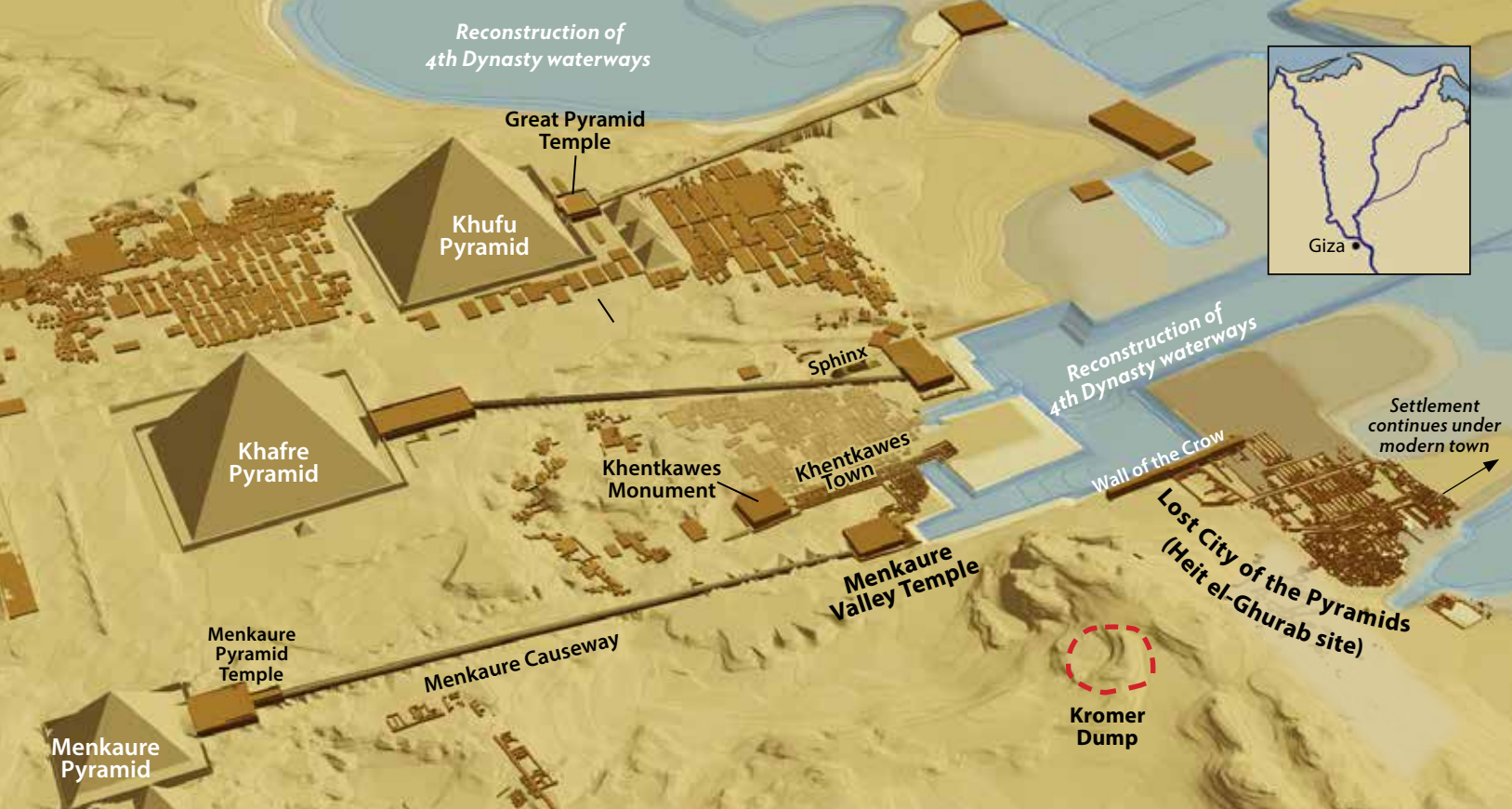


# Full Steam Ahead in the Field and Lab

Annual Report 2022–2023







## AERA: WHO WE ARE

For 31 years Ancient Egypt Research Associates (AERA) has brought together archaeologists and specialists from around the world to address questions regarding the origin, nature, and development of the Egyptian state—one of the earliest states of the ancient world.

We seek answers on the Giza Plateau, at our flagship site, “Lost City of the Pyramids” (also called Heit el-Ghurab, HeG), and the Kromer Dump site, where debris from HeG was deposited, as well as the Great Pyramid, Sphinx, and communities associated with the tombs of Pharaoh Menkaure and Queen Khentkawes. After more than three decades of field and laboratory work, we have constructed a nuanced interpretation of how the Egyptians supplied and transported raw goods and materials to build the pyramids and maintain the HeG settlement, a large urban center dating to the reigns of Menkaure, Khafre, and probably Khufu, builders of the third, second, and first Giza pyramids, respectively.

Excavation, analysis, publication, and educational outreach stand as pillars of our mission in Egypt. Through multidisciplinary analysis, rigorous archaeological fieldwork, and laboratory science we open windows on the everyday lives of Egyptians who built and administered the Giza Pyramids and Sphinx during the 4th and 5th Dynasties (ca. 2543–2306 BC) of the Old Kingdom. In 2005, with the sponsorship of the American Research Cen-

ter in Egypt (ARCE), we began an archaeological training program for Inspectors in Egypt’s Ministry of Antiquities. After completing more than 20 field schools and graduating more than 300 inspectors, AERA continues to embed this important outreach program within our core research.

Founded in 1985, AERA is a 501(c)(3) tax-exempt, non-profit research organization located in Boston and Giza, registered in Egypt as a foreign NGO. AERA-Egypt maintains the AERA-Egypt Center in Giza—a year-round base for our team, with library, archives, and meeting facilities. Our scientific and educational missions are supported by philanthropic individuals, foundations, and USAID government funding, as well as USAID in collaboration with the American Research Center in Egypt (ARCE).

Photos in the 2022–2023 annual report were taken by Mark Lehner, Dan Jones, and Sayed Salah Abd el-Hakim. Maps by Rebekah Miracle, AERA GIS.

