Guide  
(800) CARAVAN  
[caravan.com](http://caravan.com)

# caravan®

Guided Tours Since 1952

  
**PETER SOMMER**  
TRAVELS

EXPERT-LED ARCHAEOLOGICAL & CULTURAL TOURS



Tel: 855 4433027 | [www.petersommer.com](http://www.petersommer.com)

#### Contact Info:

[karina@archaeology.org](mailto:karina@archaeology.org)

Materials for the May/June issue  
are due on March 9, 2017

## Photo Credits

COVER—Getty Images/Danny Lehman; 1—R. Bénali, Inrap; 2—HIP / Art Resource, NY, National Park Service, © Emmanuelle Collado, Inrap, © Courtesy Museum of London Archaeology; 4—Courtesy AECOM, Digging I-95; 9—Courtesy University of Manchester School of Computer Science; 10—Courtesy C.P. Burton, Courtesy Alain Vandal, Pointe-à-Callière, Courtesy Caroline Bergeron; 12—National Park Service, Adobestock, Courtesy University of Nottingham; Nottingham Geospatial Institute; 14—© The Trustees of the British Museum/Art Resource, NY (3); 16—SIA/EFAK/YPOPA, ImagineChina 17—© Courtesy Museum of London Archaeology; 18—HIP / Art Resource, NY, Courtesy Mark Leone; 19—© The Trustees of the British Museum, © The Trustees of the British Museum. Photo by RN-DS partnership; 20—© Hervé Paitier, Inrap, © Emmanuelle Collado, Inrap, © Bastien Simier, Inrap, © Emmanuelle Collado, Inrap; 22—Courtesy Norwegian Institute for Cultural Heritage Research, Courtesy Nikita Konstantinov; 23—Courtesy of the La Manche Prehistoric Research Group; 24—(clockwise from top left) Library and Archives Canada, Nick Norman/Getty Images, Courtesy Pedro Saura, John Warburton-Lee Photography/Alamy Stock Photo, LEEH-USP, © Linda Nicholas, The Field Museum; 25—(clockwise from top left) © Neues Museum für die Heuneburg, Courtesy Evgeniy Bogdanov, Courtesy M.C. Langley (Australian National University), Adobestock; 26—De Agostini Picture Library/Getty Images; 27—Courtesy Christopher Pool; 28—Courtesy Christopher Pool (4); 29—Courtesy Christopher Pool; 30-31—Courtesy Bay of Kiladha Project; 32-37—© Courtesy Gabriele Rasbach, DAI; 38-39—B. Thomas, Inrap; 40—F. Leroy, Inrap, J. Grimaud, Inrap; 41—M. Rochette, Inrap, F. Leroy, Inrap; 42—© James Q. Jacobs; 43—© Corrie Photograph; 44—Courtesy Robert Preucel; 45—Courtesy Matthew Liebmann, Museum of New Mexico/Museum of Indian Arts and Culture; 46—Eric A. Powell; 47—Eric A. Powell; 48-53—Courtesy Murat Gulyaz; 55—Courtesy AECOM, Digging I-95; 56—Courtesy AECOM, Digging I-95; 57—Courtesy Wheaton Arts and Cultural Center, Museum of American Glass, Millville, NJ; Courtesy AECOM, Digging I-95; 58—Courtesy AECOM, Digging I-95 (2); 62—Courtesy AECOM, Digging I-95; 63—Courtesy AECOM, Digging I-95; 64—Courtesy AECOM, Digging I-95; 68—Courtesy Clara Amit

## FREE INFORMATION SERVICE

Visit **archaeology.org/products** and click on "Free Info" for products and services featured by our advertisers. You can also get this information by filling out and mailing the attached card, or by faxing the card to the number provided.

