



AERA

Annual Report 2008–2009

Ancient Egypt Research Associates



AERA

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Ancient Egypt Research Associates is a 501(c) (3), tax-exempt, non-profit organization dedicated to research on ancient Egypt.



Cover photo: Stairways of the Khentkawes Valley Complex ascending to the Northern Lateral Ramp, marked by the rising ledge cut into the bedrock face (below). Remains of House E lie exposed halfway to the monumental Khentkawes tomb, with the Menkaure Pyramid in the background (above).

A Message from Mark Lehner

AERA's 2008–2009 fiscal year saw our 18th season of archaeology at Giza. AERA, Inc., has grown into a viable research organization, with twelve full-time staff members, offices in Boston, and, now, AERA's own Giza Archaeological Center and Field School. It was a year of doing what AERA does best—executing one of the largest archaeological missions in Egypt and teaching state-of-the-art archaeology in a field school that sets the standard for members of Egypt's Supreme Council of Antiquities (SCA).

AERA's major discovery of the year: an entire new architectural layout east of the Khentkawes Town, what may indeed be the valley complex of this enigmatic queen who ruled as king.

AERA's major leap forward this year: securing our own property, one block from the entrance to the Giza Plateau, at the bottom of the road leading to the very foot of the Great Pyramid. Here we will build our own facilities for the AERA Archaeological Center and Field School. Already in the month and a half at the end of our busy field season, we refurbished the old villa with a view to the pyramids. In the long term, this will prove the most important of AERA's achievements during our year 2008–2009.

Let me list all of AERA's achievements during the past year, which were possible thanks to your interest and generous support, combined with a skilled team of archaeologists who take on AERA's mission with dedication, skill, and passion. Please see at the end of this report the list of everyone who supported the following:

Accomplishments

- **Discovery of the Valley Complex of Queen Khentkawes**

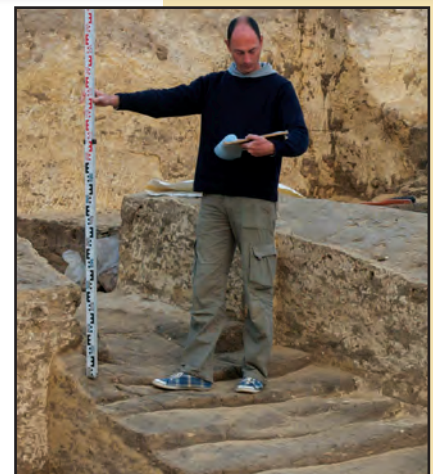
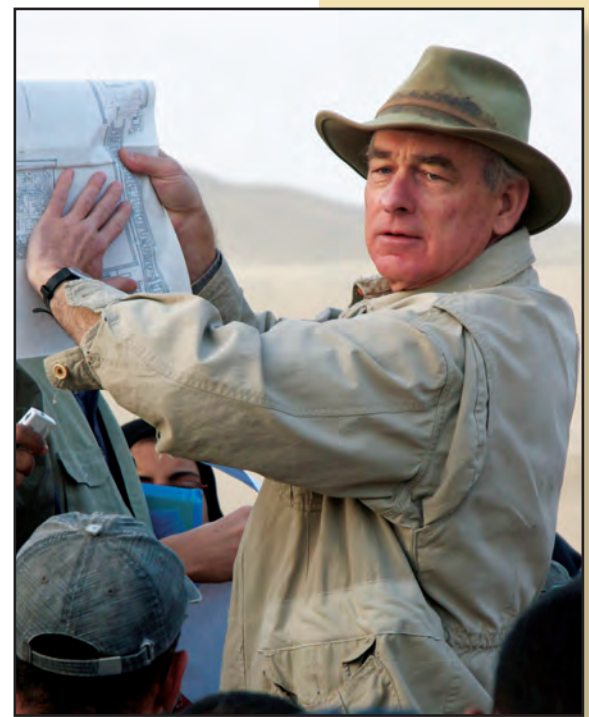
After two seasons (2007–2008) of struggling with the depredations of previous excavations, erosion of the surrounding site, and an enormous overburden of sand, the AERA team found a complex of terraces, ramps, stairways, and a yawning, deep basin at the eastern end of the causeway leading through the Khentkawes Town and to the monumental tomb of this mysterious queen who ended Giza's 4th Dynasty of pyramid-building kings. We may indeed have here the equivalent of the king's valley temples, this one built for a queen who ruled as king.

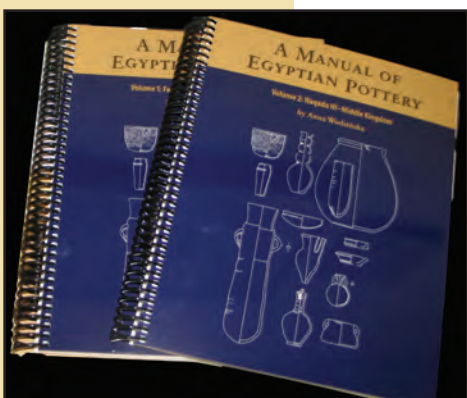
- **Lost City Site Excavations**

After a two-year hiatus because of the rising water table, we resumed excavations in our flagship site, the Lost City of the Pyramids. Archaeologists and students of AERA's Advanced Field School excavated scores of graves of the Late Period (around 664–525 BC) in order to reach the floors and walls of the enigmatic western part of the settlement dating 2,000 years earlier than these graves.

- **Advanced Field School 2009**

Field School Co-Directors Mohsen Kamel and Ana Tavares successfully designed and fielded the second session of the AERA-ARCE Advanced Field School at Giza. Nine SCA supervisors and eight non-Egyptian





teachers gave eight-week advanced courses for 42 former field school students specializing in osteoarchaeology (excavation of human remains), advanced excavation methods, archaeological illustration, survey and mapping, and ceramics.

- **Archaeological Science Program**

In the Giza Field Laboratory AERA's international team of specialists honed their analyses of the material culture from six years of excavations in the Royal Administrative Building (RAB). Through workshops and study sessions the site and lab teams integrated macro- and micro-archaeology to reveal patterns of life within the RAB of the Lost City in advance of its final publication.

- **Property Purchase for the AERA Archaeological Center and Field School**

We realized our three-year quest for property near the pyramids where we will build the AERA Archaeological Center and Field School. For the first time AERA has its own home, one block from the entrance to the Giza Pyramids, where at the end of this season we were able to move our books, computers, and dig equipment instead of putting them into rented storage.

- **Villa Renovation as AERA-Egypt Headquarters in Giza**

With funds left in the capital campaign after our purchase, the AERA team completely renovated the 1930s villa on the property, installing new wiring and plumbing, plastering, and painting.

- **AERA Pottery Manual and Giza Occasional Papers**

AERA published *A Manual of Egyptian Pottery* volumes 1 and 2 by AERA ceramicist Dr. Anna Wodzińska, the first-ever comprehensive catalogue of Egyptian pottery. The manual covers pottery from the earliest Neolithic period until modern times. The four-volume set is the first publication of the *AERA Field Manual Series (AFM)*. AERA also completed *Giza Occasional Papers (GOP)* volumes 1 through 4. These monographs summarize the results of AERA excavations during seasons 2004 through 2008.

- **AERA Anniversary and Study Day in Cairo**

In celebration of 10 years since AERA's Millennium Project launched, 20 years since AERA began to excavate the Lost City of the Pyramids, and 30 years since I began directing archaeological projects at Giza, Dr. Zahi Hawass and the SCA hosted the AERA Study Day at the SCA headquarters in Cairo. AERA team members presented results of excavations, analyses, and the field school program in lectures and posters to the entire Egyptology community in Cairo.

- **COSI Science Museum Exhibit Highlighting AERA's Work**

AERA worked with a team from COSI, the Center of Science and Industry in Columbus (Ohio) on an immersive, interactive exhibit, "Lost Egypt," featuring AERA's archaeology. "Lost Egypt" will tour science museums around the United States.

Through the past year, AERA continued to grow, and more important, to consolidate its growth of prior years. It is enormously satisfying to all of us at AERA that we are now making a difference—to Egypt through the field school, and to the common understanding of ancient Egypt through a variety of formats.

Dr. Richard Redding continues to donate his time as Chief Research Officer, working with Dr. Mary Anne Murray, Director of Archaeological Science;

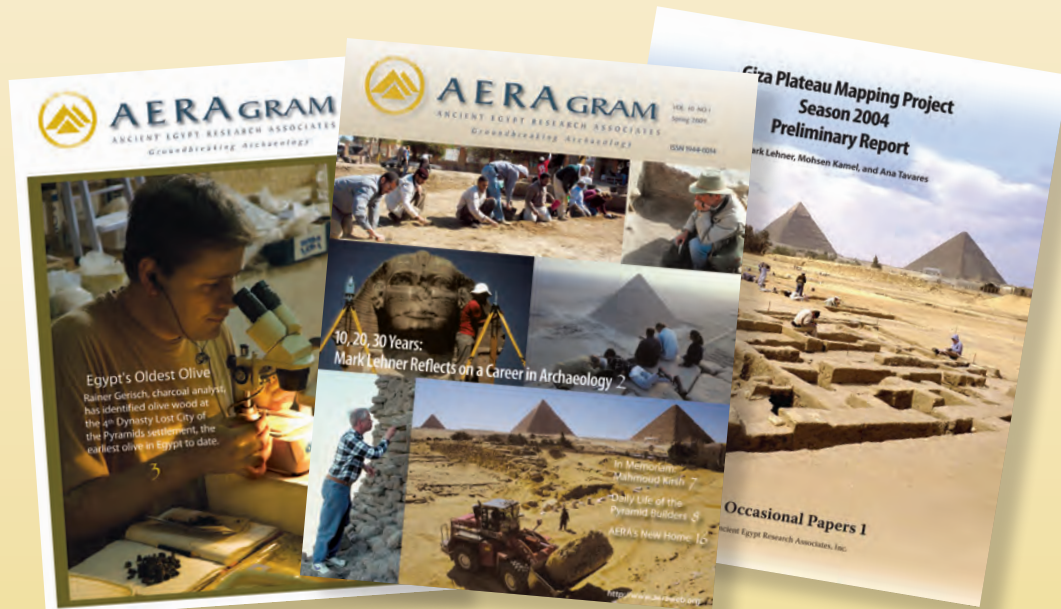
Mohsen Kamel and Ana Tavares, Field Directors and Directors of the AERA Field Schools; John Nolan, Associate Director and Chief Financial Officer; John Anderson, who donates his time to provide counsel on finances and operations; Dr. Wilma Wetterstrom, Science Editor; Erin Nell, Business Manager; Jim Schnare, Communications Associate; and Ali Witsell, Assistant Editor.

All of us at AERA thank Douglas Rawles and Mark Wakim of Reed Smith LLP for providing advice and counsel on a myriad of legal matters. Douglas, who has worked with AERA for over 13 years, continues to provide services on a pro bono basis, which is much appreciated by everyone in the AERA family.

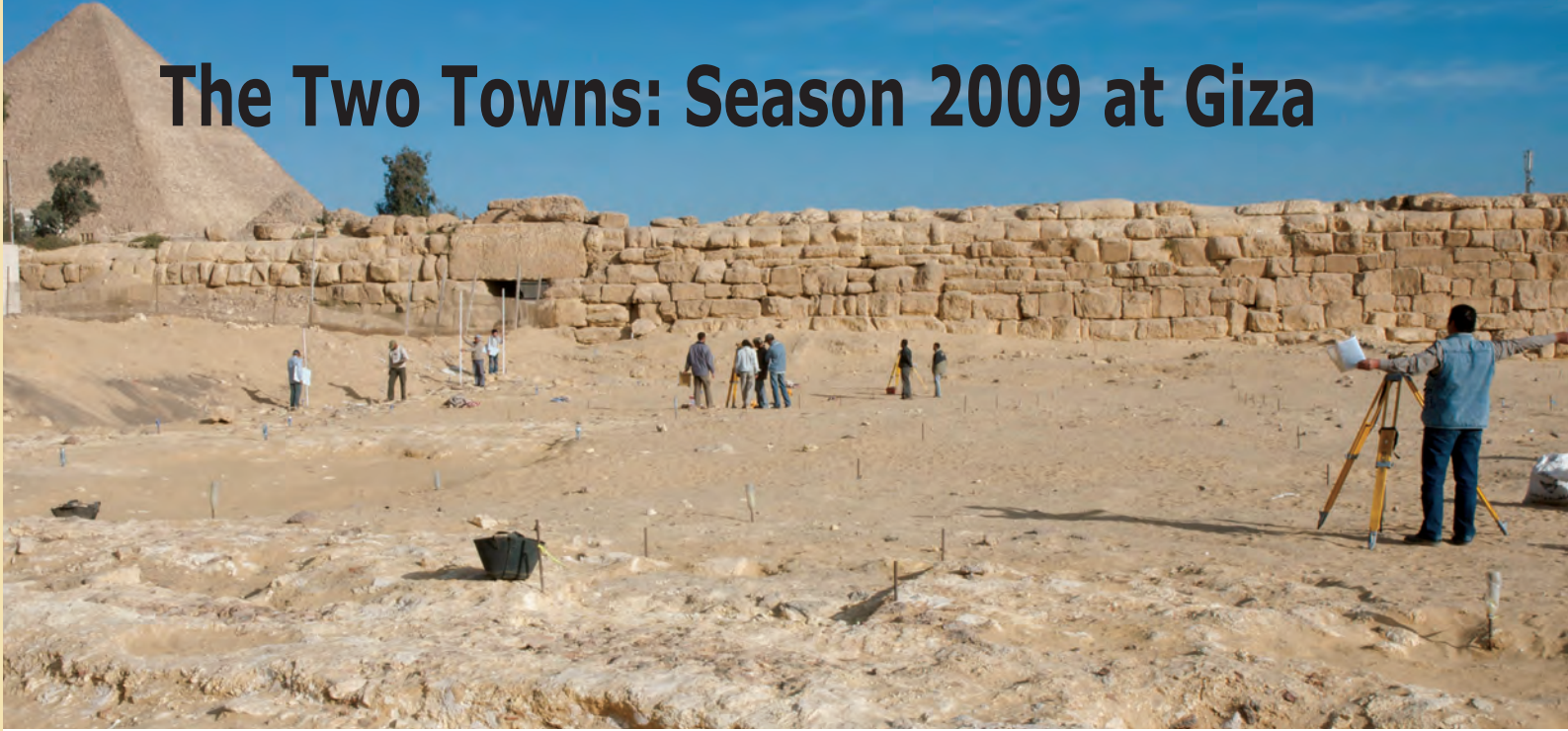
In Boston, AERA continues to fill three suites with a total of five rooms at 26 Lincoln Street. AERA Archivist Mari Rygh assisted by Aparna Das, continually upgrades the organization and filing of the back suite, where AERA archives its ever-growing corpus of original maps, drawings, notebooks, and photographs. AERA shares one of the three suites with the Dash Foundation for Archaeological Research, thanks to AERA Board member Glen Dash.

It is entirely right and extremely satisfying to see our work get out to the world at large in a variety of forms and media—the COSI Science Exhibit, the AERA Study Day during our mid-March celebration, our *AERAGRAM* newsletters, our website (aeraweb.org), as well as traditional, substantive forms: *A Manual of Egyptian Pottery*, our *GOP* series, and our forthcoming volumes of *Giza Reports*. Stay tuned for the AERA team featured in a forthcoming NOVA documentary film on the Sphinx and its builders. And, we are even testing the waters of newer “social media:” our monthly AERA E-Bulletin and tweets to Twitter.

The AERA team now looks forward to building our Archaeological Center and Field School in bricks and mortar on our land in Giza at the foot of the Pyramids. Under the title, Bringing the Lost City Back to Life, we are planning ambitious new projects: re-creations of the Lost City, not only in published reports, but also in new, exciting ways by rebuilding parts of the ancient city in mudbrick, through experimental archaeology as a kind of “This (4,500-year-) Old House” approach, and digitally using the latest computer graphics. These re-creations take special place in our forthcoming long-range plan.



The Two Towns: Season 2009 at Giza



Between January 31 and May 7 we worked at our flagship Lost City site south of the Wall of the Crow (which we refer to as HeG, after *Heit el-Ghurab*, Wall of the Crow in Arabic) and in the town attached to the monument of Queen Khentkawes (κκτ) to the northwest of the high desert knoll, the Gebel el-Qibli, which dominates both sites. We embedded the AERA Advanced Field School for Supreme Council of Antiquities (SCA) Inspectors in our excavation program from February 7 to April 2, 2009.

Heit el-Ghurab (HeG): The Lost City Site

In the Lost City site we spread our forces over two distinct excavation zones: the Western Compound and, much farther to the south, House Unit 1, possibly the residence and workplace of an administrator.

