

A man wearing a blue and white striped shirt and a dark cap is kneeling on the ground, working on an ancient wall. He is using a brush with a wooden handle to clean a recessed area in the wall. A trowel with a wooden handle and a metal blade lies on the ground nearby. The wall is made of rough, textured material, possibly mud-brick or plaster. The ground is dirt and sand.

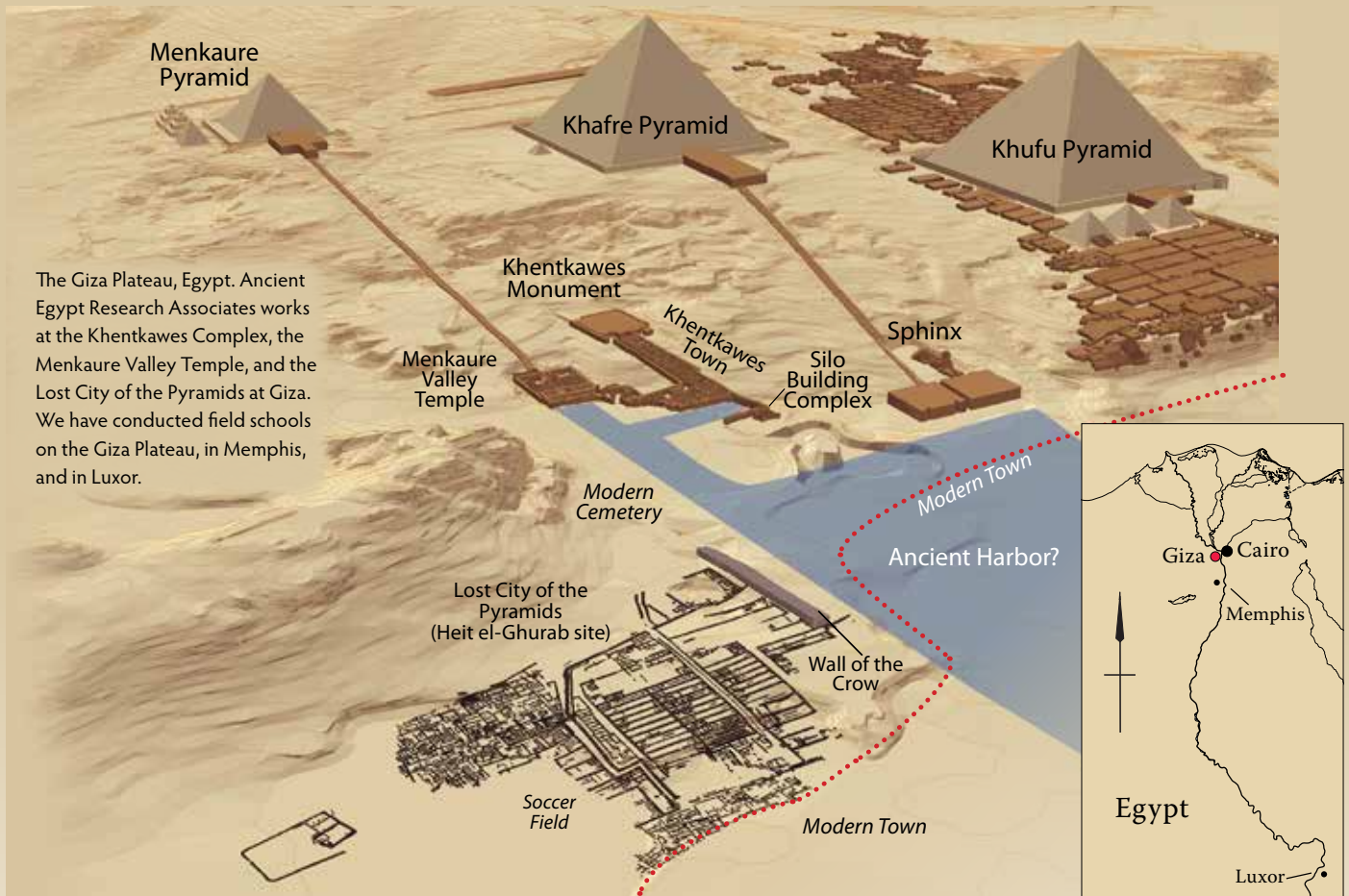
**2013–2014
Annual Report**

**Revealing the Past,
Building Our Future**



AERA

Ancient Egypt Research Associates



The Giza Plateau, Egypt. Ancient Egypt Research Associates works at the Khentkawes Complex, the Menkaure Valley Temple, and the Lost City of the Pyramids at Giza. We have conducted field schools on the Giza Plateau, in Memphis, and in Luxor.

AERA: Who We Are

For over 25 years Ancient Egypt Research Associates (AERA) has brought together archaeologists and specialists from around the world to address one of the most important questions in Egyptian and world archaeology: What is the origin, nature, and development of the Egyptian state, one of the earliest states of the ancient world.

We seek answers in our excavations of three ancient settlements at the base of the Giza Plateau: the “Lost City of the Pyramids” and the communities associated with the tombs of the pharaoh Menkaure and queen Khentkawes. Through multi-disciplinary analysis and rigorous archaeological field methods we open windows on the everyday lives of ancient Egyptians who built and administered the Giza Pyramids and Sphinx during the 4th and 5th Dynasties (circa 2543–2306 BC) of the Egyptian Old Kingdom.

Publication and educational outreach are central to our mission in Egypt. In 2005 we began an archaeological training program for the young archaeologists who safeguard their country’s heritage as Inspectors in the Egyptian Ministry of Antiquities with the sponsorship of the American Research Center in Egypt (ARCE). We are pleased to have completed nine AERA-ARCE Field Schools at Giza, Luxor, and Memphis with the unfailing support of the Ministry and the generous funding of USAID through ARCE.

The AERA-Egypt Center, located just a few blocks from the entrance to the Pyramids, serves not only as a year-round center for our excavations and field school, but also offers library and meeting facilities that are an integral backdrop for open archaeological dialogue and cultural exchange.

Founded in 1985, AERA is a tax-exempt, nonprofit research institution located in Boston and Giza, fully registered in Egypt as a foreign non-government organization. AERA-Egypt owns and maintains the AERA-Egypt Center in Giza. Our scientific and educational missions are supported by philanthropic individuals and foundations and USAID government funding in collaboration with the American Research Center in Egypt.

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The photos in our annual report were taken by Mark Lehner, Ali Witsell, Sayed Salah, Rebekah Dash, Francis Dilks, Dan Jones, Ana Tavares, Mohsen Kamel, Claire Malleson, Richard Redding, Emmy Malak, and Jason Quinlan.

Cover photo: Sayed Salah gently brushes dirt away to reveal a limestone hieroglyphic relief carving at the base of one of the silos in the Silo Building Complex. It probably came from a nearby tomb.

Revealing the Past, Building Our Future

A Message from Our President

It's been 25 years since I opened the first 5 × 5-meter excavation square at the Lost City of the Pyramids. After all these years I am still amazed and humbled by the discoveries the AERA team makes each season. And 2014 was just as rewarding.

Revealing the Past

This year at Giza we explored the Silo Building Complex (SBC), part of the pyramid town along the southeastern base of the Giza Plateau. Egyptologists know of pyramid towns from ancient titles in the tombs of their overseers and from royal decrees that protect the residents from taxation in return for their service to the memorials of deceased rulers. From the SBC, people served in the chapel attached to the gigantic mastaba tomb of the queen mother, Khentkawes I, and in the temples of the pyramid of king Menkaure. These monuments rose on the plateau to the west in the late 4th Dynasty. Now, AERA opens an archaeological window onto an actual institution and workings of a pyramid town. We see how kings of later generations, well into the 5th Dynasty, supported the Giza pyramid towns and exchanged gifts with deceased rulers, as they helped nourish them in the Afterlife. Later kings turned to the great pharaohs of the past for their blessing from the netherworld, as well as for legitimacy during power struggles among potential contenders to the throne.

Challenges

A popular Arabic saying reminds us of life's ups and downs: "Youm asel, youm basel," "day of honey, day of onions." AERA experienced challenging times and good times during 2013–2014. We were set to inaugurate in January 2014 the AERA Field Training (AFT) program, our first archaeological field school open to non-Egyptian students, in partnership with the American University in Cairo. Violent demonstrations in August 2013 compelled us to postpone the AFT, but we stayed the course for a long season of targeted research excavations and laboratory analysis. And Egypt calmed.