### Travel and Tours

**1. AIA Tours** Join distinguished lecturers at the greatest archaeological sites with the Archaeological Institute of America Tours program. **archaeological.org/tours, p.67, Brochures, Free**

**2. Andante Travels** are leading specialists in archaeological and ancient world travel. Owned and run by archaeologists for 32 years. **andantetravels.com, Inside Front Cover, Brochures, Free**

**3. Archaeological Paths** presents the Royal Tour to Egypt. Visit the Land of the Pharaohs with world-famous archaeologist Dr. Zahi Hawass. Enjoy a lecture and dinner with the former First Lady of Egypt, Mrs. Jehan Sadat. You will stay in a 5-star hotel and on a luxury Nile River Cruise ship, taste delicious local cuisine, and embrace the outstanding Egyptian culture. Available tour dates are: March 18–31, October 1–14, November 3–16, 2017. January 14–27, February 1–14 and March 18–31, 2018 **archaeologicalpaths.com, Brochures, Free**

**4. Archaeological Tours** Looking for a stimulating, insightful, and educational experience in the ancient world? Archaeological Tours has the trip for you. We have an amazing collection of 12- to 21-day tours available, which offer travelers a unique mix of culture and history. Each tour is led by a noted scholar, who will offer an insightful introduction to great archaeological sites. **archaeologicaltrs.com, Inside Back Cover, Brochures, Free**

**5. Caravan Tours** Fully Escorted Tours \$1095, Costa Rica, Guatemala, United States, and Canada. 65 years, since 1952. 800-Caravan **caravantours.com, p.60, 28-Page color brochure, Free**

**6. Crow Canyon Archaeological Center** Travel abroad. Change the way you see the world. Travel with Crow

Canyon's Cultural Expeditions program and discover the global context of human history. **crowcanyon.org, p.19, Brochures, Free**

**7. Jamestown Yorktown Foundation** Jamestown Settlement and Yorktown Victory Center. Explore America's colonial beginnings through museum gallery exhibits and living history depicting 17th- and 18th-century Virginia. **historyisfun.org, p.19, Brochures, Free**

**8. Maxxim Vacations** Maxxim Vacations is a team of travel experts who have traveled extensively throughout Atlantic Canada to find the best vacation destinations. Each team member has a wealth of first-hand knowledge to share about the region. Visit us today to find out how we can make your next getaway an unforgettable experience. Based in Newfoundland and Labrador, Maxxim Vacations has earned a solid reputation as a leader in the tourism industry within Canada—we are the experts in Atlantic Canada vacation planning. **www.maxximvacations.com, p.62, Brochures, Free**

**9. Maya Research Program** Excavate Maya ruins in Blue Creek, Belize, with a professional team that needs volunteer help. No experience necessary. Please include your email address for more information. **mayaresearchprogram.org, p.60, Brochures, Free**

**10. Peter Sommer Travels** A specialist in expert-led cultural, luxury, and archaeological tours. Gulet cruises and private charters go to some of the world's best-preserved ancient sites in Turkey, Greece, and Italy. **petersommer.com, p.60, Brochures, Free**

**11. Spiekermann Travel Service** has been helping travelers plan trips and explore some of the most fascinating destinations in the world for over 55 years while specializing in travel to the Middle and Near East. **mideasttrvl.com**

**12. Voyages to Antiquity** Voyages to Antiquity cruises to classical civilizations include shore excursions, gratuities, pre- and/or post-cruise hotel stays. For information and reservations, call 877-398-1460. **voyagestoantiquity.com, p.17, Brochures, Free**

### Publishing

**13. Morris Publishing** Publish your book! Our free guide to self-publishing gives you all the features and prices up front. **p.60, Guide to self-publishing, Free**

### Art

**14. DKL Studios** Unique and beautiful jewelry and ceramic art pieces inspired by artifacts from ancient cultures, designed to look as if they were just unearthed from an archaeological dig. **DKLstudios.com**

### Field School

**15. Crow Canyon Archaeological Center** Looking for a learning vacation? Crow Canyon offers archaeology, cultural, and adventure travel programs in the Southwest and beyond for adults, teens, and families. **crowcanyon.org, p.19, Brochures, Free**

**16. The Irish Fieldschool of Prehistoric Archaeology** Where first-class education and cutting-edge research go hand in hand. Our field school is fully accredited and transferable academic credits are available for international students. 2-, 4-, and 6-week courses are available in 2017. **prehistoricfieldschool.ie**