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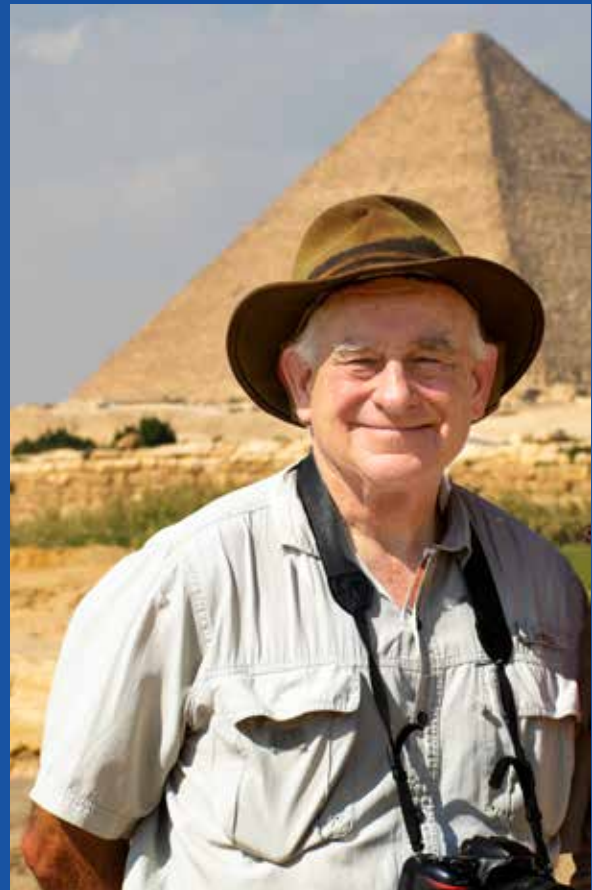
# PRESIDENT'S MESSAGE

## A Huge Reveal AERA 2022–2023

Since the old and derelict Abu Hol Sports Club and soccer field became available for excavation in the fall of 2021, thanks to the Ministry of Tourism and Antiquities, we have worked nearly year-round to take advantage. The soccer field lay directly above the Royal Administrative Building, or RAB. We have been telling you about the RAB since 2001, when we found it diving under the sports club, and since 2002 to 2007, when we excavated its northern end. We waited twenty years to salvage the rest of the RAB, with the question hanging: What might it have to do with a palace?

We spent much of last fiscal year (2021–2022) removing the modern structures and taking out the north-west and southwest corners of the club. Under the northwest corner we found port structures—corridors, ramps, magazines, and huge warehouse-like enclosures. Under the southwest corner we found a closure for the OK (Old Kingdom) Corral, its gate and frontage onto what seem to be the backyard service harbor of this (formerly) Lost City of the Pyramids, a harbor hidden still under deep water-logged sands filling an immense linear depression.

This fiscal year (2022–2023) we moved south into the RAB, where no one had gone before. We found its southern end and the last of the silos at the south end of the Sunken Silo Court. This was a real “Storehouse of Pharaoh,” with 30 large silos. Now we can calculate the total amount of grain stored in the silos (and its caloric value). Beyond the RAB south end, we found walls that frame trackways, possibly ramps leading down into the water-logged depression—our hypothetical harbor. Surprisingly, we found the RAB to be more permeable for folks in the Eastern Town than we might expect of a palace-connected building. In particular, multiple doors opened from the Eastern Town into RAB’s production yard on the north, our Area EOG (East of the Galleries) with its dozens of bakeries. (See the “real story” of the RAB on pages 6 and 12.) But



the RAB was also curiously permeable on the south. Rather than a palace per se, the RAB and the whole of the Lost City site belonged to a much wider palace city. The Wadi el-Jarf Papyri, discovered in 2013, tell us of a palace of Khufu, possibly inherited by Khafre and Menkaure, far to the north, near Khufu’s buried valley temple.

Next to the RAB on the east, we found 1,600 square meters more of the Eastern Town. The outlines of its streets, houses, workshops, and granaries showed as clear as a map in the surface of the ruins, an urban footprint not seen in nearly five millennia. To our surprise, the Eastern Town not only merges with the RAB, but the town also continues south, wharf-like, beyond the southeast corner of the RAB.

Next to the RAB on the west, long corridors in Enclosures 1–3 open onto ramps and terraces filled with smaller compartments. The latter open onto more corridors that descend deeper into the depression. The walls frame rectangular inlets off the depression, suggesting it was a harbor built with retaining walls.

*continued on page 4*



*President's Message continued from page 3*

Immediately next to the RAB on the west, we excavated Enclosure E1 and found it contained a workshop for crafting artifacts from alabaster. At the end of every day, our team members logged and bagged flint drill bits, hundreds of worked alabaster fragments, and even cores from drilling out alabaster vessels. Our results are now telling us this was no mere “Workers Town” (as our site is often called). Fine craftspeople, scribes of the highest governmental rank, as well as bakers, brewers, and maybe sandal makers all lived here.

Under the northwest corner of the soccer field, we found a large stone building, flanked by multiple ramps leading up from the harbor. It appears to be the northern outpost of the harbor. The stone-fortified house (ES2) that we excavated in 2015–2016 at the OK Corral was its mate and the southern outpost.

We found evidence of the final days of life in this pyramid city, as people abandoned and reused its material. We found the names, on clay sealings, of pharaohs Shepseskaf and Userkaf, the kings who ruled for a total of 11 years immediately after Menkaure, during the transition from the 4th to 5th Dynasty. (See the new dating evidence on pages 7 and 14.) Egyptologists who are experts in the 5th Dynasty suggest Userkaf and Shepseskaf may have been brothers, even twins. As young princes of the royal house, they may well have walked the Lost City site.

Just how precious and fragile is this new information? On October 25, a drenching downpour—the likes of which I had never seen—helped confirm a long-held understanding. The rain cut deep canyons through the escarpment above our site and flooded our excavations. Rain like this will dissolve mudbrick structures, like those of the Lost City, into a puree that looks like melted chocolate. That is why we preserve each place we excavate by covering it with fabric and sand after

each field season. At the same time, the October 25 storm gifted us a glimpse of the “forces of erosion” that, during a period of rapid climate change, cut a horizontal section through the site, and blew the material away. When the climate stabilized to where it is now, the wind brought fine sand, leaving a protective blanket up to 12 feet thick. When we pull back the blanket, we see the outlines of the city in that horizontal cut. Most of our map comes from these traces. We drill down on select areas and learn more from our dissections and the cultural material they yield about the elementary structures of the everyday lives of the people who built the pyramids.

In May we were shocked and deeply saddened when our dear colleague Richard Redding passed away unexpectedly. Brilliant archaeozoologist, beloved teacher, wise board member, generous donor, ever-patient and supportive colleague, and so much more, Richard left a very large void at AERA that we will never be able to fill. Still grieving, we are gradually adjusting and, as I write, scrambling to make plans for a field season without Richard’s steady hand, wide-ranging skills, and resourcefulness. Richard loved exploring under the soccer field, particularly testing his 2011 hypothesis about the OK Corral during our Spring 2022 season. When ground truth “injured” the theory, he revamped it. If only he could see his new ideas tested in the coming years.

This annual report is but a brief overview of the exciting work that your support has made possible. With your help we have been able to continue revealing the fascinating story of the Giza pyramid builders. Please stay with us for another season of discoveries.