We faced financial challenges. With a reduced budget, a smaller but dedicated AERA team drilled down on specific questions about life in pyramid towns. To obtain answers, we developed a finely honed excavation strategy for an extended field season from January to June. Excavators worked closely with specialists in the analysis of material culture. Within two weeks of the end of fieldwork, the team submitted a manuscript for a peer-reviewed journal. In academia, this is lightening speed.

Building Our Future

In spite of postponing the AFT, we maintained our core mission of training and outreach. Five Egyptian archaeologists, AERA field school graduates, joined the AERA team as excavators and material culture specialists, gaining valuable experience in field research and in preparing work for publication.

To assure that we continue to train new students who work for Egypt's Ministry of Antiquities, we applied for and secured grants for two programs through the American Research Center in Egypt's Antiquities Endowment Fund. One grant will support a field school this fall at Mit Rahina (ancient Memphis), where we ran the Mit Rahina Field School in 2011. The second will provide funds to train ten Egyptian students, alongside non-Egyptian students, in the AFT at Giza during Winter-Spring 2015.

We continue to apply for grants to support research, training, and outreach, as well as conservation. But you, our benefactors, have played the largest role in keeping AERA at work through days of honey and days of onion, revealing Egypt's ancient past and training young archaeologists for the future. We are honored that you put your trust in AERA and very grateful for your ongoing support.

In the following pages we share the accomplishments and discoveries that you made possible during 2013–2014. Toad bones, cattle horns, forelimbs, snail shells, and hedgehog-headed boats all tell stories of village life, piety, and politics for god-kings and queens, living and dead, in a pyramid town on Giza's back bay.

~ Mark Lehner



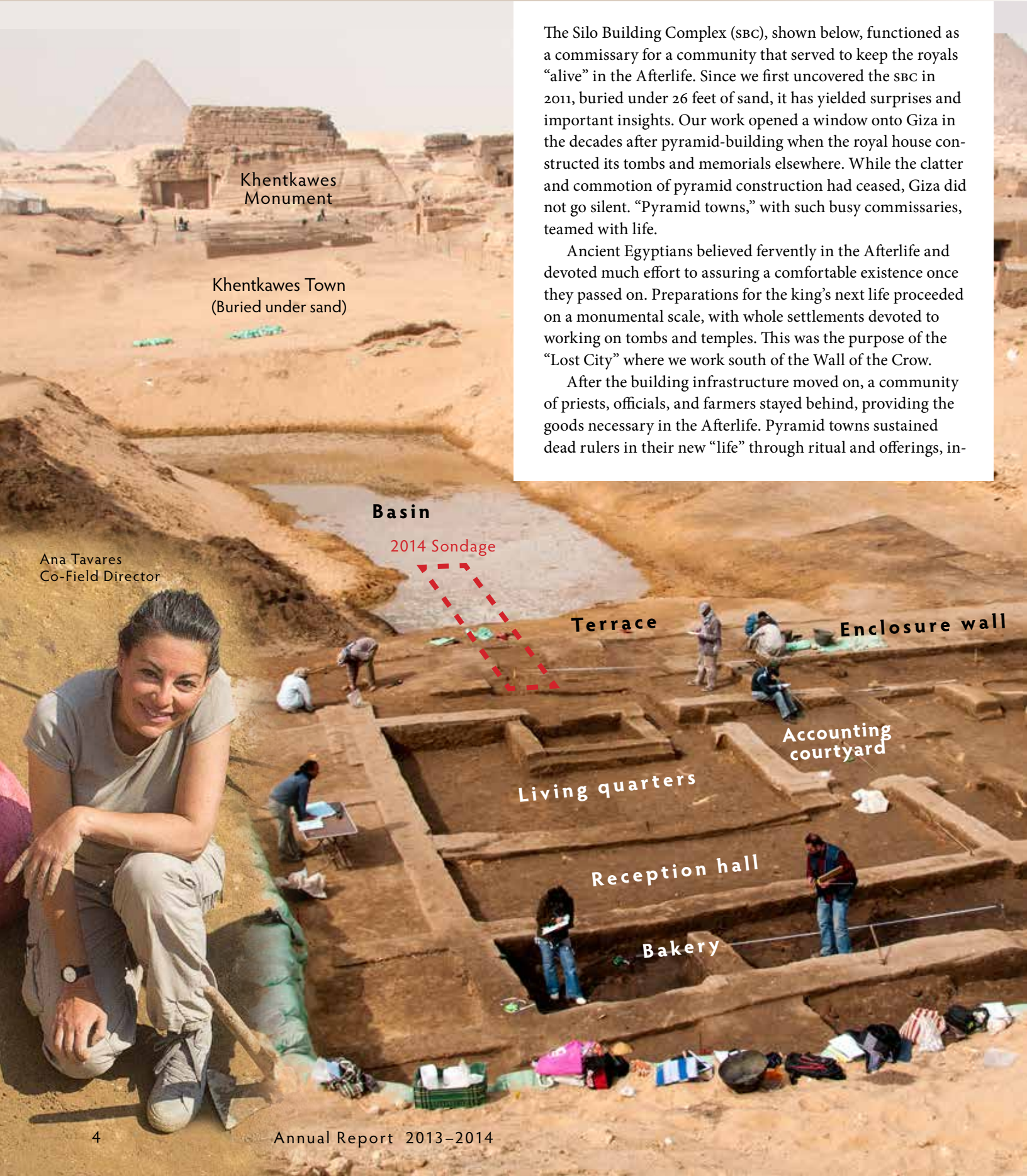
Bread and Beer for Dead Kings

Piety and Politics

The Silo Building Complex (sbc), shown below, functioned as a commissary for a community that served to keep the royals “alive” in the Afterlife. Since we first uncovered the sbc in 2011, buried under 26 feet of sand, it has yielded surprises and important insights. Our work opened a window onto Giza in the decades after pyramid-building when the royal house constructed its tombs and memorials elsewhere. While the clatter and commotion of pyramid construction had ceased, Giza did not go silent. “Pyramid towns,” with such busy commissaries, teamed with life.

Ancient Egyptians believed fervently in the Afterlife and devoted much effort to assuring a comfortable existence once they passed on. Preparations for the king’s next life proceeded on a monumental scale, with whole settlements devoted to working on tombs and temples. This was the purpose of the “Lost City” where we work south of the Wall of the Crow.

After the building infrastructure moved on, a community of priests, officials, and farmers stayed behind, providing the goods necessary in the Afterlife. Pyramid towns sustained dead rulers in their new “life” through ritual and offerings, in-



Khentkawes Monument

Khentkawes Town
(Buried under sand)

