



AERA 2011–2012 ANNUAL REPORT

NEW LIGHT ON TRANSITIONS

Ancient Egypt Research Associates



A satellite image of the Giza Plateau, Egypt, showing the Sphinx and pyramids of Khufu, Khafre, and Menkaure. The sites where Ancient Egypt Research Associates works include the Khentkawes Complex, the Menkaure Valley Temple, and the Lost City of the Pyramids. Image © 2012 GeoEye, © 2012 ORION-ME.

Google earth

AERA-Egypt: Who We Are

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

Answers lie in our excavations of the ruins of ancient settlements at the southeastern base of the Giza Plateau: the “Lost City of the Pyramids” south of the gigantic stone Wall of the Crow and the pyramid towns of the queen Khentkawes and the pharaoh Menkaure. Through multi-disciplinary analysis and rigorous best standard practice of field archaeology, we open windows on the emergence of the ancient Egyptian civilization that built the Giza Pyramids and Sphinx and shed light on the elementary structures of everyday life at that time.

In 2005 AERA developed the extraordinary opportunity to work at Giza granted by the Egyptian Ministry of State for Antiquities into a training program for young Egyptian archaeologists who safeguard and investigate their country’s heritage. AERA teams have designed and directed nine archaeological training missions at the world heritage sites of Giza, Luxor, and Memphis in a comprehensive program funded by USAID through the American Research Center in Egypt.

Founded in 1985, AERA is a 501(c)(3) tax-exempt, nonprofit research institution located in Boston, Massachusetts, and in Giza, fully registered in Egypt as a foreign non-government organization. AERA-Egypt owns and maintains the Mark Lehner Center in Giza. Our scientific and educational missions are supported by philanthropic individuals and foundations, and USAID government funding in collaboration with the American Research Center in Egypt.



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The photos in our annual report were taken by Mark Lehner, Yaser Mahmoud, and Hilary McDonald.

Cover photo: Excavations in the Silo Building Complex, February 2012, Giza Plateau. Left to right (starting on the back cover) in the background: Menkaure Pyramid, Khentkawes Monument, Khafre Pyramid, and southeastern foot of Khufu Pyramid. The basin (seen on the back cover) is flooded with ground water. View to the northwest.

ANCIENT EGYPT RESEARCH ASSOCIATES NEW LIGHT ON TRANSITIONS

A Message from Mark Lehner

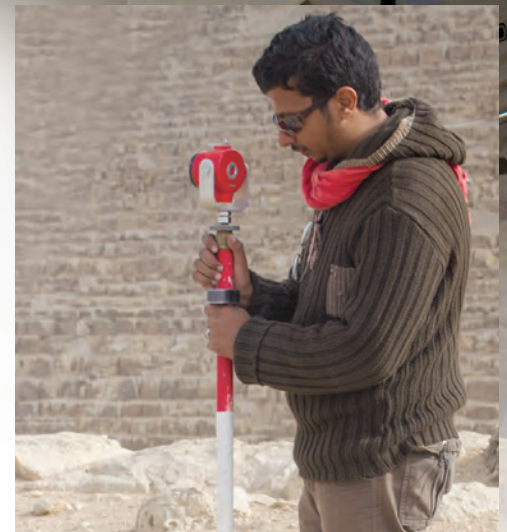
While in 2010–2011 we worked at Giza through abrupt change wrought by Egypt's January 25th Revolution, this year we worked through longer-term transition in Egypt, no less a transition of historic proportion. These modern transitions occur just when our archaeology shines new light on an ancient transition of national significance 4,500 years ago: a change of dynasty, from the 4th Dynasty rulers who built the giant pyramids at Meidum, Dahshur, and Giza in a single century, to the following 5th and 6th Dynasty rulers, who built smaller pyramids at Abusir and Saqqara, but administered a countryside more complex and nuanced—a development perhaps catalyzed by the gigantic 4th Dynasty pyramid projects.

At the same time, AERA itself is in transition, from a 25-year-old research dig and comprehensive field school program, to a permanent institution with a mission increasingly dedicated to the future of Egyptian archaeology. We have come to the end of AERA's 2009–2012 three-year plan, with many of our major goals accomplished. We now embark on a new vision, focused on sustaining AERA in the long term and broadening our institutional partnerships and donor base.

Thus on more than one order of magnitude this has been a year that looks at transitions: for AERA, for Egyptians today, and for Egypt at its first, ancient efflorescence as a civilization.

Archaeology Unbroken

Within two months of the close of our last fiscal year, we were back in the field. On September 3, Field School Directors Mohsen Kamel and Ana Tavares launched the Mit Rahina Field School 2011 (MRFS) for inspectors in the Ministry of State for Antiquities (MSA) at the site of Memphis, ancient Egypt's northern capital city. The American Research Center in Egypt (ARCE) sponsored the MRFS with USAID funding. The MRFS averaged 150 crew members—up to 212 at times—including trainees, professional archaeologists, and





support staff, making AERA one of the largest missions working in Egypt. Nine weeks after the close of the MRFS, an AERA team was back in the field at Giza starting January 9, for Season 2012, and excavation with employees from the Giza Inspectorate of the MSA embedded in our crew for on-the-job training.

At a time when most of the Egyptian Ministry of State for Antiquities’s field archaeology was on hold due to the transition underway in the Egyptian government, AERA continued to create meaningful archaeological work for skilled, experienced Egyptian excavators. And AERA offered training at a time when jobs and education are critical for younger Egyptians just out of university and embarking on a career in the field of Egypt’s cultural heritage. That we could draw on experienced Egyptian archaeologists for a nearly all-Egyptian team marks both the success of the AERA-directed field schools and the continued development of this mutually beneficial, symbiotic relationship.

Accomplishments



Mit Rahina Beginners Field School (MRFS) 2011

The MRFS, the ninth AERA-ARCE Field School in the last seven years, was a Beginners Archaeological Field School, the first course in our cycle of Beginners, Advanced, Salvage, and Analysis and Publication Field Schools. The excavations of the Mit Rahina Field School shed new light on the transition from the Old to the Middle Kingdoms, complementing previous excavations there that span the Middle to New Kingdoms.



Giza Season 2012: On-the-Job Training Field School

AERA trained 27 beginning archaeologists from the Giza Inspectorate of the MSA by incorporating them in our 2012 field season where they worked with 15 experienced Egyptian archaeologists and two British excavator-teachers, as well as specialists in survey, osteoarchaeology, and ceramics.



Discovering a New Enclosure: the Silo Building Complex

In our ongoing excavations in the area to the east of the Khentkawes Town, we discovered a house-like complex of round silos and bakeries nestled within massive enclosure walls. One of our finds, a clay sealing impressed with the title “Overseer of the Pyramid, ‘Great is Khafre,’” hints that we might have stumbled into the pyramid town dedicated to the cult of Khafre.



Khentkawes Town Resurveyed to its Western Limit

Meanwhile, in the Khentkawes Town, which extends east from the tomb of this 4th Dynasty queen, we finished resurveying what remained of the town exactly 80 years after Selim Hassan excavated the whole of it in a single season. Our work tells us that the construction and history of this settlement are more complex than Egyptologists knew.



Menkaure Valley Temple-East Completely Remapped

The AERA team re-cleared the entire eastern front of the Menkaure Valley Temple—the first time it has been exposed since George Reisner’s 1910 excavation—and produced a new understanding of the temple and its occupation history through targeted excavations of the temple anatomy.



Gallery III.3: Return to the Gallery Complex

On our flagship “Lost City” site, aka Heit el-Ghurab (Arabic for “Wall of the Crow”) we excavated a complete gallery, exploring down to the earliest levels, tracing changes through its occupation.



Hippo Hip and Olive Pit: Lessons from the Lab

Chief Research Officer Richard Redding led a team of analysts in the AERA Giza Field Lab. Claire Malleson’s finding of an olive pit serves as an index of provisioning from the Levant, while Richard’s identification of a nearly complete hippopotamus pelvis offers another hint of the 4th Dynasty environment and possibly a ritual hunt involving the royal guard.



The Glen Dash Foundation Survey: Points on Pyramids

Glen Dash’s foundation financed a focus on the Giza Plateau Mapping Project point of beginning: a comprehensive archaeological map of the Giza Plateau. A Dash survey team took thousands more points on the pyramids, tombs, and temples, working toward an accurate and comprehensive archaeological map of the Giza Plateau.



Comprehensive Information Management: 30 Years of Data

Megan Lallier, pursuing a higher degree in archiving, library science, and history at Simmons College, joined the AERA team to direct the integration of 30 years of excavation, survey, and research at Giza into a Comprehensive Information Management System that will combine excavation and survey data, photographs, reports, and all AERA administrative and financial records.



Once again, as we pass the transition of a new fiscal year cycle, we thank you for making possible all of these accomplishments. I hope you share our pride in these contributions to our understanding of ancient Egypt, and to making Egyptian archaeology more Egyptian.

Thank you again for all your help and support. We will keep you posted on our challenges, accomplishments, and transformations through this very interesting time of transition.

~ Mark



2012 FIELD SEASON EXCAVATIONS

In January we launched Field Season 2012 at our flagship site, Heit el-Ghurab (the Lost City of the Pyramids), and nearby at the Khentkawes Town and the Menkaure Valley Temple at the southeastern base of the Giza Plateau. We began excavating an administrative facility that we first uncovered in 2011 east of the Khentkawes Complex and, to our surprise, found ourselves in a 5th Dynasty complex lying within a 4th Dynasty enclosure wall. A clay sealing we found here hints that this was the pyramid town dedicated to maintaining the memory of the 4th Dynasty pharaoh Khafre and was sustained by the patronage of the 5th Dynasty pharaoh Niuserre. Our work in the Menkaure Valley Temple revealed a 5th Dynasty refurbishing that earlier archaeologists had missed. In the Khentkawes Town we completed the map of the settlement that we began in 2005. In the Gallery Complex at the Lost City we excavated another gallery to test the barracks hypothesis. Results hint that the occupants may have enjoyed a much higher status than the most common of the pyramid builders. Co-Field Directors Mohsen Kamel and Ana Tavares organized the field season; Mohsen oversaw most of the operations in the field.

The Silo Building Complex

Since 2005 we have been exploring the Khentkawes Town, the settlement attached to the tomb of the late 4th Dynasty Queen Khentkawes. Although Selim Hassan excavated here in 1932, we found important new information where he worked. Beyond the boundaries of prior excavations, we made major discoveries. We found a previously unknown eastern approach to the town—what we call the Khentkawes Valley Complex—consisting of ramps, stairs, and corridors along the northwest corner of a deep basin.


In 2011 we discovered the opposite side of this basin, which may have been a harbor connected to the Nile via a canal that yet eludes us. Beyond the basin and the enclosure wall bounding it, we uncovered traces of grain silos and courtyards.