With deep gratitude,



Mark Lehner

# SHARING OUR WORK

## Publications

### VICTORIA ALMANSA-VILLATORO

"In the Houses of the Menkaure Valley Temple: The *Pekher* Offerings in Texts and Archaeology," in *In the House of Heqanakht: Text and Context in Ancient Egypt. Studies Presented in Honor of James P. Allen*, edited by M. V. Almansa-Villatoro, S. Štubňová Nigrelli, and M. Lehner, Leiden: Brill, 2023, pages 3–17.

### VICTORIA ALMANSA-VILLATORO, SILVIA ŠTUBŇOVÁ NIGRELLI, AND MARK LEHNER, editors

*In the House of Heqanakht: Text and Context in Ancient Egypt. Studies Presented in Honor of James P. Allen*, Leiden: Brill, 2023.

### FLORENCE DUNN FRIEDMAN

"Evidence for more Statues of Menkaure," in *The Overseer of Works in Memphis and Thebes. Studies in Honour of Nigel Strudwick*, edited by M. Pitkin, Merseyside, UK: Abercromby Press, 2023, pages 45–59. (assisted by Michelle Pisa)

"Interpreting the Damage on the Boston Dyad of King Menkaure: Part I," in *In The House of Heqanakht: Text and Context in Ancient Egypt. Studies Presented in Honor of James P. Allen*, edited by M. V. Almansa-Villatoro, S. Štubňová Nigrelli, and M. Lehner, Leiden: Brill, 2023, pages 73–86.

### ZAHİ HAWASS, MARK LEHNER, and DANIEL JONES

"A Tour Around the Great Pyramid Temple. The Great Pyramid Temple Project 2020," *Scribe*, Spring 2023, pages 52–63.

### MARK LEHNER

"Giza Plateau Mapping Project," in *The Oriental Institute Annual Report 2021/22*, edited by C. Woods, Chicago: University of Chicago, 2022, pages 51–54.

"Sensory Experience and Social Space at Heit el-Ghurab, the Giza Pyramid Builders' Settlement." *Daily Life in Ancient Egyptian Settlements*, Sonderschriften des Deutschen Archäologischen Instituts Kairo 47, edited by J. Sigl, Wiesbaden: Harrassowitz, pages 131–149.

### WILMA WETTERSTROM

(Karin Sowada, Wilma Wetterstrom, Geraldine Jacobsen, Fiona Bertuch, and Margaret Serpico)

"Contents, Status, and Symbolism: The Study of Residues from Imported Jars at Old Kingdom Giza," *Journal of Ancient Egyptian Interconnections*, Vol. 37: *Egypt and the Mediterranean World from the Late Fourth through the Third Millennium BCE*, edited by K. Sowada and M. J. Adams, 2023, pages 281–300.

## Lectures and Presentations

### VICTORIA ALMANSA-VILLATORO and ALEXANDRA WITSELL

"The Seal(ers) of Giza: Seals of the *xm wDA* from Old Kingdom Contexts at Giza," Annual Meeting of the American Research Center in Egypt, April 21, 2023.

### FLORENCE DUNN FRIEDMAN

"Reading the Menkaure Triads as Heb Sed Accounting Documents," Annual Meeting of the American Research Center in Egypt, online, May 19, 2023.

### DAVID JEŘÁBEK

"Giza During the Kings of the Sun: Activities in the Proximity of the Khentkaus Town in the 5th Dynasty According to the Clay Sealings," Annual Meeting of the American Research Center in Egypt, online, May 19, 2023.

### MARK LEHNER

"Heit el-Ghurab and Wadi el-Jarf: Landscape and Waterscape at Giza When the Pyramids Were Built," The Southampton Ancient Egypt Society, Oct. 15, 2022.

"Home Office, Office Home: The Pilaster Niche Room in Early Egyptian Houses," Living in the House: Researching the Domestic Life in Ancient Egypt and Sudan Symposium, Institut français d'archéologie orientale du Caire and the Polish Centre for Mediterranean Archaeology, November 27–30, 2022.

"Rescuing More of the Lost City of the Pyramids – Season 2023 Update." Danish Egyptological Society, online March 4, 2023.

"The AEF-Funded Great Pyramid Temple Project," with Zahi Hawass, Annual Meeting of the American Research Center in Egypt, Minneapolis, April 22, 2023.

### CLAIRE MALLESON

"When Smoke Gets in Your Eyes: Domestic Fuels in Ancient Egypt," Living in the House: Researching the Domestic Life In Ancient Egypt and Sudan Symposium, Institut français d'archéologie orientale du Caire and the Polish Centre for Mediterranean Archaeology, Cairo, November 2022.

"Exploring the Links Between Agriculture and Ceramics Via Bread and Beer Production in Early Pharaonic Egypt," Brussels Institute for Advanced Studies Workshop: Interdisciplinary Approaches to Food History in Egypt, Université libre de Bruxelles, online, February 2023. Co-presented with L. Warden.

### RICHARD REDDING

"Animal Use in the Old Kingdom: The Value of Archaeozoology and the Comparative Approach," Bibliothec Alexandrina, Antiquities Museum, Afterlife Section, Alexandria, Egypt, October 26, 2022.

"Using Animal Bones to Understand the Diet and Economy of Ancient Societies," Kelsey Museum of Anthropology, University of Michigan, online November 4, 2022.

"Modeling Old Kingdom Economic Infrastructure: Can We Use Faunal Data to Look at Settlement Patterns?" Faculty of Archaeology, University of Warsaw, online May 9, 2023.

### MANAMI YAHATA

"AERA Excavations on the Giza Plateau," Safir Etap Hotel in Dokki, Cairo, March 2, 2023.

"Ancient Egypt: Study and Analysis of Roofing Materials and Plaster of the Old Kingdom Houses, Giza," The Asahi Culture Center Osaka, Japan, online, March 24, 2023.

# FIELD WORK 2022–2023

We continued working at our flagship Heit el-Ghurab site in areas that had been buried under the Abu Hol Sports Club soccer field. We uncovered most of the silo court in the Royal Administrative Building (RAB), excavated Enclosure 1 (E1), and revealed more of the HeG footprint in the Western and Eastern Towns. The work answered lingering questions, but also produced unexpected discoveries prompting new questions.