Basin

2014 Sondage

Ana Tavares
Co-Field Director

Terrace

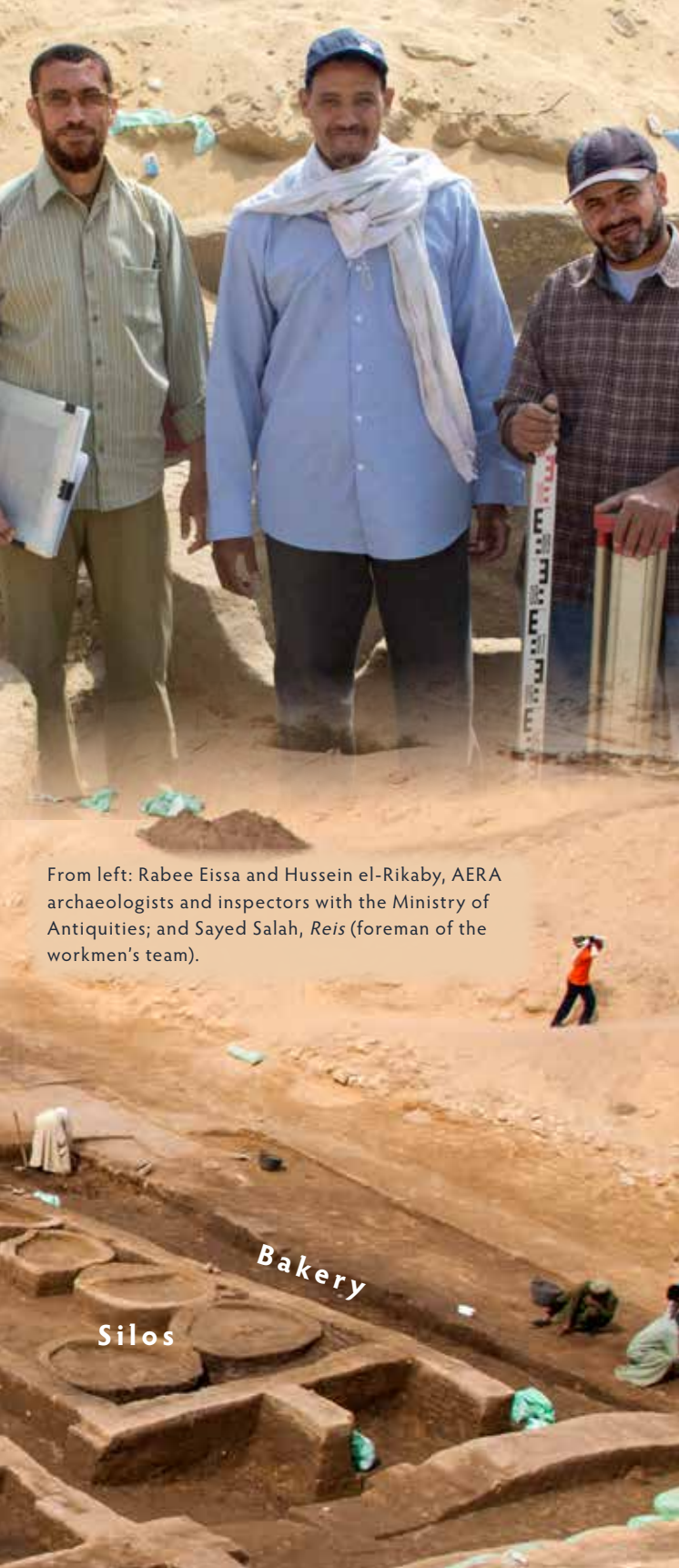
Enclosure wall

Accounting courtyard

Living quarters

Reception hall

Bakery



From left: Rabee Eissa and Hussein el-Rikaby, AERA archaeologists and inspectors with the Ministry of Antiquities; and Sayed Salah, *Reis* (foreman of the workmen's team).

cluding bread, beer, and meat. These special settlements functioned, in part, as regular villages, fending for themselves, but they were exempt from obligatory labor and property tax. In addition, the current, living royal house offered some provisions, sometimes only token gestures.

The pyramid towns eventually died out, some later than others. Our commissary, or *per shena* in Egyptian, offers evidence that a pyramid town lasted at Giza for at least 85 years after the deaths of Khafre and Menkaure, builders of the second and third pyramids, respectively, and after Khentkawes, the queen mother whose colossal tomb memorial rises high above the town to the west of the SBC. Who kept the town going?

We discovered that kings from the 5th Dynasty provisioned and possibly rehabbed it. Although they were busy preparing their own burials elsewhere, they kept the 4th Dynasty royals “alive,” feeding them bread, beer, and meat offerings through the first half of the 5th Dynasty. Why would they venerate and invest resources in long-dead kings?

Politics—we should not be surprised—played a role. Several lines of evidence suggest that 5th Dynasty kings looked to the past to establish their legitimacy, perhaps because of conflict over succession and doubts about the rightful heirs to the throne. Through their efforts at Giza, they affiliated themselves with the late, great pharaohs of the 4th Dynasty—Khufu, Khafre and Menkaure—and apparently Khentkawes.

Belief was also a potent motivator. Those great kings of the 4th Dynasty past could have a profound influence on the 5th Dynasty present. One could curry their favor by caring for their needs. The “Royal Golden Rule” probably guided the 5th Dynasty kings as well: Do unto dead kings as you want future living kings to do unto you.

During Field Season 2014 we carried out our second excavation in the Silo Building Complex, under the direction of Co-Field Directors Ana Tavares and Mohsen Kamel. Over four months a dedicated team of excavators in the field and specialists in the lab worked closely together. Their findings, along with results from the 2012 excavations, came together to flesh out an intriguing picture of post-pyramid-building life on the Giza Plateau. The following pages offer brief accounts of the evidence, conclusions, and finer points of an emerging picture of pyramid town life.

The Silo Building Complex

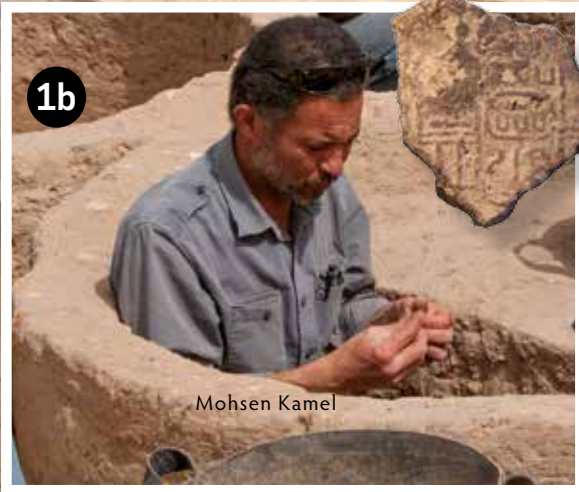
Excavations in 2012 revealed the layout of the mudbrick Silo Building Complex (SBC), but did not get down to the earliest levels, a goal in 2014. Groundwater fills an ancient basin, possibly used for delivering supplies and construction material. The basin is the western end of a larger, now buried ancient waterway (see page 12). Beyond, stand the flat-topped tomb of 4th Dynasty queen Khentkawes and in the distance, the pyramid of

Menkaure. The Khentkawes Town, buried under sand, extends from the queen’s tomb to the edge of a cliff overlooking the basin.

The SBC includes five round silos, bakeries, and rooms for administration, living quarters, and storage. The structure continues on beyond our limit of excavation on the left and at the bottom of photo.



Mohsen Kamel
Co-Field Director



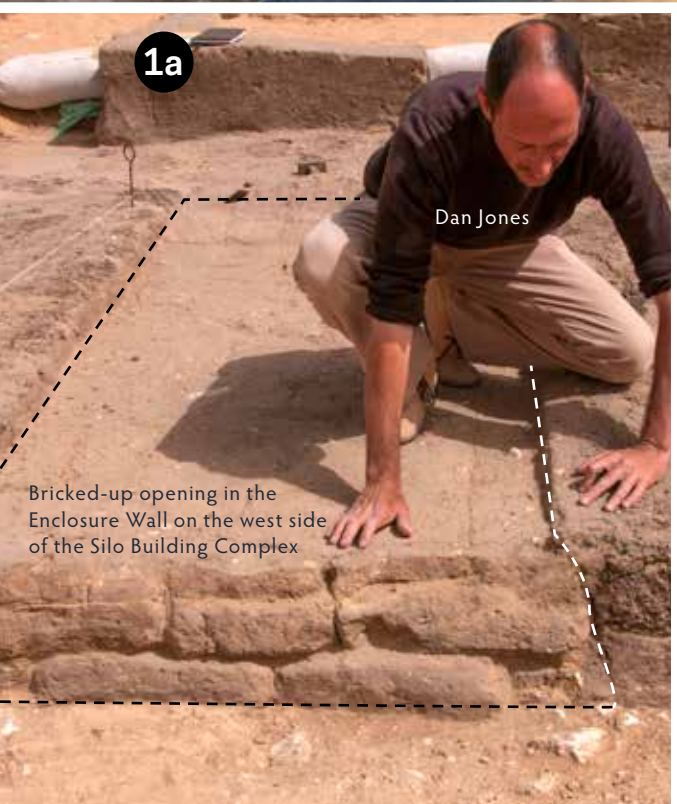
1b

Mohsen Kamel

Original size and shape of silo?

Stairs?

Silos for grain storage



1a

Dan Jones

Bricked-up opening in the
Enclosure Wall on the west side
of the Silo Building Complex

The Silo Building Complex

① An Older Complex - 1a. Evidence of an older phase included the mudbrick fill used to block a large opening through the western enclosure wall of the complex. In addition, the remnants of older walls and baking pits appeared under lower levels of the bakery (3a). 1b. In these early deposits, we found clay sealings bearing the name of Menkaure, a 4th Dynasty king, as well as ceramics dated to the 4th Dynasty.