We proposed that this “Silo Building Complex” (SBC), as we dubbed it, stored offerings for Queen Khentkawes, delivered to the queen’s monument via a corridor along the north side of the basin,

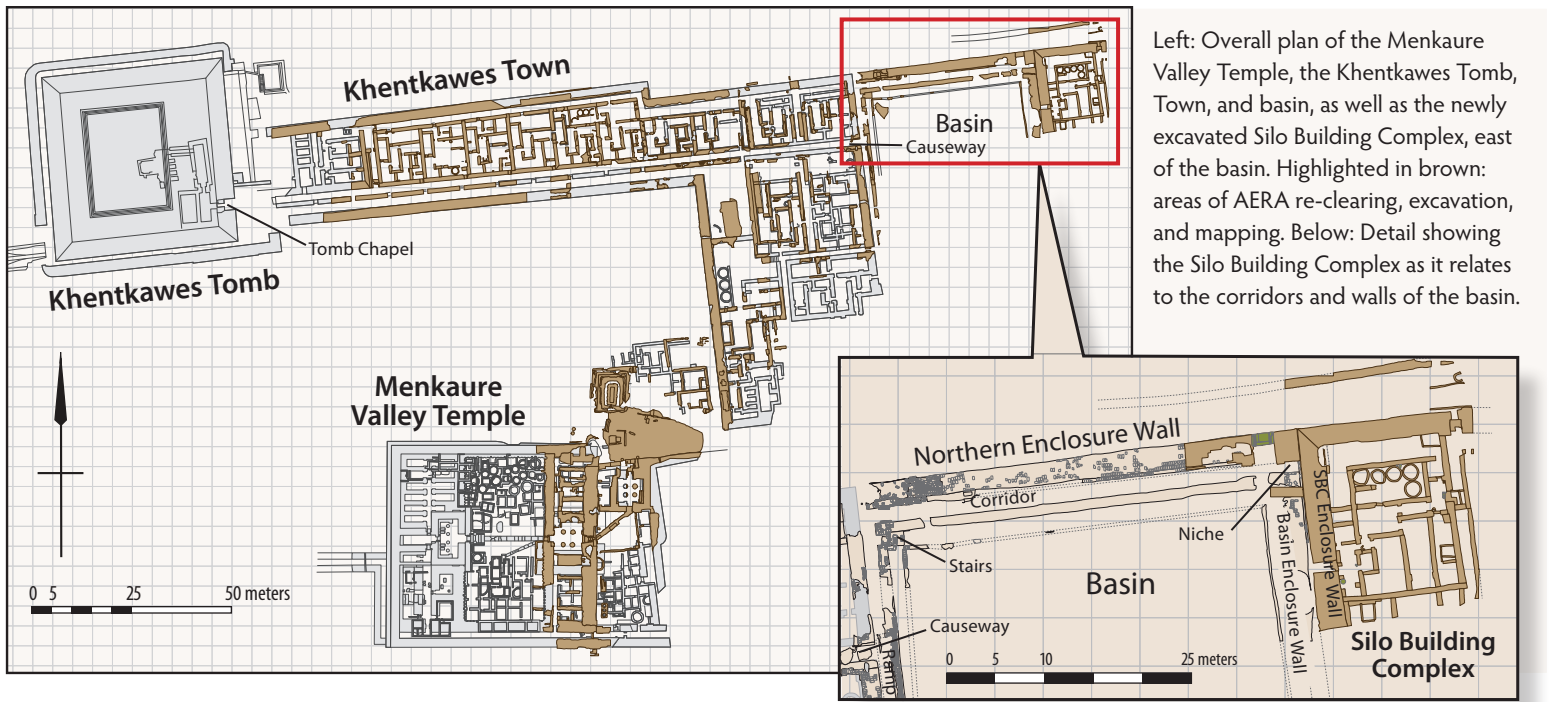
up ramps, and finally through the town via the causeway to the queen’s chapel set within the southeast corner of her gigantic monument 150 meters up the slope of the plateau.

This plausible hypothesis neatly explained the purpose of the SBC, but it unraveled this season when we began to excavate the facility. We lost the first thread of our argument when excavation supervisors Rabee Eissa and Hussein Rikaby found a thick wall around the north and west sides of the SBC, apparently sealing off access to the west and the route to Khentkawes’s tomb. It was built back-to-back against the enclosure around the Khentkawes basin, which opens to the southwest. This enclosure opened to the southeast, not toward the Khentkawes Valley Complex. We were onto a more complicated architectural puzzle than anticipated, but we turned up hints and clues that suggested possible solutions.

As we dug further, we discovered that the enclosure wall around the SBC is older than the 4th Dynasty Khentkawes basin



Excavations in the Silo Building Complex, February 2012. The basin, flooded with ground water, lies just beyond the complex. The ramps, stairs, and terrace we discovered on the other side of the basin lie buried under a protective layer of sand. In the background, left to right: a queen’s pyramid, the Menkaure Pyramid, the Khentkawes Monument, and the Khafre Pyramid. View to the west.



Left: Overall plan of the Menkaure Valley Temple, the Khentkawes Tomb, Town, and basin, as well as the newly excavated Silo Building Complex, east of the basin. Highlighted in brown: areas of AERA re-clearing, excavation, and mapping. Below: Detail showing the Silo Building Complex as it relates to the corridors and walls of the basin.

enclosure. But the SBC itself is younger; the pottery and other artifacts place it in the 5th Dynasty.

The SBC must have replaced something older, but we do not know what that was. A tantalizing clue turned up in the silos—a 5th Dynasty sealing fragment impressed with the title “Overseer of the Pyramid, ‘Great is Khafre’”—the name of Khafre’s pyramid, the second Giza pyramid. The older enclosure walls might have circumvented Khafre’s pyramid town, the community that carried out rituals in his pyramid temples, in order to provide for him in the Afterlife, just as the occupants of the Khentkawes Town served her memorial.

Baking/Brewing Complex?

The ground plan of the SBC and other evidence suggests how people used the complex. We have only cleared down to the final occupation deposits and dug small trenches to floor level, so we must wait until future field seasons to test our hypotheses with excavations to the earliest levels.

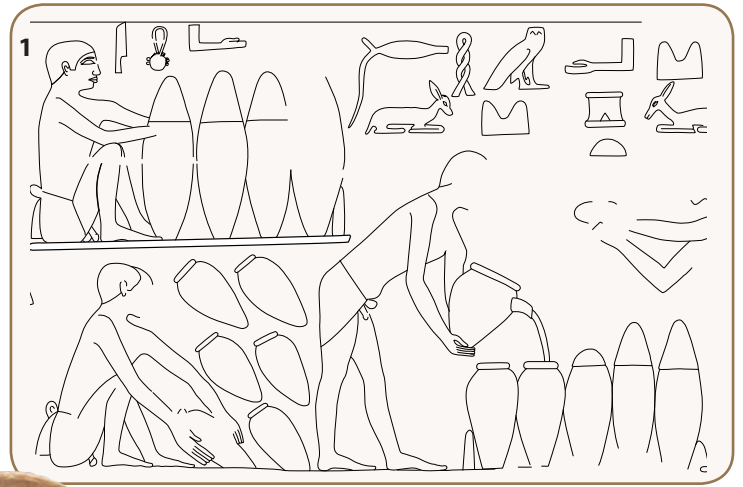
The layout of the SBC looks like a high-volume bakery (and possibly brewery) surrounding living quarters and administrative space for an overseer. Pilasters that set off a niche in the southern end of Room G, labeled in the photo on the facing page, may indicate this served as a reception hall where the overseer received visitors and conducted business. Similar rooms are found in the center of the Khentkawes Town houses. We could see in Rooms H, Q, and V the overseer’s personal kitchen area or possibly part of a brewery. We found abundant pottery here, including five complete beer jars ly-



Ahmed Orabi excavates one of the silos in the Silo Building Complex. View to the west.

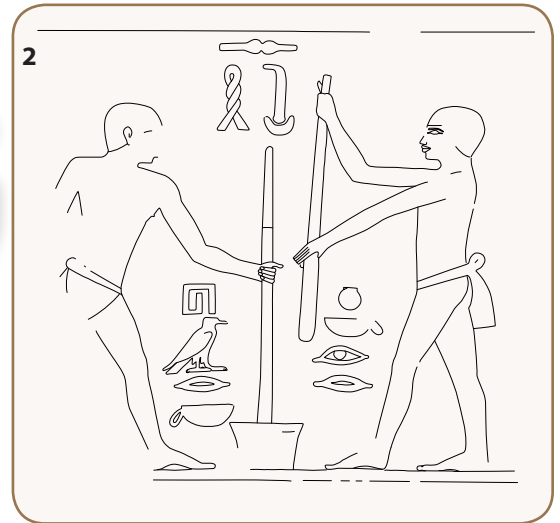
ing together (shown in photo below) and a storage jar embedded in the floor.

The large silos most likely stored barley and emmer, an ancient wheat. On the basis of ashy deposits covering most of the floors and scorching on walls in Rooms A through L, we suggest that here people transformed these staples into bread and beer. Artifacts and features associated with baking and brewing include a granite quern, or grinding stone, from Room A, which people would have used with a handstone to mill cereals, as depicted in a scene from the 5th Dynasty tomb of Ti at Saqqara (facing page). A depression in the floor of

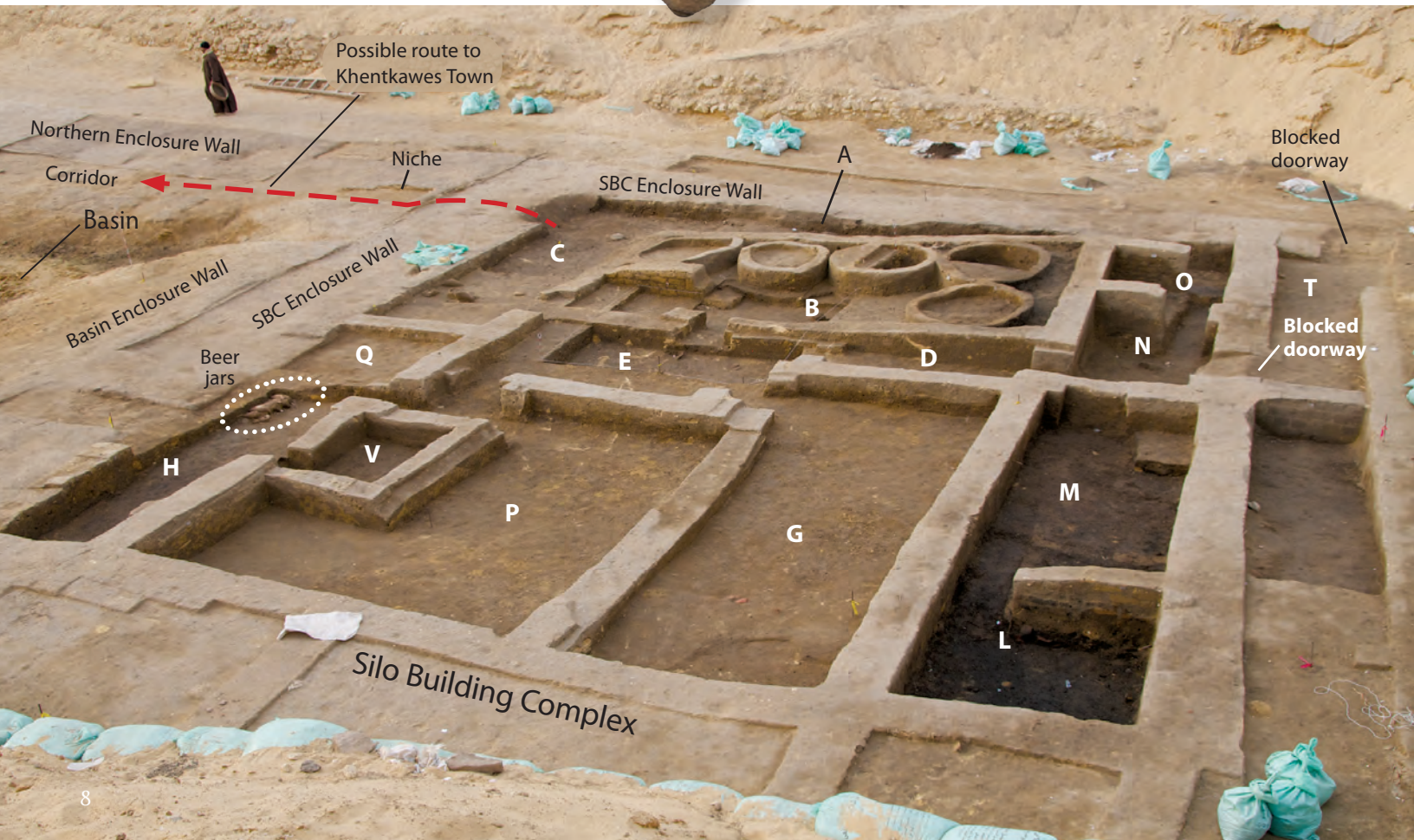


Right: A beer jar found in the Silo Building Complex in Room H.