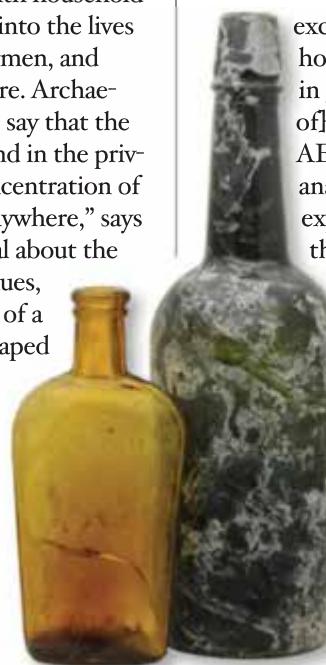
### AIA

**17. Archaeological Institute of America** Join the oldest and largest society devoted to the study and preservation of the record of the human past. **archaeological.org**

## LETTER FROM PHILADELPHIA

(continued from page 58)

with full privies packed with household trash, providing glimpses into the lives of the glassworkers, fishermen, and shipwrights who lived there. Archaeologists and other experts say that the great amount of glass found in the privies and elsewhere—"a concentration of glass like I haven't seen anywhere," says Cress—tells us a great deal about the artisan skill, home life, values, and cultural development of a neighborhood strongly shaped by glassmaking. It represents new knowledge about the history of one of America's oldest cities. "This was a working-class neighborhood," says Mooney. "And we have found a great density of objects from their homes,



both stuff that was made right here and imported wares."

"You don't usually get to excavate a glassworks *and* the homes of people who worked in glass factories *and* [those of] their neighbors," adds AECOM senior research analyst Rebecca White. Mills explains, "What has made this dig so important is not just the factory, but where people lived. Understanding how this community differed [from others] does have to do with the amount of glass."

**The Dyottville Glass Works continued operation after Dyott's time. These liquor bottles found there date to the end of the nineteenth century.**

But also with the whimsies."

Whimsies? Glassblowers worked their way up through an apprenticeship system, often starting in boyhood with tasks such as carrying coal and weaving wicker wrappers for large bottles. A master blower, or gaffer, would have developed the skills and dexterity to control and manipulate very thin blown glass. It took plenty of stamina to work in the constant heat of a furnace to produce vases, pitchers, and flasks, but at day's end workers used their leftover time and materials to make "whimsies"—exquisite, often fragile, personal artistic pieces, or demonstrations of skill to impress factory visitors. The glass colors—aqua, amber, and green, mostly—match those used on the production line, but there was a difference between work, which was done as quickly as possible, and making whimsies, according to White. "These

**Discover Newfoundland and Labrador**

A photograph of a person standing outside a traditional wooden hut with a thick, dark green grass roof. The hut has a simple wooden door. The person is wearing a dark jacket and is looking towards the hut. In the background, there are more huts and a dirt road under a blue sky with clouds.

The rich and diverse human history of this place is unlike anywhere else in the world. This is where East met West, when two streams of humanity finally came face-to-face at L'Anse aux Meadows around AD 1000, at the only confirmed Norse site in the New World.

We invite you to trace the steps of 9000 years of Indigenous and European explorers and settlers as you drive across Newfoundland and into the south coast of Labrador.