② Grain Storage - 2a. The five mudbrick silos, now preserved only three feet high, may have originally stood nearly seven feet high, an estimate based on extrapolating from the curvature of the walls. The drawing above suggests what the silo might have looked like. Workers probably poured grain in from above, accessing the opening from the top of the wall around the silos. They may have climbed the wall via a stairway, perhaps using the steps seen on the left in the photo. Grain was stored for making bread and brewing beer, the staples of the ancient Egyptian diet. 2b. The opening near the bottom of the silo would have been used to remove grain, as shown



in this scene from the 6th Dynasty tomb of Nikauisesi at Saqqara.* The opening on our silo was probably closed with a wooden hatch.

③ Baking - 3a. We found two sets of rooms with much ash and evidence of extensive burning. Heat from baking destroyed the plaster and scorched the walls. 3b. We also found large quantities of broken bread molds, or pots, used for baking, including a nearly complete conical bread mold upside down in trash deposits.

④ Beer Brewing - We did not find definitive evidence of brewing, but uncovered enormous quantities of broken beer jars in a trash dump near the Silo Building Complex. Although the jars could have been used for other liquids, they were the standard vessel for beer offerings in tomb scenes, such as the one on page 9.

*After Kanawati, N., and M. Aber-Raziq. *The Teti Cemetery at Saqqara. Vol. vi. The Tomb of Nikauisesi.* Australian Center for Egyptology Report 14. Wiltshire, UK: Aris and Phillips, 2000, plate 48.



Putting the Pieces Together



Ali Witsell photographs sealings in the lab.



A sealer's tool kit? A ceramic tray such as the reconstructed example above may have been used to hold blank daubs of levigated sealing clay (at left). These blanks often look like they had been carefully formed and laid on a flat, lightly pitted ceramic surface, like a tray or platter, ready for a full session of sealing work. The large numbers of blanks that turned up in the Silo Building Complex indicate that workers were busy sealing doors and containers, not just opening containers that came in from elsewhere.

Royal Attention, Busy Center

Ancient Egyptians secured containers, doors, and papyrus rolls with string, cloth, or leather and a daub of clay that they impressed with a cylinder or stamp seal bearing either official titles and the name of a king or geometric or naturalistic designs. When the Egyptians broke the sealing, the resulting pieces became part of the archaeological record.

During the 2012 and 2014 excavations John Nolan and Ali Witsell, the AERA sealings team, studied nearly 400 fragments of sealings or sealing-related material recovered from the Silo Building Complex (SBC).

Dates

More than 75 SBC sealings bear a king's name: the 4th Dynasty monarch Menkaure and four 5th Dynasty rulers (Userkaf, Sahure, Raneferef, and Niuserre), indicating that perhaps the SBC was in use from the late 4th through the mid-5th Dynasty (circa 2435–2374 BC). It is also possible the Menkaure sealings remain from an older structure.

Royal Attention

The sealings with kings' names link these rulers to the SBC.

So we know that 5th Dynasty rulers bestowed attention on the SBC, probably for the mortuary cults serving Menkaure, Khentkawes,

Sealing bearing the name of Niuserre, a mid-5th Dynasty king (outlined in red).

and maybe Khafre, at least intermittently, over a period of about 60 years.

Busy center

Unsealing Jars: The backs of the sealings often capture an impression of the material onto which the clay was pressed. Nearly 20% of the sealings were used to secure jars, indicating that people opened many storage jars in the SBC, possibly containing goods that rulers provisioned to the residents.

Opening Doors: The backs of nearly half the SBC sealings with clear impressions indicate they had been pushed onto a closure mechanism of a peg with a string wrapped around it. These sealings may have secured the hatches at the base of the silos. When authorities removed grain for redistribution to the pyramid town as rations or for making token offerings for the deceased, they broke the sealings and left the fragments.

Sealing Up: But SBC workers did not just crack open clay sealings; they also sealed things on site. The multiple steps involved in sealing containers, doors, etc. are reflected in the large quantity of "sealing-related material" found in the SBC: blank daubs of clay prepared for sealing, shown above, and wads of sealing-quality clay that were either thrown away or possibly saved for recycling in levigation pits. Many of the discards show signs of being crumpled up before they were discarded, as if they were applied, deemed unsuitable, and then removed.





Sherif Abd el-Monaem examines a jar.

Nermeen Shaaban Abayazeed

Rodayna Bayoumy Hassan

Serving Ware, Cookware

Ritual

Amidst the large quantities of pottery—mostly broken fragments—recovered from the Silo Building Complex, two types stood out. The ceramics team of Sherif Abd el-Monaem, Nermeen Shaaban Abayazeed, and Rodayna Bayoumy Hassan identified innumerable fragments of miniature “votive” vessels as well as some complete ones (small plates shown on the right). These tiny plates, bowls, and jars served as token offerings in temples and chapels.

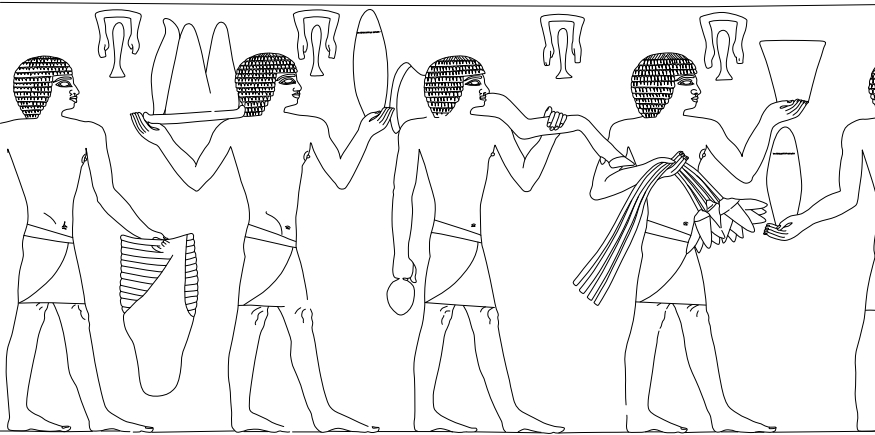
The other pottery type that stood out is the stand. Used to support round-bottomed jars and bowls, it was the dominant type in some of the SBC trash deposits. Two examples are shown on the right, one demonstrating how it would be used with an elegant 5th Dynasty jar. The stands and votives together suggest official, ritual service.



From left to right: a stand demonstrating how it might have been used to support a jar; another stand; a crude redware vessel called a beer jar; and miniature plates used for token offerings.

Food Production

In other deposits in the SBC, broken bread molds (such as 3b on page 7) and baking trays dominated the ceramics, reflecting the busy bakery that once flourished here over 4,300 years ago, producing food for the pyramid town residents and offerings for the deceased. Crude redware beer jars were also abundant; some may have been used to “bottle” beer for residents and offerings, like the jars seen in Old Kingdom tomb scenes, such as the one on the left.



Part of a procession of offering bearers from the 5th Dynasty tomb of Ti at Saqqara. A bearer on the left carries a tray of bread in one hand and a sealed jar (probably containing beer) in another. The bearer in the center carries the forelimb of a cow, a traditional offering (see page 11). Another sealed beer jar can be seen on the right and above it, an object that is probably a loaf of bread that was baked in a mold. After H. Wild. *Le Tombeau de Ti, 2^{ème} partie, La Chapelle. Fascicule 3*. Cairo: Institut Français d’Archéologie Orientale, 1966, plate CLXII.