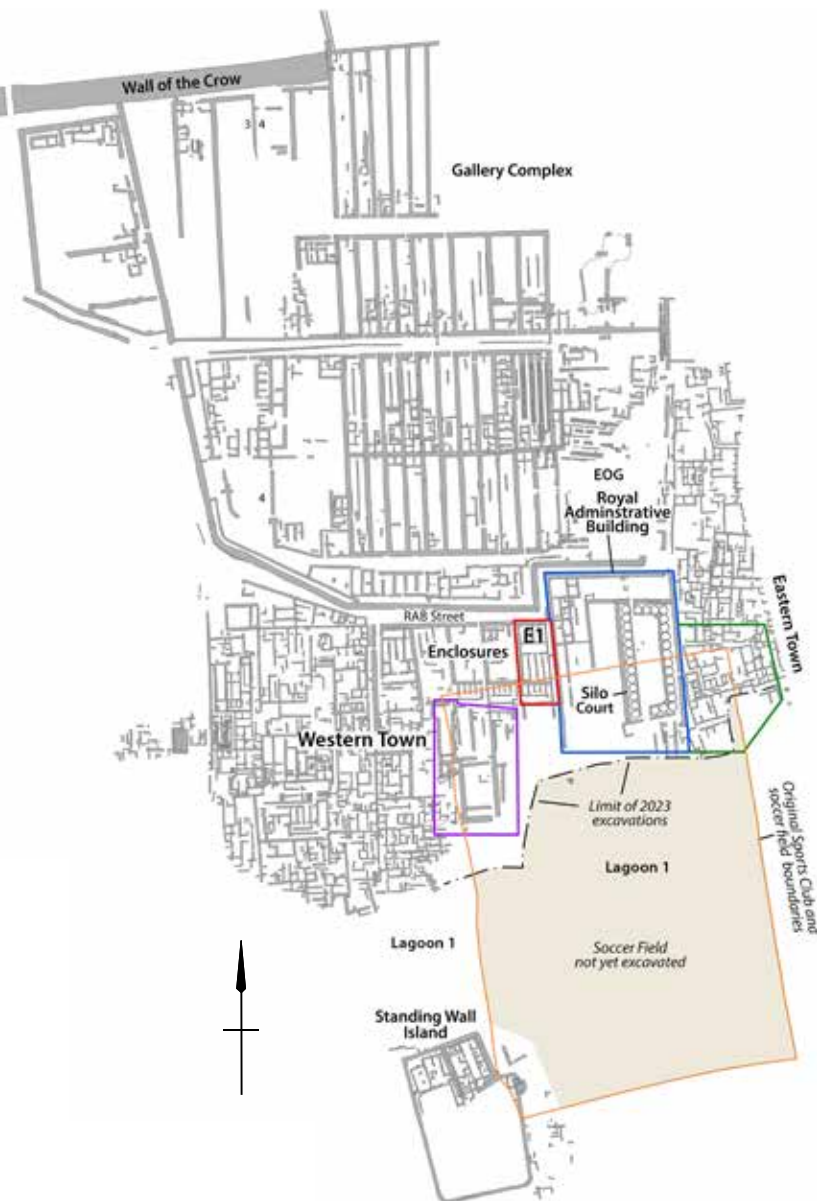
## Royal Administrative Building

We finally resumed excavations in the sunken silo court where we had last worked in 2005, this time free to dig what had been previously covered by the modern soccer field. Round mudbrick silos, about 2.62 meters in diameter, line the court walls on all four sides. Between the structures and the outer wall of the court on all four sides, a narrow corridor, with a floor higher than the silo bases, allowed workers to fill the silos from the top. Inside the court they removed grain, or other stored material, from openings near the bottom of the silos.

The silo court floor sloped down gradually from east to west, with the north row of silos following the slope. Quite unexpected, we found the silos in the eastern row were based about half-a-meter higher than those on the north. A small ramp leads up to the silo in the northeastern corner and a low retaining wall runs along the fronts of the eastern silos. Why the builders raised the eastern silos higher, we do not know. We also do not know how high the silos stood, but they were probably domed.

The silo court,  $39 \times 17.50$  meters (7,346 square feet!), probably held 30 silos; we have excavated or uncovered walls of 15 so far. Four entrances opened into the court: one on the north, two in the south, and one in the east through the outer wall of the RAB. We hypothesize grain and other goods could have been delivered up into the RAB from boats in a harbor that filled with water during the inundation. RAB and the southeastern part of the HeG slope down to the south into a depression filled with sand soaked in ground water, the remains of our hypothetical harbor.

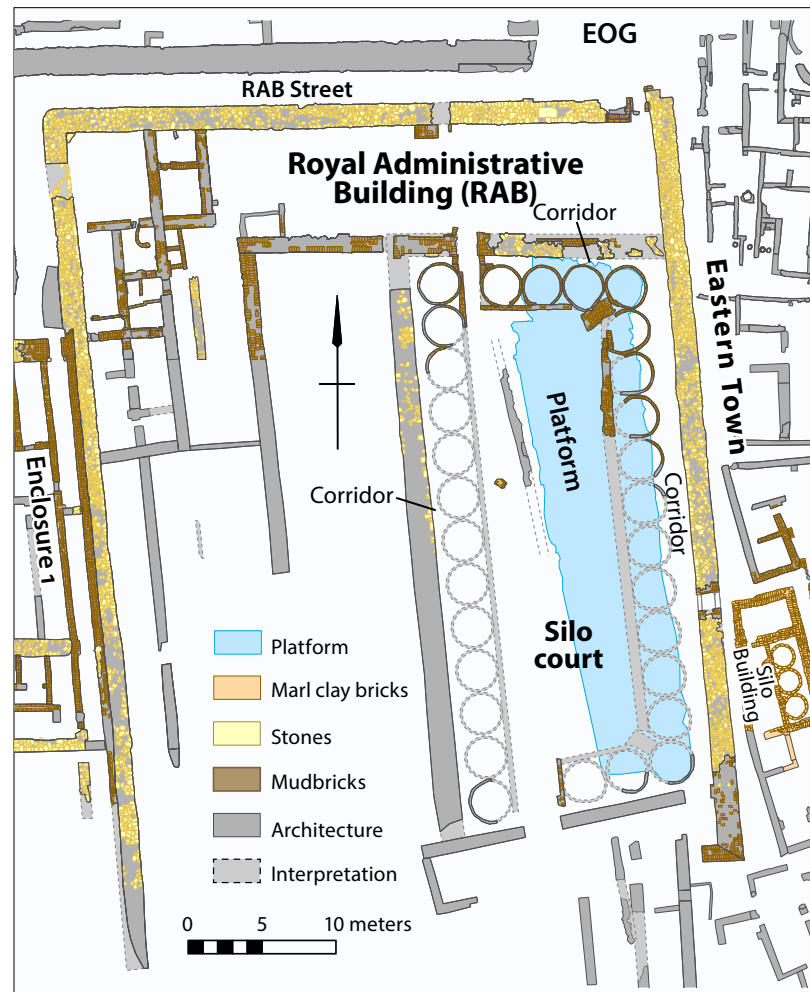
We were surprised to find more conclusive evidence of activity after the reign of Menkaure, as it had appeared from all our work over the years that people largely abandoned the HeG settlement after his reign. A thick platform of stone debris lay above the collapsed remains of the eastern silos. The platform might have been used to drag away stones from HeG





buildings for other construction projects. Complicating matters, we may have evidence that the silos were still in use during the 5th Dynasty before the platform was built: five sealings bearing king Userkaf's name, which we found in 2005 but could not tie to HeG at the time. Userkaf was the first king of the 5th Dynasty. A new Userkaf sealing this season also matched to the same seal as the previous five, and confirmed that the seal was owned by an official who held the title the "Elder of the House." Some of these were used to seal peg-and-string closures, which most likely were on doors for storage structures like bins and silos. This new evidence suggests the decommissioning of the site in the early 5th Dynasty.