Far right: Details of baking and brewing scenes from the 5th Dynasty tomb of Ti at Saqqara: 1) Workers in a brewery. 2) Using a mortar and pestle for the initial stage of grinding grain. 3) Workers do the fine grinding using a hand grinder on a saddle-shaped quern (facing page). After L. Épron, *Le Tombeau de Ti*, Cairo: Institut Français d'Archéologie Orientale, 1939, plates LXVII, LXXI, and LXXI.



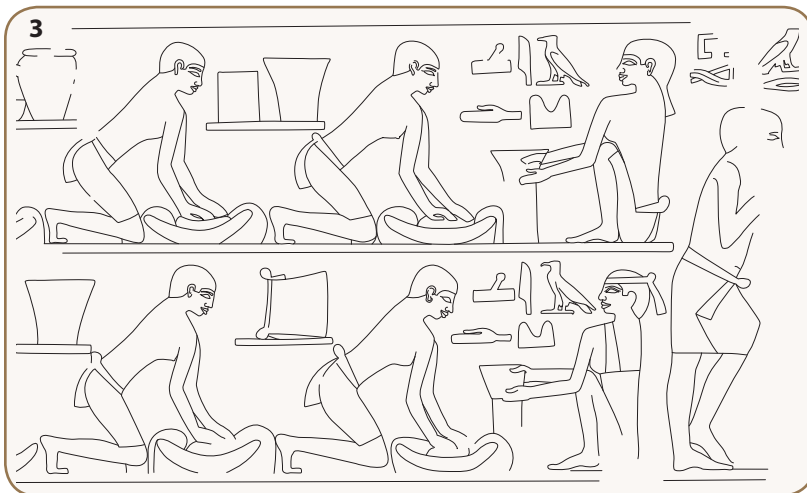
Below: The Silo Building Complex. People accessed the complex through Room N until they sealed it with mudbrick. The team found beer jars lined up on the floor in Room H, where they might have been stored for use in a brewery. View to the north-northwest.



“Overseer of the Pyramid, ‘Great is Khafre’”

So reads this clay sealing, found in the Silo Building Complex. The image was impressed with a cylinder seal, an important administrative tool used through much of ancient Egyptian history. The cylinder was rolled across a specially prepared dollop of clay when it was still wet, leaving behind an impression. Clay sealings were applied to jars, doors, boxes, papyrus documents, bags, and other objects to deter unauthorized access.

Cylinder seals bear the name of the king that the seal owner served and the owner’s titles—in this case, “Overseer of the Pyramid, ‘Great is Khafre’.” This title is well-known from tombs of 4th Dynasty high officials buried at Giza, but the name of the king is surprising: Niuserre, a mid-5th Dynasty ruler (ca. 2416–2392 BC). The discovery of this sealing inside the Silo Building Complex suggests that the structure belonged to the pyramid town of Khafre, and that this settlement housing the priests and support people who maintained Khafre’s memorial service was sustained by King Niuserre’s patronage 70 years after Khafre died.

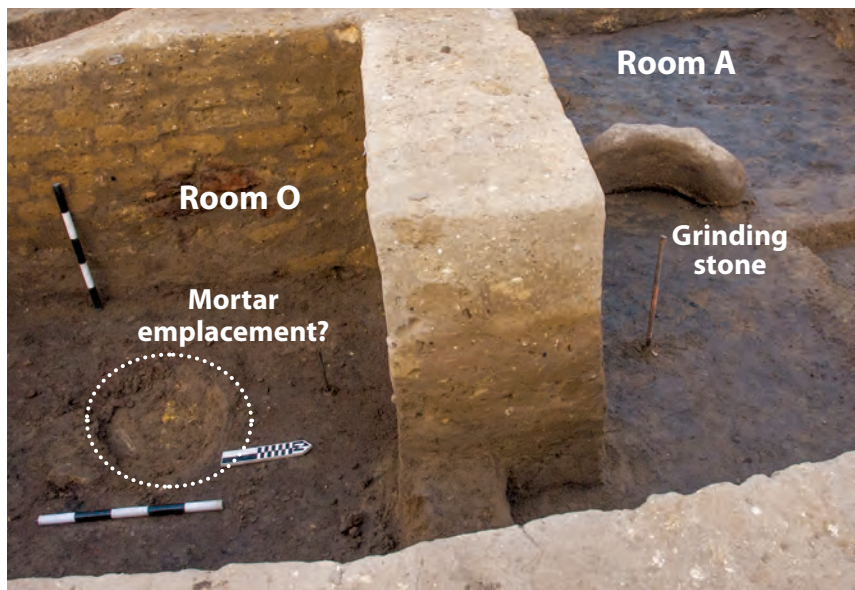


Room N may have been an emplacement for a mortar in which workers, using large pestles, broke apart the tough spikelets of emmer wheat to release the grains, as shown in Ti’s bakery scene (2, facing page). In Room O we found a large vat that could have been used to mix bread dough, and numerous molds and trays for baking bread.

Access Conundrum

At some point, someone sealed up the main entrance into the Silo Building Complex, the door in Room N, as well as the doorway through the enclosure wall into the corridor leading to this main entrance. This may signal a shift in the building’s purpose. Without access to the Khafre Valley Temple to the northeast, where priests would have maintained Khafre’s cult, perhaps the SBC was turned over to the Khentkawes endowment, which brings us back to our original hypothesis. But how would anyone get in and out of the building? It looks like there was no access, but if the older enclosure wall—dating before the SBC—had been reduced to less than waist high by the 5th Dynasty, people may have simply walked across it and then through a niche in the basin enclosure wall at the end of the corridor running along the north side of the basin. From here people could proceed from the SBC to the ramps leading up into the Khentkawes Town. A low enclosure wall around the north and west sides of the SBC might have worked with rooms abutting the wall—H, Q, C, and A. Considering all the evidence of fires, these rooms were most likely open to the sky.

We are eager to get back to another season of excavations at the SBC to test our hypotheses. Egyptologists have not yet located Khafre’s pyramid town, although the settlement is mentioned in the tomb chapels of its administrators. If our SBC proves to have been part of Khafre’s pyramid town, it will be a major find.



Rooms O and A in the Silo Building Complex. In Room O the depression in the floor may have been an emplacement for a mortar which workers would have used with a pestle to break apart emmer cereal heads, as depicted in the scene from Ti’s tomb on the facing page (number 2). In Room A a broken grinding stone, or quern, lies on the floor. Women ground cereals into flour on this type of quern using a handstone, as shown in the scene from Ti’s tomb, above. View to the west.

2012 FIELD SEASON EXCAVATIONS: Menkaure Valley Temple

This season we explored deeper into the interior of the Menkaure Valley Temple (MVT) for the first time since George Reisner excavated the temple 102 years ago. After Mohsen Kamel and Ana Tavares directed the clearing of the sand overburden along the MVT eastern wall, Amelia Fairman and Hanan Mahmoud supervised team members who excavated seven small trenches, looking for clues to the construction history and use of the temple over more than 300 years, from the 4th Dynasty reign of Menkaure (2490–2472 BC) to the end of the 6th Dynasty (2152 BC). We were rewarded with a discovery that earlier archaeologists missed: embellishments added by a pharaoh long after Menkaure amounting to a major building phase that included the construction of the Annex on the eastern temple terrace.

Two Buildings or One?

Selim Hassan excavated the Annex in 1932, 20 years after Reisner stopped his excavations before reaching it. Hassan failed to see the Annex as part of the temple because Reisner had backfilled his own work in the main temple. So the Annex and MVT were taken as two conjoined but separate layouts. In 2008 we recognized that the four alabaster column bases in the MVT Vestibule 1 (seen below) matched the set in Vestibule 2 in the Annex. All eight must have been made at the same time, when authorities ordered a renewal project that included the additions of the Annex on the front terrace, a limestone pathway connecting the two vestibules, and another leading across the central court to the sanctuary. But who ordered the renovations and when?

Four Building Phases

In the temple proper, Reisner recognized three major building phases: 1) Menkaure laid massive limestone foundation blocks for an all-stone temple, but died before he completed his pyra-


mid complex. 2) His successor, Shepseskaf, hastily completed the temple in mudbricks. 3) About 300 years later, in the 6th Dynasty, the temple was rebuilt. Reisner recognized additions made in the 5th Dynasty, but did not see them as a separate phase. Our new excavations, however, provide evidence for a fourth building phase with substantial additions in the 5th Dynasty.

The Annex as a Terrace East of the Temple

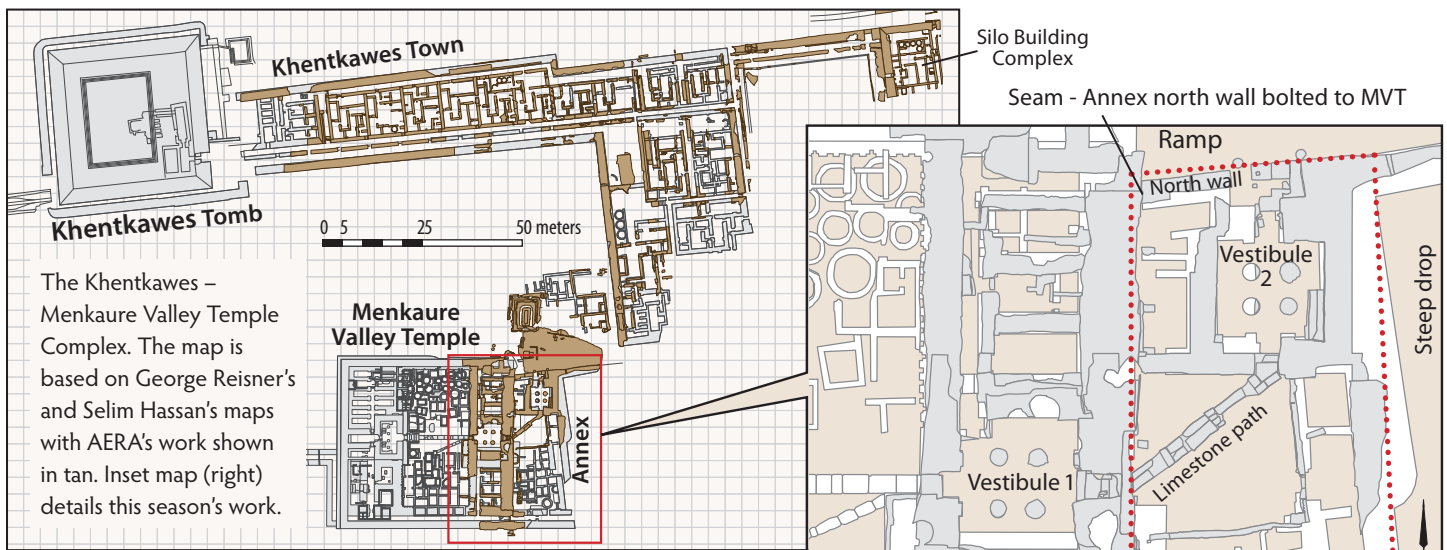
That the original MVT included a front terrace is a new finding for Egyptology. The terrace extended east from a foundation platform of limestone blocks and rubble 2.5 meters (over 8 feet) thick that Menkaure's builders prepared in order to compensate for the slope of the ground down into the mouth of a wadi. When Shepseskaf completed the temple in mudbrick he incorporated this terrace, accessed by a broad ramp on the northeast and a corridor on the south. Otherwise people exiting the front of the temple would have tumbled down into the wadi. This configuration—front terrace, with double access at either end—is a known attribute of other valley temples, such as Khafre's.

Annex “Bolted” to the MVT

The terrace must have stood empty for some time before people built the walls of the Annex. We found white plaster on the MVT wall where the northern Annex wall abuts it, indicating that the wall was finished before the Annex wall was attached. The Annex's northern wall was “bolted” onto the MVT east



A worker clears the west wall of Vestibule 1 inside the Menkaure Valley Temple. The large, round alabaster column bases on the floor match column bases in Vestibule 2, in the Annex (shown on map on facing page). The Menkaure Pyramid rises in the distance on the left. Khafre's pyramid and the Khentkawes Monument stand on the right. View to the west-northwest.