**MAXXIM**  
**Vacations**  
Creating Memorable Experiences

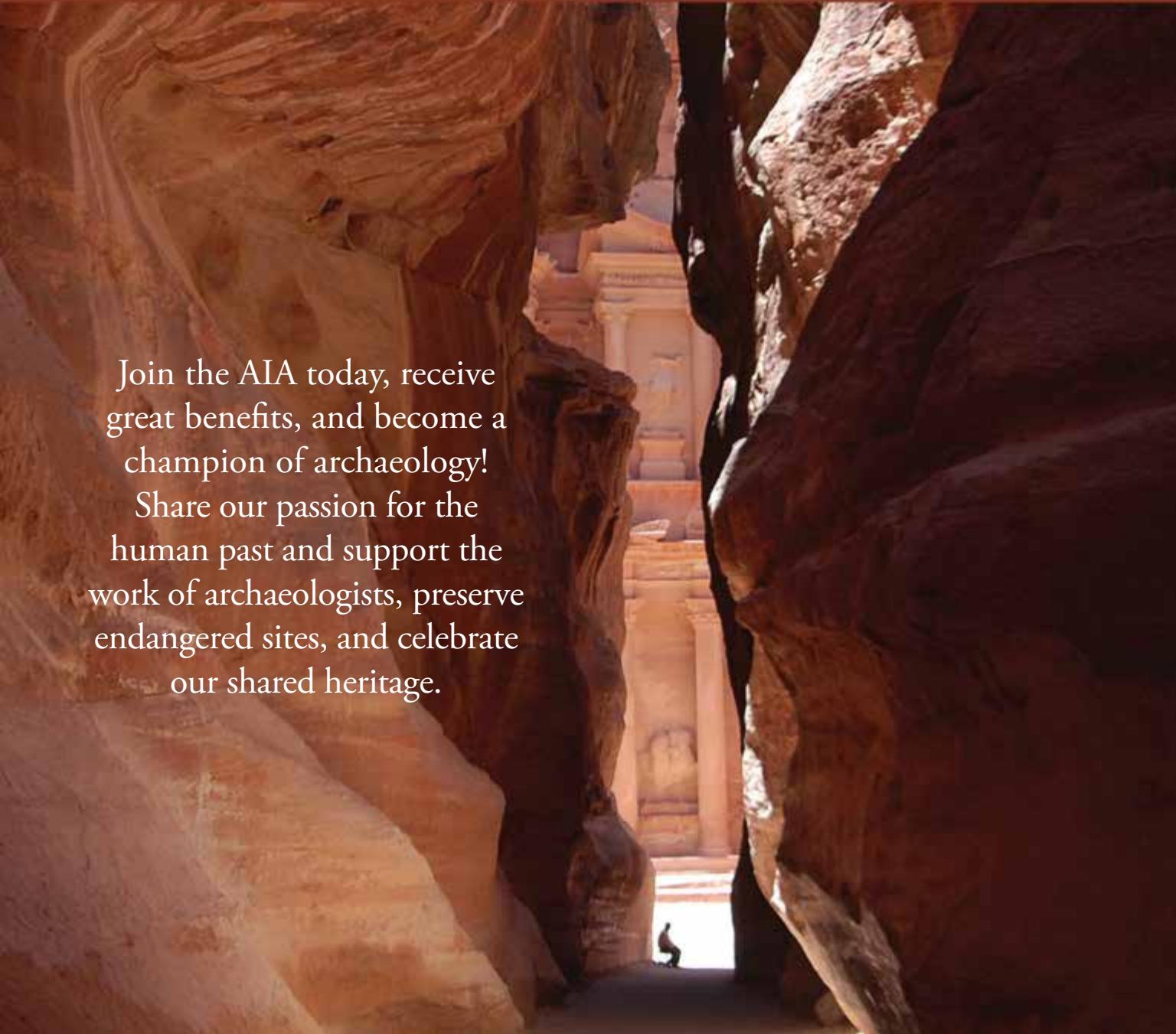
Call Maxxim Vacations today to learn more.

1 800 567 6666  
[maxximvacations.com](http://maxximvacations.com)

L'Anse aux Meadows National Historic Site © Newfoundland and Labrador Tourism



Turn your love for archaeology into *action*  
**JOIN THE AIA TODAY!**



Join the AIA today, receive great benefits, and become a champion of archaeology!

Share our passion for the human past and support the work of archaeologists, preserve endangered sites, and celebrate our shared heritage.

**New Members:** \$70 for one year (includes award-winning *ARCHAEOLOGY* magazine)—go to [archaeological.org/join](http://archaeological.org/join) and enter promo code **NM916**

**ARCHAEOLOGY subscribers:** Join for a special reader rate of just \$40—go to [archaeological.org/join](http://archaeological.org/join) and enter promo code **RS916**

---

ARCHAEOLOGICAL INSTITUTE *of* AMERICA

## LETTER FROM PHILADELPHIA



Among the most distinctive artifacts from Dyottville and the neighborhoods around it are whimsies, or artistic, personal glass pieces that workers made in their spare time, including a hat (top left), glass canes (above left), and delicate Jacob's ladders (right, with an intact example at center).

were things they made for each other, for family, for wives, for romanticized notions,” Mills says. Whimsies appear in the surrounding home sites, but also in the manufacturing debris in the Dyottville annealing ovens.