To the east side of the RAB, we cleared some of the area previously under the soccer field and uncovered more evidence of the Eastern Town (ET), a village-like district unlike other areas of HeG. But the newly revealed architecture included a building with three domestic silos, built entirely of yellow, marl-clay bricks, distinct from the dark Nile Valley clay mudbricks. Near this building, we found a door in the RAB eastern wall opening into the silo court. The ET had access into the RAB on the south and northeast as well.



Right above: Map of the Royal Administrative Building and abutting areas. Map by Rebekah Miracle.

Below: The silo court on March 22, 2023. Workers clear the court floor and silos on the west side. View to the east.





# FIELD WORK 2022–2023

We worked next to the Royal Administration Building in the district called the Western Town. The long enclosures and the structures just to the southwest were a port facility with a warehouse to store unloaded goods and workshops to process some of the deliveries.



## The Enclosures

### A Port, Warehouse, and Processing Facility

We uncovered and partially excavated Enclosure 1 (E1) and the adjoining Enclosures 2 through 5 in 2002 and 2005. However, as we were only able to access the north ends of the structures, we could not tell how they were used. That changed once we could excavate in the former Abu Hol Sports Club soccer field. In Spring 2022 we uncovered the southern ends of Enclosures 1, 2, and 3, found three more broad galleries extending south of E3 and E4, and traced still more walls going farther south and disappearing under sand soaked in ground water. Altogether these enclosures, with their chambers and galleries, appear to have comprised an impressive, orthogonal port structure, for both storing and processing commodities. They could be easily accessed from boats making deliveries as they were located next to the low area on the south end of HeG, which we believe filled with water during the annual inundation.

Left: Discards recovered from the stoneworking craft shop in Enclosure 1: Worked travertine (alabaster) pieces with flat surfaces and a drill core. Below: Excavations in Enclosure 1 during Spring 2023. View to the southwest.



Enclosure 1

Space  
10,861

Space  
10,860

Space  
10,859

Corridor



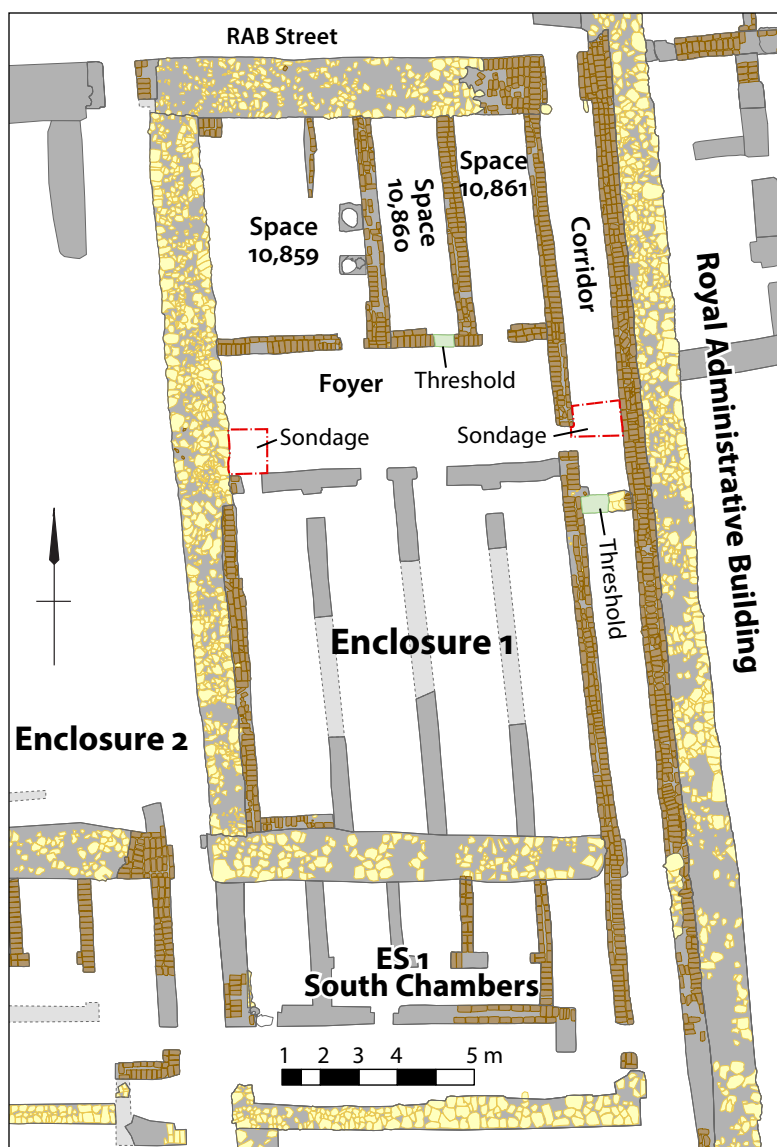
In Spring 2023 we found further evidence suggesting this area received deliveries from the seasonal harbor. In the Western Town, after clearing down to the ruin surface once covered by the soccer field, we discovered ramps that slope up gradually from the east, from the sand-filled depression we think was the harbor, to two entrances of a large stone-built structure.

### Enclosure 1

In the north end of Enclosure 1 (E1), we excavated three rooms opening into a common vestibule and a long corridor that runs from RAB Street down the entire eastern side of E1. The room on the west, Space (10,859), had been used as a bakery late in the occupation at HeG. Below was an older workshop where craftsmen created travertine (alabaster) and other stone objects. They left the waste and discards from their work: drill cores, drilled negatives with concave surfaces, a cache of cylindrical cores from round vessels, and hundreds of worked pieces with flat surfaces. These pieces suggest boxes and small vessels. The craftsmen left tools—stone drill bits, whetstones, abraders, pounders, axes, grinders, and polishers—as well as raw material: a large block of travertine. Two clay sealings impressed with craftsman-related titles also turned up in the workshop. Against the east wall, two shallow, round stone emplacements were probably used for working stone objects, possibly for drilling out vessels. The workshop space was unroofed for ventilation and light.