The Khentkawes – Menkaure Valley Temple Complex. The map is based on George Reisner's and Selim Hassan's maps with AERA's work shown in tan. Inset map (right) details this season's work.

wall, and we found a similar situation at the southeast corner of the MVT. The southern wall of the Annex “bolts” onto a projection from the eastern MVT wall, which had also been plastered before the Annex wall was attached.

A Tale of Two Floors

In our trenches we found traces of a floor associated with the initial building and plastering of the eastern MVT wall. About a foot above it we found a higher, later floor connected to the eastern face of the MVT wall. This later floor dates to around the time that people laid down the limestone path connecting the two vestibules. We cannot be sure if the column bases were installed at the same time. But we hypothesize that all of these additions were part of 5th Dynasty work that created the Annex on Shepseskaf's open terrace.

A 5th Dynasty King: Niuserre Confirmed?

In 2011 we began to suspect that Niuserre was the 5th Dynasty king who embellished Menkaure's pyramid complex, based on the fact that his name is the first in a series of sealings and stelae from Menkaure's Valley Temple and upper pyramid temple. We also saw architectural hints—features in the MVT that otherwise are found for the first time in Niuserre's pyramid temple at Abusir. But we had nothing else to link him to Giza, until this season when his name appeared on clay sealings from the Silo Building Complex, east of Khentkawes Town. A fragment bearing his Horus name alongside the title “Overseer of the Pyramid, ‘Great is Khafre’” affirms his attention specifically to the pyramid temples of Khafre and Menkaure (page 11). This is but one example of links we begin to see across the Menkaure Valley Temple, the Khentkawes Town, and the Lost City, the “company town” occupied during the building of Khafre's and Menkaure's pyramids and temples.

The findings from our trenches this season make an important contribution to Egyptology with a more complete picture of the construction history of the MVT.



Amelia Fairman works in a trench along the eastern base of the MVT east wall. View to the south-southwest.

2012 FIELD SEASON EXCAVATIONS: Khentkawes Town-North

This season we resumed work in the Khentkawes Town, where we have been mapping and excavating since 2005. This mudbrick settlement adjacent to the tomb of Khentkawes, a late 4th Dynasty queen, housed the community of priests charged with carrying out rituals to provide for her afterlife. In the spring we mapped the last area of the town that we had not yet studied—the west end—allowing us to meet the goal we set our first season: a map of the whole settlement, an important contribution to Egyptology and the history of urbanism. This settlement is recognized as one of the earliest planned towns in Egypt. The map published by Selim Hassan in 1943, which scholars have used until now, presents a simplified and often confusing picture of the settlement. Hassan did not distinguish building phases that we now realize may span centuries. We have revealed changes over time in the layout of the community, which we capture in phase maps for different periods.

West End of Khentkawes Town

Essam Shehab, a graduate of the AERA-ARCE Field School program, led a team in clearing and mapping the far west end of the town (map on the facing page), including three modular houses, magazines, the causeway to the Khentkawes chapel, the northern and southern enclosure walls of the town, as well as the interior streets running along the walls. The team excavated two deep probes, Trenches 129 and 131, to explore the construction history and foundation of this end of the town.

The AERA team clears and maps houses in the west end of the Khentkawes Town. The Khentkawes tomb rises behind them. The chapel entrance opens on the left side of the monument at the end of the causeway. View to the west.

Built Over a Deep Quarry

Those trenches produced the biggest surprise: the west end of the town was built over a deep quarry, whereas our prior recording to the east suggested the entire town was built on an even, sloping bedrock surface. The town builders used massive layers of crushed limestone fill, 2.2 meters thick (7.2 feet!), to fill this chasm and level the surface for construction (photo on facing page).

The deep quarry below the west end of the town suggests that as quarrymen extracted stone for the pyramids, tombs, and temples here, there was as yet no plan to build the Khentkawes Town, even though they were reserving the huge block of bedrock that would become the base of the Khentkawes monument. This discovery bolsters our conclusion from Season 2007 that the mudbrick structures forming the eastern “foot” of the L-shaped town were neither built for Khentkawes’s cult nor in the beginning for her pyramid town, but more likely associated with the adjacent Menkaure Valley Temple. And we found in 2007 that the Khentkawes Town builders cut the causeway leading through the town straight to the queen’s chapel across a north-south avenue between the earlier mudbrick buildings. To keep the avenue functioning, they cut an underpass through the bedrock beneath the new causeway so as not to close off the northern and southern end of the eastern layout, which they incorporated into the expanded settlement.



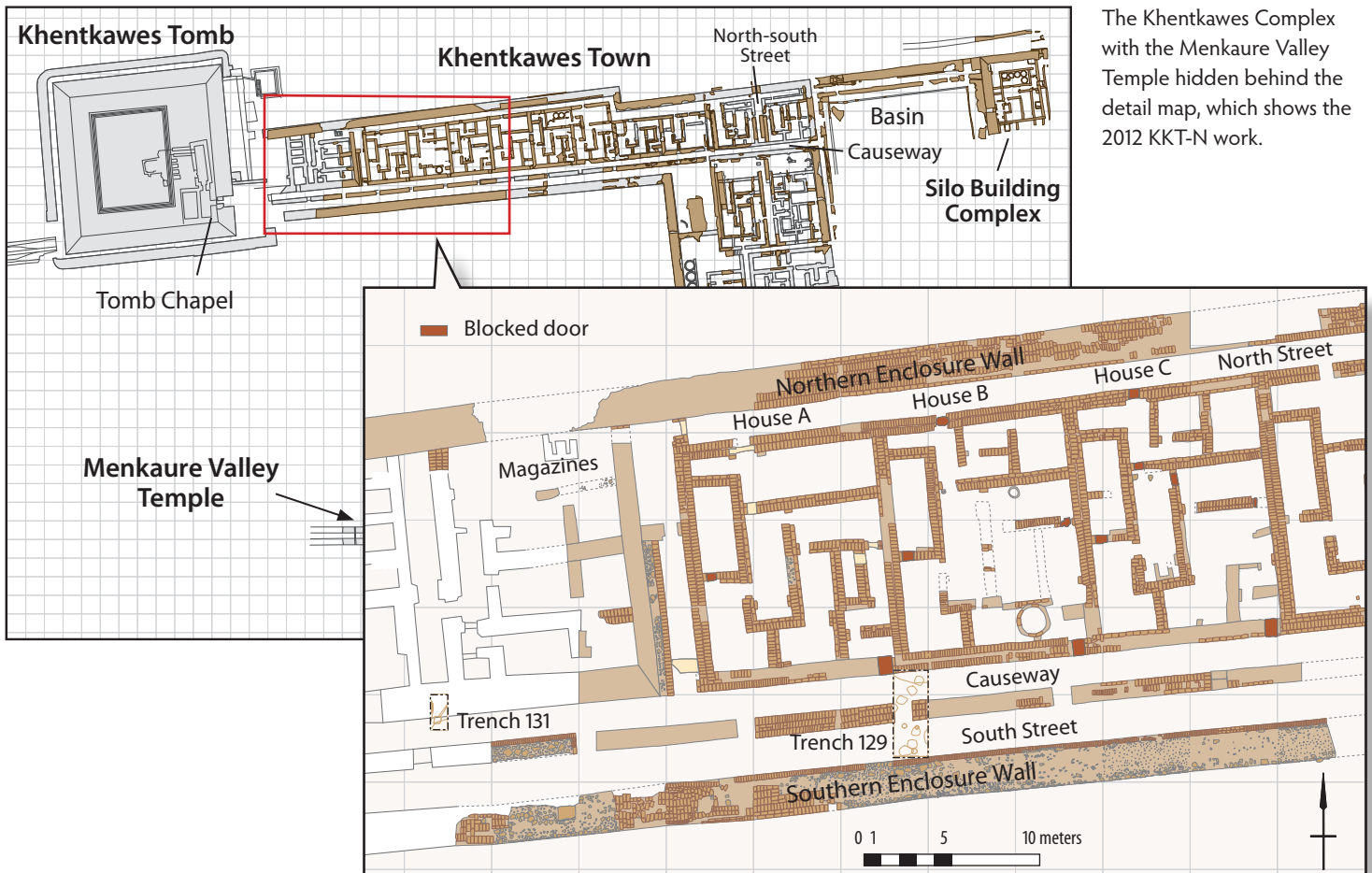


Hamam Ahmed (left) and Mamdouh Farouk record features in Trench 129. Note the crushed limestone quarry debris (evident in wall of the section) used to create a flat surface for building the causeway and its walls.

We found further evidence this season that people abandoned the settlement and others reoccupied it many years later, using the same structures, but repairing or completely rebuilding walls. Doors on the south side of Houses A, B, and C, opening onto the causeway, had been blocked, like the causeway doorways in houses to the east. This finding strengthens our 2009 suggestion that the basic function of the settlement must have changed. Since the residents no longer had direct access to the causeway to Khentkawes's chapel where rituals

were carried out, their primary purpose was, apparently, no longer to serve as priests of her cult.

Our 2012 work in the Khentkawes Town augments our growing understanding of the pyramid towns of the Giza Plateau and makes an important contribution to the Egyptological literature. The complex history of the town emerging from our work, along with our completed map showing the phases of development, will revolutionize Egyptologists's view of the settlements of the Giza Plateau.



The Khentkawes Complex with the Menkaure Valley Temple hidden behind the detail map, which shows the 2012 KKT-N work.

2012 FIELD SEASON EXCAVATIONS: Gallery III.3

At our flagship Lost City site (aka Heit el-Ghurab) we excavated another complete gallery in 2012, to test the idea that these curious long structures served as barracks for the pyramid workforce. This was our first complete gallery excavation since 2002 when we excavated Gallery III.4 (fourth from the west in Set III) of the Gallery Complex—four large blocks of similar narrow structures approximately 35 by 4.5 meters (115 by 5 feet), built side by side and sharing side walls. Occupying an area about 1.5 times the size of an American football field, the complex forms the central feature of our exposure of the site.

Since first uncovering the galleries we have puzzled over their function. When in 2002 we found sleeping platforms in the open forecourt of Gallery III.4, we proposed that the galleries served as barracks for workers, with an overseer residing



Gallery III.4 after 2002 excavations. This much-reprinted photo of our team lying on the dirt floor of the colonnade shows how the structure might have served as a barracks.

in a house-like structure in the back chambers. But we only excavated the final level of occupation and had limited comparative data from other galleries to support our hypothesis.

So this season we set out to explore another entire gallery and excavate down to the earliest levels. We selected Gallery III.3, adjacent to III.4, partly because we had dug portions of it in previous seasons. Ashraf Abd el-Aziz and Dan Jones supervised ten weeks of excavation. This season's work, when combined with analyses from our lab (page 20), generates new information that bring into question whether the galleries housed low-status workers.

Early Occupation

We could not excavate through all layers in the entire gallery—an area of nearly 1,700 square feet—but we dug seven trenches that exposed the earliest levels, under which we might find traces of an earlier layout, such as we have seen in several places across the site. On the northern end we found no evidence of an older occupation, but the high water table prevented us from exploring deeply. On the southern end, however, the wall foundation cut through earlier features, confirming that an older phase lay under at least a portion of the complex.