Exploring Terra Incognita: The Western Compound

Up to now the expansive area immediately south of the tunnel-like gate through the Wall of the Crow has remained *terra incognita*. Thick fieldstone walls that show through the surface define the broad Eastern and Western Compounds, separated from each other by the even thicker Enclosure Wall. The surfaces within these compounds rise higher than the floor levels of the Gallery Complex and Eastern and Western Towns. In 2008, when an elevated water table saturated most of these low-lying areas, we chose to focus work in 2009 within the mysterious Western Compound. The whole site has since dried out, but we stuck to our decision to finally explore what lay inside the Western Compound. Our goals were as follows:

- Establish the chronology, phasing, and function of the Western Compound.
- Find the path of “the Chute,” a corridor of fieldstone walls curving northwest from an alignment with the gate at the western end of Main Street.

We began with questions. Was the Chute like a chute in an abattoir for introducing and possibly slaughtering animals? Did the occupants use the Western Compound as a holding area for the large numbers of animals consumed by people elsewhere in the Lost City site, as indicated by Richard Redding’s analysis of animal bone from our excavations over 20 years? Was the Western Compound a provisional storage zone, like the water depot known from the entrance to the Workmen’s Village at Amarna? Or did the Western Compound simply contain yet more food production facilities, especially bakeries?

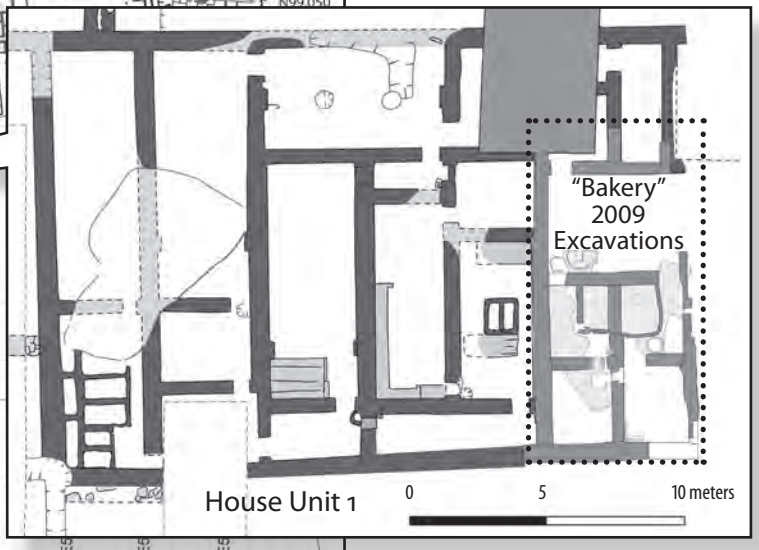
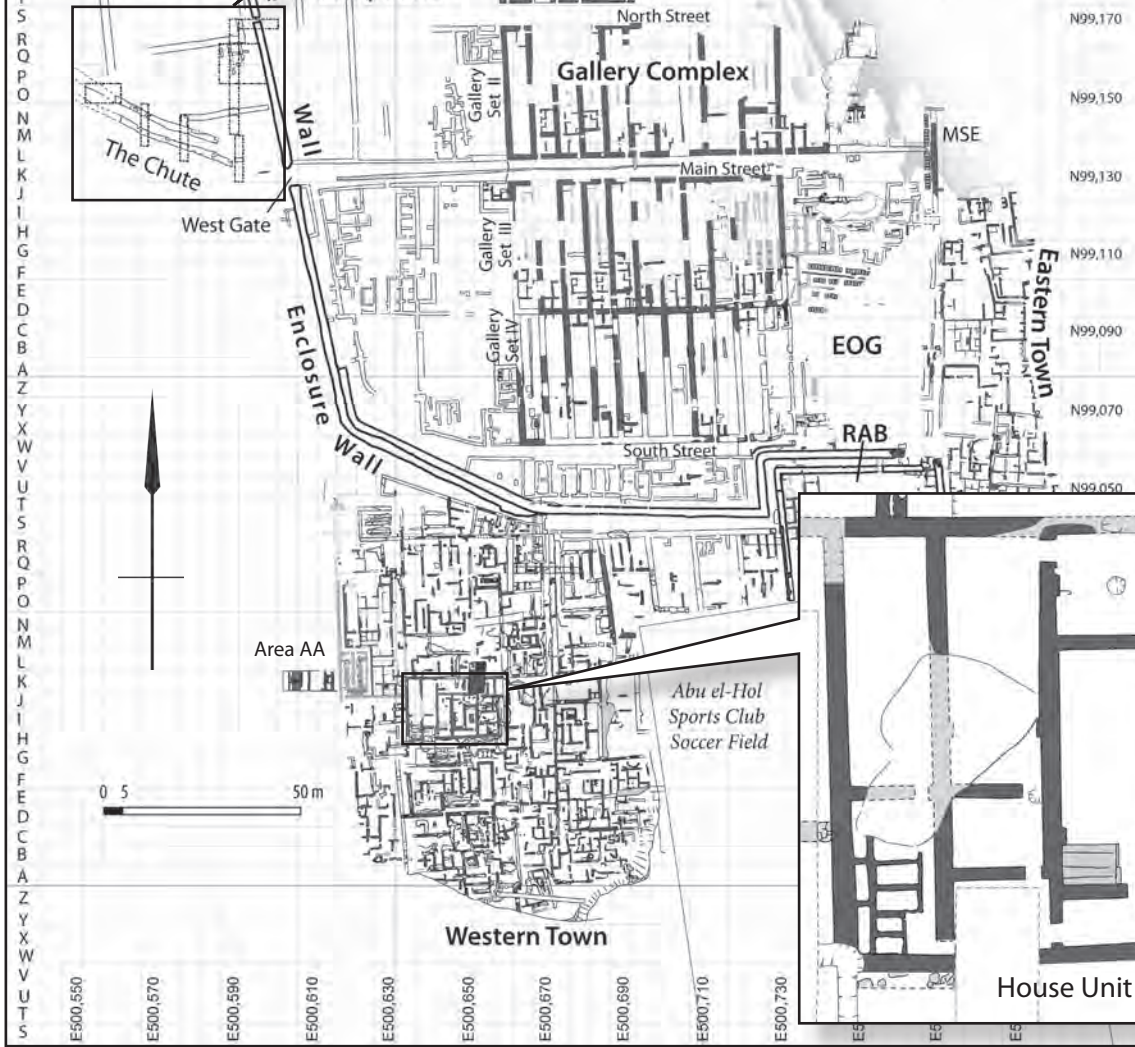
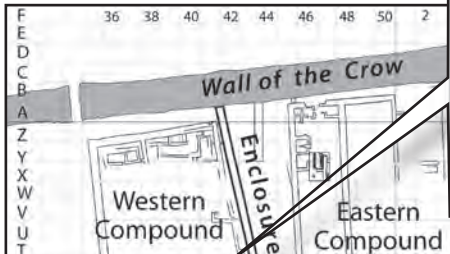
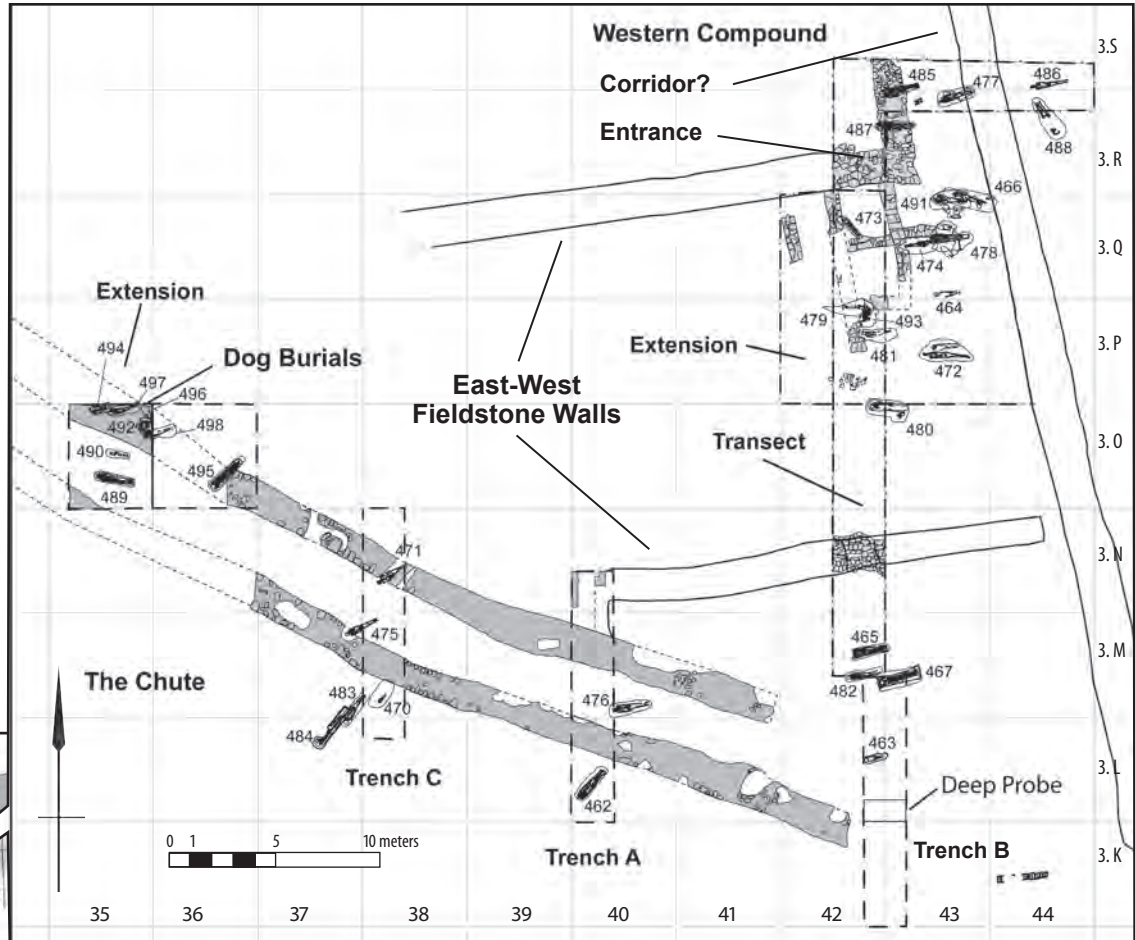
Unfortunately for answering these questions, the dead lay in our way; a Late Period cemetery punctuated the Old Kingdom settlement. Excavating the dozens of burials in our path took much of our time in the field.

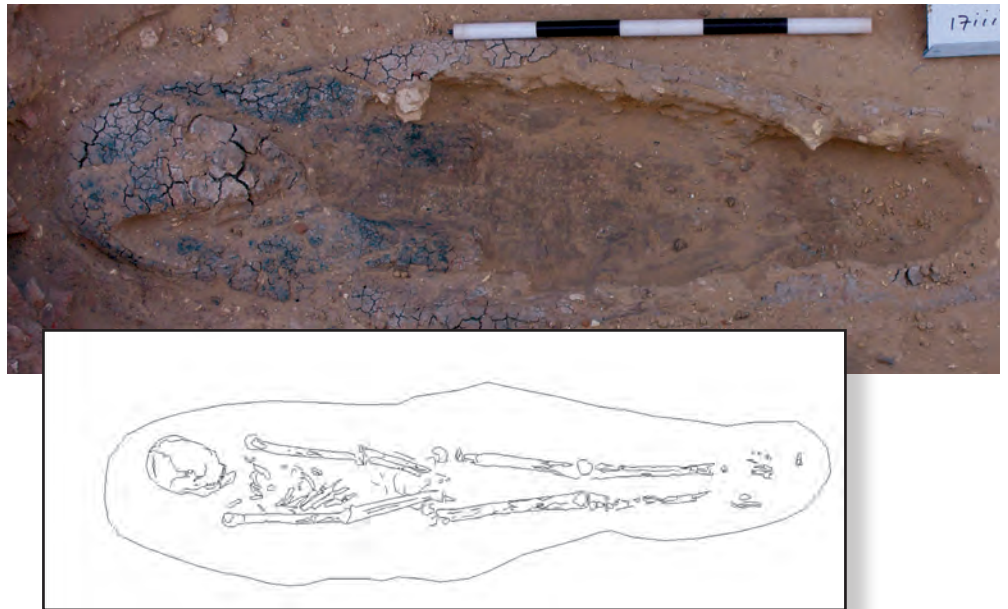
The Late Period Cemetery

We expected that numerous burials would lie between us and the more ancient features. The northwest part of the site contains thousands of burials dating from the Late Period (664–525 BC) into Roman times—2,000 years after people abandoned the Old Kingdom settlement. In previous seasons, Jessica Kaiser and her osteoarchaeology team excavated close to 300 burials, an important achievement, delivering systematic information on a corpus of 2,500-year-old human remains, a corpus that draws the attention of medical researchers and anthropologists.

Facing page: Work begins in the Western Compound. Advanced Field School students and their instructors lay out grid stakes, backed by the Wall of the Crow and its Gate. Khufu's pyramid rises to the northwest. The stony mass of the Chute lies in the foreground. View to the northwest.

Below: Plan of the Heit el-Ghurab site. Right: the Chute operations. Lower right: the excavations in the "bakery" of House Unit 1.





Above left: Our archaeologists examine a cut through a 4th Dynasty wall in the Western Compound made for a burial interred in the Late Period. Right: A Late Period burial of a male in an anthropoid painted mud coffin. The skeleton was poorly preserved, but the osteoarchaeology team was able to estimate his age as between 35–45 years old, based on dental wear.

But we did not expect that Jessica, Scott Haddow, and the Advanced Field School Human Osteology team would have such a busy season. The density of burials and the fact that many had fragile, delicately painted mud coffins required careful excavation, consolidation, and lifting. Progress was frustratingly slow. The team excavated 17 burials in the Western Compound and 19 in the Chute, as well as one in KKT. Field school students gained invaluable experience that will help when, all too often, they encounter and have to excavate ancient burial grounds lying in the path of modern development throughout Egypt.

Dog Burials

It is well known amongst archaeologists that the most significant or unusual discoveries come in the last few days of work on site! So on the last days of excavation, we found an intriguing child burial in our attempt to trace the path of the Chute. Eight dogs, some wrapped in linen, (Burial 492), which have no parallels at Giza, lay above the burial.

In the Late Period, people buried thousands of mummified ibis birds, falcons, baboons, cats, cows, bulls, shrews, small reptiles, amphibians, jackals, and dogs. Such animal cemeteries are large and numerous at Saqqara, the national cemetery of ancient Egypt. But the only other animal burials at Giza consist of a cache of ibis mummies and an interment of shrew mice. Our discovery, although only a single burial, merits further study.

Old Kingdom Burials

Amongst scores of Late Period burials, we found two Old Kingdom graves dating close to the time people lived here.

Lying south of a massive east-west limestone wall, under small chambers belonging to the later phases of Old Kingdom occupation (see below), these simple burials predate the limestone structures. They may have been poor people interred in free ground outside of the Enclosure Wall. When builders expanded the settlement, they built their walls over the earlier graves. We must add these to three other Old Kingdom burials we have found at the HeG settlement site. They could be outliers to the crowded “Workers’ Cemetery” that Dr. Zahi Hawass and the Giza Inspectorate have excavated up the slope from our site.

Old Kingdom Landscaping, Compounds, and More Bakeries

We entrusted the excavations in the Western Compound to the Advanced Field School students specializing in excavation techniques. Freya Sadarangani, James Taylor, Essam Mohamed Shehab, and Rabea Eissa Mohamed supervised the excavators.

The idea was to clear down to the Old Kingdom floor level, along a transect—a line of excavation squares or trenches. Our intended transect began on the north in our grid square 3.S42, just where we saw a break through the Enclosure Wall (map on page 5). Because it roughly aligns with North Street, 60 meters (197 feet) to the east, we thought this break might be a gate at the end of the street. The transect crossed two thick fieldstone walls that run east-west across the southern end of the Western Compound and ended on the south at the eastern end of the Chute. We thought this trench would give us a section across all these Old Kingdom structures.

The 2009 team revealed another north-south wall, running parallel to the Enclosure Wall, possibly forming a corridor. This

wall attached to the eastern end of the east-west fieldstone wall. Just where the two walls might connect in a 90° corner, a large dump of Old Kingdom pottery, disturbed by Late Period burials, obscured the possible intersection. However, the team was able to see an entrance that people later blocked after they had dumped the vast quantities of broken pottery.