The middle room (Space 10,860) may have been used for administrative functions. It had a remarkable bright white plaster floor, unlike any other floors we have found at HeG. It appears to have been made of alabaster dust, mixed, perhaps, with limestone or gypsum powder, and would not have been robust enough for heavy manual labor or heavy foot traffic. We have no clues as to how the room on the east (Space 10,861) was used. We found no installations, nor any objects.

The doorways that opened onto the eastern corridor (see map) were blocked at some point, as was the corridor. But the entrance to the corridor from RAB Street apparently remained open. We wonder if such blockings came with official abandonment of the HeG site. Perhaps the corridor had been put to a new use other than an access route into E1 and farther south. Perhaps it was used as a track for carrying away material from the northern parts of HeG down into the seasonal harbor.



Above: Map of Enclosure 1 following the 2023 excavations. Map by Rebekah Miracle, AERA GIS.

Below: AERA team members excavate Enclosure 1. In the middle room (Space 10,860) they uncovered a bright white plaster floor. View to the north.



# Great Pyramid Temple Project - Finished!

Goals:	Conserve and fully document the remains of Great Pyramid Temple, Make it comprehensible to visitors with signage.
Dates:	Phase 1 - Fall 2020, Phase 2 - Fall 2022
Funding:	American Research Center in Egypt
Context:	The Great Pyramid Temple was part of Khufu's mortuary complex.

**BEFORE the Great Pyramid Temple Project:** Very few visitors knew they were walking on an ancient temple and, along with camel, horse, and carriage traffic, were gradually obliterating it. For 50 years vehicles drove over it on an asphalt road that covered most of the temple until the paving was removed in 1995.



## GREAT PYRAMID TEMPLE PROJECT

### 1. DOCUMENTATION:

We mapped by hand and Total Station to produce a comprehensive map of the temple remains. We photographed and wrote extensive descriptions of temple details.



**2. CONSERVATION:** We installed a walkway that follows the outer wall of the temple. It offers visitors a comfortable, accessible way to walk around and view the temple. We added protective fencing that keeps carriages, horses, and camels off the temple and shifts their "parking lot" well beyond the temple.



**3. DISCOVERIES:** We learned how workers created a smooth, level floor of very hard basalt slabs: they modified the under layer to fit the irregular bottoms of the slabs. We discovered the first attempts at a wall trench for the northwest corner of the temple, indicating that the builders changed their minds about where to position the corner.

We found fragments of the temple walls with painted relief scenes of the king's Heb Sed rejuvenation ceremony.







#### 4. PAVEMENT CONSERVATION:

We repaired and stabilized margins of the paving where blocks were collapsing. Where stones were missing from the pavement, we filled the holes.

**5. BOAT PIT CLEAN UP:** We cleared and mapped the massive boat pit on the north side of the temple causeway in front of the Pyramid Temple.

**6. VISITOR-FRIENDLY ADDITIONS:** We installed three information panels mounted on heavy granite slabs that explain: 1) Khufu's mortuary complex, 2) the Great Pyramid Temple, and 3) the temple sanctuary and tomb shaft cut into the bedrock long after Khufu. We added amenities to enhance the visitor experience: four benches and four trash bins.



# FIELD LAB

## Discoveries, Learning, Insights

Specialists and trainees studied animal bones, plant remains, chipped stone tools, granite tool fragments, pottery, clay sealings, travertine and greywacke fragments, and objects in the AERA field lab at Giza.



The AERA Field Lab (officially a Ministry of Tourism and Antiquities [MoTA] Magazine) rarely offers exciting reveals like an excavation often does (but see below). Our specialists' slow, meticulous, detailed analyses generate insights into the daily life of those who lived in the pyramid city, insights that cannot come from excavation alone.

Most of the specialists and students analyzed material arriving from excavations in Enclosure 1 (E1), the Royal Administration Building (RAB), and the area previously covered by the northwest corner of the soccer field (see pages 6 through 9). Some of the specialists whittled down backlogs, which accumulate because recovery in the field is faster than analysis in the lab.

The sealings team, lead by Ali Witsell, focused on their backlog as well as the new E1 and RAB material. The clay sealings, and many clay blanks and discards from past and recent excavations in RAB, studied together this season, revealed a surprising insight into RAB (see pages 14 and 15). It provides nuance for one of our long-held assumptions about the compound.

The ceramics team of specialists and students, headed by Anna Wodzińska, discovered that the pottery in E1 had been used mainly for baking bread and preparing and serving food. Dumped after E1 had been abandoned, the pottery probably came from residences in the Western Town and the northwestern corner of the RAB, which included houses, a bakery, and craft areas. The E1 bread molds—a large proportion of the pottery sample—were medium size, unlike the big communal molds used to bake for large groups. The smaller molds

suggest baking for households and perhaps workshops.

Lithics specialist Samar Mahmoud determined that the chipped stone tools from E1, mainly drill bits of various shape and sizes, were consistent with a stoneworking craft shop. On the other hand, the lithics from the RAB 2023 excavations reflected a variety of activities. But were they all used in the RAB? That has yet to be determined as they may have been dumped from adjacent areas.

Richard Redding and his students analyzed the backlog of animal bone from the 2020 and 2021 Standing Wall Island (SWI) (map, page 6) excavations. The bones—dominated by sheep, goats, cattle knuckle bones, and catfish—suggest a low-status diet, provisioned by the crown. However, this conclusion is tentative due to the small size of the sample, which came from dumped deposits that probably derived from the settlement area just east of SWI.

Lab director and archaeobotanist Claire Malleson and her assistant analyzed backlogged samples of plant remains recovered through flotation from eight different areas at Heit el-Ghurab (HeG). The remains, the same as we have seen repeatedly at HeG, indicate that the settlement was provisioned with cereals already cleaned, except for a final hand-sorting and sieving before being ground into flour.

Egyptologist Florence Friedman studied stone fragments George Reisner discarded when he excavated the Menkaure Valley Temple in 1908, 1909, and 1910 that we recovered while re-excavating the site. Florence identified parts of Khafre's names, sculpted hair





Samar Mahmoud examines chipped stone tools and fragments from Giza excavations.

locks—some possibly from a queen’s wig (she is researching this possibility)—and pieces from Menkaure statues that reflected multiple hands at work.

Objects specialist Emmy Malak worked with finds from RAB and E1. The latter included a variety of tools for stoneworking, such as pounders, abraders, and polishers, as well as manufacturing waste. The discarded travertine (alabaster) included pieces with one or more worked surfaces and drilled fragments, evidence of drilling activity. But at this point it is hard to determine what craftsmen were producing in this travertine workshop. Further studies are required.