Provisioning the Town

Cereals Ready to Go

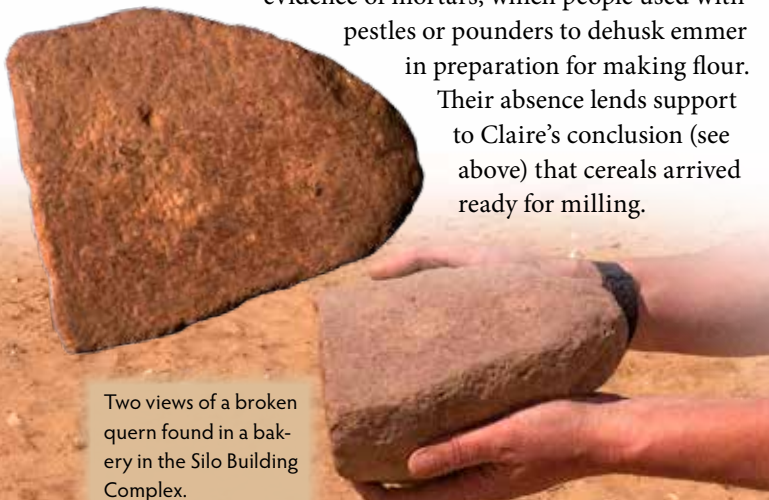
Dr. Claire Malleson, AERA Director of Archaeological Science and archaeobotanist, was surprised when she peered into her microscope to examine plant remains from the Silo Building Complex (SBC). The samples were mostly emmer wheat and barley grains, with a few weed seeds and chaff. Usually it is the other way around with plant samples from ancient Egyptian sites: a few grains with many weed seeds and chaff fragments from dehusking the cereals. The ancient Egyptians generally cleaned the grains of these products by pounding and sieving cereals when they were preparing to make bread and beer. At both the Lost City of the Pyramids and the Khentkawes Town sites, the samples were loaded with chaff and weeds.

The small quantities of these contaminants in the SBC samples indicate that the cereals had been cleaned and dehusked elsewhere before going into the silos, saving the workers from a time-consuming and onerous task. They only had to do a quick final sort to remove the last bits of chaff and weeds—which Claire found in her samples—before going on to mill or malt the grains. This would have made for an efficient bakery-brewery operation.

Grinding the Grains

Ana Tavares, Emmy Malak, and Nagwan Bahaa el-Hadedi identified among the artifacts from the SBC a number of broken querns, or grinding stones, that were probably used in milling cereals. The ancient millers, kneeling on the floor hunched over the quern, ground the emmer or barley grains using a handstone. According to one thoughtful estimate, a miller could produce enough flour for a household's daily bread in about three hours. The bakery in the SBC, turning out loaves for residents and offerings, would probably have kept several millers busy for many hours grinding cereals drawn from the silos.

Notably absent from the artifact inventory was any evidence of mortars, which people used with pestles or pounders to dehusk emmer in preparation for making flour. Their absence lends support to Claire's conclusion (see above) that cereals arrived ready for milling.



Two views of a broken quern found in a bakery in the Silo Building Complex.



Emmer wheat grains

Barley grains

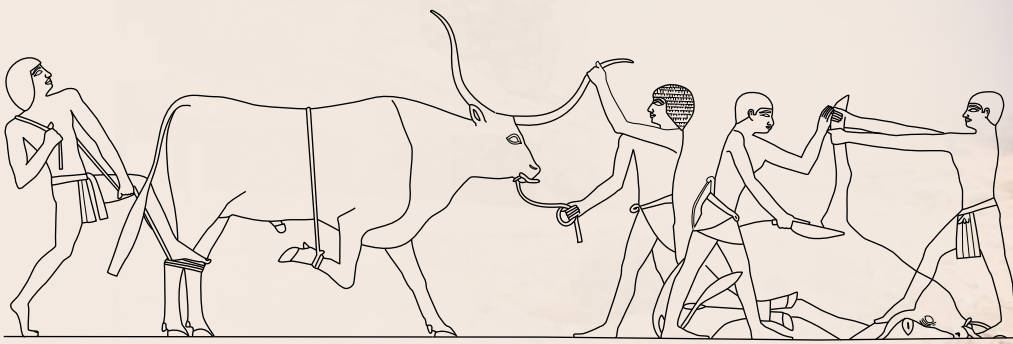
With forceps, Dr. Claire Malleson at her microscope deftly sorts through a sample from the Silo Building Complex (SBC). The black, charred bits are archaeological remains of plants, while the rest is recent—mostly root fragments. The emmer wheat and barley grains, shown enlarged about 3.5 times, were among the plant remains she found in SBC samples.

Beautiful Imported Knives and Blades

Dr. Richard Redding, trained geologist, as well as AERA Chief Research Officer, board member, and archaeozoologist, found that the chipped stone tools in the SBC were nearly all finished tools. There were knife fragments and many nicely-made blades, like the ones to the right, all made of high-quality imported chert. The tools must have been manufactured elsewhere and probably provisioned for the settlement since there was almost no evidence of chipping debris left from shaping the tools. Nor did excavators recover the cores from which the blades are struck, except for a single lump of chert. The craftsmanship and quality of the tools, and the lack of waste from their manufacture, suggests they were given to the SBC occupants ready-made for preparing ritual meat offerings.



Beautifully crafted chert tools that were delivered to the Silo Building Complex as finished products. From left: a blade, a blade tip, and a knife.



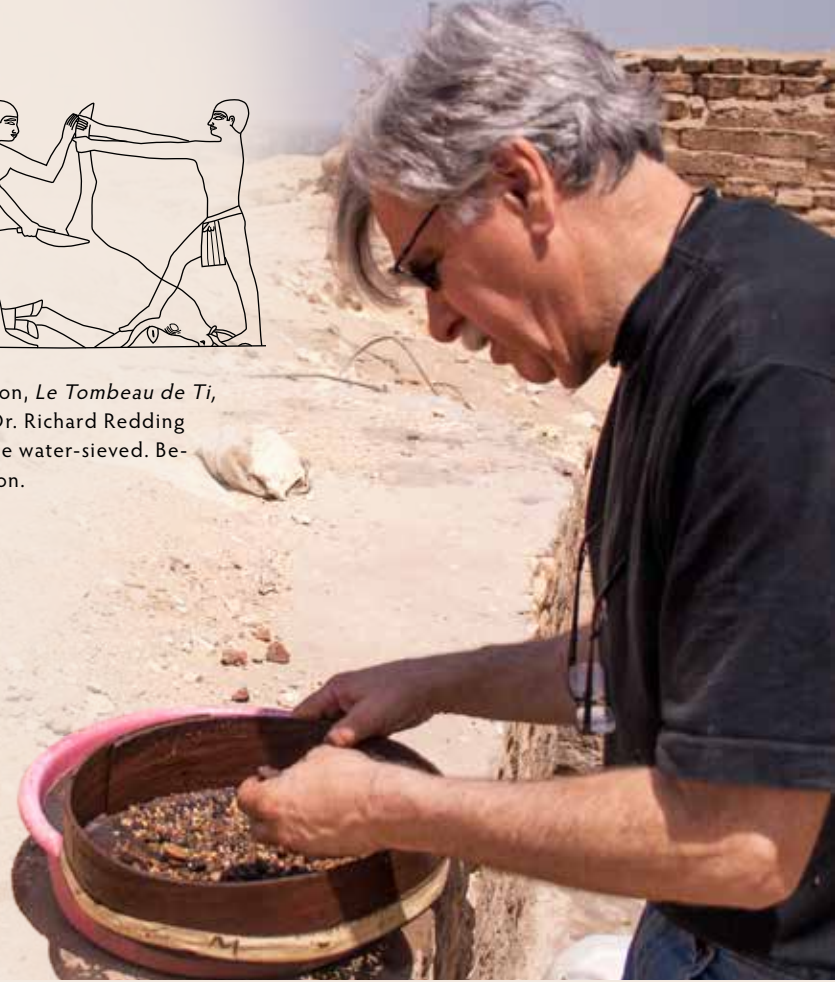
Slaughter scene from the 5th Dynasty tomb of Ti at Saqqara. After L. Épron, *Le Tombeau de Ti*, Cairo: Institut Français d'Archéologie Orientale, 1939, plate XIV. Right: Dr. Richard Redding picks out small bones, such as the toad bones on page 13, from fill that he water-sieved. Because it is so small, such material usually goes unnoticed during excavation.

Supplying Meat: A Beefy Diet

Dr. Richard Redding determined that people took most of their meat from cattle, some from pig, and a little from goat. The bone remains, on which he based his conclusions, came from trash middens in the Silo Building Complex.

Young animals under two years of age account for most of the cattle, which central authorities must have provided. If local villagers had supplied the animals, they would have been mostly elderly cattle, too old to breed or work, or young calves that failed in their first few months.

Many of the cattle bones came from forelimbs, suggesting a ritual connection. Forelimbs were standard offerings in pharaonic times, seen in numerous tomb scenes carried by marching offering bearers such as the one on page 9. In the scene above, butchers are removing the forelimb to use as an offering. Priests associated with the sbc probably presented the forelimbs as offerings in the Afterlife to one of the 4th Dynasty royals: Queen Khentkawes, Menkaure, or even Khafre. We can imagine that after they performed the ritual offering, priests ate the meat or distributed it to others.