The entrance opened into the southeastern corner of a large space, extending 45 meters (148 feet) to the north and 34 meters (112 feet) to the east, taking up the northern two-thirds of the Western Compound, enclosed by thick walls. After the southern wall of this space had stood for a long while, people built thinner fieldstone walls up against it, forming small chambers, which were filled with dark ash and fragments of bread pots—yet more bakeries, which we can add to the dozens we have located elsewhere across the site.

As much as the numerous Late Period burials hindered a broader exposure of the Old Kingdom structures, the sections through ancient layers in the sides of the graves gave us valuable archaeological information. We could see in the burial cuts “tip lines” where people had tipped their baskets full of material to dump. This dumping raised the surface two to three

Stone walls uncovered in the Western Compound operation. View to the northwest.



meters (roughly 7 to 10 feet) higher than the floor level inside the Gallery Complex.

From our work in the Western Compound we learned:

- People began to raise the surface in the northwestern area of the site before they built the Enclosure Wall.
- The opening in the Enclosure Wall is not an entrance or gate, rather a gap that someone hacked through the wall.
- People built the Western Compound after the construction of the Enclosure Wall.
- People, and not natural forces, continued to raise the area west of the Enclosure Wall by dumping sand.

The Puzzling Chute

The Chute starts 12 meters (39.3 feet) west of West Gate, the only known entrance in the Enclosure Wall, and disappears on the northwest at the limit of our clearing. Since we found and mapped the Chute in 2001 we have drawn a dashed line from its northwestern end to the gate in the Wall of the Crow, thinking it could be the principle conduit into the site. It reminds us of modern cattle chutes (narrow passageways through which animals are driven). It forms the southern side of the Western Compound.

The fact that the passage between the walls is so restricted, and then simply stops at an open area before West Gate, led to the hypothesis that people used it to control, and perhaps count, animals brought to the site for slaughter, possibly in the open area.

Ashraf Abd el-Aziz supervised Noha Hassan Bulbul, Amy McMahon, and May Al-Haik, the first Syrian archaeologist to join the AERA team. The goals of their excavation were to learn more about the date and purpose of the Chute, as well as to determine if it turns north to feed into the Gate in the Wall of the Crow.

The team excavated three trenches perpendicular to the Chute (Trenches A and C) along its length and at the eastern end (Trench B). The stratigraphy of these trenches established that the Chute walls are contemporary with the walls of the Western Compound.

The Chute consists of two parallel walls forming a passage 2.40 to 2.80 meters (7.9 to 9.2 feet) wide. Each wall, approximately 1.45 meters (4.8 feet) wide, is built of un-coursed limestone blocks, with two skin walls holding a core of mixed material, including stone, sand, and broken pottery. The team excavated successive street surfaces that functioned between the walls of the Chute at approximately 18.08 meters above sea level.

Trench B, at the eastern end of the Chute, revealed that the space outside West Gate was an open area in which a series of trampled surfaces formed upon layers containing large quantities of animal bone; cattle and sheep in an upper layer and

mostly sheep in a lower one. The layers might indicate that people indeed butchered animals in front of West Gate. However, the walls of the Chute rest upon these trampled surfaces and thus date after them. The results at best indicate that the inhabitants might have slaughtered animals in the area where people later built the eastern end of the Chute.

Where Goes the Road?

A basic question at the beginning of the season was whether the Chute turns north to the Gate in the Wall of the Crow or continues to the northwest. To find out we cleared west as close as we could to the modern Coptic Cemetery (shown in the map on page 17). Here on line with the gate in the Wall of the Crow were two very disturbed humps of stone, the remains of the Chute, indicating that it continues on its trajectory to the northwest. Perhaps this is already too far west-northwest to make a turn toward the Gate. Unfortunately, the end of digging was upon us before we could resolve this question.

Deep Probe and Ancient Landscaping

Could there have been an older Chute, buried by sand? To assess this possibility and to look at what lies below, Noha and May excavated a small probe 2 meters (6.7 feet) below the base of the Chute walls in Trench B. The probe descended about 40 centimeters (15.8 inches) lower than the general floor level at the lower, northern ends of the galleries. Below the animal bone layers (mentioned above), the probe showed thick dump deposits. People had intentionally filled in the area.

This evidence for ancient landscaping is one of the most important results of our excavations in the northwest territory. The dumped layers of desert clay under the eastern end of the Chute and the dumped sand layers under the Western Compound show how drastically people altered the terrain. We see similar massive remodelling of the ancient landscape in other areas of the site, such as along the Wall of the Crow and in the Royal Administrative Building. We should not be surprised at the impressive scale of the artificial landscaping in a settlement of Giza pyramid builders, for the pyramids and their quarries themselves represent human intervention on a geological scale.

The parallel stone walls of the Chute. In the background Main Street shows as a linear depression. View to the southeast.

Character of the Western Compound

The Western Compound appears to contain massive dumps of pottery waste and ash. People built fieldstone walls and chambers, ad hoc, as they dumped, so that some of these structures rest upon already dumped waste, and such waste also covered the structures.

In this respect, the Western Compound is similar to Area EOG, an industrial yard east of the galleries, with many bakeries. The Western Compound also resembles the Eastern Compound, with concentrated ashy dumps of pottery waste embedding fieldstone structures, one of which was a bakery we excavated in 1991. Was the Western Compound a compounding, if you will, of the extensive production facilities, especially bread-baking, that surrounded the central Gallery Complex?

The people who lived in the HeG settlement during its later years seem to have turned to bread-baking on a massive, industrial scale. It may be historically significant that the intensification of production, and the signs of its control, occurred in the later phase of occupation, not long before people abandoned this site.

Baking and Brewing in House Unit 1

With great relief, by autumn 2008, we saw that the water table, which had been steadily rising and saturating the site since 2005, was falling as a result of a series of pumps installed by the SCA and Cairo University. We seized the opportunity to finish excavating House Unit 1 in the Western Town.

House Unit 1 (map on page 5), the largest house we have so far found on the site, covers 400 square meters (4,306 square feet), with approximately 20 rooms/spaces. More elegant than





House Unit 1 in the Western Town. Yukinori Kawae (right), area supervisor, and his workman excavating the dark, ashy fill of a hearth. View to the north.

most of the other houses we have seen at the site, it includes very large rooms, well-laid floors, traces of red and black paint on the base of the plastered walls, and a master bedroom with a sleeping platform for two.

Yukinori Kawae, assisted by Manami Yahata, continued the excavations of House Unit 1 that they had carried out over four seasons between 2004 and 2007. When Yuki had to leave unexpectedly in mid-season, Freya Sadarangani took over. Advanced Field School students Hussein Rikaby Hamid and Ahmed Shukri Omar supplemented the team.

They excavated the eastern “bakery,” the last unexcavated component within the house. Unlike the rest of the house with its well-laid floors, the five small chambers of the bakery were buried in dark, ashy fill that the residents seemingly allowed to accumulate over time, rather than remove. The floor level was higher here than elsewhere in the house.

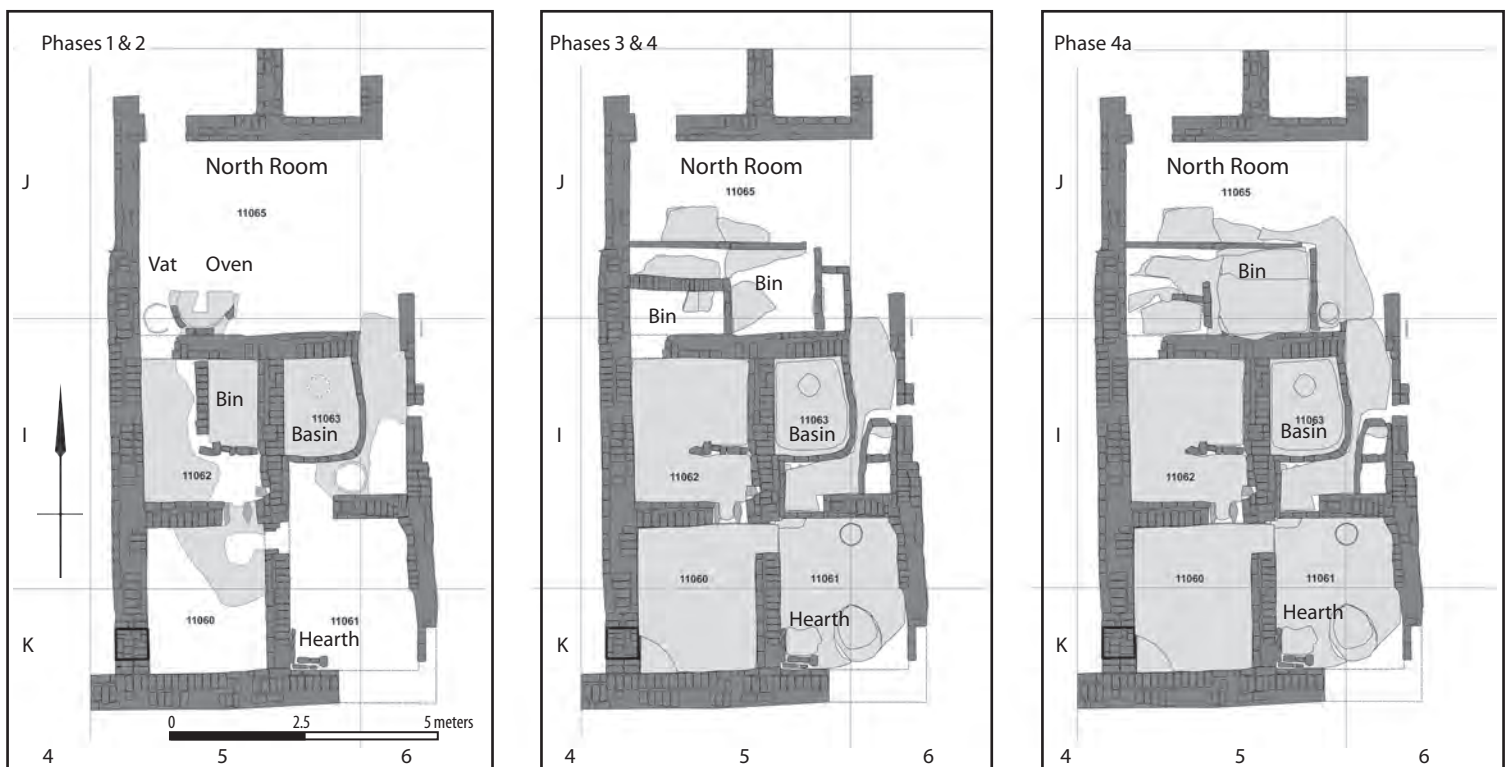
During its lifetime the “bakery” went through a succession of renovations. The team identified at least four phases of remodeling and occupation, although they did not finish excavating the bakery.

The North Room initially included an oven and vat standing side by side. Later the residents built a rectangular bin around this area, followed by another, smaller bin. Over time ash accumulated, the floor rose, and the occupants built a small bin directly over the top of the oven, the vat, and the large bin. Such rebuilding and accumulation is why the latest floors within the “bakery” are 0.60 meters (2 feet) higher than the other floors of House Unit 1.

In the two small chambers in the mid-section of the bakery the residents built more low bins. The one in the eastern room was a basin, with a sunken floor sloping down to a center hole where the occupants probably stuck a small pottery vat. Yet another vat and a smaller set of two bins were added later in the southeast corner.

The basin, vat socket, and small bins in this room are very similar to installations in the bakery we found east of the Pedestal Building in Area AA during 2006 and 2007. They probably served the same function, which we hypothesized was malting. In this process emmer or barley grains are soaked in water, spread out on a moist surface to allow sprouting, which

House Unit 1, phases in the “bakery.” See map on page 5 for the location of the “bakery” within the house.



activates enzymes that produce sugars. Subsequently the grains are spread out to dry in warm air so as to arrest the sprouting before the growth of the stem consumes the sugars. People might have used vats sunk into the floor of these basins for soaking grain, which they then spread out across the basin within the low rim, while excess water drained back to the socket or a vat.

In the southern rooms people built hearths, probably for baking and cooking. In the southeast chamber people lined a hearth with mud accretions against the southern wall and the western wall. The structure is very similar to the hearths built against the southeastern corners of the bakeries we excavated in 1991. In the southwest chamber ash with pottery and bone filled the southeast corner, which was scorched. In the northwestern corner the team found a simple platform made of two pieces of limestone and one of granite.

Bakery or Brewery?

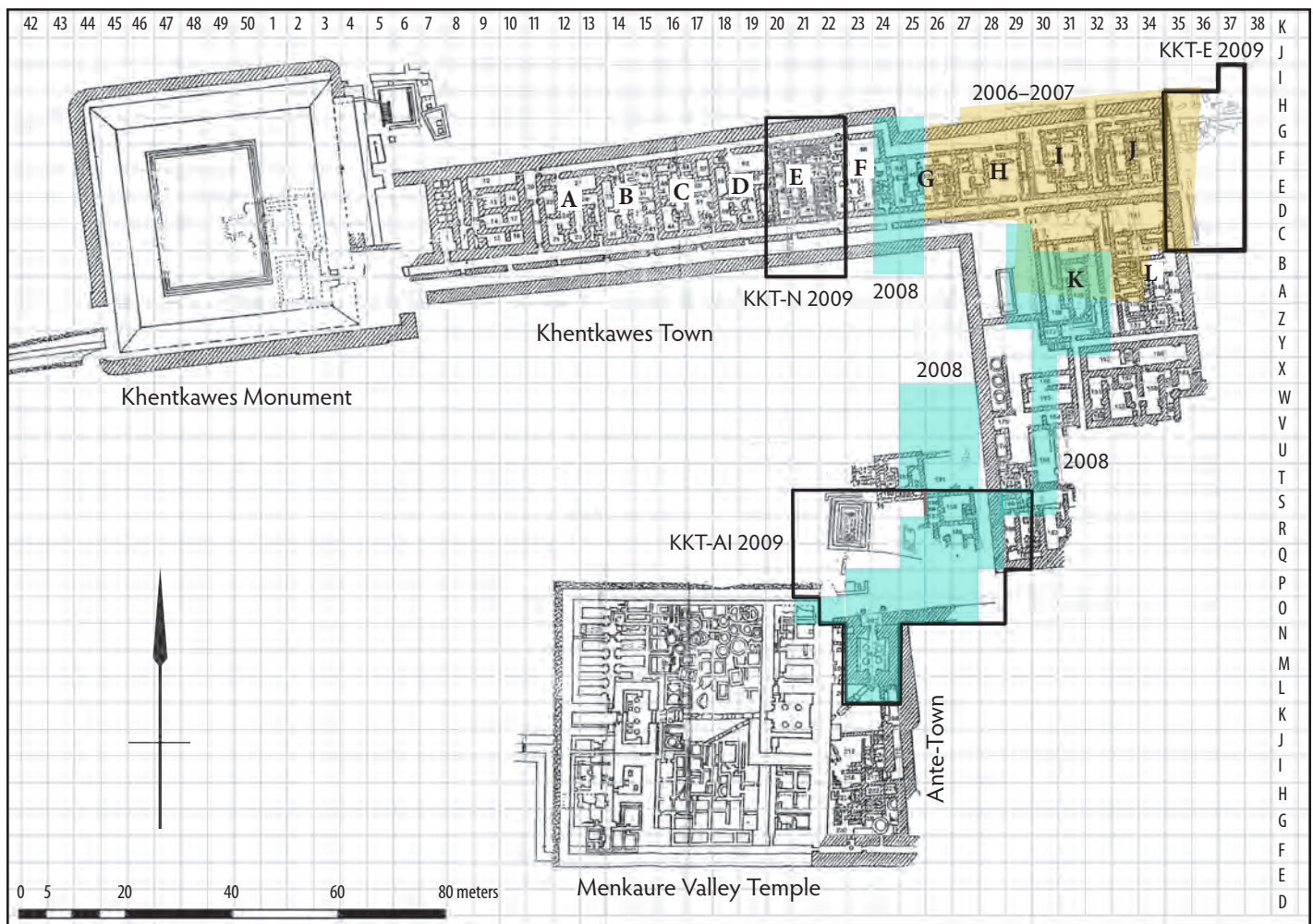
The preponderance of low bins and vats suggests that the “bakery” may have had as much to do with malting, hence brewing, as baking. Other evidence suggests people might have devoted

this complex to beer production. It connects via a long corridor to a room in the southwestern corner of the house with a set of eight shallow bins, like the ones we proposed were used for sprouting. Immediately south of this corridor we found large quantities of beer jar fragments in a massive dump we called “Pottery Mound.”