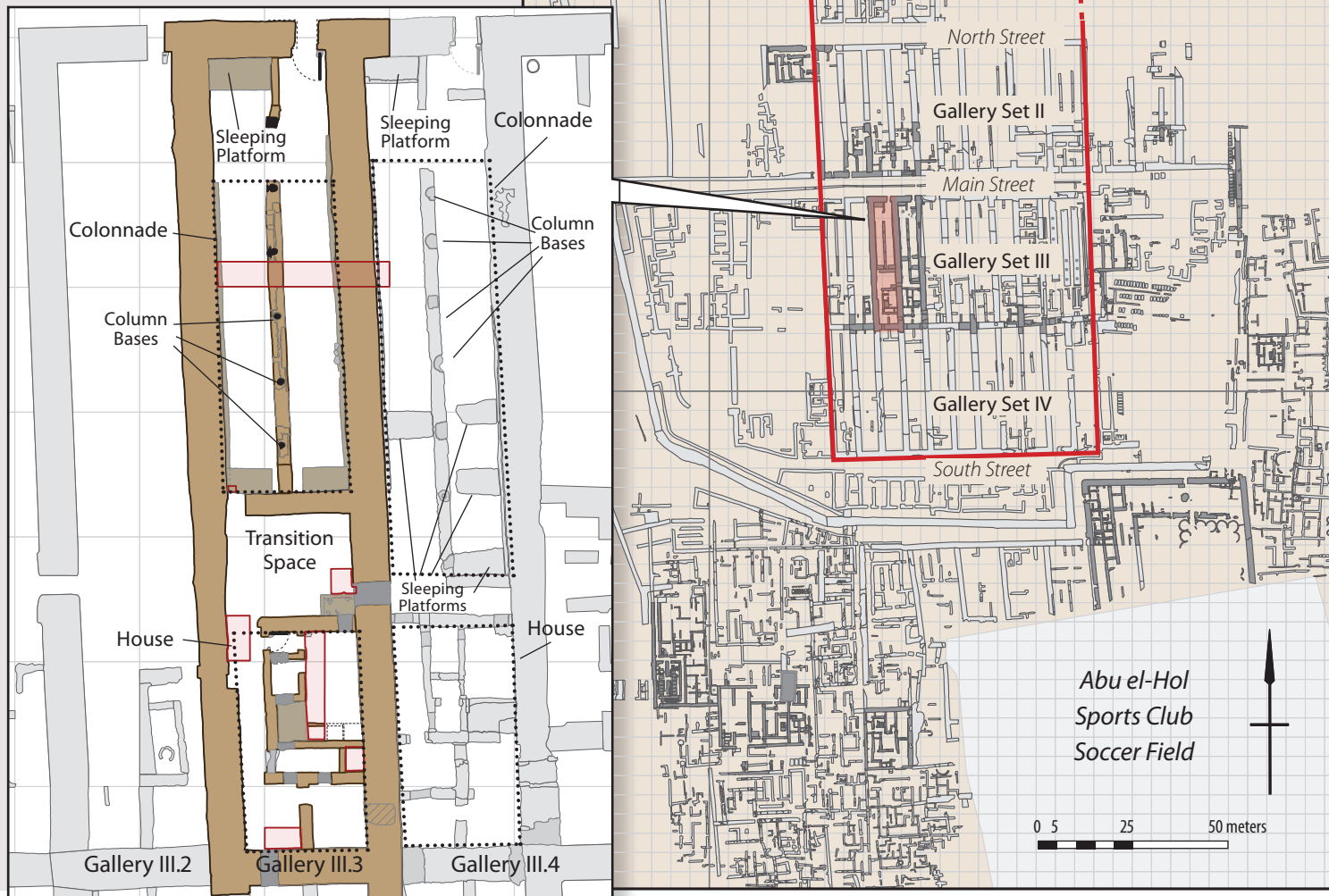
Gallery Features

As far as we can tell, the builders put up Gallery Sets III and IV as a set piece. Once they had laid the thick sidewalls and end walls, they built Gallery III.3's internal features: a line of thin columns—probably wood—down the center of the northern 20 meters (66 feet), making a colonnade that would



Gallery III.3 (right) on a misty morning this past spring following excavations. Gallery III.4 (left), excavated in 2002, was cleared of backfill to reveal features. Team members sit in the structures, providing a sense of scale.

Right: Map of AERA's flagship Heit el-Ghurab 4th Dynasty settlement site. Below: Detail shows Gallery III.3 and adjacent galleries. The trenches we excavated in 2012 are shown in pink. The irregular gouge in the west wall of the gallery was cut by mudbrick robbers in antiquity.



have supported a light roof or ceiling. The columns are long gone, but the limestone bases remain. Mudbrick walls form a house-like complex of small rooms at the rear of the gallery. This configuration remained essentially unchanged through the occupation; no walls were added or removed. But people repeatedly altered the house by closing openings, creating new ones, and later blocking them. They also added features—such as bread-baking pits—and later decommissioned them. They resurfaced the house floors five or six times. In the transition space between the house and the colonnade, they blocked an opening into Gallery III.4 and built a small platform. They left the colonnade unchanged, as far as we can tell, except for two platforms they added after plastering the floor and sidewalls.

Customizing a Template

The basic layout seen in Gallery III.3—the long hall with a house at the back—appears to have been the template for much of the Gallery Complex. Adjacent Gallery III.4 shared these

and many additional features with III.3, as can be seen in the detail plan above. For example, the houses were the same size with similar configurations. But the two galleries differed in the length of their colonnades, suggesting that the gallery template could be customized, perhaps for particular groups or for other specific purposes.

This season's work has taken us another step toward understanding the enigmatic galleries. By exploring to the earliest levels we were able to trace the development of Gallery III.3. We found that the colonnade remained static with light foot traffic and little if any change in its function. The evidence for little wear and tear may indicate occasional occupation, such as a royal guard force (discussed on page 21) rather than common pyramid workers rotating regularly in and out of service. The house, on the other hand, hummed with activity; in its rear chambers it appears people cooked, baked, or roasted continuously. Who carried out this production and for whom, as well as for how long, remain in question.

2011–2012 ARCHAEOLOGICAL FIELD SCHOOLS

During 2011–2012 AERA continued its successful training programs for young archaeologists in the Ministry of State for Antiquities (MSA) with two demanding field schools: the Mit Rahina Beginners Field School (MRFS) at Memphis, September–November 2011, and an on-the-job training program at Giza during our 2012 excavations.

Mit Rahina Field School

The MRFS was a challenging departure: a new site, new chronological periods, and a new partner, the prestigious London-based Egypt Exploration Society (EES). The MRFS worked in the village of Mit Rahina at the core of Memphis, the Old Kingdom capital of Egypt and a major city of the ancient world, 20 kilometers south of Giza. We excavated in the area with the oldest known ruins of ancient Memphis, Kom el-Fakhry, on the west side of the site. We chose this location in response to a direct appeal from local MSA officials. Memphis was scheduled for a tourism and heritage plan and threatened by rapid urban expansion.

The MRFS was a Beginners Field School, the first part of a training pro-

gram that offers a progression from Beginners, through Advanced, Salvage, and Analysis and Publication Field Schools. This was our ninth field school since launching the program in 2005 with the American Research Center in Egypt (ARCE) and support from a USAID grant and generous donors.

During our eight-week excavation, the MRFS salvaged important archaeological information and launched new excavations at a much-neglected and important site.

Kom el-Fakhry

Like most of ancient Memphis, Kom el-Fakhry was discovered by chance. A road cut in 1951 revealed a cemetery and a settlement here. Three years later

Early morning at the Kom el-Fakhry excavation. In the center Hanan Mahmoud, Mohsen Kamel, and Mohamed Abd el-Aziz discuss the coming day. View to the north.





Eman Abd el-Hady Naser (left), one of five students from the Department of Islamic Antiquities and our first student from an oasis (Daklah Oasis), and Dina Mohamed Abd el- Fatah (far right) work side by side with workers from Upper Egypt.



an inspector in the antiquities service excavated the cemetery, dating to the First Intermediate Period (2134–2040 BC). In 1981 another inspector worked in the settlement, a Middle Kingdom (2040–1640 BC) town.

Even though the cemetery had already been excavated, it still held valuable information. After we removed modern garbage covering the area, we mapped the cemetery. Sadly, most of the original tomb color decoration, revealed during the 1954 excavation, was gone. To preserve what remained, we covered the cemetery, as well as the settlement, with a thick layer of clean sand at the end of the season—something we always do after our excavations.

The settlement turned out to be challenging. “This site is impossibly complex!” declared one experienced archaeologist halfway through the season. Many walls were built over earlier walls, and in many cases, only a single course of bricks remained. In addition, distinguishing mudbricks from floors, remains of collapsed walls, and dumps of debris was trying—they are all made of Nile silt, all shades of brown.

Despite the challenges, the field school team determined that the site saw seven broad phases of construction, occupation, and demolition dating from the late 13th to the early 12th Dy-

nasties, with many sub-phases, reflecting constant remodeling.

We also discovered that Kom el-Fakhry may have been a high status neighborhood. The buildings have large rooms and well-carved limestone sills, such as the one shown in the photo on the next page. Some rooms even had painted walls and ceilings, as indicated by the traces of color we found on remains of plaster.

Training: All the Basics

At Mit Rahina, as with all of our Beginners Archaeological Field School programs, we taught basic excavation techniques, survey, site recording and mapping, photography, and burial excavation. Students also spent a week in the “laboratory” tents for an introduction to ceramics, object recording, conservation, illustration, archaeobotany, and archaeozoology. In addition, we were able to offer students basic training in ancient landscape reconstruction for the first time, described in the box on the next page.

Diverse Students, Outstanding Egyptian Staff

Our 29 students were a diverse lot, hailing from Middle Egypt, the Fayum, Cairo, and the Delta, areas that we targeted when selecting the MRFS

COMMEMORATIONS

ARCE Field Schools

The MRFS commemorates the beginnings of the American Research Center in Egypt (ARCE) field schools for Egyptian antiquities inspectors, launched in 1995 at Mit Rahina by Dr. Diana Craig Patch at the initiative of then ARCE Director Mark Easton and Assistant Director Ibrahim Sadek. We salute ARCE’s vision in starting the field schools, and also Michael Jones, Associate Director of the Egyptian Antiquities Conservation Project at ARCE, for the continual help and encouragement he has given the field schools.

Egypt Exploration Society

The MRFS also marked the 30th anniversary of the Egypt Exploration Society (EES) Survey of Memphis (SoM) project, initiated to commemorate the EES’s 100th year of archaeological research in Egypt. Initially directed by Prof. Harry Smith (University College London, [UCL]) and field directors Dr. David Jeffreys (UCL) and Dr. Lisa Giddy (Sydney University), the SoM recorded the remnants of Memphis, reconstructing the ancient landscape and movement of the Nile, and carried out one of the few settlement excavations in the area.



A worker excavates a limestone doorsill. The door socket and doorjamb slots are clearly visible.

class as the archaeological problems in these regions are similar to those at Mit Rahina. Women accounted for almost half of the students. One student in each of the five student teams was from the Department of Islamic Antiquities of the MSA.

We were delighted and very proud that the MRFS staff was predominantly Egyptian, mostly graduates of AERA-ARCE Field Schools. They reflect our sustained field school training and demonstrate the scope of skills taught over the full cycle of AERA-ARCE Field Schools. The Egyptian staff took the initiative with many aspects of the project, such as setting up a Geographic Information System (GIS). Through the entire program MRFS staff and students worked with endless enthusiasm, despite the heat, dust, and strenuous physical work.

Pushing Toward Publication

Although Memphis was one of the preeminent cities of the ancient world, very little excavation has ever been carried out in the domestic parts of the city. The MRFS helps redress this imbalance. We hope to continue work at Kom el-Fakhry, and with the field school, bring to publication this complicated and interesting site.

MRFS Acknowledgements

The EES team of Dr. David Jeffreys (UCL), Dr. Judith Bunbury and Pedro Gonçalves (both of Cambridge University, UK), brought to the field school their knowledge of core sampling, geomorphology, and landscape reconstruction.

The initial site survey for the MRFS was greatly facilitated by surveyor Olivier Onezime and his assistant Mohamed Gabr of the French Archaeological Institute. We thank Director Dr. Béatrix Midant-Reynes for the services of the survey team.