Right: A horn core from a young long-horned bull found in trash deposits in the Silo Building Complex. Long-horned cattle were often depicted in Old Kingdom tombs, such as in the scene above, and are believed to have been the dominant breed in Old Kingdom Egypt, while over time the short-horned breed increased. Richard was pleased to discover a find that identified the breed of cattle that was consumed on site. This particular horn core may have been intended for use as an object.



The Pyramid Town as a Village

Locally Sourced Food

The pig bones among the faunal remains in trash at the Silo Building Complex reflect a food source that was not provisioned. Pigs were outside the state economy, and villagers raised them with no interference from the authorities. So the pyramid town residents may have obtained their pigs from a nearby village. Or the pyramid town may have owned pigs.

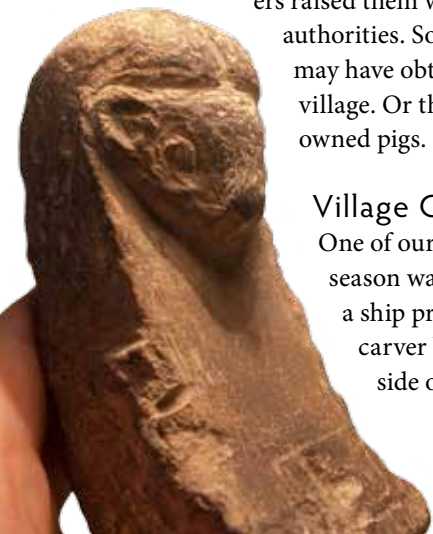
Village Cult Object

One of our most interesting objects this season was a broken limestone model of a ship prow with a hedgehog head. The carver beautifully executed the right side of the hedgehog's face, but

discarded the model before completing the left side, possibly because the stone broke, leaving this 5.5-inch-long section.

Vessels with hedgehog prows, called *henet* boats, are shown in relief in scenes on the walls of lavish, private Old Kingdom tombs, mostly at Saqqara and Giza. However, many other models of hedgehog boats have been found at village sites. People deposited such models—many crudely done in faïence—as votive offerings in local temples. We do not know much about the private beliefs of ancient Egyptians, but these offerings reflect popular rather than state religion.

Someone may have intended to offer this hedgehog prow in one of the nearby temples. It probably also reflects the village aspect of the pyramid settlement.

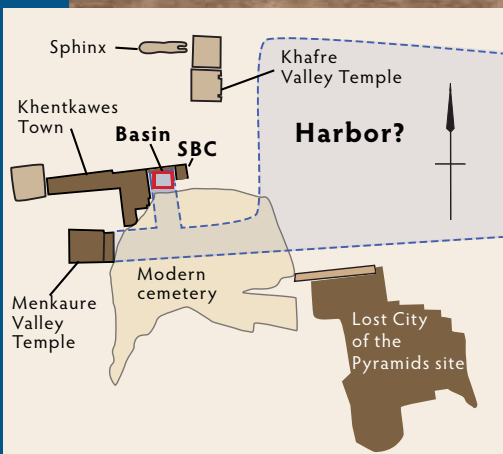


Giza's Back Bay: Marina Del Rey

The king's marina, literally. The basin, seen in this 2012 photo, must have been the farthest outreach of an Old Kingdom royal waterway. And it is one of our major discoveries, which we have been uncovering over three field seasons.

Egyptologists have long suspected that a man-made waterway ran from the Nile to a harbor in front of the Khafre Valley Temple, allowing the pyramid builders to float massive granite blocks to the Giza Plateau. But no one thought that the waterway extended so far west; this basin is the first part of the waterway that has come to light. We believe the basin connected to a channel extending to the Menkaure Valley Temple, which provided a way to bring building materials to the temple. The sketch below suggests a possible configuration for the channel and harbor.

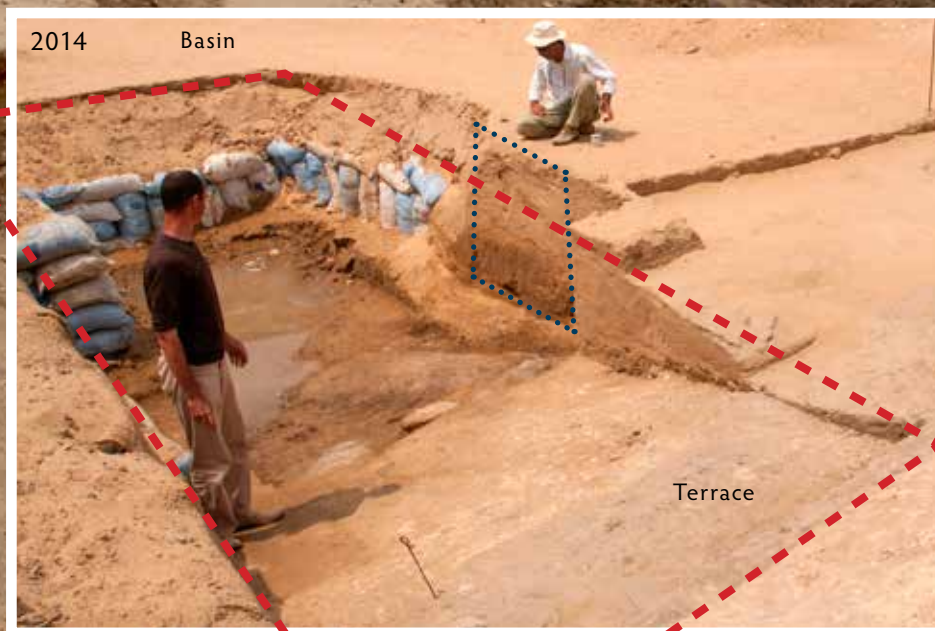
Here we present some of the things we have learned about the basin.



Basin Design

The basin was created in a quarried depression, with banks reinforced by crushed limestone debris and mudbrick. The Silo Building Complex lies on the east bank. On the west bank the pyramid town of 4th Dynasty queen Khentkawes, buried under sand, sits on a bedrock terrace high above the basin. Both banks were stepped with two terraces and 90° corners at the north end. Over time the corners and the steps eroded. Depending on exactly how the banks were finished, the basin was 87 or 101 feet east to west, just large enough for a vessel to turn around.

During the 2014 field season, with the water table much lower than in 2012, we were able to dig a sondage, or trench (shown in red dotted line on the facing page below), from the Silo Building Complex outer wall into the basin, which allowed us to determine how the east bank was built.



Evidence of Ancient Harbor

Deposits in the basin seen in the section on the left (blue dotted line square) are what you would expect to find in an abandoned harbor that filled over time with wind-blown sand, according to Dr. Judith Bunbury, a geologist at Cambridge University.

Khentkawes Monument

Khentkawes Town

A Changing Waterfront

We discovered with our 2014 excavation that the Silo Building Complex's thick Enclosure Wall originally featured an opening, 3.6 feet wide, which allowed people to go directly from the basin into the complex. This was probably during the time that Menkaure's Valley Temple was under construction. Later the opening was bricked up (photo of block on page 6).

Signs of Standing Water

Snail shells recovered from a thick silt deposit sealing the lower terrace in the sondage. These are probably *Ampullaria*, a common snail in the Nile that likes deep, quiet water.

Bones of the African toad, which breeds and spends its tadpole days in water, were found *in situ* in the Silo Building Complex. Richard Redding identified the archaeological toad bones on the basis of comparison with modern specimens (light colored bone in photo below). Photo (lower right corner) of an African toad courtesy of nature-images.eu, Arthur Tiutenko.



Water snails

87 ft
or 101 ft

Basin

2014 Sondage

Upper terrace

Silo Building Complex (2012)

Enclosure wall

Bricked-up opening

Bones of the African toad, ancient (dark) and modern (light)

African toad

Sharing Our Work: Lectures, Publications, Aw



John Nolan, AERA
Associate Director,
sealings specialist

Chris Dilks, AERA
Community Outreach
Director

AIA Archaeology Fair Boston Museum of Science

On October 19, 2013, AERA joined 20 other organizations to share the excitement of archaeology with the public during the 7th Annual Archaeology Fair, sponsored by the Archaeological Institute of America (AIA) and the Museum of Science, Boston. John Nolan and Chris Dilks demonstrated analysis of clay sealings, animal bone, and pottery.