“We found so many ‘Jacob’s ladders’ in the Dyottville factory and throughout the neighborhood,” Mills adds. “I had never seen them before.” They were made by wrapping a thin thread of molten glass around a tool to make a delicate spiral that symbolizes the connection between Earth and heaven. Mills also notes the discovery of fragments of “flip-flops,” distinctive noisemakers consisting of a thin bubble of glass flattened on one side with a mouthpiece on the other. When one blew into the mouthpiece, the flat glass vibrated, making a loud popping or cracking sound. “These were very thin, and were blown in and out, so you had to be very skilled to make them,” she says.

Glass canes, another kind of whimsy, have been found in different sizes and styles, usually in bright colors. Few are alike. Sometimes these nonfunctional canes were given to visiting dignitaries, while others were take-home amusements. Then there are glass top hats, some full size, and witch balls, or blown-glass spheres in a variety of colors and sizes. Domesticating and keeping birds rose in popularity during the nineteenth century, and bird fountains, elaborate and plain, functional and decorative, have turned up as well. “Within three blocks of Dyottville, we’ve found mugs, pitchers...so much else that workers made for themselves,” says White. All of the whimsies, beautiful creations, fun things, and individual expressions, functional or not, personalized these working-class homes.

The artistic glass items weren’t exactly part of Dyott’s outsize vision and ambition—he had a keener eye for

making money than for art, perhaps a little too keen in the end. Dyottville seems to have been humming along until Dyott devised a bank scheme that went bad and landed him in Eastern State Penitentiary in Philadelphia, and put the glassworks in a sheriff’s sale. His social experiment had lasted less than a decade and sputtered to a close in 1837. But the factory reopened, and the Dyottville name reemerged, rather unscathed, a few years later under new ownership. Gradually the glass industry in Kensington-Fishtown declined, and today there’s little sign aboveground that it was ever there. Dyott, after serving his sentence for fraud, returned to the streets of Philadelphia not as a property owner and manufacturing magnate, but once again as an apothecary. ■

Margaret Shakespeare is a freelance writer based in New York.



# Dispatches from the AIA

archaeological.org

EXCAVATE, EDUCATE, ADVOCATE

## AIA Welcomes New President, Officers, and Trustees at Annual Meeting in Toronto

**T**HIS PAST JANUARY, Toronto, Canada, was the site of the 118th Joint Annual Meeting of the Archaeological Institute of America and the Society for Classical Studies. More than 2,000 archaeologists, philologists, art historians, conservators, and more attended the four-day-long program, which featured paper and poster presentations, colloquia, workshops, roundtable discussions, receptions, and several special events. Next year's Annual Meeting will be held in Boston, home city of the AIA, and we hope to see you there.

We are pleased to announce the election of a number of new officers, including president Jodi Magness. Magness is the Kenan Distinguished

Professor for Teaching Excellence in Early Judaism in the Department of Religious Studies at the University of North Carolina at Chapel Hill. She succeeds

Andrew Moore as president of the AIA. Other officers include Laetitia La Follette, First Vice President; Elizabeth L. Greene, Vice President for Cultural Heritage; Bonna Wescoat, Vice President for Research and Academic Affairs; and Ann Santen, Vice President for Societies. Academic Trustees elected are Lisa Kealhofer and Monica Smith, and General Trustees are Julie Herzog Desnick, Michael Wiseman, and Deborah Arnold.



New AIA president,  
Jodi Magness



Cotsen Grant site in Ethiopia

## AIA Pleased to Announce New Research and Fieldwork Grants

**I**N KEEPING WITH ITS mission to support archaeological fieldwork and research around the world, the AIA, through the support of generous donors, has established several new grant programs that will be available starting in 2017. The grants offer support for excavation, survey, scientific analysis, and the innovative use of technology. The new grants join a growing list of awards that include the Cotsen Excavation Grants, the John R. Coleman Traveling Fellowship, the Waldbaum Archaeological Field

School Scholarship, and the Bartman Museum Internship Fund.