Special thanks to the Charles and Lisa Simonyi Fund for Arts and Sciences and Susan Hutchison for their support of the Mit Rahina Field School.



Foreman Fakhmy, veteran borer at Memphis, works with students Nabil Abd el-Lattef and Rabiee Akl (left) as part of the EES ancient landscape training.

Landscape Reconstruction

Our collaboration with the EES allowed us for the first time to teach students how to gather evidence for reconstructing the ancient environment. Drilling with augers deep into the ground, the students brought up long cores of earth that offered a profile of deeply buried layers. Their cores showed a very long period of human occupation as well as evidence of river activity. We found at the deep end of the cores a layer showing stream-deposited sand, which may represent an island or a bank of a paleo-river channel on which the settlement was founded. This is consistent with the results of the EES environmental studies, that the Nile initially was located on what is now the west side of Memphis and migrated eastward over time.



The AERA-ARCE Mit Rahina Field School 2011 was made possible by the generous support of the American people through the United States Agency for International Development (USAID).



The contents of this article are the responsibility of AERA and do not necessarily reflect the views of USAID or the United States Government. Funding was provided through the American Research Center in Egypt (ARCE) USAID grant (No. 263-A-00-04-00018-00).



2011–2012 ARCHAEOLOGICAL FIELD SCHOOLS: *Taking Charge, On-the-Job Training*

Teachers Hanan Mahmoud (left) and Mohamed Abd el-Rakhman check trainees' paperwork in the Menkaure Valley Temple. Hanan, teacher and supervisor of many AERA-directed field schools, has been an AERA team member since 2004. Mohamed joined us as a student in the Salvage Archaeology Field School in 2008 followed by more AERA-ARCE Field Schools.

Taking Charge

The AERA-ARCE Field School has trained a large number of very professional and committed Egyptian archaeologists. Our graduates now run almost all aspects of the field schools, as seen in the Mit Rahina Field School in Fall 2011.

Many graduates have also initiated and taught in Ministry of State for Antiquities (MSA) field schools. Following the MRFS our graduates ran a field school in North Saqqara, teaching not only excavation and recording techniques, but also an introduction to specialist studies such as archaeobotany, ceramics, and human osteology. They now also run a field school at Giza for new MSA inspectors, covering the basics of excavation techniques and recording. We encourage them to use our teaching materials, manuals, and lectures and offer support and advice.

On-the-Job Training

During our 2012 Giza field season we continued teaching inspectors through on-the-job training. As we had just completed the large field school at Mit Rahina in November, we could not mount another full-fledged program starting in January. However, with four areas under excavation, we seized the opportunity to train 27 local Giza MSA inspectors by integrating them into the AERA team.

Most of the students worked on excavations, two worked with the ceramics team, two with the objects registrar, one with the surveyors, and another with the photographer. Although trainees did not attend formal daily lectures or take weekly exams, they participated in all steps of the excavation and recording process. By training on the job, they acquired and practiced the basic skills needed on an archaeological site. Their work was an integral part of the team's accomplishments in the Giza 2012 season.

Right top: Hands on! Giza trainee Marwa Mohamed Mohamed excavates at the Menkaure Valley Temple.

Right bottom: Ceramics teacher Mahmoud Shafey (left) and trainee Shima Alaa el-Deen Abd el-Rahman discuss a pot base on the Khentkawes Town site.



ARCHAEOLOGICAL SCIENCE: Hippo Hip and Olive Pit

Every season the AERA Field Laboratory sends down word of discoveries that open windows onto life in the 4th Dynasty. This season a hippo hip and an olive pit add to clues that the occupants of the Lost City galleries might have enjoyed a higher status than common laborers and perhaps assisted royal rituals. Added to the olive wood charcoal previously discovered at the Lost City site, the pit is the oldest example of olive in Egypt. The hippo figured prominently in Egyptian iconography, religion, and ritual.

Hippos at Giza

Team members found the complete adult hippopotamus hip broken and crammed into the fill of a niche in the main eastern wall of the southeastern cooking chambers of Gallery III.3 (discussed on pages 14–15). This was not our first hippo find. AERA faunal analyst Richard Redding has identified 21 hippo fragments, mostly bits of tusk, as well as a foot bone and a kneecap. The presence of various body parts suggests that whole animals—and not just tusks for carving—ended up at Giza. Considering the scatter of bone, it is likely that the hippos were consumed. Adults—weighing up to three tons—would have been a meat bonanza.

Hippos in the Nile Valley

During the Pharaonic period and earlier, hippos—the largest mammal at that time in Egypt—were common throughout the Nile Valley, coexisting uneasily with people. They spend their days semi-submerged in shallow marsh waters and along river banks and emerge at dusk to graze on land, primarily eating short grasses and consuming vast quantities every night. Hippos could have easily decimated cereal fields in short order and stripped meadows where livestock grazed. During

The AERA Field Lab nestled amongst the giant mastaba tombs in the Western Cemetery at Giza. View to the south with the Khafre Pyramid rising prominently in the background and the Menkaure Pyramid visible in the distance.

the inundation when land was scarce, hippos and people must surely have been in fierce competition.

Although the animals are dangerous and difficult to kill, hippo is the most abundant game animal found in settlement sites in Lower Egypt dating from the Predynastic and Early Dynastic periods. But hippos were more than game in ancient Egypt. They were oft-used metaphors in iconography and religion.

Hippo Iconography, Royal Ritual

The female hippo represented fertility and protection as she aggressively defends her young. Thus the goddess of birth and fertility, Taweret, sported a hippo's head, and women wore amulets in the shape of hippos. The male hippo served as a metaphor for chaos, evil, and destruction in hippo-harpooning scenes on scarabs and in tombs of both nobles and kings. In the scene on the facing page from the entrance hall of the pyramid temple of the 6th Dynasty pharaoh Pepi II, the king stands on his reed boat, about to drive a harpoon into the hippo, while holding the ropes tied to harpoon points embedded in the hippo's mouth. This is monarchical order overpowering chaos at the temple entrance to secure the inner temple zone, symbolically strengthening and regenerating royal power.

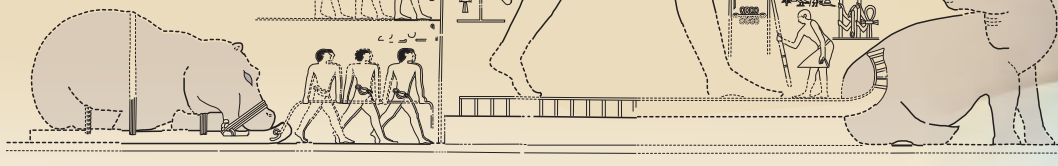
Captive Hippos

In the Pepi II scene a second hippo appears to be a live animal tied to a sled being pulled by the king's men. We believe this depicts the king's troops arriving with a captured hippo that was brought to the site for enacting the hunt ritual.

Scholars have found compelling evidence that Egyptians did indeed capture and confine wild animals. Richard also concluded that hippos were brought to Giza alive, based on the fact that some of the largest, deepest bones are found there, such as the pelvis. We can imagine that hippos were kept in water nearby until the ritual. During the event the royal guard probably speared en masse to dispatch the creature, stepping aside, per-



Limestone relief scene of the 6th Dynasty king Pepi II harpooning a hippopotamus, from the entrance hall of the upper pyramid temple of Pepi II at South Saqqara. Drawing after G. Jéquier, A. E. Youssef, and J. P. Lauer, *Le monument funéraire de Pepi II*, Tome III: Les approches de temple. Cairo: Institut français d'Archéologie Orientale, 1940, pp. 20–22, pl. 32.



Right: Richard Redding points to the socket of one side of a pieced-together hippo hip found in Gallery III.3 (page 15) stuffed in a niche as fill along with rocks, mudbrick, and pottery.



haps, for the king to deliver the final blow. We consider, as a hypothesis, that the king's guard quartered in the galleries—at least for a time, and perhaps serving in rotation.

Oldest Olive Pit

From an ashy deposit near the hippo hip, AERA archaeobotanist Claire Malleson identified a charred olive pit. Previously, the only olive pits known before the 18th Dynasty were from a context with a questionable Middle Kingdom date. How do we account for this olive at 4th Dynasty Giza so much earlier than any other examples in Egypt? Perhaps a stray olive ended up with a shipment of olive oil from the Levant, where olives have been pressed since the 4th Millennium BC. From the Old Kingdom on, olive oil was imported to Egypt, probably in storage jars such as those found in the mastaba tombs of high officials. We have found fragments of this hard-fired ceramic, called combed ware after the striations etched across the outer surface, suggesting that oil might have been delivered to the Lost City site—perhaps for storage before it went to the tombs as offerings. Or the oil might have been a luxury for high status residents.

The olive pit is not our first instance of olive; charcoal analyst Rainer Gerisch has found bits of charred olive twigs scattered throughout the settlement—the oldest olive wood in Egypt.* The twigs, probably prunings, may have come as packing material for oil shipments. Rainer found the olive twigs associated with bits of other Levantine woods, such as cedar, pine, and oak. If the woods did indeed travel with storage jars, we can pin the source down more precisely. Our combed ware came from Lebanon, according to ceramicist Mary Ownby

who determined its provenance through clay analysis.

The woods found with the olive charcoal suggest yet another possible explanation: Egyptian workers brought olive twigs back from the Levant with timber shipments. In Old Kingdom temple scenes, squads of young men comprising the troops of the royal guard occur in association with ships and boats. Egyptologists have long recognized that the phyle organization of workers and temple priests was the same for nautical crews. When crews went to the Levant to fell trees, they may have taken firewood for the return trip, perhaps even olive pits, which make good fuel. Our olive specimen—two complete halves—may have come from fruit eaten out of hand or a spoiled olive. It was not a by-product of an olive press, as pressing crushes the stones.

Purveyors to the King

However the olive came to Giza, the wood and fruit bespeak trade goods from the Levant coming through the Lost City settlement. The hippo hip suggests a live animal held nearby and possibly a ritual harpooning and a royal entourage to capture the beast and assist in slaying it. Troops of the royal suite may have been commissioned for duty far—as far as the Levant—and near—as near as the marshes where hippos lurked. And rather than common workers packed in the galleries like sardines, it may have been these young men of the elite troops who spent time in the Giza galleries, where they enjoyed the spoils of royal procurement.

*The olive wood finds are discussed in *AERAGRAM* 8-2, page 3, 2008, available for free download at aeraweb.org.

GLEN DASH FOUNDATION SURVEY: Data for First Accurate Archaeological Map of the Giza Plateau

The 2012 Glen Dash Foundation Survey took AERA back to its beginnings: the Giza Plateau Mapping Project, launched by Mark Lehner and David Goodman in 1984 to create an accurate map of the natural and man-made features of the entire Giza Plateau. Despite the intense interest in the pyramids over the centuries, no one had yet produced a good topographic map that showed the precise locations of the pyramids and other monuments at Giza.

Mark and David laid the groundwork for the map with a survey control network. But the map was never completed—more urgent projects demanded our attention. Thanks to the Glen Dash Foundation, the GDFS picked up where Mark and David left off. During Season 2012 the GDFS team collected much of the data needed to finally create the map.

The Local Grid

Mark and David began the Giza Plateau map by setting up a local grid that would be used to fix any point around the plateau with respect to any other. David based his grid on 11 primary control stations—chosen in part for their clear sight

Mohamed Abd el-Basat, Mark Lehner, and Mohsen Kamel search for traces of the Khafre Causeway in order for members of the Glen Dash Foundation Survey to map it.

lines—which formed a 5.4-kilometer (3.4-mile) loop around the plateau. The loop “closed” to one part in 326,762, meaning that we would be able to establish the location of any point on or near the plateau to within one centimeter. David also established 32 secondary control points. Once the grid was established, we could have quickly mapped the exact location of Giza’s pyramids, temples, causeways, and mastabas. But our attention shifted to excavation.