Another possible connection to brewing may be a set of pedestals, similar to those we have found across the site, under Pottery Mound and in a court south of the “bakery.” We believe that jars and pedestals functioned together to effect evaporative cooling to keep grain cool and moist in a jar or other container, a stage preliminary to spreading out on a cool bin floor to allow continued sprouting.

If we could ascertain some degree of specialized work with brewing or malt production here, it would be the first and so far only facilities for beer brewing that we have found across the site, whereas we have found dozens of bakeries. It will be interesting to see how this evidence of specialized beer production associated with House Unit 1 plays out in our continued excavations.

The Khentkawes Town (KKT) and Monument and Menkaure Valley Temple. AERA operations in 2009 are outlined in black; 2008 operations are shown in aqua; and 2006–2007 in yellow. The houses in KKT are indicated with letters. The map is from Selim Hassan's 1942 publication, *Excavations at Giza IV (1932–33)*. George Reisner published the map of the Menkaure Valley Temple in his 1931 publication, *Mycerinus, the Temples of the Third Pyramid at Giza*. Hassan excavated and mapped the Ante-Town.



The Khentkawes Town (KKT) and the Menkaure Valley Temple (MVT)

Expecting a wealth of information, and new discoveries at the Khentkawes complex, we placed the core of the excavation team here. We were not disappointed.

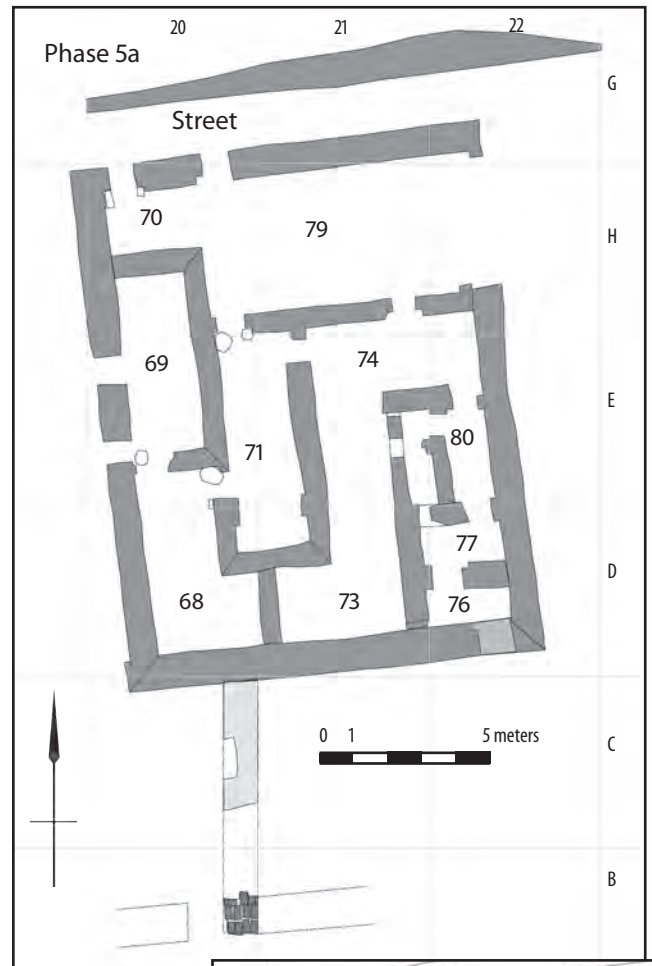
On the east we uncovered a striking arrangement of terraces, ramps, stairways, and a very deep basin, which could belong to the valley temple and harbor of Khentkawes' funerary complex. In the town we completely excavated one of the houses and discovered that the town was not continuously inhabited, but endured a long hiatus before being reoccupied. To the south we pursued the elusive stratigraphic link between the Khentkawes Town and the Valley Temple of King Menkaure, possibly Khentkawes' husband or father.

A House Through Time

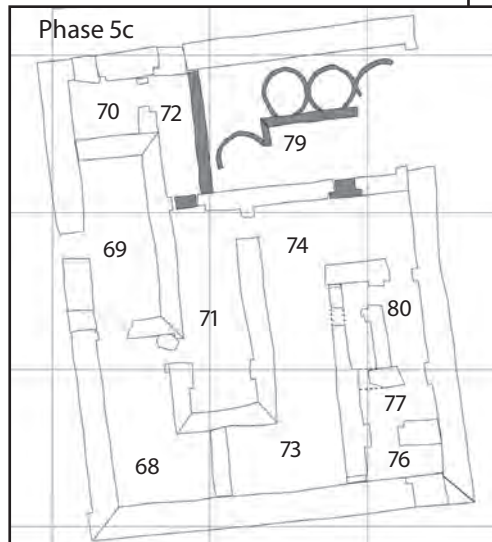
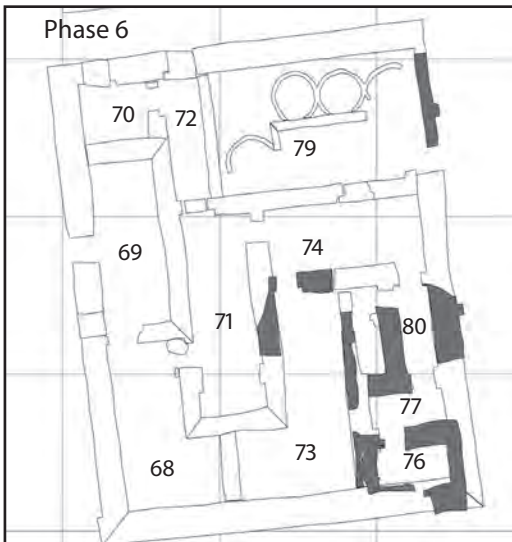
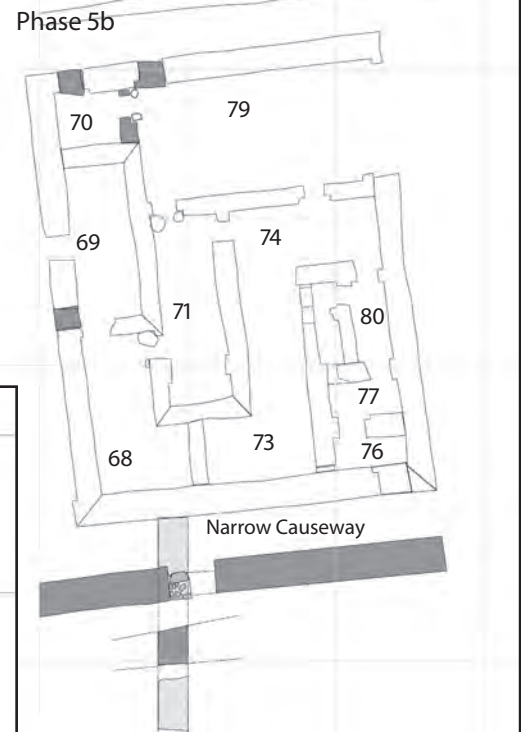
For three seasons we have been gradually clearing and mapping the houses where Egyptologists have long thought priests lived in the Khentkawes Town (map on facing page). This year one of our most experienced archaeologists, Lisa Yeomans, assisted by Hanan Mahmoud, a gifted Egyptian archaeologist, seized the chance to excavate one of the better preserved houses that remained after Selim Hassan's large scale excavations in 1932. Hanan expanded our knowledge of the phasing and layout of this part of the town by dissecting a cross-section of the causeway. The layers revealed the history of its building.

Khentkawes' town planners laid out eight houses along the north side of the causeway. The western six houses (A-F) share the same general plan; the four houses on the east are smaller. Two larger houses (K-L) lay south of the causeway. We mapped the scant remains of the eastern houses in 2007.

During 2007 and 2008 we progressively cleared southwards across the foot of the town and westward along the causeway. In 2007 Lisa Yeomans and Pieter Collet recorded the scanty remains of the houses I-J, where many of the walls had been scoured down to bedrock. During our 2008 season Pieter continued clearing and mapping westward. During 2009 Lisa and Hanan excavated House E.



Phases of occupation and renovation in Building E at the Khentkawes Town. Changes in the walls in Phases 5b through 6 are shown in gray.



House E covers about 189 square meters (2,034 square feet) (15.70 × 12.05 meters), about mid-range between the area of the Eastern Town House (100 square meters) and House Unit 1 (400 square meters) at our HeG site.

Lisa and Hanan identified six discreet phases of occupation and structural modification. Originally the house had four elongated, north-south rooms, and one transversal room (74) opening from a courtyard (79), which was shared with neighboring House F to the east. A doorway on the north opened to a street along the town Enclosure Wall.

The main entrance, on the southeast, opens to a zigzag succession of small chambers (76, 77, 80), typical of Old Kingdom houses and shrines, which provided privacy from the street. These lead to a central room (74), a vestibule possibly left unroofed, from which doorways open north to the open courtyard (79) at the back of the house, another leading to a “kitchen” (73) and the third leading to an elongated room (71).

Room 73, which Selim Hassan identified as a “kitchen,” showed much evidence of burning that left thick ash over the floor and damage to the western wall. The room may have been open or only partially covered to allow smoke to escape.

Hassan designated Rooms 68 and 69 as bedrooms. However, Lisa found a number of hearth features against the eastern wall of Room 69, opposite a doorway from Room 67 in House D, including pottery, bone, and burnt fish bone that suggest Room 69 shared cooking facilities with the people in House D. On the other hand, Room 68 could have been a bedroom, with a bed in an eastward niche. We have found bed platforms within niches that turn off a main room in the HeG site, and bed platforms within niches are known from ancient Egyptian houses at other sites.

Room 71, which Selim Hassan described as the “living room,” might also have been a bedroom. At the southern end, pilasters define a niche, the width of the room. In House Unit 1 in the Lost City site the large central room was also configured with two pilasters defining a niche. A bed platform tucked in the niche suggests it was for sleeping.

In the first phase (5a) of House E, the builders framed two entrances to the street on the north. In the next phase (5b) they blocked the northern entrances of the house and partitioned off a small room (70) in the northwest corner. About this time, builders put up an east-west wall on the street to the south. This wall now formed the southern border

Khentkawes Town Building E, phase 6, plan superimposed over a digitized version of Hassan's original map.

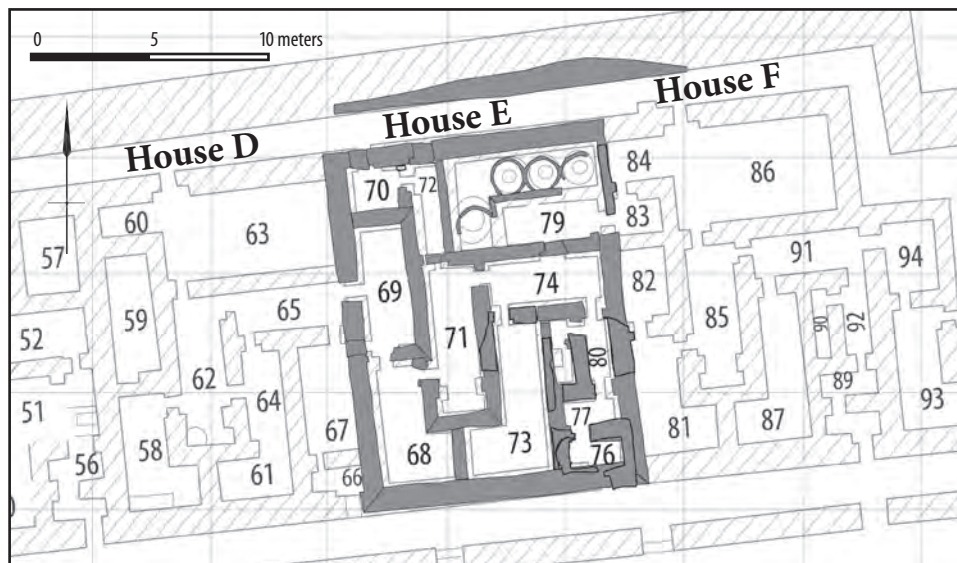
of a narrower causeway running straight from the doorway of the queen's chapel to the valley complex.

House Intermingling

One of the most significant discoveries of our 2009 season is that what we perceive as separate house plans at some points in time were “intermingled” houses. These “separate” houses had rooms that were more easily accessible, or only accessible, from the house next door.

Room 69, a “bedroom” in House E, could be more easily accessed through two open doorways from House D to the west. Room 79, the supposed reception hall of House E, was completely open to the northern end of House F to the east during all but the last period (Phase 6) that people lived here. In fact Room 79 was for much of the time one very long court which continued east to span the entire width of House F. Selim Hassan's map shows the most direct access into this court was a doorway from the northern street into the part of the court spanning House F. At some point the occupants built walls to subdivide the western end of this court within House F into two small chambers, Rooms 83 and 84. We do not know when these walls went up since we have not yet excavated House F. But we suspect it was during Phase 6 of House E, when people made the thin north-south wall that closed Room 79, now with the silos, on the east. Even at this point, the most direct access into the granaries at the northern end of House E was through the doorway in the northern wall of House F.

In fact, Lisa Yeomans' preliminary chronological phasing suggests that people blocked both of the two doorways through the northern wall of House E in Phase 5b, and then, in Phase 5c, they built the silos in Room 79. But they screened this storage off from the northwest corner of Building E with a thin wall (creating Room 72). Eventually they blocked the doorway through the southern wall of the silos court (Room 79) into the rest of House E via Room 74. If we understand this sequence



correctly, people completely blocked access to the silos from inside House E, while making them fully accessible to House F. Later they reduced the access to the silos to a door in a thin wall during Phase 6, but still left them inaccessible to House E.

Selim Hassan's map of the Khentkawes Town indicates no lateral access via doorways between Houses A, B, and C. However, doorways or openings allowed passage through four houses, D to G, without going into the northern street or causeway. Could what we perceive as four separate house plans have been occupied by one extended household at some period? Unfortunately, Hassan's map is not entirely reliable.

We cannot be certain that the complex of rooms along the northern side of the Khentkawes causeway functioned as distinct structural and social units in spite of the houses we distinguish.

Abandonment and Reoccupation

Another of the most significant discoveries of this season was that the Khentkawes Town was completely abandoned, perhaps for a considerable time. Evidence of abandonment has cropped up in each of our three seasons of work, but it was particularly striking this season in House E and in the southern causeway and street during Phase 6 (map page 11).

In House E people used mudbricks of a very different size and material for rebuilding many of the walls on the southeast corner. These bricks are distinct from those of earlier building periods; they are small and formed of brown sandy silt with a slight reddish tint, as though the soil had been burnt. Builders used such bricks to make a thin wall screening off the court with silos (Room 79). In this period the northwest corner of the house was now totally inaccessible, as all doorways had been blocked (in Phases 5b-c) and fell into disuse. The residents used the small brown bricks to repair major parts of the walls in the

small chambers inside the southeast entrance, and the walls of Room 73, the kitchen, which might have suffered heat damage from long contact with cooking fires.

The streets to the south were resurfaced at least three times. Most dramatic, the original southern town enclosure wall was drastically cut down and back on the north, leaving only a patch of its characteristic large bricks of dark clay. It looks as though people robbed the bricks, as they did in much of the Lost City site, for reuse elsewhere. Perhaps generations later, people rebuilt the wall using the small reddish brown bricks and small local limestone fragments as the casing of a debris-filled core, a cheap way to fill out a wall 2.22 meters (7.3 feet) thick.

The reoccupation of the town was not haphazard. Here and there throughout the town we see that masons used the same small, reddish brown bricks and local limestone pieces for rebuilding, from foundation level up, parts of older walls that had been cut away. It is possible that a tax-exemption or, a re-endowment of the Khentkawes funerary cult, encouraged people to move into the deserted town, as happened with the settlement inside the Menkaure Valley Temple to the south during the reign of the 6th Dynasty pharaoh Pepi II.



Above: SCA inspector Hanan Mahmoud carefully trowels a surface in Building E.



Left: Building E with silos of Phase 5c exposed. In the background Khentkawes' tomb stands directly in line with the house; to the right, Khafre's pyramid. View to the west.

KKT-E: A Queen Who Would Be King?

Queens of the pyramid age were buried in small pyramids and mastabas next to the large pyramid of the king. They did not usually have valley temples, nor causeways leading from the chapels attached to their tombs.

But Khentkawes had both. She may have been one of those rare queens who, at the end of a dynasty, took the throne as king in her own right. Her titles can be read either “Mother of the Two Kings of Upper and Lower Egypt,” or, “Mother of the King of Upper and Lower Egypt, and King of Upper and Lower Egypt.”

Khentkawes must have lived and ruled at the end of the 4th Dynasty, the era of pyramid-building kings Khufu, Khafre, and Menkaure, and built her tomb in the final years of our Lost City site. Was she a daughter or a wife (or both) of Menkaure?