The new grant programs are:

The Julie Herzog Desnick Endowment Fund for Archaeological Surveys to support initial survey and reconnaissance of sites and landscapes

The Richard C. MacDonald *Iliad* Endowment to support archaeologists working at the site of ancient Troy or in locations or time periods that enhance our understanding of ancient Troy

The Ellen and Charles Steinmetz Endowment Fund for Archaeology to support field research, especially projects that include innovative uses of technology

The Kathleen and David Boochever Endowment Fund for Fieldwork and Scientific Analyses to support innovative field and laboratory research

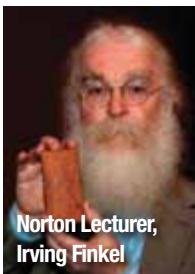
The AIA Fund for Fieldwork to

assist archaeologists who are starting new field projects

Awards from the Herzog Desnick, MacDonald, and Steinmetz funds will be available starting in spring 2017. Grants from the Boochever Endowment will be available in 2018. Full details for each of these grants are available at [archaeological.org/grants](http://archaeological.org/grants). To find out more about supporting archaeology and archaeologists through the AIA, please contact the Institute's Development staff at [sraig@aia.bu.edu](mailto:sraig@aia.bu.edu).

## Lecture Program Begins Spring Schedule

**W**E ARE MIDWAY through the AIA's 121st lecture season. Each year the AIA sends nearly 100 lecturers out to more than 100 Local Societies across the United States and



Norton Lecturer,  
Irving Finkel

Canada. This year's highlights include talks by noted philologist and Assyriologist Irving Finkel, Assistant Keeper of the Department of the Middle East at the British Museum and a curator of the museum's cuneiform tablets since 1979. Finkel, this year's Charles Eliot Norton Memorial Lecturer, speaks on a number of topics, including cuneiform instructions for building an ark long before the biblical Noah would have lived, based on his book *The Ark Before Noah*. Be sure to check out the schedule at [archaeological.org/lectures](http://archaeological.org/lectures) to find a lecture near you.

## Join a Society Today

**I**N ADDITION TO THE national lectures, AIA Local Societies organize many other events, such as archaeological fairs, conferences, colloquia and

symposia, themed dinners, and garden parties. Become a part of this wonderful network of people who are promoting and preserving archaeology by finding and joining a Society near you. To learn more, visit [archaeological.org/societies](http://archaeological.org/societies).

## International Archaeology Day Continues to Grow

**I**NTERNATIONAL ARCHAEOLOGY Day (IAD), the yearly global celebration of archaeology coordinated by the AIA, continues its unprecedented growth. In 2016 more than 700 events (about 200 more than in 2015) were held in 24 countries. The events were organized and hosted by about 530



IAD event at the Museum of Central Bohemia, Roztoky, Czech Republic

Collaborating Organizations, including 78 AIA Local Societies. The U.S. National Park Service was once again an IAD sponsor. We estimate that more than 150,000 people attended IAD events in 2016. Join us for IAD 2017, October 21, by attending an event or by becoming a Collaborating Organization and hosting an event.

## AIA Award Winners

Gold Medal Award for Distinguished Archaeological Achievement:

John R. Clarke

Martha and Artemis Joukowsky Distinguished Service Award:  
Barbara Tsakirgis

Pomerance Award for Scientific Contributions to Archaeology:  
Curtis W. Marean

Outstanding Public Service Award: Jessica Johnson

Excellence in Undergraduate Teaching Award: Bonna Wescoat

James R. Wiseman Book Award: Michael Jones and Susanna McFadden

Felicia A. Holton Book Award: Miranda Aldhouse-Green

Outstanding Work in Digital Archaeology Award: Pleiades

Graduate Student Paper Award:

Andrea Brock and Danielle Smotherman Bennett



2017 AIA award winners at the Annual Meeting in Toronto



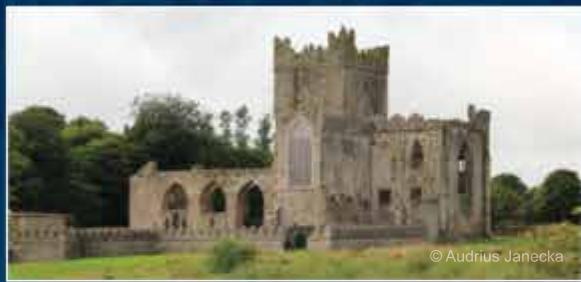
ARCHAEOLOGICAL INSTITUTE  
OF AMERICA TOURS