During the “Ask Dr. Dig” component of the fair, John Nolan answered audience questions along with three other professional archaeologists.

In the museum’s auditorium, George Mutter and Bernard Fishman, on behalf of AERA, presented a 3D tour, “Up the Nile,” using late 19th and early 20th century stereoview images from their vast photoarchive (<http://www.photoarchive3d.org>).

Lectures and Conference Presentations

AFIFI ROHIM AFIFI and GLEN DASH

“The Discovery of Intact Foundation Deposits in the Western Valley of the Valley of the Kings,” *Current Research in Egyptology 2014*, London.

YUKINORI KAWAE

(with Yoshihiro Yasumuro, Ichiroh Kanaya, and Chiba Fumito). “3D Reconstruction of the ‘Cave’ of the Great Pyramid from Video Footage.” 2013 Digital Heritage International Congress, Marseille, France. October 28, 2013.

“The Forefront of the Pyramid Study.” The Asahi Culture Center, Nagoya, Japan. November 12 and December 8, 2013.

“The Most Up-To-Date Information about Pyramids.” The NHK Culture Center, Nagoya, Japan. March 9, 2014.

“The Latest Information on the Pyramid Study.” Harukasu University, Osaka, Japan. April 13, 2014.

(with Yoshihiro Yasumuro, Ichiroh Kanaya, and Chiba Fumito). “3D Reconstruction and its Interpretation of the ‘Cave’ of the Great Pyramid in an Inductive Approach.” The 6th Old Kingdom Art and Archaeology Conference, Warsaw, Poland. July 3, 2014.

MARK LEHNER

“The Lost Port City of the Pyramids? Heit el-Ghurab at Giza: Workers’ Town, Port City and More.” Society for the Study of Egyptian Antiquities, Vancouver, Canada. November 7, 2013.

“New Discoveries on the Giza Plateau, Egypt” American Institute of Archaeology Annual Meetings, Chicago, January 4, 2014.

“The Lost Port City of the Pyramids? Heit el-Ghurab at Giza: Workers’ Town, Port City and More” and “A Short History of Pyramids in Ancient Egypt, Origins.” Society for the Study of Egyptian Antiquities, Toronto January 11, 2014.

“Complexity and Social Organization in Old Kingdom Egypt: A View from the 4th Dynasty Settlement at Giza.” Boston University, March 28, 2014.

“Floodplain Interventions and Water Transport Infrastructure of 4th Dynasty Giza.” Profane Landscapes, Sacred Spaces Conference, Charles University, Prague. June 26, 2014.

CLAIRE MALLESON

“Come, Tell Me How They Lived!: Techniques in Egyptian Settlement Archaeology.” Course director for Bloomsbury Summer School, London, England. July 19–August 2, 2013.

“Modeling the Economy of Bread Production in the Old Kingdom.” Archaeological Institute of America annual meeting, Chicago. (Read by Richard Redding). January 4, 2014.

“Modeling the Economy of Bread Production in the Old Kingdom.” Food ‘Stuffs’: Exploring the Materialities of Foods, their Artefacts and their Environments conference, Lampeter, University of Wales. May 21–22, 2014.

REBEKAH MIRACLE and FREYA SADARANGANI

“Something Old, Something New: Integrating Legacy Data and Preparing for the Open Access Future.” Society for American Archaeology 79th Annual Meeting, Austin, TX. April 27, 2014.

JOHN NOLAN

“Cutting Edge Archaeology: Exploring Ancient Lives.” Massachusetts Archaeological Society, Central Chapter, Boston. December 7, 2013.

“New Excavations at the Pyramids: The 2014 Season of the Ancient Egypt Research Associates.” Massachusetts Archaeological Society, Boston. June 14, 2014.

RICHARD REDDING

“A Tale of Two Sites: Feeding the Pyramid Builders.” The Society for the Study of Egyptian Antiquities, Toronto. January 11, 2014.

wards, and an Archaeology Fair

“Old Kingdom Animal Economy: The Infrastructure of Pyramid Construction, a View from the Delta.” American Research Center in Egypt Annual Meeting, Portland, Oregon. April 4, 2014.

ANA TAVARES

“More from Memphis: Kom el-Fakhry, a Middle Kingdom Settlement in Context.” Egypt Exploration Society, British Council, Agouza, Cairo. February 2, 2014.

“More from Memphis: Results of the Mit Rahina Field School.” Giza Inspectorate, Giza, Cairo. February 10, 2014.

“The Town and Funerary Complex of Queen Khentkawes: Recent Work of Ancient Egypt Research Associates (AERA) at Giza.” Netherlands-Flemish Institute in Cairo. March 6, 2014.

“The Heit el-Ghurab and Khentkawes Settlements: Exceptions or Prototypes?” Egyptology Club, The American University in Cairo. May 5, 2014.

ANNA WODZIŃSKA and MALGORZATA KORZENIOWSKA
“Pottery from sw1 Area - Heit el-Ghurab Settlement, Giza.” The 6th Old Kingdom Art and Archaeology Conference, Warsaw, Poland. July 3, 2014.

ANNA WODZIŃSKA and AGATA BEBEL
“Old Kingdom Bakeries: Iconographic, Lexical and Archaeological Evidences.” The 6th Old Kingdom Art and Archaeology Conference, Warsaw, Poland. July 4, 2014.

Publications

AFIFI ROHIM AFIFI and GLEN DASH

“An Excavation and Geophysical Survey in the Western Valley of the Valley of the Kings.” *Current Research in Egyptology* 2013, Oxford: Oxbow Books, 2014, pages 1-10.

DELPHINE DRIAUX and ANA TAVARES

“Esquisse d’une mosaïque urbaine. Villes et villages de Giza à l’ancienne empire.” *Égypte Afrique & Orient* 72, Décembre 2013–janvier-février 2014: pages 3–14.

YUKINORI KAWAE

(with Yoshihiro Yasumuro, Ichiroh Kanaya, and Chiba Fumito). 3D Reconstruction of the “Cave” of the Great Pyramid from Video Footage. *Proceedings of the 2013 Digital Heritage International Congress*. Institute of Electrical and Electronics Engineers, 2013, pages 227–230.

RICHARD REDDING

“A Tale of Two Sites: Old Kingdom Subsistence Economy and the Infrastructure of Pyramid Construction.” In *Archaeozoology of the Near East x: Proceedings of the Tenth International Symposium on the Archaeozoology of South-Western Asia and Adjacent Areas*, eds. B. de Cupere, V. Linseele, and S. Hamilton-Dyer. Leuven: Peeters, 2013, pages 307–322.

“Pyramiden und Proteine.” *ANTIKE WELT*, WBG Redaktion Zeitschriften, posted online February 10, 2014.



Shanghai Archaeology Forum

In August 2013, AERA President Mark Lehner received an award at the inaugural session of the Shanghai Archaeology Forum in Shanghai, China. The Forum recognized AERA's excavation and survey of the Lost City of the Pyramids, along with AERA's broader research into the settlements at Giza, as one of the ten major field discoveries in the world. AERA was chosen through a rigorous selection process from an initial pool of 99 nominees. The Shanghai Archaeology Forum Program, in its own words, “recognizes individuals and organizations that have achieved distinction in innovative, creative, and rigorous works, and generated new knowledge about our human past, which has significant relevance to the contemporary world and our common future.” As part of the program, attended by 180 delegates, Mark presented “In Search of the Pyramid Settlements: Archaeology of Everyday Life at Giza.”

The Shanghai Archaeology Forum
上海考古论坛: 2013.08

AERA in the Public Eye



Top: A Flight 33 camera man films Joan and Glen Dash demonstrating a method for determining true north that ancient Egyptians might have used. Above: Flight 33 films an interview with John Nolan.

...in the news

Richard Redding and Mark Lehner presented talks at the Society for the Study of Egyptian Antiquities in Toronto (listed on page 14) that caught the attention of science writer Owen Jarus, who subsequently interviewed them and wrote two articles for the Live Science website. The first described Richard's work: "Tasty Life: Leopard Teeth, Calf Bones Found in Ruins Near Pyramids" (<http://www.livescience.com/42717-leopard-teeth-found-at-giza-pyramids.html>). The Chinese Academy of Social Sciences website reprinted the article and several news outlets picked up the story, including nbcnews.com, news.discovery.com, and news.yahoo.com.