Ramping Up: A Valley Complex for Khentkawes

Until 2007 no one knew why the Khentkawes Town (κκτ) extends along the causeway east of the queen’s tomb only to turn south abruptly in an L-shape. Clearing the deep sand to the east in 2007, we learned that the eastern enclosure wall of the town ran flush along the upper edge of a quarry cut. Below, on the east, at a lower level, lies a large mudbrick layout.

In our 2009 season we excavated 20 meters (66 feet) along the north and 45 meters (148 feet) along the west side of this complex. We uncovered a lower terrace formed of crushed limestone over bedrock, retained by mudbrick walls. The open area in front of these walls drops 3 meters (9.8 feet) to bedrock. We believe this sand-filled depression is a basin, which opens to the east.

KKT-E 2009 operation. Left: Daniel Jones picks through mud mass collapse on the Lower Terrace. Below: Clearing over two seasons revealed the Khentkawes Valley Complex. The town sits above on a bedrock plane. Lateral ramps ascend the bedrock face to the threshold of the Khentkawes causeway.



From the depression, a stairway ramp leads up to the lower terrace and from there another stairway leads to an upper corridor along the north and west sides of the basin. At the bottom of the stairs and in our excavation of the northern corridor we found deposits of votive miniature ceramics, similar to those archaeologists have found outside pyramid temples.

On the south, from the lower terrace a long north-south ramp ascends along the face of the bedrock ledge to the threshold of the queen's causeway at the east edge of the town. Builders later added a second ramp to the threshold from the north.

We need to investigate this structure further, but we can suggest, based on its position, size, and layout, that it is the valley complex and harbor for the funerary monument of Queen Khentkawes. Below we summarize the excavations in KKT-E.

**Tumble in the Temple:
Mud Mass of the Ruins**

Daniel Jones and Kasia Olchowska supervised the KKT-E excavations. At the beginning, they faced a massive mudbrick collapse sloping to the south and east in the northwestern corner of the bedrock ledge. The thick mudbrick walls had collapsed down and into the southeast, better preserving this corner against forces of erosion that scoured the walls to the south.

On the northern limit of the excavation area, Kasia excavated the Northern Corridor for a distance of 12.40 meters (40.7 feet). The corridor is practically the same width as the Khentkawes causeway in its second phase. The builders may have intended the northern corridor as a continuation of the causeway passage.

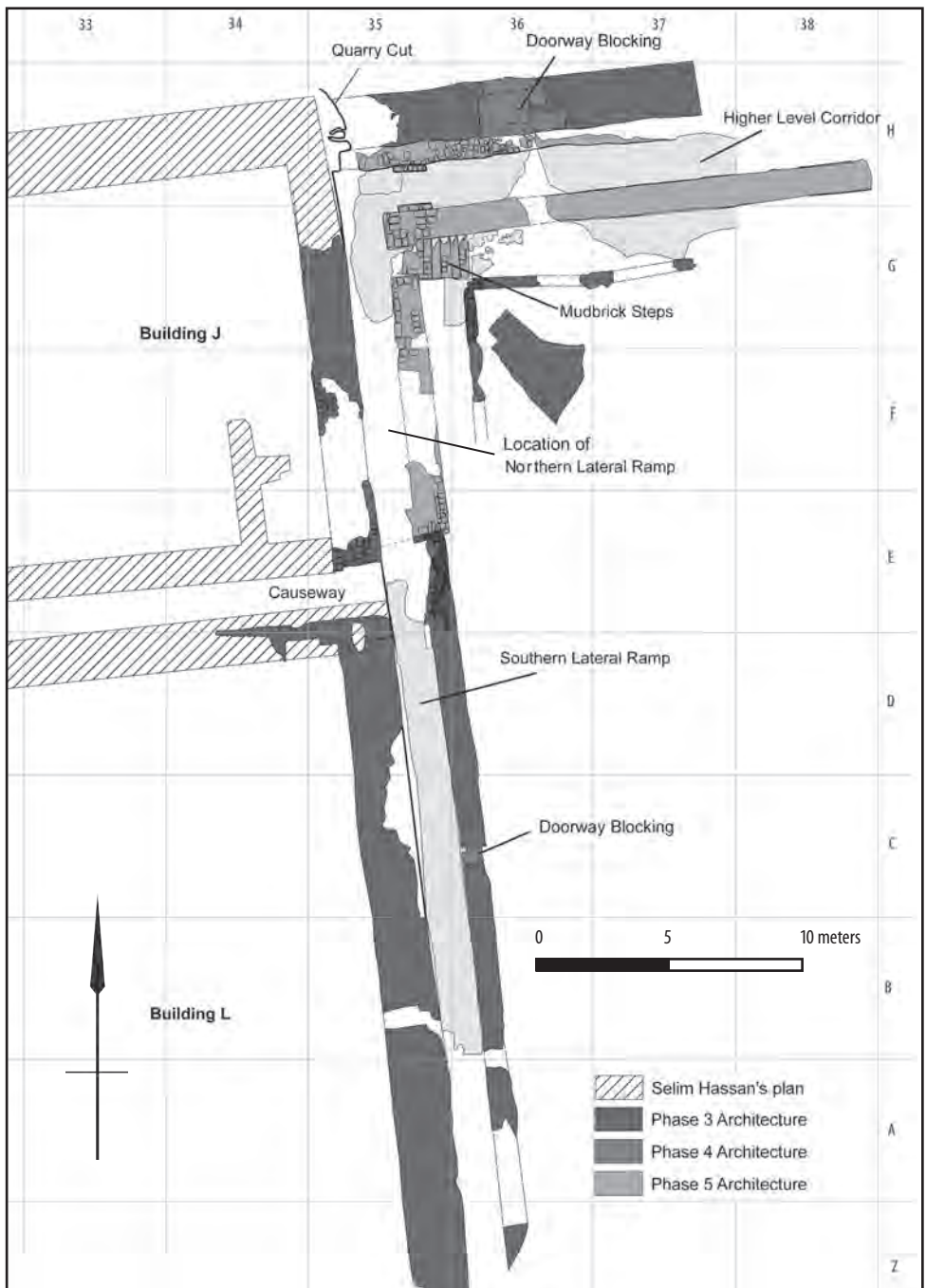
The builders created the Southern Lateral Ramp (SLR) between the eastern edge of the KKT-E town terrace and a parallel mudbrick wall. They filled the north-south corridor with crushed limestone to make a floor surface ascending to the causeway at an 11° slope. At the top of the ramp, just south of the causeway threshold, a jamb projects from the corridor wall to make a restriction, possibly a doorway.

KKT-E 2009 operation. The Khentkawes Valley Complex, phases 3, 4, and 5. The Northern Lateral Ramp had not yet been built but its future location is indicated.

Sometime later the builders constructed the Northern Lateral Ramp (NLR). Like its counterpart on the south, it slopes up within a corridor, but its incline is half that of the SLR, rising at around 4° over a length of 8.41 meters (27.6 feet).

At the northern end of the NLR corridor, a doorway opens onto a stairway that descends to the lower terrace. Dan expertly articulated six steps and exposed a little banister, one brick wide, on the south along the uppermost two steps.

As we cleared the clean sand during our 2009 season we realized that the builders extended the remains of a bedrock quarry ledge with crushed limestone debris held in place by mudbrick retaining walls. The lateral ramps, the northern corridor, and the stairs rest on this lower terrace. From this level the bedrock drops again down into a deeper depression.





The Khentkawes Valley Complex. A deep basin fronts the eastern end of the Khentkawes Town. Two flights of stairs (the lower one not yet exposed) lead up to the Northern Lateral Ramp. The Northern and Southern Lateral Ramps ascend a steep bedrock face to the threshold of the east end of the Khentkawes Causeway.

The upper terrace on which the KKT is founded slopes down from north to south following the natural dip of the limestone bedrock strata, while the lower terrace is roughly level. Builders added the lateral ramps to bridge this difference in elevation.

As our workers cleared the clean sand deeper and deeper, Dan found a second stairway ramp embedded in the slope at the northwest corner of the terrace. The ramp descends at a slope of 20° down into the clean, wet sand filling the basin at the base of the terrace. At the southern end of our clearing we noted cuttings into the bedrock foundation of the terrace that might indicate where another stairway or ramp ascended as a compliment to the one on the north.

Drastic Climate Change: The Sand Blanket

As the team excavated into the toppled, eroded mud mass to articulate the various floors, stairs, and ramps, Field Director Mohsen Kamel saw to it that workers, and then machines, continued to remove the clean sand filling this corner.

So consistent was the clean sand from the top of the mound that covered the site to the deepest fill of the basin, we could assign it a single stratigraphic feature number. The enormous deposit seems to have resulted from a single long-term event or set of conditions.

Just as consistent as the sand in the depressions, is the mudbrick tumble that filled the corridor Kasia excavated; it was completely devoid of sand. The mudbrick collapsed in the corridor and hit the surface of the latest floor directly. We found this to be the case, with some exceptions, in the HeG site as

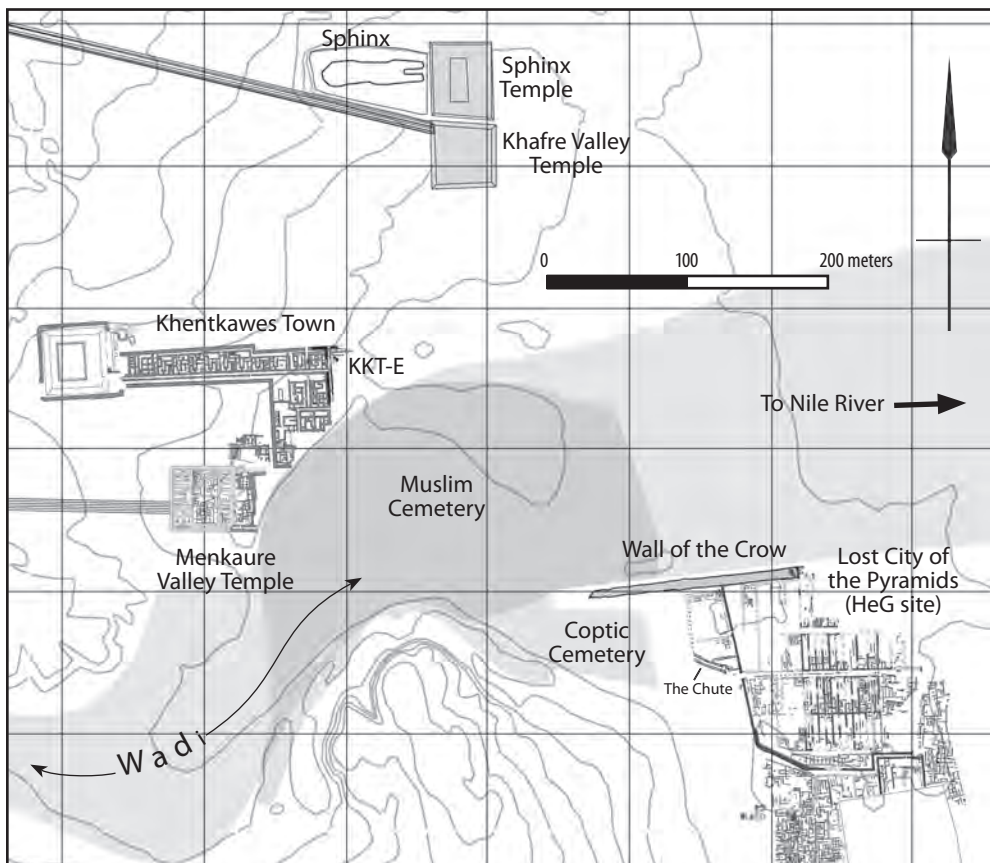
well. If the structures of that site and the Khentkawes Valley Complex had been left derelict, to decay over time, we would expect mudbrick fragments and silt from the gradual deterioration of the walls intercalated with sand from sandstorms. The evidence suggests that the 4th Dynasty structures came down quickly after people abandoned them. Mudbrick debris, possibly left by people robbing bricks for reuse, filled streets, corridors, and chambers right down to the floor level.

It now seems evident that the same forces of erosion that cut a roughly horizontal section through the Lost City ruins also cut the structures of the Khentkawes Valley Complex into the pronounced 30° slope down into the deep basin. These same forces of erosion may have differentially weathered the limestone bedrock layers in the Sphinx core body and Sphinx ditch.

The thick, heavy overburden of clean sand filling and covering the sunken Khentkawes Valley Complex and blanketing the HeG site signals a drastic change in environmental conditions, a shift toward the aridity of the present day. Archaeologists have found immense sand deposits over other Old Kingdom structures in other parts of Giza and in other sites from Abu Roash to Dahshur. The story is one of dramatic climate shift, such as archaeologists suspect for the time of the late Old Kingdom elsewhere in Egypt and in other parts of the Near East.

Temple Harbor? The Very Deep Basin

It is hard to convey the immensity of the sand deposit, and the great depth down to the queen's valley complex. We cleared an area 30 meters (98.43 feet) long (north-south) by 15 meters



Topographic map showing the area around the Khentkawes Town and the HeG site. The contour lines are at intervals of 5 meters (16.4 feet).

Nile lay 700 to 800 meters (2,300 to 2,600 feet) to the east across a terrace (at 16.30 meters above sea level) built on natural, desert wadi deposits. We found no evidence of Nile alluvium for up to 20 to 30 meters north of the wall.

Now, 50 to 100 meters (164 to 328 feet) north of the Menkaure Valley Temple, we have evidence of a very deep cut into the bedrock reaching down to Old Kingdom floodplain levels. But our four cores so far show no evidence at the bottom of silts that Nile flood waters would have left. A thick layer of such silt filled a depression into which the entrance ramps of

(49.2 feet) wide (east-west) on the north, narrowing to 6 meters (19.7 feet) wide on the south, where we were constrained by the curve of the modern cemetery and road.

At the beginning of our season 2009, the sand mounded up to around elevation 24.00 meters above sea level. Dan's deepest probe reached 14.60 meters above sea level, where we had to stop because of the water table. The drop of 9.4 meters (30.8 feet) made this one of the deepest, most dramatic excavations we have ever undertaken at Giza.

We then carried out four drill cores with a hand augur. These suggested that the bedrock bottom of the basin steps down toward the east. The core farthest out into the basin went the deepest, hitting bedrock at about 12.50 meters above sea level, the elevation of the 4th Dynasty Nile Valley floodplain. The level at which we stopped clearing the sand is very close to the average base level, 14.74, of Old Kingdom settlements in the Nile valley east of the Giza Plateau. Those settlements would have stood on islands and levees above the Nile flood waters, which probably reached 14.00 meters above sea level during peak flood season, when the flood waters stood at 1.5 meters (4.9 feet) average depth above the floodplain. Based on the erosion of the mudbrick retaining wall of the lower terrace, Dan suggested that water filled the basin to this level, giving a total depth of 3.17 meters (10.4 feet) of water.

Our results from previous seasons' work north of the Wall of the Crow, bounding our Lost City site on the north (map page 5), suggested that the Menkaure Valley Temple could never have fronted directly onto Nile waters. Access to the

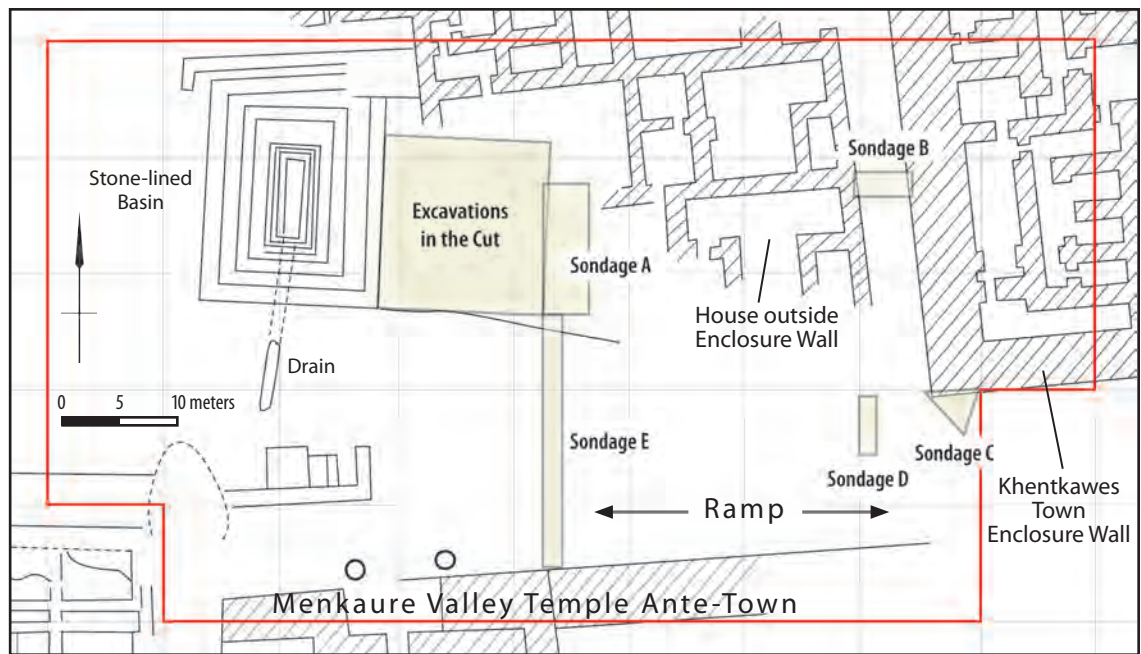
of the Khafre Valley Temple descend.