# EXPERIENCE EUROPE WITH THE AIA

*"An exceptional experience! The guides and sites were incredible, the hotels and food, absolutely the best!" - Donna, California*

## IRELAND'S ANCIENT EAST

June 11 - 21, 2017 (11 days) with  
archaeologist Stephen Mandal



## WALKING IRELAND'S WILD ATLANTIC WAY

September 4 - 15, 2017 (12 days) with  
archaeologist Stephen Mandal



## NORTHERN ITALY: CULTURAL & NATURAL TREASURES, WITH THE ALPS & SLOVENIA

September 7 - 19, 2017 (13 days) with  
archaeologist Patrick Hunt



## PREHISTORIC CAVE ART OF SPAIN & FRANCE

September 20 - October 2, 2017 (13 days)  
with prehistorian Paul Bahn



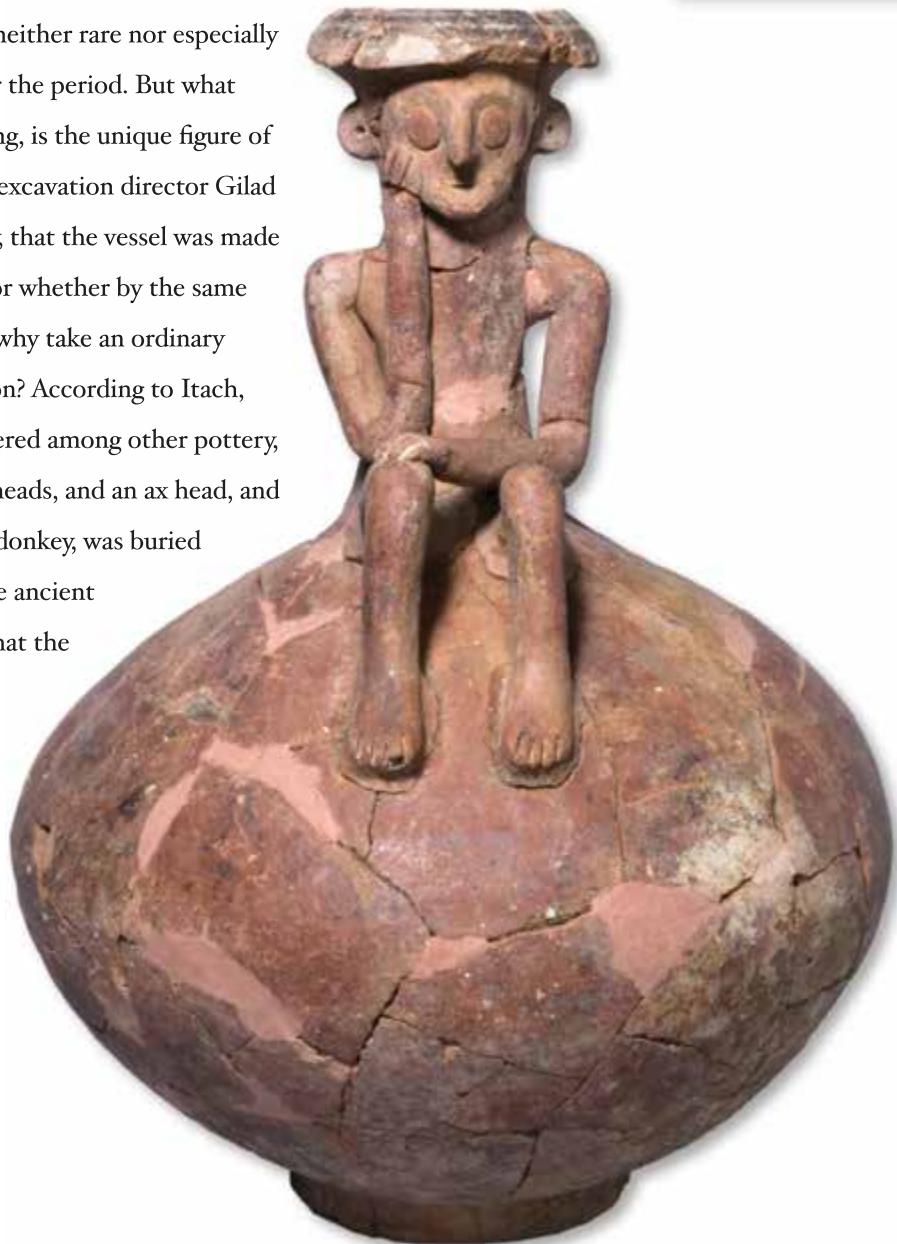
*"Our tour leaders were excellent in personality and knowledge and helped us understand the history of Ireland." - Jim, Florida*