Owen Jarus's second article for Live Science, based on Mark's presentation, was "Ruins of Bustling Port Unearthed at Egypt's Giza Pyramids" (<http://www.livescience.com/42902-giza-pyramids-port-discovered.html>). *Scientific American* magazine republished the article on its website, and nbcnews.com, huffingtonpost.com, and yahoo.com posted the story on their websites.

...in a documentary

Four AERA team members appeared on the History Channel 2 program "The Universe" in "The Pyramids" episode, which aired March 8, 2014. Among the "world's renowned Egyptologists, astronomers and engineers" on the program were John Nolan, AERA epigrapher and associate director; Mark Lehner, AERA president; James Allen, AERA board member and Professor of Egyptology, Brown University; and Glen Dash, engineer, AERA board member, surveyor, and remote sensing specialist.

Last summer a film crew from Flight 33 Productions, the documentary film company that produced the show, spent a day at the Dash home in Connecticut filming. Glen and Joan Dash demonstrated a method that ancient Egyptians might have used to find true north for aligning their pyramids with equipment that Glen had built and previously tested. Glen had determined that it was possible to find true north to a high degree of accuracy with this simple method.

The Flight 33 team also filmed an interview with John Nolan at the Dash home and later in the summer met with Mark Lehner and Jim Allen.

...in a museum exhibit

Dr. Richard Redding, AERA Chief Research Officer, board member, and animal bone specialist, helped develop an exhibit that ran from August through November 2013 at the University of Michigan Kelsey Museum of Archaeology, where he is Associate Research Scientist.

Richard created an archaeozoology component for "Discovery! Excavating the Ancient World," about the methods archaeologists use in studying and interpreting the past. He presents the steps he took in discovering that meat consumption was closely tied to status and ritual practices at the ancient settlements AERA excavates.

Richard also invites Museum visitors to "Be an archaeozoologist."

They can pick up and handle modern cattle bones (right and below) and then identify these elements in a diagram of a cow skeleton.



Catching Up with Our Field School Alums

In collaboration with our friends at the American Research Center in Egypt and London's Egypt Exploration Society, we have completed nine sessions in our four-component field school training program, a critical element of AERA's mission and outreach. In addition, we have carried out three sessions of on-the-job training during our regular field seasons.

Many of our former students, all inspectors in the Egyptian Ministry of Antiquities, have gone on to further their careers with additional archaeological training and academic pursuits. We are delighted that our field schools could provide one rung on their archaeology career ladder, and we are proud of their continued achievements. Here we catch up with just a few of our former students, but we look forward to featuring updates on more of them in the future.

IBRAHIM MITWALLI

Alexandria Inspectorate

Field Schools: Giza 2009, Luxor 2010, APFS 2010, and Memphis 2011

Further Education: MA student, Dept. of Maritime and Coastal Archaeology, Aix-Marseille University, France

Other field work: Director of Elabed excavations of the eastern Graeco-Roman cemetery in Alexandria, Director of the Dept. of Nautical and Underwater Archaeology for the Nile, Alexandria



ZEINAB HASHESH

Kafr el-Sheikh Inspectorate

Field Schools: Giza 2006 (bioarchaeology specialty)

Further Education: Completed PhD, 2012, Tanta University. Now working toward a second degree in physical anthropology, Alexandria University, Physical Anthropology Dept.

Other field work: Buto and Tell el-Amarna

AFAF WAHBA

Permissions, Ministry Head Office

Field Schools: Giza 2006 (bioarchaeology); teaching assistant Giza 2007 and 2009; APFS 2010

Further Education: MA student, Dept. of Anthropology, Cairo University; Tell el-Amarna bioarchaeology field school; Bioarchaeology internship, British Museum; Travel grant (German Archaeological Institute, Cairo) to visit major collections of German museums.

Other field work: Helwan, Heliopolis, Saqqara, and Luxor



HASSAN RAMADAN

Luxor Inspectorate

Field Schools: Luxor 2008; Giza 2009; APFS 2010

Further Education: PhD student, Egyptology Dept., Humboldt University, Berlin, with full scholarship from Deutscher Akademischer Austausch Dienst (DAAD)

Other field work: West Bank sites in Luxor, Luxor and Karnak Temples

OUR FOUR-COMPONENT FIELD SCHOOL CYCLE

Beginners • Giza 2005, 2007; Memphis 2011

Advanced • Giza 2006, 2009

Salvage Archaeology • Luxor 2008, 2010

Analysis and Publication (APFS) • Giza 2010; Luxor 2011



Thanks to Our Donors

The generous contributions of our benefactors and members have made our work possible. Every tax-deductible donation supports AERA's archaeological excavations, publication of our findings, and educational programs aimed at advancing knowledge about our common human heritage. We are extremely grateful to the following foundations, businesses, and individuals who support our work.

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Geodetic System 1984), which will be essential for sharing our data in coming years through Open Context on the internet.

AERA thanks George Mutter and Bernard Fishman for presenting, on AERA's behalf, their 3D tour "Up the Nile" at the Museum of Science, Boston, as part of the 2013 Archaeological Institute of America Archaeology Fair.

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Dr. Richard Redding, *Chief Research Officer, Archaeozoologist*

Mohsen Kamel, *Co-Field Director, Executive Director of AERA-Egypt*

Ana Tavares, *Co-Field Director*

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A colossal Anubis, standing 26 feet high, "attended" the annual meeting of the AERA Board of Directors in November 2013, when board member Ed Fries and his wife Kathy hosted a visit to their home. Anubis watches over Kathy's garden, a much visited high point of tours. Ed and Kathy adopted Anubis after he stood guard over the Tutankhamun exhibit at Seattle's Pacific Science Center, which ended in January 2013.



Panoramic view to the east taken from the top of the Khentkawes Monument during the 2012 field season. The Khentkawes Town, mostly buried under sand, extends eastward from the base of the monument to the edge of a deep basin, filled with groundwater. Just beyond lies the Silo Building Complex. Modern Giza looms in the distance. On the left in the foreground stand the remains of 5th Dynasty rock-cut tombs. On the right, AERA's replica of House E in the Khentkawes Town, built in 2011, allows visitors, school groups, and colleagues to see and study the structure. At the bottom of the page, the walls of Khentkawes Town were exposed by AERA excavators for mapping during the 2012 season.

Invest in our Global Past, Present, and Future

Your donations directly support the main pillars of AERA's mission: excavation, analysis, publication, and educational outreach.

For over 25 years our multinational team has studied the daily lives of Giza's ancient inhabitants, both royal and worker, through excavation, survey, and laboratory analysis. Our AERA-Egypt Center provides a unique, year-round meeting place for this growing band of archaeologists, fostering an open environment for cultural exchange and education. Our field school program for inspectors in the Egyptian Ministry of Antiquities offers valuable training in archaeological methods, empowering students

to become active participants in the international discussion of their country's past.

By contributing to AERA, you'll receive the benefit of knowing that you've made a valuable investment in us all, helping to broaden our knowledge of the past, make an impact in the education of our students, and strengthen the future of our global community.

Please contribute online at:
<http://www.aeraweb.org/support>.

Or send donations to the address below. Donors who contribute at the level of basic member (\$55) or senior/student member (\$30) receive our AERAGRAM newsletter twice a year and the AERA Annual Report.



Ancient Egypt Research Associates
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E-mail: info@aeraweb.org
Website: <http://www.aeraweb.org>
Phone: 617-783-0737

Hanan Mahmoud, Giza inspector for the Ministry of Antiquities and regular AERA team member, displays a jar she uncovered during this year's excavations. Hanan is a graduate of our field school and now an instructor in our program, helping to train her fellow colleagues in the Ministry.



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Donors who contribute at the level of basic member (\$55) or senior/student member (\$30) receive our AERAGRAM newsletter twice a year and the AERA Annual Report hot off the presses, months before we post these publications to our website. Donors also receive invitations to special events and regional lectures, as well as firsthand updates on research from the field.

By contributing to AERA, you'll receive the benefit of knowing that you've made a valuable investment in us all, helping to broaden our knowledge of the past, make an impact in the education of our students, and strengthen the future of our global community.

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