The artificial 90° cut into the bedrock at KKT, which drops the surface nearly 10 meters (32.81 feet), must continue at least 50 meters (164.04 feet) farther east of our 2009 excavations. Exposed bedrock with rock-cut tombs continues this far east just to the north of the open area east of KKT.

North of the Wall of the Crow, the 2500 BC surface must have remained high and dry on an artificial terrace of limestone debris. We did not find the northern edge of that terrace. It is possible that farther north, we would find a large 4th Dynasty cut that the builders made through the natural wadi sediments, and perhaps a wall they used to hold it in place. The edges might form the southern and northern sides of a basin that delivered water to the eastern foot of the terraced Khentkawes complex and perhaps to the town and valley temple of Menkaure.

We exposed the "glacis" of the eastern enclosure wall of the Ante-town attached to the eastern front of the Menkaure Valley Temple at a depth as low as 16.00 meters above sea level. Immediately beside the "glacis" a broad ramp ascends to the Ante-town and temple. We have not seen the eastern ends of the broad ramp or the glacis, which disappear under the modern road and Muslim cemetery. If the depression, or basin, east of the Khentkawes Town extends 100 meters south, it would reach the line of the broad ramp. It is possible that our 2004–2007 trenches north of the Wall of the Crow came down to, and excavated through, a shoulder of a broad depression (or a bottom surface at Nile flood depth) that delivered water to both the Khentkawes and Menkaure valley complexes.

Operation KKT-A1, the interface between the Khentkawes Town and the Menkaure Valley Temple. For a map of the whole area see page 10.



The Elusive Interface

One of our main reasons for working at KKT has been to find out how this town related to the houses that invaded the Menkaure Valley Temple (MTV). The village inside the Menkaure Valley Temple functioned for at least 350 years, until the end of the 6th Dynasty. Selim Hassan, who excavated KKT in 1932, mentions houses of a later phase in the eastern part, but largely assumed that the Queen's town dated to the 4th Dynasty. Disconcertingly, the only archaeological map known of this zone shows an "empty" area between the Khentkawes Town and the eastern extension of the Menkaure Valley Temple, the Ante-Town. We have been investigating the stratigraphic and chronological link between these two communities since 2005.

In 2005 we saw that the "empty" space was in fact a very broad Ramp built of mudbrick and quarry debris, sloping up from the east and running along the northern side of the Menkaure Valley Temple. In our 2008 and 2009 seasons we excavated a trench across the Ramp and into the vestibule of the Ante-Town. We found evidence that people had been living, cooking, and storing foodstuffs in the small temple vestibule between four magnificent alabaster column bases, each a meter in diameter (3.3 feet). George Reisner had earlier (1904–1910) found such secular use of sacred structures farther inside the Menkaure Valley Temple.

Over three seasons we gathered a wealth of information on both towns and yet the stratigraphic link has proved elusive. A large and deep, canyon-like, irregular trench that people excavated along the northern side of the Ramp in a late phase of occupation removed the crucial deposits that link these distinct towns. The ancient trench diggers cut deeply into thick deposits of limestone quarry-chips, used to level the area and as a foundation for the construction of the Ramp and of the KKT town.

People later filled the trench with slightly different limestone chip gravel.

Mike House, assisted by Kate Liszka, took on the task of excavating the trench. Later in the season they were joined by James Taylor, SCA inspector Hanan Mahmoud, and Nagwan Bahaa Fayeza, an Advanced Field School student. We followed the canyon-like, ragged trench east to the very face of the KKT western Enclosure Wall, where it turns almost 90° south to cut across the broad Ramp. We tracked the trench to the west and found that it narrows and runs to the southeast corner of a deep stone-lined basin, described below.

As Mike and Kate excavated the debris fill of the ancient trench, and a deep sondage on the edge of the Ramp, it became apparent that only the lower rubble deposits were preserved across the area. The stratigraphic link was eluding us again.

We refined our strategy and decided to pursue the stratigraphic link between the two settlements in a series of our own controlled trenches at key points. We wanted to find a sequence of ancient deposits across the interface that would help us with relative and absolute dating of the two areas. We positioned our trenches (B, C, and D) to find links between the houses lying outside the KKT western Enclosure Wall, the Enclosure Wall, and the Ramp; our trenches A and E in turn related the houses outside the wall, the stone-lined Basin, the Ramp, and the Ante-Town to each other. The information assembled and especially the results of trench E, excavated by Hanan, finally provided us with the elusive stratigraphic link.

We now know that the houses outside the KKT Enclosure Wall are later than the Enclosure Wall and that the Ramp surfaces are later than the Ante-Town, but earlier than the houses. So, in broad terms, we now know that the houses outside the KKT Enclosure Wall are later than the Enclosure Wall and that

the Ramp surfaces are later than the Ante-Town, but earlier than the houses.

Our trenches provided a few direct stratigraphic ties between deposits across the ancient trench. We saw traces of a prepared surface approximately 5 meters (16.4 feet) wide running along the north side of the Ramp, which was itself approximately 10 meters wide (32.8 feet). Quite a monumental approach to this area of the settlement and necropolis!

The Mysterious Basin

During the 2009 season, we cleared and recorded the large stone-lined basin (photo on pages 21 and 32) to the northwest of the Ramp. The well-cut rectangular limestone blocks, laid in five stepped courses, increase in size with each course up. People may have used these projecting courses as steps to go in and out of the basin since there is no stairway. On the south a shoulder of limestone debris rises higher than the top of the Ramp, held in place by a fieldstone retaining wall.

A stone-lined drain slopes down to the north from the surface of the Ramp under the southern shoulder to empty into the upper course of the stepped basin. The drain consists of three

different elements: a base made of carved U-shaped stones, the cover (also U-shaped in cross-section), and Nile silt sealing the top of the drain, possibly to make it water-tight. The drain is about 9 centimeters (3.5 inches) in diameter and over 7.20 meters (23.6 feet) long.

Two stepped gravel terraces surround the basin, rising above and stepping outward from it. Traces of mudbrick walls remain on each terrace. The southern shoulder and fieldstone retaining wall are built over the surface of the Ramp.

The basin is part of a series of basins and water tanks known from both the MVT and the KKT settlement. It seems to relate to a mudbrick podium structure, now much denuded, at the top of the Ramp, immediately to the southeast.

The information gathered so far from recording and excavating at the town of Khentkawes has changed substantially our understanding of the nature and time span of this settlement. The analysis of the material culture and the integration of the various excavation reports into an overall, coherent narrative is our next priority.

The Ramp area in the KKT-AI operation. View to the west.



"Grad School" at Giza: The 2009 AERA-ARCE Advanced Field School

The Field School changed our lives and the way we think about archaeology and our own heritage. Now, archaeology is not just about monuments, but is a source of information about our ancestors.—Essam Shehab, Field School graduate

Thank you for all that AERA has done for us. Please convey our thanks to everyone who made the Field School possible and gave us this chance to improve our careers and our lives.—Rabea Eissa, Field School graduate

It is always incredibly meaningful to hear the responses of our Field School graduates. As Inspectors of Egypt's Supreme Council of Antiquities (SCA), they hold university degrees in Egyptology, the culmination of an impressive four years of Egyptological study, but are assigned to supervise excavations throughout Egypt with virtually no archaeological field-training. Significantly, this "clean hands" approach is not exclusive to Egypt: it is unfortunately typical of many academic programs in archaeology. It doesn't make a whole lot of sense. To us at AERA, what does make sense (you'll forgive a smidgen of bias here) is to equip today's guardians of one of the world's most important ancient cultures with the know-how to protect their heritage. It was in this spirit of profound respect and commitment that this year we launched the fifth in our series of Field Schools (ongoing annually since 2005) for Egyptian inspectors of the SCA, with funding from USAID through the American Research Center in Egypt. Held at Giza from February 6 to April 2, 2009, our session was an Advanced Field School—a "grad school" of sorts, designed for graduates of our prior Beginners sessions, and in keeping with our comprehensive two-part program that alternates yearly between beginners' and advanced training. We embedded the school, as we have done previously, within our controlled excavations at the Lost City of the Pyramid Builders (Heit el-Ghurab site).

We selected 40 trainees (11 of them women) out of 180 applicants, each personally interviewed, armed with a curriculum vitae in English, and expressing a keen interest in increasing their knowledge and skill in a particular specialization. We integrated the rigorous eight-week training session into our standard excavation season. Under the overall direction of Co-Field School Directors Mohsen Kamel and Ana Tavares, a crack team of instructors and their ten Egyptian assistants (all graduates of our previous Field Schools—very gratifying!) provided concentrated training in osteology, excavation, survey, ceramics, and archaeological drawing/epigraphy. Each day at 7:00 AM work began, either on site or in the AERA Field Lab. We gave each student a study manual covering the topic of their specialty. They took regular exams and quizzes, attended evening lectures, prepared weekly presentations of their work, and wrote mid-term and final reports.

Osteology

Inspector Maha Sayah, Advanced Field School graduate in osteology, makes no bones about the significance of her training under instructors Jessica Kaiser, Scott Haddow, and their team. She explains that, in Egypt, it is almost impossible to enter a program of biological anthropology without attending medical school. For an SCA Inspector with a background in Egyptology,



Osteo supervisor Ahmed Gabr gently brushes fill to expose the bones in a burial.



Jessica Kaiser, head of the AERA Osteo team, works with Osteo Student Maha Hassan Sayah.

there are essentially no options for osteology study short of education abroad and field schools. Further underscoring the urgent need for osteology training is the fact that so many sites in Egypt, like ours, are riddled with Late Period burials. Because the burials are stratigraphically later than our settlement, they are effectively blocking excavation of the Old Kingdom site. Through a collaborative effort, the osteology and excavation students excavated, recorded, and analyzed a total of 38 burials, many with fragile, painted mud coffins that required extra-careful handling.

The entire Survey group works in the stone-lined basin (described on page 19) in operation KKT-AI.



Excavation: Can You Dig It?

Instructors James Taylor and Freya Sadarangani and their team emphasized a true archaeological imperative: as SCA Inspectors, the students must learn how to be independent excavators, capable of supervising their own sites throughout Egypt and of analyzing and reporting their own data. The students, therefore, carried out all stages of the excavation process—excavation, recording, analyses, and report writing—working shoulder to shoulder with AERA archaeologists in the enigmatic area known as the Western Compound.

Survey

The ability to survey varied terrains and structures using both high-tech and low-tech strategies was the goal of our advanced survey course, taught by Ana Tavares. Survey students were assigned practice in a number of areas within and outside the AERA concession, and even at our newly purchased villa property off Pyramid Street. Here the students gained experience in handling urban salvage situations (such as the one we experienced first-hand at last year's Salvage Archaeology Field School in Luxor). The mastaba of Nensedjerkai in the Western Cemetery of Khufu afforded students the opportunity to survey and map a superstructure with, among other features, a sloping enclosure wall, an off-axis entry, and three floor levels. Pragmatism was an important characteristic of the course. Not only did we train students to use the total station, but also to measure by simple pacing—the minimal recording strategy they would be able to use at provincial sites. As SCA Inspectors working in locations throughout Egypt, our students are destined to face the gamut of



Above: Hans-Åke Nordström, Janine Bourriau, and Ceramics student Mohamed Naguib Reda pose with the ceramics poster exhibited during AERA Study Day on March 15, 2009 (discussed on pages 32–33) .

Left: Illustration supervisor Yasser Mahmoud showing student Assayed Muhammed El-Banna how to draw.

survey predicaments that Egyptian archaeology presents—from sloping pyramid to terraced temple, from desert escarpment to subterranean tomb shaft; as Advanced Field School graduates, they will be equipped to meet these challenges. We are proud of that.

Ceramics

The study of ceramics lends itself to (begs for!) an empirical approach. After a general introduction to the identification of pottery manufacture, surface treatments/decoration, and typology of clays by advanced ceramics instructors Teodzja Rzeuska and Janine Bourriau, the students practiced drawing

and processing pottery, using a variety of samples taken from locations throughout the site. During the second month of the course, the group was joined for a time by guest instructor Hans-Åke Nordström. Professors Bourriau and Nordström, eminent ceramicists both, are among the developers of the widely used “Vienna System” of ceramic fabric classification. Their presence on our staff was a special privilege for AERA. This was not lost on the student body: Advanced ceramics student Mohamed Naguib went far beyond the call of duty in spending every free minute of his time translating the Vienna System into Arabic. His translation, now ready for publication, will soon be available to all SCA Inspectors.



Archaeological Illustration

Before one can draw, one must learn to look. This was a fundamental lesson taught in our advanced archaeological drawing/epigraphy course, led by Will Schenck and his team. To this end, we encouraged students to spend time handling, studying, and really “seeing” an object before drawing it. In this way, their drawings could capture information that would not register in a photograph, such as signs of wear, damage, or retouching. Part of this training included study

Ceramics student Yasmien Hassan Mustafa uses a profile gauge to create an outline of a pottery sherd.



The Ceramics group discuss their assignment in a session held at our rented villa. Teodozja Rzeuska, one of the Ceramics teachers sits at the far end of the table.

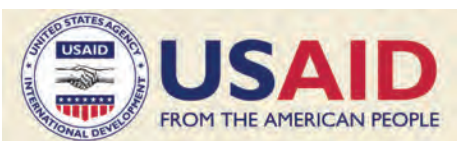
trips to the Coptic and Egyptian Museums, where the students sketched and discussed a number of artifacts. Will emphasized the value of a clean and organized archive. As such, students were required to maintain their work in well-organized portfolios that they would take with them upon graduation. The group joined the survey students at the mastaba of Nensedjerkai to gain epigraphical training through copying the hieroglyphic inscriptions there.

Graduation and Beyond

It was in an atmosphere of pride and celebration that on April 2, at the end of eight weeks' intense training, the students one by one received their graduation certificates from SCA Chairman Dr. Zahi Hawass and AERA President Dr. Mark Lehner in a ceremony held in Zamalek. The growing reservoir of skilled archaeologists (graduates of all our Field Schools) now contains over 150 names and is drawn upon by the SCA to address their archaeological challenges wherever they arise in Egypt.

And the wave of graduates is making a difference. Last year Afaf Wahba, osteology graduate of our first advanced Field School (2006), was sent to work at Saqqara. Her meticulous recording of burials in the necropolis drew the attention of surrounding foreign missions, as well as the commendation of Dr. Hawass himself. What's more, Afaf's SCA colleagues at Saqqara are now applying her methodology, because she trained them while she was there. The wave ripples.

The Illustration group at work on drawings in the Giza Field Lab.



Under the Microscope: 2009 Archaeological Science

From February 1 to April 31, 2009, the Giza Field Laboratory—home to the AERA Archaeological Science program—was opened to our international team of specialists who analyze the material culture and environmental information from our excavations. This interdisciplinary team includes experts from ten countries who examine the artifacts, pottery, human bone, animal bone, plants, stone tools, pigments, wood charcoal, mud sealings, roofing material, faience, mudbrick, and geological specimens from the Lost City, Heit el-Ghurab (HeG), and the nearby site of Khentkawes (κκτ). Our experienced team of photographers, illustrators, and videographers are also on hand to help us record our findings.

An exciting addition to the 2009 Archaeological Science season was the celebration of the 20th anniversary of our HeG excavations (described on page 32). This included numerous tours of the Giza Lab for donors, colleagues, and friends. Each specialist team produced attractive, informative posters on their particular subject to accompany their lab talks. We held a well-attended Study Day of lectures that included several members of the “Arch Sci” team—Anna Wodzińska (pottery), Marina Milić (lithics), Emmy Malak (artifacts), Richard Redding (animal bone), Jessica Kaiser and Afaf Wahba (human bone), John

Nolan (mud sealings), and Mary Anne Murray (on both the Archaeological Science program itself and the ancient plants from our excavations).