Excavations

In 1988 AERA began excavations in an area south of the Sphinx and discovered the previously unknown settlement of the pyramid builders, Heit el-Ghurab (aka the Lost City). This site was too important to not give it our full attention. For the first time we had the footprint of monument-building operations at Giza; the archaeological remains captured the “neural circuitry” of the organization that went into marshaling and coordinating manpower and resources to build the Giza pyramids. We had a window onto the development of ancient Egyptian bureaucracy, one of the world’s first states. But it could be lost if we did not act quickly; the Heit el-Ghurab site was threatened by the ever-expanding metropolis on the east, the tourist trade, and a rising water table underneath. In 2005 we expanded our excavations west to the nearby 4th Dynasty Khentkawes Town site, which was rapidly erod-



ing, and in 2007 we began work in the adjacent Menkaure Valley Temple.

So, as of 2011, we still had no accurate archaeological map of the Giza Plateau. We could not even answer the most-oft asked question—where, exactly, are the Pyramids? In 2012 the Glen Dash Foundation Survey took up the challenge of finally answering those questions and gathering the data to complete the map.

The Survey

Beginning in February, Mark Lehner and the survey team reconnoitered each major pyramid, temple, causeway, and tomb to decide where best to take survey points on what we believe to be the original builders' lines. It was clear we would have our difficulties. After 4,500 years and millions of tourists, there is hardly a well defined edge or corner left at Giza. The 4th Dynasty tomb of Akhethetep and Meritites in the cemetery east of the Great Pyramid was a case in point. While maps of Giza show the tomb as a rectangular feature with well-defined walls, in fact nothing of its corners and few of its lines remain. To establish the tomb's true location on our maps, the best we would be able to do would be to take as many survey points around its periphery as possible, and then stitch them together by eye or by way of a statistical analysis.

The Great Pyramid itself was another example. Despite 200 years of archaeological scrutiny, we still do not know precisely its dimensions or the locations of its corners. Like

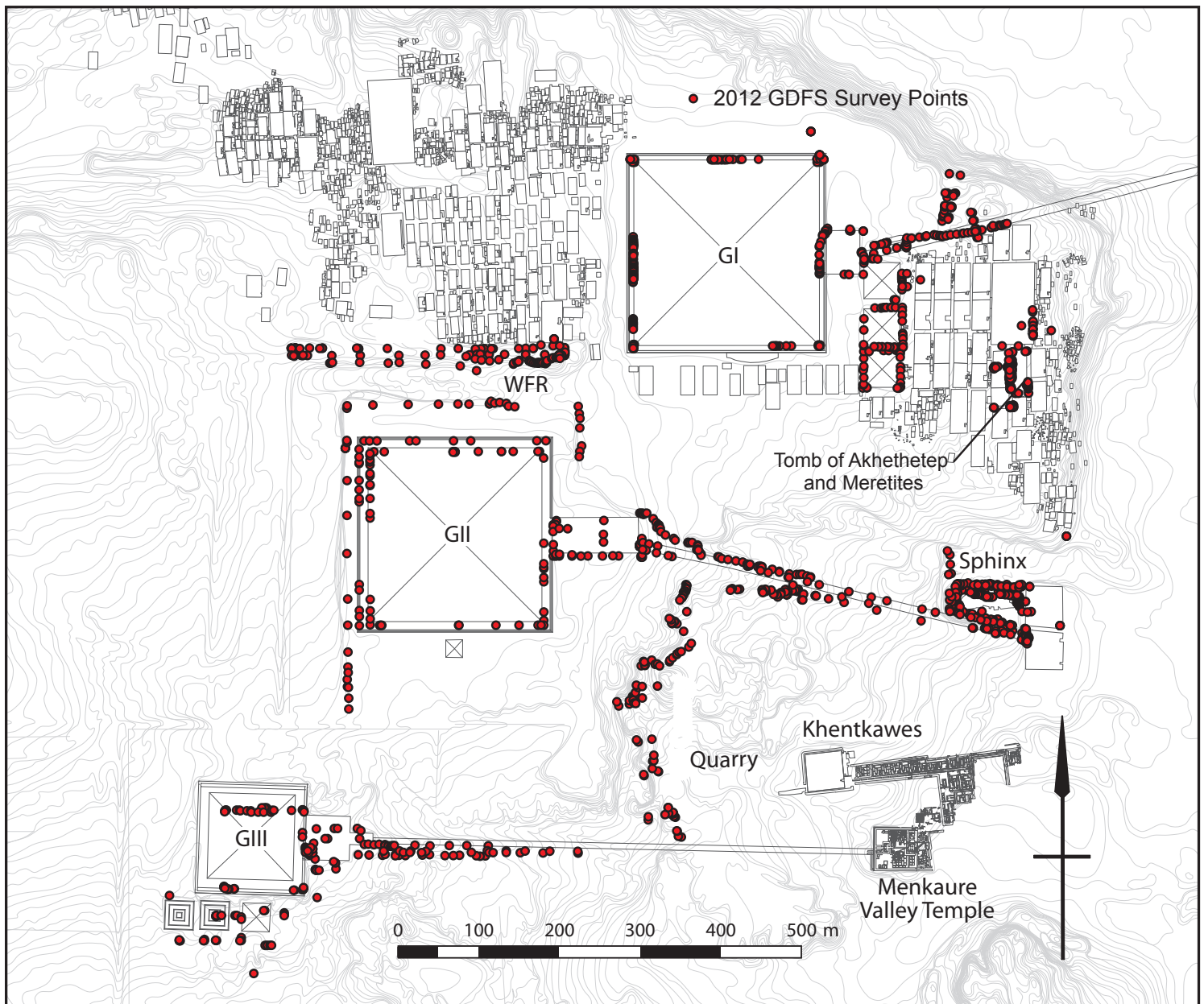


Top: Mohamed Abd el-Basat, Field School surveyor, sets up the reflector rod, while Giza survey trainee Mohamed Helmy Abd el-Halim, takes notes on the location of the survey point.

Middle: Amr Zakaria, survey graduate from the first Advanced Field School in 2006, and Giza trainee Mohamed Helmy Abd el-Halim, set up the total station on top of the southernmost pyramid of Khufu's Queens.

Bottom: Survey team members Becky, Glen, and Joan Dash pose in front of the Great Pyramid. They joined the survey in the third week of February.





Survey points taken by the 2012 Glen Dash Foundation Survey Project, shown in red. The 2012 survey reveals a need to shift southward the Menkaure Pyramid (GIII), temple, and causeway. WFR stands for Western Field Ramp, an ancient construction embankment along an unfinished colossal stone wall. Map prepared by Rebekah Miracle, AERA GIS.

the tomb of Akhethetep and Meretites, little of its outer casing survives. Here again, the best we could do was map as many points along its periphery as possible. Then we could project its original lines and corners by extrapolation.

As the survey team subsequently carried out the survey, they gave each point a number and documented it with a photograph, description, and date. They sketched each corner and wrote notes on where and why they took particular points.

This process would be repeated more than 200 times around the Great Pyramid and more than 1600 times as we worked our way across the plateau. The map above shows all the points the survey team measured. In most cases, Giza's monuments were about where we expected them to be. However, our new data gives us their exact location whereas before

we only knew their approximate positions. In a few cases, we were surprised by our findings. For example, our best available maps placed the Menkaure Pyramid more than 20 meters (65.6 feet!) from its true location.

Despite the many points the team surveyed, they were unable to gather all the data needed to complete the map. They will resume next field season and finish the project. When all the survey data is entered into the AERA Geographical Information System, it will be used to produce new maps of Giza with unprecedented accuracy. These maps will be a great boon to Egyptologists and archaeologists as well as nonprofessionals interested in Giza. We are sure they will affect theories based on pyramid alignments.

AERA ARCHIVES: 30 Years of Data

The AERA Archives—one of our most precious assets—encompasses the records of our survey, mapping, excavation, and material culture analyses from over 30 years of archaeological work in Egypt, plus our administrative and financial records. Until this spring we curated the archives to the best of our abilities as archaeologists. But in March we made the leap to professional curation. Megan Lallier, a masters candidate in archiving and library science at Simmons College, Boston, joined our team as Head Archivist.

In the short time she has been on staff, Megan has brought new vision and direction to the way we organize and access our collections. With an eye to the future, she created an archives mission statement, redesigned the layout of the room in our Boston offices where we house our archive in order to maximize storage space, inventoried all archival materials, and hired a new Assistant Archivist for our AERA-Egypt Mark Lehner Center.

Megan is also collaborating with other team members on a Comprehensive Information Management System that will combine excavation and survey data, photographs, reports, and all AERA administrative and financial records.

In addition, Megan laid the groundwork for an exciting new phase in which we will open our archive to public users interested in our history and archaeology.



Megan Lallier, AERA Head Archivist, shelves notebooks in the Boston Archives.



In addition to the vast collection of photos we have taken, the AERA Archives include a photographic record of Giza from the late 19th century to the present in the way of visitor photos, stereo photo cards, and old postcards that we have collected over the years. These offer valuable information about Egypt in the late 19th and early to mid-20th centuries. The postcard at the left shows the floodplain adjacent to the Giza Plateau during the annual inundation. Digital photo of postcard courtesy of George Mutter.

MARK LEHNER CENTER: Home Base at the Pyramids

Our AERA-Egypt Center at the foot of the Pyramids has become a fine base of operations for us in Egypt. During the field season it supports our team and field school with work space, computer stations, archives, a library, offices, a kitchen, and a home. The Center secures our equipment during the off-season and allows us to keep our archives and library open year-round for AERA staff in Egypt as well as for our former field school students and for colleagues. It also provides accommodations for team members during off-season visits. Additionally, having a year-round base vastly simplifies the process of opening and closing field seasons and offers far better facilities than we could rent.

In short, we are delighted with the Center. But we have a greater vision for our home base: to emerge as a first rate archaeological facility in Egypt and the center of an international community of archaeologists. To fulfill the center's potential, we need to build additional facilities on the property, which currently includes only the original villa and a small staff building with a rooftop work space, which we added in 2011. We began planning more than a year ago by identifying our needs, shown in the table on the facing page. This year, after our property was officially recorded with the Egyptian Registry and Documents Office, we selected an architectural firm for the development project. From among the

three companies that we interviewed we chose Ramses Noss-ahi of MADA Architects and we also selected a design consultant, Nicholas Warner. MADA and Nicholas had the best understanding of our needs and are dedicated to constructing sustainable buildings. The MADA portfolio includes designs that use traditional, vernacular architecture, and Nicholas has been involved in both the restoration of older structures and the construction of archaeological dig houses in Egypt.

They will be developing plans and producing construction drawings that are suitable for submission to the permit-issuing authorities in Giza. We are excited about working with Ramses and Nicholas to produce a complete plan for the use of the Center and a visionary building program.

Honoring the Donors

As we continue to develop the Center and our programs, we are very grateful to all those who have helped make us the strong, vibrant organization we are today. We are delighted to recognize the generous benefactors who made it possible

The Mark Lehner Center, AERA's home base in Giza, Egypt. Below: One of the center pathway signs for Lurie Lane, named in honor of board member and major donor Ann Lurie, who helped AERA buy and renovate the Center property.





Thanks to Our Benefactors

We are grateful to generous donors whose major gifts made it possible for us to establish the Mark Lehner Center: the Waitt Family Foundation, the Ann and Robert H. Lurie Foundation, the David H. Koch Foundation, Charles and Lisa Simonyi, Peter Norton and the Isambard Kingdom Brunel Society, Dr. Marjorie Fisher, and the Urban Land Institute tour members on behalf of Bruce Ludwig.