**call: 800-748-6262 • web site: [www.aiatours.org](http://www.aiatours.org) • email: [aia@studytours.org](mailto:aia@studytours.org)**

esterday, just as today, even common objects sometimes received special attention. A favorite mug decorated with an image of a cherished dog, or inscribed with a clever phrase that elicits a smile as you take your first morning sips of steaming coffee. Or that prized T-shirt proudly displaying the logo of your beloved team's most recent trip to the World Series. These seemingly superfluous additions to utilitarian items can communicate identity, status, and kinship in a way that can be hard to detect in the archaeological record, especially where no written sources survive.

This small jug, which was found in pieces and has now been completely restored, is, in and of itself, neither rare nor especially informative. In fact, it is very typical for the period. But what makes it distinctive, and thus so revealing, is the unique figure of a person perched on top. It seems, says excavation director Gilad Itach of the Israel Antiquities Authority, that the vessel was made and then the figure was added—when, or whether by the same potter or a new artist, is unknown. But why take an ordinary pot and add such an evocative decoration? According to Itach, it's likely that the jug, which was discovered among other pottery, metal objects, including daggers, arrowheads, and an ax head, and bones belonging to a sheep and likely a donkey, was buried in honor of an important member of the ancient community. "It's customary to believe that the objects that were interred alongside an individual continued with them into the next world," says Itach. Thus the little pot, at first mundane and familiar, becomes a distinctive marker of a person's individuality and place in society even after they are long gone.

WHAT IS IT	Jug
CULTURE	Middle Bronze Age
DATE	ca. 1800 B.C.
MATERIAL	Pottery
FOUND	Yehud, Israel
DIMENSIONS	7 inches high



# Discover Israel with Prof. Jodi Magness



## Israel

The Bible Lands have attracted the attention of scholars for over two centuries — travel to Israel with Professor Jodi Magness, take in the country's marvelous kaleidoscope of archaeological riches, and it won't be long before you see why...

October 14 - 29 | \$5,995

*“Jerusalem’s every nook and cranny contains something of archaeological interest”*

— Prof. Jodi Magness



## Worldwide archaeological adventures, from Israel to Iceland

A small selection of our 2017 tours...

### ◆ Classical Greece

May 7 - 22 | \$5,995

### ◆ Mongolia

June 24 - July 11 | \$8,895

### ◆ Russia

July 4 - 17 | \$5,975

### ◆ Iceland

July 31 - August 15 | \$8,250

### ◆ Ireland

September 6 - 21 | \$5,995

### ◆ Sicily & Southern Italy

October 7 - 22 | \$6,375

**Noted Scholars | Superb Itineraries | Unsurpassed Service**

Order your FREE catalog today at [www.archaeologicaltrs.com](http://www.archaeologicaltrs.com)

Call 212-986-3054 | Toll-free 866-740-5130 | Email: [info@archaeologicaltrs.com](mailto:info@archaeologicaltrs.com)

\*Price excludes international airfare



**archaeological tours**

Led by noted scholars | superb itineraries | unsurpassed service

• Marc Zender • Elizabeth Graham • Jaime Awe • Simon Martin •

Melissa Burham • Stan Guenter • Timothy Beach • Matthew Restall • Dori Reents-Budet • Jason Yaeger

James Aimers • Scott Simmons • Christophe Helmke • Maxime Lamoureux St. Hilaire • Ryan Collins

APRIL 27-30  
2017

SEVENTH ANNUAL

DAVIDSON

# MAYA AT THE LAGO CONFERENCE



AMERICAN  
FOREIGN  
ACADEMIC  
RESEARCH

[MAYAATTHELAGO.COM](http://MAYAATTHELAGO.COM)

Davidson Day  
school



Stephanie Strauss • Jack Biggs • Erlend Johnson • Maggie Morgan Smith