As ever, the Giza Field Lab also accommodated the teaching of several of the specialized subjects provided by the Advanced AERA Field School, such as human osteology (Jessica Kaiser), pottery (Anna Wodzińska), and illustration (Will Schenck). Other members of the Giza Lab gave evening lectures to the Field School students on their specialized subjects, so as to show the full range of data available to a well-excavated, well-integrated archaeological project.

The next area of our HeG site to be published in full is the Royal Administrative Building (RAB). This season, the specialists finished their analyses and wrote up their results from this complex area of the settlement. The integration of these specialist data within the final RAB archaeological report by Freya Sadarangani is a priority. The team held a series of meetings, international Skype calls, and, ultimately, a day-long RAB Workshop with Freya and specialists—another highlight of the 2009 Giza Lab season.

Two documentary film productions were filmed in the AERA field lab, one to show AERA’s interdisciplinary scientific analyses and another produced by NOVA in Boston on the Giza Sphinx. Several members of the Lab team were also featured in the *COSI Lost Egypt* exhibition (discussed on page 35).

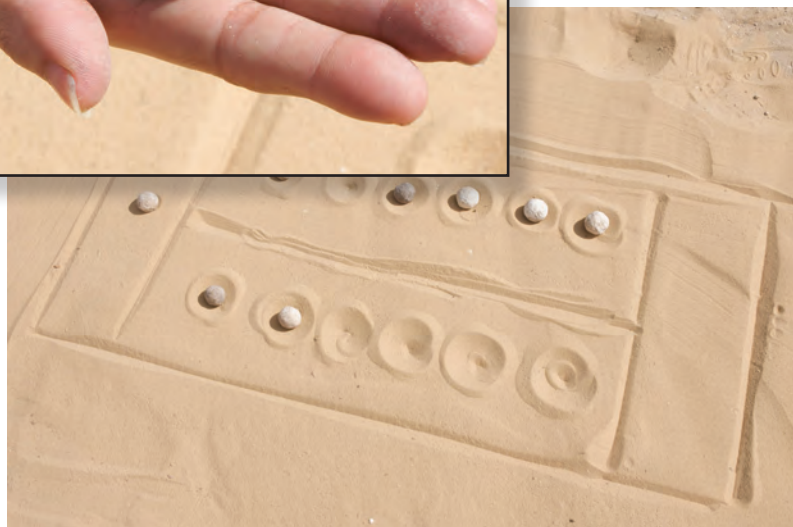
Here we list by specialty some of the other highlights of our 2009 Archaeological Science season in the Giza Field Lab:

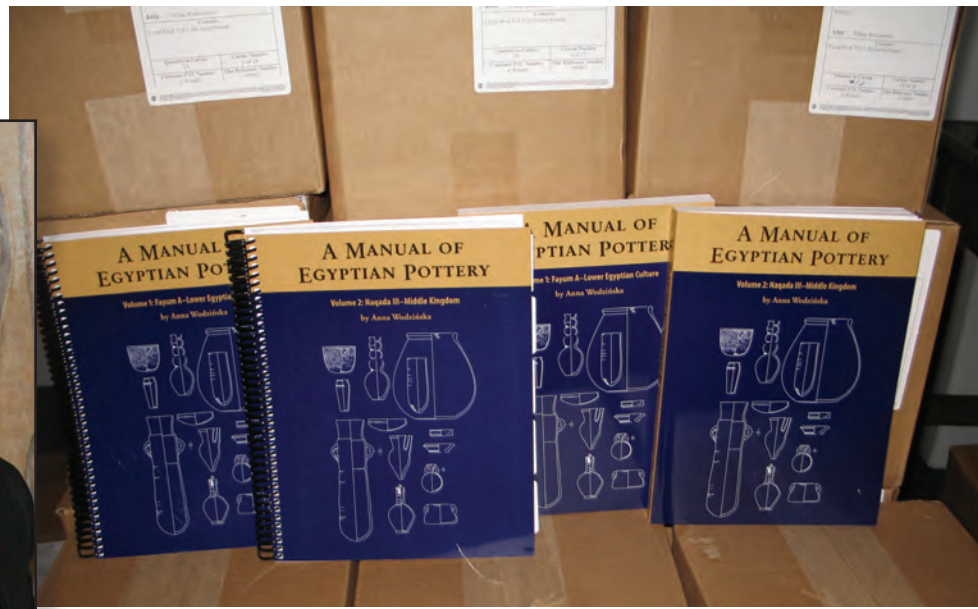
Artifacts

The main goal of the artifacts team of Ana Tavares and Emmy Malak was to complete the identification and analysis of the artifacts from RAB for the final publication. By the end of the 2009 season, they had analyzed and entered in the database 1,063 objects. They assessed objects from κκτ, including faience beads, re-cut pottery sherds, limestone objects, and a calcite vase.

Ana and Emmy also reorganized and reshelved artifacts by category, including metals; anvils; querns; abraders; whetstones; burnishers; pounders; weights; palettes; household items; drills;

Limestone marbles or gaming pieces recovered from the Lost City. The objects team experimented with how they might be used in a board game.





The first two volumes of *A Manual of Egyptian Pottery*, in spiral and perfect-bound editions, “pose” on the stack of boxes in which the manuals were delivered to the Boston AERA offices. Left: Author Dr. Anna Wodzińska.

vessels; gaming pieces; tokens; inscribed, painted, or incised objects; burial objects; faience, personal adornment, and fragile/fine objects; and re-cut ceramic sherds later used as tools. Each category requires a different type of storage and artifact-specific ways to record the details of the objects.

Emmy Malak designed the artifact database with a view to the ease of access. Emmy also worked closely with our new geologist, Philip LaPorta, who identified the raw materials in many of the artifact categories. The team drew and photographed objects to keep up with basic recording.

Lithics

Marina Milić, from Serbia, analyzes our lithics. “Lithics” refers to all chipped stone tools and/or flakes and other debris produced during the manufacture of tools (usually made of chert). In the 2009 season Marina largely focused on the final write-up of the RAB report.

For Marina and all of the specialists, checking and correcting the database was also a priority. The analytical team works from the comprehensive RAB “synoptic” feature list, which includes all the information about a deposit required to complete statistics, graphs, charts, and a final interpretation. They work closely with GIS team members who create distribution maps of chipped tool types, for example, and who furnish other information for the various spatial and temporal variables associated with the RAB.

As it was only Marina’s second season at Giza, her research also included reading as many relevant lithics articles as possible from the wider region to get a better idea about the nature of the Giza chipped stone within the Egyptian context and beyond.

Ceramics

The ceramics team, headed by Dr. Anna Wodzińska, accomplished many tasks this season, including the analysis of the 2009 pottery from the Khentkawes town and the main HeG site. The team completed drawings and photographs of the pottery from the two sites.

The KKT material makes a fascinating contrast to the HeG site ceramics in terms of style (e.g., many miniature votive offerings) and the later date of the KKT assemblage, which includes pottery from the 4th, 5th, and 6th Dynasties, long after the Lost City was abandoned.

Two volumes of Anna Wodzińska’s *A Manual of Egyptian Pottery* were printed in time for the 20th Anniversary celebrations. The remaining two volumes of the manual are now complete and are currently being peer-reviewed prior to their imminent publication. This invaluable resource describes and illustrates ceramics from all periods of Egyptian history, from the earliest Predynastic periods to traditional, modern Egyptian pottery. Anna also completed her comprehensive report on the ceramics from the RAB.

Archaeozoology

Dr. Richard Redding had three goals for his research on animal bone in 2009:

1. Finish identifying all the bird bone from HeG and KKT to date. He identified the species of more than 500 fragments, most of which were ducks and geese. But the identifications also included common sparrow and Egyptian vulture.
2. Finish analyzing animal bone from RAB. The final report now awaits editing for publication.



Left: Faunal analyst Richard Redding examines an animal bone fragment. In determining an identification he may consult his reference collection of modern animal bone, some of which lie on the table in the foreground.

Below: Claire Malleson, archaeobotany assistant, sorts samples of plant remains.

individual plant species and of legumes, as well as relatively large quantities of fruits, roots/tubers, animal dung, and especially weeds (including numerous water-tolerant plants). Emmer wheat and barley were both common throughout the complex. The main fuels used for cooking and heating were a mixture of wood (or wood charcoal) from trees and shrubs, primarily Nile acacia; cereal processing waste; other household debris; and some animal dung. The residents might have also burned grasses and other materials. Curious textured fragments recovered from RAB may be dregs from beer brewing.

We also analyzed many of the archaeobotanical samples from KKT. The contrast between KKT and the HeG site is notable. All of the ancient botanical material at both sites is preserved by charring, i.e., by burning. But the KKT plants are much better preserved than the HeG remains. Most of the same species occur at both sites, but in different proportions. More work is required on the KKT material before we can make a direct comparison.

Human Osteology

Jessica Kaiser heads our Human Osteology team.

She and her crew, along with the Osteology Field School students, excavated human burials from the Chute and the Western Compound at HeG (described on pages 4 and 6). In all, the team exhumed 37 burials. One contained several mummified dogs, perhaps interred as a votive offering. Preservation of the burials varied from very poor to fair. The osteo team excavated one burial at KKT.

Jessica and her team examined the burials for evidence of skeletal pathologies that offer vital insights into the health and diet of past populations, as well as living conditions and occupations. A number of the individuals showed signs of disease, primarily osteoarthritis, especially in the spine. Ancient Egyptian human skeletons often show a pattern of osteoarthritis to the lower (lumbar) spine in men and to the cervical (neck) spine in women. This has been interpreted as evidence of men engaging in heavy lifting and hard manual labor and of women carrying heavy loads on their heads.

The few artifacts associated with these burials include a single cowrie shell, two fragmented faience scarabs, and a large amphora. Preliminary dating places the amphora to around the

3. Identify the faunal remains from Area AA (a storage/production facility in the Western Town in HeG), prepare the assemblage for final analysis, and write a report for the 2011 publication on AA.

It is a maxim in archaeology that in excavation things never go as planned—something unexpected always turns up. Such was the case in 2009 when Lisa Yeomans and Hanan Mahmoud excavated House E (described on pages 11–13) in the Khentkawes Town. The evidence for the subsistence base here turned out to be quite different from that of the Lost City. Although the sample of animal bone fragments is small, it presents a unique fauna, dominated by domestic pig and ducks, the latter probably also domesticated. Only a single sheep or goat fragment was recovered. The fauna suggests that we are dealing with a small “village” that was located near a lake or pond and was probably producing garden crops.

Archaeobotany

During 2009, Dr. Mary Anne Murray and her assistant, Claire Malleson, finished analyzing and recording the ancient plant material from RAB, more than 95,000 individual plant items. Relative to HeG as a whole and most other areas of the settlement, the archaeobotanical record of RAB has good preservation, a large number of plant items per liter of soil, a high number of





Charred plant remains under the microscope. From left: lolium grains, seeds of mallow (both weeds of grain fields), and emmer wheat chaff.

25th or 26th Dynasty. In addition, several of the individuals were buried in coffins. Overall, the coffins in the area of the Western Compound and Chute were generally made with better craftsmanship than what has been noted elsewhere at HeG.

Pigments

Dr. Laurie Flentye's main objective in 2009 was to finish analyzing all the excavated pigments, minerals, and painted plaster from the RAB, as well as to refine and enlarge the pigment database. Laurie precisely defines the color using Munsell color charts, identifies the material, produces a photographic record, and measures each specimen.

Red hematite and yellow ochre were the most common pigments from the RAB. The presence of querns with hematite staining suggests that some type of pigment production was taking place there. Most samples of painted plaster, primarily red, came from the earlier structures of the RAB.

We identified a number of raw materials for pigments in the mineral samples, which helped complete the inventory of pigments from RAB. Having our new geologist, Philip LaPorta, on hand greatly facilitated this line of inquiry. Laurie and Philip will collaborate to find the source of pigments and identify the process of their production.

Geology

Dr. Philip LaPorta joined our Giza Lab team for a week in the 2009 season. During his brief visit, he managed to analyze more than 500 objects and specimens recovered from Areas RAB, BBE, MSE, KKT, and the Chute. More than 100 of the items analyzed were from the RAB.

Philip identified nine broad categories of raw materials used at HeG and KKT. In order of abundance, these are: limonite (used in pigment production), hematites (used as pigments and a by-product of pigment production), limestones (used for tools and objects), intermediate to ultrabasic igneous rocks (used for quarry tools and querns), granites (used as a building stone or for statuary), sandstones (used as abraders and whetstones), quartzites (used as querns and drill bits), calcites (used for small vessels, jars, and dishes) and minor minerals (used as statuary, small jars, plates, beads, and bracelets).

Philip concluded that a foundry or kiln requiring an enormous quantity of quartz sand for casting objects was set up somewhere near the RAB. He inferred that the RAB must contain discrete areas for the production of pigments and abrasive materials to polish stone; for processing a considerable quantity of alabaster; and perhaps also for minor bead manufacture. We find pillow stones, and headrests, used as anvils that would be perfect for making faience beads, folding thin sheets of copper, possibly working leather sandals, and so on.

While some of the raw materials from the site could be acquired locally, some may have come from as far away as Aswan. The range of raw materials indicates the residents of the Lost City had a deep understanding of the mineral resources available.



Stone headrest/anvil from RAB, approximately 16 centimeters long (about 6 inches).

The success of the 2009 Archaeological Science season is a credit to our interdisciplinary Lab team, who, surrounded by the imposing Giza Pyramid complex, patiently explore some of the most minute and elemental structures of daily life at Giza 4,500 years ago. Our collaborative efforts in the Giza Lab also help keep AERA at the forefront of modern archaeology and archaeological science.

The Giza Center Becomes a Reality



Over the last three years, AERA searched for property to house our future base of operations in Egypt. The search has been intense and, frequently, disappointing. Several times we found promising properties, but our hopes were dashed by questions of ownership, legal title, and Egyptian restrictions on building. In fact the future home of AERA in Egypt lay within two blocks of the villa that we have been renting, every season, for the last 19 years.

On February 24 AERA closed on property one block from the entrance to the Giza Plateau. Major gifts from the Waitt Family Foundation, the Ann and Robert H. Lurie Foundation, the David H. Koch Foundation, the Charles Simonyi Fund for Arts and Sciences, the Peter Norton Family Foundation, Dr. Marjorie Fisher, and the ULI (Urban Land Institute) tour members on behalf of Bruce Ludwig made the purchase possible.

The property includes not only a substantial piece of land but also a large villa, with a separate storage building/garage. This property will become the AERA-Egypt Center, which is critical for AERA's future in Egypt. It will become the center for all of AERA's education and research activities. The villa will house our library and archive, laboratories, lecture rooms, and a dining room and catering kitchen. On the additional land we will build a dormitory to house our excavators, researchers, and students.

Since we purchased the property, we have been engaged in a period of assessing its potential and making it immediately functional for AERA. We would like to share with you what we have done and our plans for the future.

The property is perfect for our needs. First, it is within easy walking distance of the pyramids; as the real estate agents say, "location, location, location." The property includes enough space to build a sizable dormitory complex and other structures. Jon Jerde, of the Jerde Partnership, Venice, California, has taken the lead in helping us with architectural planning. We will have designs by fall and hope to build within a couple of years.

The existing villa has large rooms on all of its three floors, which is ideal as we need sizable spaces to accommodate the large number of people who will be using the AERA-Egypt Center. On the first and second floors the Villa will house a library/archive, computer room, human osteology laboratory/library, and large lecture room. The first floor includes a large kitchen, capacious dining room, and a lounge area. The third floor will house some staff until we build the dormitory complex, at which time it will become work, laboratory, and classroom space.

We decided that as we developed plans for the land, we



Facing page: South facade of the renovated villa.
 Above: Mark Lehner signs the sale documents to purchase the villa as our lawyer assists. Standing behind him Amir Abdel Hamid, our Cairo Project Manager, watches. A member of the Helmy family, the sellers, sits at the table (far right) with his lawyer (back to the camera).
 Right: The villa before we began renovations.
 Right below: Renovations underway on the villa at the foot of the Pyramids.



would focus our efforts in 2009, while still in Egypt, on making the villa functional for the 2010 season. If we can use it as our headquarters in 2010 we will save \$4,300 per month, the rent of our current headquarters, which totals \$21,500 for the season.

When we purchased the Villa, a 60-to-70-year-old structure, it had not been occupied for 20 years and suffered from neglect. The primary problems were the plumbing and electrical systems. The cast iron plumbing pipes (the stacks) were broken. Water draining from the fixtures over the years of neglect had damaged broad swaths of plaster. The electrical system was inadequate to support present-day electronics and computers. So we completely replaced the plumbing and the electrical wiring. We also installed Ethernet cables so that every room in the Villa would connect to our main server.