The RAB artifacts included a wide variety of tools,

Richard Redding explains diagnostic features of a cow long bone to Amal Ahmed, one of three students who studied advanced faunal analysis with him.



such as abraders, burnishers, and whetstones, and finished products, whole and broken, such as limestone vessel fragments, anvils, beads, and gaming pieces, all reflecting craft workshops.

Geologist Philip LaPorta continued his work on groundstone tool fabric (the configuration of elements in the stone) and also analyzed the tools’ use and reuse. He discovered that some granite fragments were discarded before they were finished as tools; they may have fractured during the later stages of manufacture. Most of the granite pieces appear to be fragments of the internal parts of carved blocks. The type of granite used was very curious, much more complex than typical granite. Where did it come from? Philip might be able to determine the specific geological formations where the granite and other stone used at Giza was quarried, which will help us to understand how the pyramid-builders extracted resources from Egypt. We would also like to know why this particular unusual granite was chosen. Philip continued work on an ongoing project on grooved mattocks, many of which showed usage patterns that are the same as those seen on the diorite pounders from HeG. Why would a tool so different from a pounder be used in the same way?

As with the excavations, the lab work during the Fall 2022 and Spring 2023 field seasons answered some questions and shed light on some issues, but also raised new ones. Work for next season.

Florence Friedman compares drawings of inscriptions from a travertine object at the Museum of Fine Arts Boston with inscriptions on the AERA objects. Arrayed on the table in front of her are the travertine (alabaster) and greywacke fragments from MVT that she is studying. Emmy Malak, who helped Florence with many of the objects, watches from the background.



# SEALINGS-PALOOZA!

The Spring 2023 season brought five specialists together in the lab for our “Sealingspalooza”—a wild, intense immersion in clay sealings.

## Sealingspalooza!

Hard, dull gray bits of clay—that’s what sealings look like to most people. But to the AERA sealings team they brim with valuable information. The ones studied this season lived up to expectations and then some.

Team leader Ali Witsell led a group of five sealings aficionados and specialists over two months for our first “Sealingspalooza”—a massive push to dig deep and clear a large portion of our sealings backlog, while also keeping up with the registration of new finds from the 2023 season. Joining her this season were David Jerabek (Charles University, Prague), working on backlog and registration from Khentkawes Town and the Menkaure Valley Temple, and new team members Brendan Hainline (Metropolitan Museum of Art, Egyptian Art Department), Vicky Almansa-Villatoro (Harvard University), and Ellie Westfall (Kenyon College). Altogether, the team registered and checked over 1,000 sealings and sealing-related objects!

## Royal Administration Building Surprises

A significant and surprising discovery came from sealings in the Royal Administration Building (RAB). Ali and Brendan are preparing a full catalog of all 600+ pieces, which were officially registered long ago, for an upcoming publication. The RAB compound was designated “royal administrative” during the 2002 season because the sealing fragments excavated suggested administrative activity. These clay bits were left when workers broke the clay sealings placed as fasteners to seal doors, bags, boxes, and ceramic and stone vessels. Many of the sealings bore the impression of an official’s cylinder seal, which included the title and name of the king the official served—hence royal.

But in 2023 the sealings, from various seasons examined together, told a different story. The RAB no longer looked so royal. In her reworking for the full catalog,

Ali saw more evidence of ordinary workers than of high officials. She discovered that the formal (official’s) sealings were outnumbered by sealings impressed by everyday workers. Called “informals,” the latter usually bear no epithets and no king’s names.

Further, there were far more sealing-related objects—objects that are somehow related to sealing manufacture and usage, but may not be sealings themselves—than formal and informal sealings together. Workers were busily sealing up containers. They abandoned their unused blanks—the leftover “dough”—at the end of the day and also discarded the ones they botched, sometimes crumpling them up like a discarded piece of paper. That’s the real RAB story—how utilitarian and un-royal it was.

The sealingspalooza also added to the evidence that the RAB was used over a longer time span than other areas of Heit el-Ghurab (HeG), consistent with the excavators’ conclusions that were based on archaeological data from 2022–2023. Previously we believed that the settlement was abandoned when Menkaure’s valley temple was finished toward the end of the 4th Dynasty; we had only found sealings bearing Khafre and Menkaure’s name. AERA discovered five sealings in pits near the surface of RAB in years past, impressed with the name of the name of Userkaf, a 5th Dynasty king. But they were mostly discounted as possible intrusives as they could not be tied stratigraphically to HeG. In 2023 Ali confirmed that there are six Userkaf sealings and the 2022–2023 RAB archaeological evidence confirmed their relationship to the stony platform (map on page 7) and the last days of HeG.



At left, Sealing 7235 from RAB, impressed by a Userkaf official seal. It belonged to a *smsw pr*, or elder of the house. The sign for *smsw* is a stooped man holding a staff. The signs at the far left are part of the name of Userkaf, in a *serekh*. This piece fits into a larger composition we have pieced together from RAB, and includes part of the same portion of the seal that is preserved in Sealing 1742, at right, also from RAB. The *smsw* figure is the same, although smeared and dragged to the left in 1742.





### Backlog Adds Another King

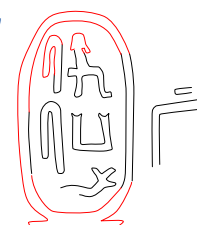
While working on the backlog from smaller, older excavations across HeG that were never prioritized for publication, Vicky added two sealings to our kingly line-up of Khafre, Menkaure, and Userkaf. Found in and outside of House Unit 3 in the part of HeG called Soccer Field West, they bore the name of Shepseskaf, the last pharaoh of the 4th Dynasty, who finished Menkaure's valley temple, after he died prematurely with only the foundation laid. Shepseskaf issued the oldest-known royal decree, engraved on a plaque in Menkaure's pyramid temple, as proof of his endeavor. He did not remain at Giza, but moved the royal family to Saqqara, where he built his tomb. The two Shepseskaf sealings are rare finds, with only four other known examples.

### Enclosure 1 Sealings: Another Trove of Clues to Life at HeG

Another truly exciting find came from Enclosure 1 (E1; see pages 6–7), which has been identified as a stoneworking craft shop based on the stone tools and alabaster waste discovered there. It is not often that multiple classes of material culture overlap to tell a

Above, left: Sealings team members hard at work in the AERA-MoTA field lab. Brendan Hainline (back to camera) checks comparatives, while Vicky Almansa-Villatoro (on left) and Ellie Westfall (right) work on data forms. Photo by Claire Malleison.