Above: Fountain rebuilding in progress. Top: Craftsmen work on the back wall with a fishing scene based on an Old Kingdom tomb relief. Inset: detail of the fishing scene. The fountain is named in honor of the late George Link, longtime AERA board member and legal counsel. Right: The Mark Lehner Center villa provides a comfortable place for AERA team members to discuss their work.

for us to buy and renovate the Center property. The walkway around the villa and garden now bears the name Lurie Lane, for Ann Lurie. The intellectual focus of the Center is the Ted Waitt Library and Lecture Hall. Our computer lab we named the Charles and Lisa Simonyi Synergy Center. Koch Commons, where we gather to discuss work and relax, is named after David Koch. The upper floor of the main building complex we dubbed Villa Giuseppe Ferlini, after the explorer who lopped tops off Nubian Pyramids, per Peter Norton's wish. We designated the main floor *Bayt** Susan for Susan Hutchison and all her counsel. The Fisher Garden honors Marjorie Fisher.

A charming fountain on the property is now named for longtime AERA board member and legal counsel the late George Link. This past year we began rebuilding it incorporating Egyptological motifs. Flanking the fountain we began creating our Donor Wall of Honor, which will recognize all our major donors.

Finally, at the request of Ann Lurie, the AERA-Egypt Center is now the Mark Lehner Center.

*Bayt is "house" in Arabic.



PROPOSED ADDITIONS FOR THE MARK LEHNER CENTER

- Dormitory complex for 30 researchers, excavators, and teachers in order to house our entire staff on site.
- Lecture hall for field school classes and public outreach to the archaeological community in Egypt.
- Specialized laboratories for archaeological sciences and illustration/photography.
- New kitchen/dining room to feed a larger staff on site and turn the existing dining area into workrooms.
- Director's/guest house.

EXCEEDING EXPECTATIONS:

With the end of the three-year plan launched in July 2009, we look back on what we accomplished.

Livestock corral and possible slaughterhouse



EXCAVATIONS

Proposed

Digs in:

- ❖ Lost City
- ❖ Valley Complex of Khentkawes
- ❖ Menkaure Valley Temple

Accomplished

Major discoveries:

- ❖ Lost City: Livestock corral
- ❖ Khentkawes Valley Complex: East end of basin
- ❖ Silo Building Complex: 5th Dynasty pyramid town
- ❖ Menkaure Valley Temple: Missing 5th Dynasty occupation



East end of basin in Khentkawes Valley Complex



Silo Building Complex, 5th Dynasty pyramid town



Missing 5th Dynasty phase in the Menkaure Valley Temple

3-YEAR PLAN 2009–2012

In many ways we exceeded our expectations. Here are some examples:

FIELD SCHOOLS

Proposed

- ❖ 3 AERA-ARCE Field Schools
- ❖ Empower students to teach
- ❖ Empower students to do research and publish

Accomplished

- ❖ 4 AERA-ARCE Field Schools
- ❖ AERA-ARCE Field School graduates:
 - ❖ Taught in 3 and helped run 2 AERA-ARCE Field Schools
 - ❖ Initiated and ran 2 field schools for the Egyptian Ministry of State for Antiquities
 - ❖ Worked as full Giza team members
 - ❖ Prepared publication on Luxor Field School excavations
 - ❖ Gave 2 presentations at annual meetings of American Research Center in Egypt



Mit Rahina Field School



Luxor Salvage Archaeology Field School



Analysis and Publication Field School



Luxor Study Field School

EXCEEDING EXPECTATIONS:



The 2011 AERA team on the porch at the Mark Lehner Center

MARK LEHNER CENTER

Proposed

- ❖ Create home base for AERA team and AERA-ARCE Field School program

Accomplished

- ❖ Renovated property and created a home base for AERA operations
- ❖ Added staff-utility building with rooftop workspace and classroom
- ❖ Began planning additional facilities
- ❖ Began raising funds for construction
- ❖ Received funding for dorm rooms
- ❖ Selected architect to design facilities



Field School students work in the rooftop classroom



Reconstruction of House E Khentkawes Town

CONSERVATION

Proposed

- ❖ Reconstruct a house in Khentkawes Town

Accomplished

- ❖ Reconstructed House E in Khentkawes Town

3-YEAR PLAN 2009–2012

ARCHAEOLOGICAL SCIENCE

Proposed

- ❖ Launch climate change study
- ❖ Complete analysis of material culture from Area AA at the Lost City site
- ❖ Train field school students in archaeobotany and archaeozoology

Accomplished

- ❖ Roger Flower (Dept. of Geography, University College London) analyzed drill cores for evidence of environmental change
- ❖ Completed analysis of material culture from Area AA at the Lost City site (ceramics, lithics, plant and animal remains, charcoal, clay sealings)
- ❖ Archaeobotanist Claire Malleson discovered oldest olive pit in Egypt
- ❖ Trained Egyptian student Rebab el-Gandy in archaeobotany
- ❖ Trained Egyptian student Rasha Nasr in archaeozoology; she now teaches in AERA-ARCE Field School



Roger Flower analyzing drill core samples



Archaeobotanist Claire Malleson



Archaeozoologist Rasha Nasr analyzes animal bone at the Mit Rahina Field School



Rebab el-Gandy training in archaeobotany

SHARING OUR

Scholarly Publications for 2011–2012

YUKINORI KAWAE

(and Hiroyuki Kamei) 2011. "Geomorphological Aspects at the Giza Plateau in Egypt during the Age of Pyramid Building." *Journal of Geography* 120 (5): 864–868.

2012. "3D Data of the Tomb of Khentkawes [I] and its Interpretation." PhD dissertation, Nagoya University.

ANNA WODZIŃSKA

(and Mary Ownby) 2011. "Tentative Remarks on Levantine Combed Ware from Heit el-Ghurab, Giza." *Egypt and the Near East - The Crossroads*, ed. Jana Mynářová. Prague: Czech Institute of Egyptology, Charles University, pp. 285–295.

Potmarks of the Early Dynastic Buto and the Old Kingdom Giza. Their Occurrence and Economic Significance, *Egypt at its Origin 3*, ed. by R. Friedman and P. N. Fiske, *Orientalia Lovaniensia Analecta* 205, Leuven: Peeters Publishers and Booksellers, pp. 1073–1096.

"Everyday life in the Workers' Village at Giza." *Z Bliska i Daleka (From Near and Afar)* (journal published by the Institute of Archaeology, University of Warsaw) 1: 49–54.

Lectures and Conference Presentations

(See also the symposia talks listed in the box on facing page)

GLEN DASH

"The Solar Alignments at Giza." ARCE and the Boston University Dept. of Archaeology. Boston University, Boston, MA, November 2, 2011.

JESSICA KAISER

"Giza Through Time and Space: The Renegotiation of a Sacred Landscape." Krannert Art Museum, University of Illinois, Champaign, IL, October 16, 2011. Burpee Museum of Natural History, Rockford, IL, October 18, 2011.

"The Wall of the Crow Cemetery in Giza, Egypt: Remembering the Children." IUPUI Indianapolis, Indianapolis, IN, October 17, 2011. Florida State University, Tallahassee, FL, October 20, 2011.

YUKINORI KAWAE

"3D Survey at Giza, Egypt." 2011 Symposium of Japan Society for Archaeological Information, Doshisha University, Tokyo, September 10, 2012.

MARK LEHNER

"The City of the Builders of the Pyramids and Other AERA Projects." The Bungie Theater at the Bellevue Galleria, Bellevue, WA, September 13, 2011.

"Living at the Pyramids - Settlements in the Southeastern Zone of Giza." The Pyramids: Between Life and Death Workshop. Uppsala University, Uppsala, Sweden, May 31, 2012.

CLAIRE MALLESON

"Five Loads of Grass, Four of Dung and Two of Straw: Archaeo-botanical Research in Egyptian Settlements." Friends of the Petrie Museum, Petrie Museum, London, May 6, 2011, and Sussex Ancient Egypt Society, Sussex, UK, June 30, 2012.

JOHN NOLAN

"Media Day: Introduction to the Lost Egypt Exhibit for the Press." Boston Museum of Science, May 26, 2012.

ANA TAVARES

"What is This? Objects: a View from the Excavation Site." Supreme Council of Antiquities training course for staff of the Islamic, Coptic, and Pharaonic Museums. Museum Sector, SCA, Cairo, October, 2011.

"AERA/ARCE's Archaeological Field Schools" for the "Archaeology of Ancient Egypt," undergrad course taught by Dr. David Jeffreys, Institute of Archaeology, University College London, London, January 26, 2012.

Scholar in Residence. Science Center of Iowa. "Lost Egypt: Ancient Secrets, Modern Science" Exhibit and "Girls in Science" program. Des Moines, Iowa, February 14–18, 2012.

"The Pyramid Complex of Queen Khentkawes: Recent Excavations at Giza." Hotel Ròseo Euroterme Bagno di Romagna, Italy. June 29, 2011.

ANNA WODZIŃSKA

"Local versus Imported Pottery from Heit el Ghurab, Giza." Old Kingdom Pottery Workshop. Warsaw, Institute of Archaeology at the University of Warsaw, July 6, 2011.

"Bakeries, Breweries and Ceramics. Works of Ancient Egypt Research Associates at Giza." Humboldt University, Berlin, July 13, 2011.

"Potmarks on Old Kingdom Bread Molds and Their Significance in Domestic Contexts," Conference on Non-Textual Marking Systems in Ancient Egypt, Institute of Archaeology, University of Warsaw; December 16, 2011.

"Daily Life at the Workmen's Village at Giza," Social High School No 16, Warsaw, December 5, 2011.

WORK

Sharing Our Training Expertise

Ana Tavares served as consultant for a site management project at Saqqara run by the Ministry of State for Antiquities (MSA) and EQI, an Egyptian firm. The project aims to create a sustainable development plan for Saqqara. Ana coordinated the training component of the project, which included a one-week course on site development and management for senior MSA staff and a five-week training program for MSA inspectors from Saqqara.



Symposia Presentations

American Research Center in Egypt Annual Meeting, Providence, RI

Hanan Mahmoud: "Teaching Archaeology at the ARCE/AERA Field School: Memphis 2011." April 27, 2012.

Mohamed Naguib: "Teaching of Pottery at the ARCE/AERA Field School," April 29, 2012.

Ana Tavares and Mohsen Kamel: "More From Memphis: Excavations at the Middle Kingdom Settlement at Kom el Fakhry," April 27, 2012.

AERA-ARCE Field School graduate, now instructor and AERA archaeologist, Hanan Mahmoud gave an exceptional presentation on the Mit Rahina Field School 2011 training program at the annual meeting of the American Research Center in Egypt.



American Schools of Oriental Research Annual Meeting, San Francisco

AERA team members presented a session, "Breaking the (Data) Bank: Twenty Years of Integrating Multi-layered Evidence at the Worker's Settlement, Giza, Egypt," at the annual meeting of ASOR on November 19, 2011. Jessica Kaiser and Dr. Richard Redding presided over the session and presented the introduction.

Dr. Mark Lehner (given by Richard Redding): "From the Hole to the Pile: Research Design of AERA Excavations at Giza"

Rebekah Miracle and Camilla Mazzucato: "Synthesis and GIS: Not Just Providing Tools"

Dr. Mary Anne Murray (given by Ana Tavares): "The Challenge of Integrating Archaeological Data"

Dr. John Nolan and Dr. Richard Redding: "Seal Impressions and Administration: Giza as a Laboratory of Cultural Complexity"

Ana Tavares and Mohsen Kamel: "Excavation: The Basic Data Set"

Dr. Anna Wodzińska: "Pottery and Settlement Use: Integration of Research Tools"

Harvard University Symposium Towards a New History for the Egyptian Old Kingdom; Perspectives On the Pyramid Age, Harvard University, Cambridge

Dr. Mark Lehner: "Shareholders: Understanding the Menkaure Valley Temple Occupation"

Dr. John Nolan: "Cattle, Kings and Priests: Phyle Rotations and Old Kingdom Civil Dates"

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 at advancing knowledge about our common human heritage. We are extremely grateful to the following foundations, businesses, and individuals who generously supported our work this fiscal year.

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1. AERA thanks Ed and Kathy Fries for invaluable help with development.
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