In the process we learned how very plastic Egyptian buildings can be. Pathways for new wiring or plumbing can be simply carved into or through the soft brick walls. Walls can easily be removed, albeit with some care. Windows and doors can be shifted and installed. However, at every step we tried to preserve the character of the building and save some of the beautiful architectural details. The bathrooms on the second and third floors had old, intricate porcelain tile floors, which we saved. Many of the rooms had parquet wood floors. And, although most had suffered water damage, we managed to save and refinish them.

In May we moved our equipment, library, archive, and computers into the Villa, saving us the cost of renting a secure, dry storage facility. This final move to a permanent home will





Before



Before



Before



After



After



After

Top: new kitchen; top left: old kitchen
Above: new clean-up/dishwasher area and new stairs; left: area before renovations

Left: Third floor bathroom before work and, below, renovated with restored tile floor and a shower stall in place of the bathtub.

also spare our books, records, and computers any further wear and tear from packing, unpacking, and moving. Staff can now stay on the second floor, saving us hotel expenses during off-season activities, such as interviewing field school candidates.

In order to have the Villa ready for the 2010 season we need to construct a 50-square-meter (538-square-foot) structure to accommodate the laundry, pantry, and staff quarters. This should cost around \$30,000. We hope to complete the building this fall so we can begin using the Villa as the focus of all AERA activities in 2010.

The Future

In the coming year we will develop plans for dormitory/housing structures and, perhaps, more lecture rooms and laboratories. When the housing complex is completed, the AERA-Egypt Center will reduce our expenses substantially. Our monthly cost for housing in 2009 was \$41,412. We estimate that a renovated and expanded Villa will save us \$91,000 per field season, not including the savings gained by using the Villa year-round.

Construction costs in Egypt are about \$60 per square foot for high quality building. A dormitory complex for 60 people would cost about \$300,000, a sum we would recover in about three and a half years.



After restoration: a welcoming entrance



The restored front door and entrance hall

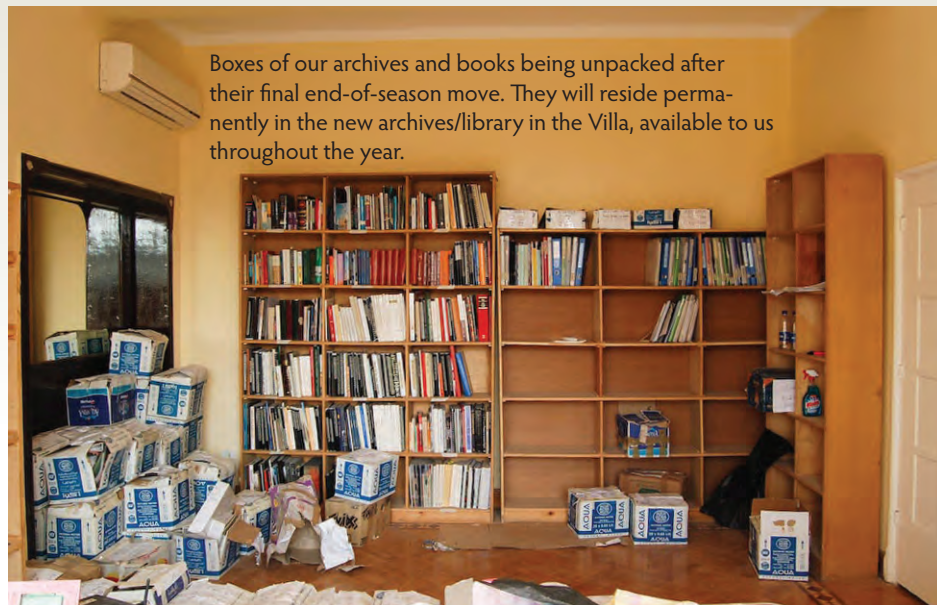


Stairwell with restored parquet floors

The most important impact of completing the Giza Center will be to bring all AERA team members (Egyptian students, Egyptian archaeologists, and foreign archaeologists) together, working and living under one roof. No longer scattered through flats and hotels across Giza, we will be a stronger team, more readily exchanging ideas, sharing our work, and collaborating on projects. This will be especially valuable for our field school students, who will finally be truly embedded in our project.

With its Giza Center, AERA will be able to establish a year-round presence in Egypt. We will have access to our library, computers, and research collections throughout the year. Team members, housed in the Center, will be able to work off-season, using the library and archives as they analyze their data and prepare publications. We also expect to open our doors to the wider archaeological community. Our library and archives will be especially useful resources for the Egyptian students we train as well as visiting scholars.

Thanks to our donors, AERA is on its way to establishing a permanent base at the foot of the Pyramids, a legacy for future generations.



Boxes of our archives and books being unpacked after their final end-of-season move. They will reside permanently in the new archives/library in the Villa, available to us throughout the year.



Restored pergola on the east side of the villa

Celebrating 20 Years of Discovery at Giza



Left: Mike House explains the stone-lined basin (Water Tank 2) north of the Menkaure Valley Temple (discussed on page 19). Mike re-excavated this large basin during our 2009 field season.

Facing page: AERA Study Day. Clockwise from top: Dr. Zahi Hawass, Undersecretary of State and Secretary General of the Supreme Council of Antiquities, opened the afternoon sessions and announced the hope for formal direct collaboration for future field schools between AERA and the SCA. Emmy Malak with the poster showing the uses of some of the objects that she and Ana Tavares have been working with. CRO and archaeozoologist Richard Redding stands with his poster illustrating the process of faunal analysis and what we can learn from it. Ashraf Abd el-Aziz discusses Gallery III.4, one of the structures that might have functioned as a barracks for rotating laborers. Marina Milić describes how she reassembled a stone tool from the chips that were struck off of it.

It has been 20 years since we first laid out grid stakes and troweled the sand in the area south of the Wall of Crow, launching our excavations at the Lost City of the Pyramid Builders. To mark the occasion and reflect on all that we have accomplished over 20 years, AERA celebrated at Giza on March 14 and 15, with an open house for the public and special events for our benefactors.

The celebration included tours of our excavations at the Heit el-Ghurab and Khentkawes Town sites and the AERA Field Laboratory. As we were in the middle of our field season, there was much to see.

We devoted the second day to formal presentations on our work at the Ahmed Pasha Hall of the Supreme Council of Antiquities, which Dr. Zahi Hawass, Undersecretary of State and Secretary General of the Supreme Council of Antiquities,

generously made available to AERA. The e-mail announcement of the event went out to the entire list of all scholars, expeditions, research centers, and foreign institutes in Cairo and abroad. Among the distinguished guests, were the directors of the French and German institutes in Cairo.

AERA Study Day, as we called the program, offered short presentations by 17 team members and 20 posters on AERA's work and discoveries.

During our celebration we were honored to host benefactor and board member Ann Lurie, whose prodding, encouragement, and financial support transformed AERA from a small excavation with periodic field seasons into a major force in Egyptian archaeology. We were also delighted to host AERA board members Matthew McCauley and Bruce Ludwig as well as loyal AERA supporters Nelson, Suzanne, and Nelson (Jr.) Del Rio; and Adina Savin.



Zeinab Hashesh (holding box), osteoarchaeology teacher in the AERA Advanced Field School, describes some of the techniques used to excavate burials. From left to right: Nelson Del Rio Jr., Jessica Kaiser (AERA osteoarchaeology team leader), Zeinab, Wayne Ewing, Mark Muheim, and Ann Lurie.

20 Years of Discovery at Giza: The Works of AERA



AERA STUDY DAY PROGRAM

Introduction to the Works of AERA · Mark Lehner

EXCAVATIONS

Village, Town, and Barracks: an Urban Footprint at Giza · Ana Tavares

Causeway for a Queen: Excavations at KKT · Daniel Jones

A Workers' Barracks: Excavations at Gallery III.4 · Ashraf Abd el-Aziz

A Tale of Two Buildings: Excavations in the RAB Area · Freya Sadarangani

The Mystery of the Pedestal Building: Excavations at AA · James Taylor

Bricks, Stones, and Broken Bones: the HeG Cemetery · Jessica Kaiser

MATERIAL CULTURE

Science at Giza: the Giza Field Laboratory · Mary Anne Murray

Broken but Revealing: Understanding the Ceramics from Giza · Anna Wodzińska

Status and Diet at Giza: the Evidence of the Animal Bones · Richard Redding

Untold Stories: the Objects Yield their Tales · Emmy Malak

Seeds of Understanding: the Archaeobotany · Mary Anne Murray

From Rocks to Royalty: Chipped Stone from the RAB · Marina Milić

Ancient Administration: Sealing Evidence from Giza · John Nolan

PROJECTS

Hands-on Learning: the AERA/ARCE Field School · Mohsen Kamal

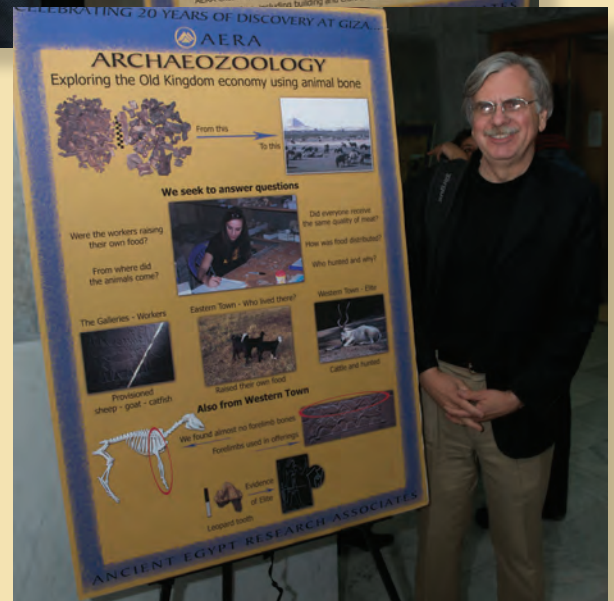
A 3-D View: Laser Scanning around Giza and Beyond · Yukinori Kawae

The Bones of Teaching: Human Osteology at the Field School · Afaf Wahba

Developing a GIS for the Giza Plateau · Camilla Mazzucato

CONCLUSION

Putting it All Together: a Picture of the Pyramid Age · Mark Lehner



SHARING OUR

Scholarly Publications for 2008–2009

MARK LEHNER

"Enigma of the Pedestal Building: Desert Refrigerator? Malting Machine? Or Both?" In *Beyond the Horizon: Studies in Egyptian Art, Archaeology, and History in Honour of Barry J. Kemp*, edited by Salima Ikram and Aidan Dodson. Cairo: SCA, 2009.

MARK LEHNER AND ANA TAVARES

"Walls, Ways and Stratigraphy: Signs of Social Control in an Urban Footprint at Giza." In *Cities and Urbanism in Ancient Egypt. Papers from a Workshop in November 2006 at the Austrian Academy of Sciences*, edited by M. Bietak, E. Czerny, and I. Forstner Müller, UZK 35. Vienna, 2009.

ANNA WODZIŃSKA

"White Carinated Bowls from Giza and Dating of the Giza Plateau Mapping Project Site." In *Chronology and Archaeology of Egypt. The Late Fourth and the Third Millennium BC, Proceedings of the Conference Held in Prague (June 11–14, 2007)*, edited by Hana Vamžalová and Miroslav Bárta, 111–123. Prague: Czech Institute of Egyptology, 2008.

A Manual of Egyptian Pottery, Vol. 1. Fayum A–Lower Egyptian Culture, Vol. 2. Naqada III–Middle Kingdom. Boston: Ancient Egypt Research Associates, Inc., 2009.

During this past year we also submitted papers for publication that will be coming out soon. Please see our website (<http://www.aeraweb.org>) for a list of these forthcoming papers and a complete list of all our publications.

Lectures and Conference Presentations

LAUREL FLENTYE

"The Decorative Programs of the Pyramid Complexes of Khufu and Khafra at Giza." Old Kingdom Art and Archaeology Conference, Cambridge, England. May 21, 2009.

JESSICA KAISER

"The Bones of Teaching: Human Osteology and Bioarchaeology at the AERA/ARCE Field School." ARCE Annual Meeting, Dallas April 24–26, 2009.

MARK LEHNER

"From the Prairie to the Pyramids: A Quest that Began in High School." Minot High School, Central Campus, Minot, North Dakota, July 31, 2008.

"Archaeology as Diplomacy: The AERA/ARCE Field School." The Woodrow Wilson International Center for Scholars. Middle East Program. October 6, 2008.

"Ramping Up to Giza: Environment and History in the Khentkawes Temple Town," Harvard Semitic Museum, May 13, 2009.

"Re-examining the Khentkawes Town (KKT): 2005 through 2009," Old Kingdom Art and Archaeology Conference, Cambridge, England. May 21, 2009.

"AERA: Finding the Lost City of the Pyramids," Opening of "Lost Egypt" exhibit. COSI (Center of Science and Industry), Columbus, Ohio. May 28, 2009.

JOHN S. NOLAN

"Scribal Organization and Hierarchical Structure in the Reign of Menkaure: Sealings from Giza." Egyptian Archives/Egyptological Archives: International Congress, Università degli Studi di Milano, Milan, Italy, September 9–12, 2008.

RICHARD REDDING

"Archaeology as Diplomacy: the AERA/ARCE Field School." University of Michigan, Museum of Anthropology, December 2008.

"The Lost City at Giza." Michigan Archaeological Society: Huron Valley Chapter, November 2008.

WILMA WETTERSTROM

(and RICHARD REDDING and MARY ANNE MURRAY)
"Feeding the Pyramid Builders." North Texas Chapter of the ARCE, Dallas, February 21, 2009.

ANA TAVARES

"Village, Town, and Barracks, a 4th Dynasty Settlement at Heit el-Ghurab (Wall of the Crow), Giza." Old Kingdom Art and Archaeology Conference, Cambridge, England. May 21, 2009.

ANNA WODZIŃSKA

"Potmarks of the Early Dynastic Buto and the Old Kingdom Giza. Their Occurrence and Economic Significance." Egypt at its Origin Conference, British Museum, London, July 27–August 2, 2008.

"Pottery of the late New Kingdom and Third Intermediate Period in Tell el-Retaba. Change of Types Repertoire." Institute of Archaeology (University of Warsaw) Annual Conference, Wiktorowo, November 24–26, 2008.

"Ancient Egypt Research Associates Settlement Site at Giza: Old Kingdom Ceramic Distribution." Old Kingdom Art and Archaeology Conference, Cambridge, England, May 21, 2009.

WORK



AERA team members and the Lost City are on tour! Travelling to science museums around the country, *Lost Egypt: Ancient Secrets, Modern Science* features AERA's work as exemplary for how modern archaeologists use science and technology to understand the people and culture of Ancient Egypt. *Lost Egypt* was created and produced by COSI (the dynamic hands-on Center of Science and Industry in Columbus, Ohio) and built by the Science Museum of Minnesota.

In videos and still photos, AERA archaeologists explain their work at Giza in the "Field Site" section of the show, where visitors explore the tools, techniques, science, and technologies used at the Lost City of the Pyramid Builders. In the "Orientation" segment of the show a modern Egyptian street scene transports visitors to Egypt where they learn about some of the archaeologists working in Egypt today, including seven of our team members.

The *Lost Egypt* production team spent a week at Giza filming our excavations and field lab and interviewing team members Dr. Mark Lehner, Ana Tavares, Dr. Mary Anne Murray, Dr. Anna Wodzińska, Jessica Kaiser, Dr. Richard Redding, and John Nolan. The interviews focused on life in the field, discoveries, artifacts, and careers.

Mark Lehner and Ana Tavares attended the opening celebration in Columbus on May 30 where Mark helped kick off the show with a lecture. The exhibition will be in Columbus until September 7 and thereafter travels among the member museums of the Science Museum Exhibit Collaborative.

We were delighted to collaborate on *Lost Egypt*. As the target audience includes families, especially those with children ages 9–13, we will reach a far wider audience than we normally do through our website and publications.

Preview the show at: <http://www.lostegypt.org/>.



Above: Mark captivates the audience at the opening of the COSI *Lost Egypt: Ancient Secrets, Modern Science* exhibition on May 30, 2009.

Below: The COSI production team films an interview with AERA osteoarchaeologist Jessica Kaiser (left).



Thank You to Our Contributors

AERA has been able to achieve all that we have described here in our annual report because of the generous contributions of our benefactors and members. Each and every tax-deductible donation supports AERA's archaeological excavations, the publication of our findings, and educational programs aimed to advance and protect knowledge about our common human heritage. We are extremely grateful to the following foundations, businesses, and individuals who generously supported our work this year.

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