Above, right: Ellie, in charge of data entry for the season, with the team's stack of 1,000+ sealing registration forms. Photo by Daphne Sinclair Myrhhvold. Below: Sealing 6336, a sealing bearing the cartouche of Shepseskaf, line drawing at right (black as preserved, red is reconstruction), from House Unit 3 at HeG.



story as clearly as this one. Two sealings from the room bore titles related to craftsmen, but were impressed by seals classified as informal. These informal craft-related pieces, along with many other informal sealings found this season in E1, are thought to be impressed by seals owned by private individuals, not officials in the administration. A large number of the sealings' back impressions showed they covered portable objects, such as jars and bags, and were seldom used on architecture, such as doors. Possible interpretations for this pattern are that these craftsmen worked elsewhere and sent their products into the area, and/or they were not formal stakeholders of the HeG administration, and thus not in control of the architecture in which they worked. Given what we know of Old Kingdom administration, the latter seems most likely.



# 2022-2023 in Photos



Philip LaPorta  
Geologist



Ellie Westfall  
Sealing assistant



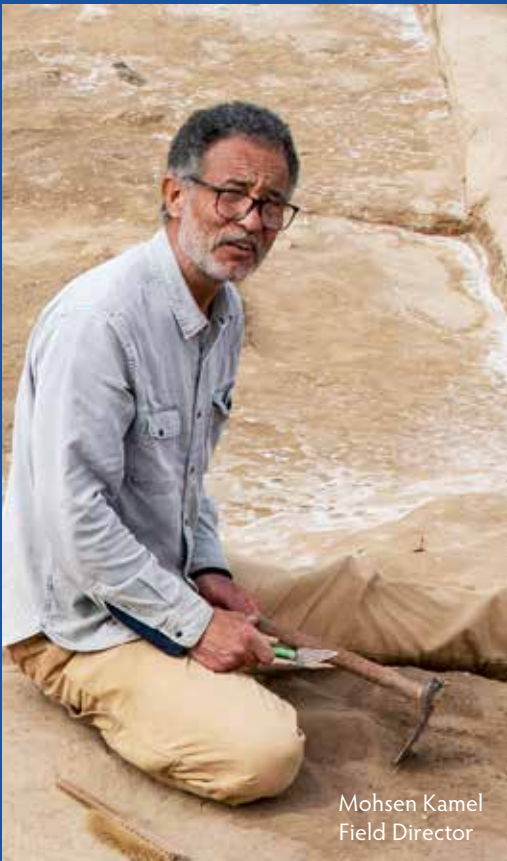
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Sealing specialist



Anna Wodzińska  
Ceramicist



Manami Yahata  
Archaeologist and  
Archivist



Mohsen Kamel  
Field Director



Brendan Hainline  
Sealing specialist



Kathy DeRue  
Archaeologist





Ibises bathing in the floodwater at the HeG site after the rain storm on October 25, 2022.



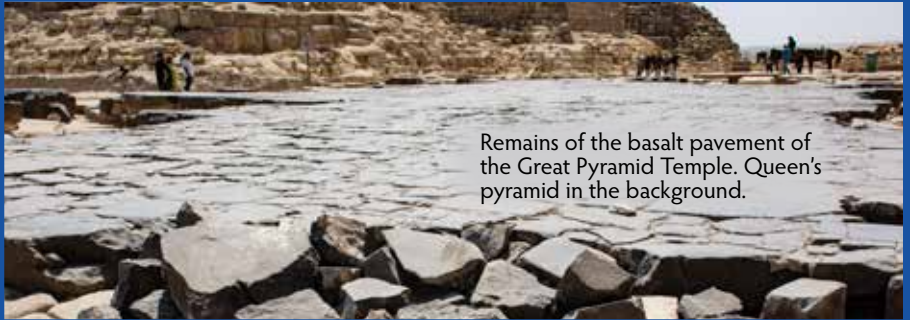
Alabaster block in the E1 stoneworking space.



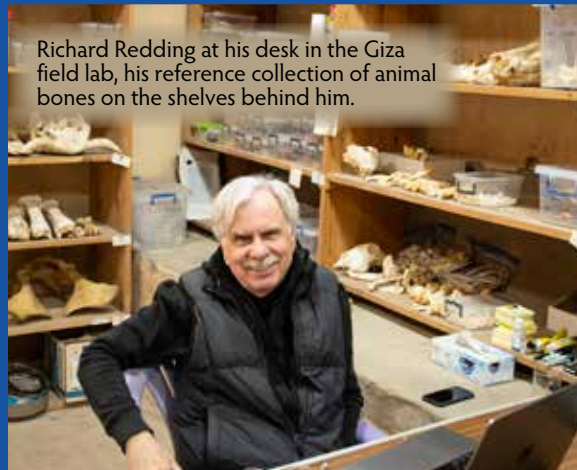
Dan Jones surveying on the Giza Plateau.



A worker wet-sieving sediments that fell through the sieves.



Remains of the basalt pavement of the Great Pyramid Temple. Queen's pyramid in the background.



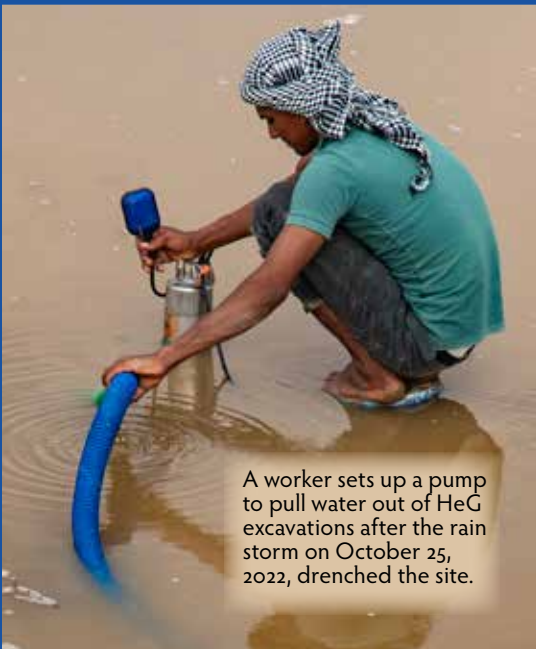
Richard Redding at his desk in the Giza field lab, his reference collection of animal bones on the shelves behind him.



An impression of woven checker-board matting on a fragment of clay found in the Menkaure Valley Temple.



A worker cuts camel thorn plants that sprung up on the HeG site in our absence during the summer of 2022.



A worker sets up a pump to pull water out of HeG excavations after the rain storm on October 25, 2022, drenched the site.



Daphne Myrhvold and Ben Bazely clearing the fill overlying Enclosure 1 at the Heit el-Ghurab site.



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1. AERA thanks Douglas Rawles of Reed Smith LLP for providing advice and counsel on a myriad of legal matters.





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