

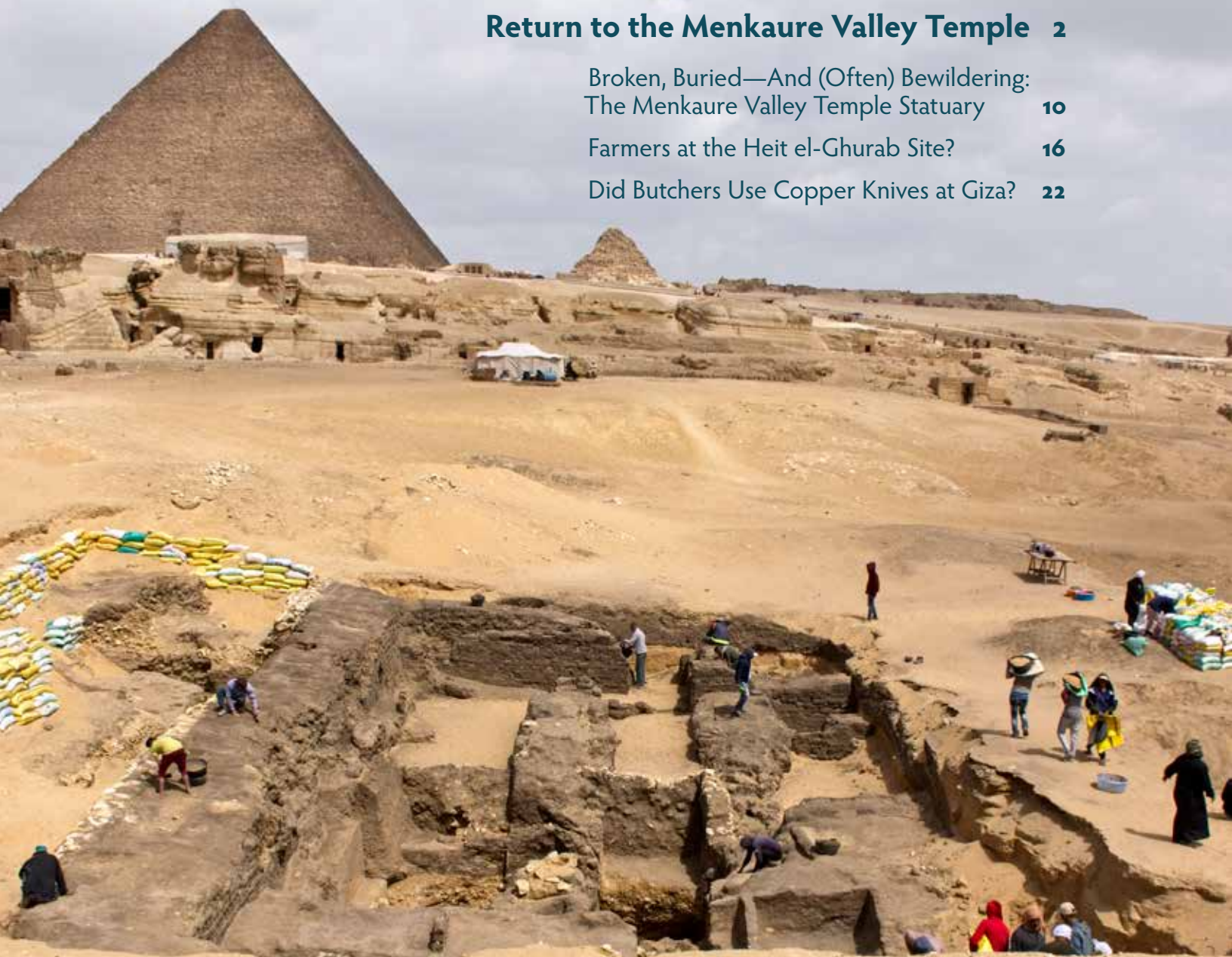


Return to the Menkaure Valley Temple 2

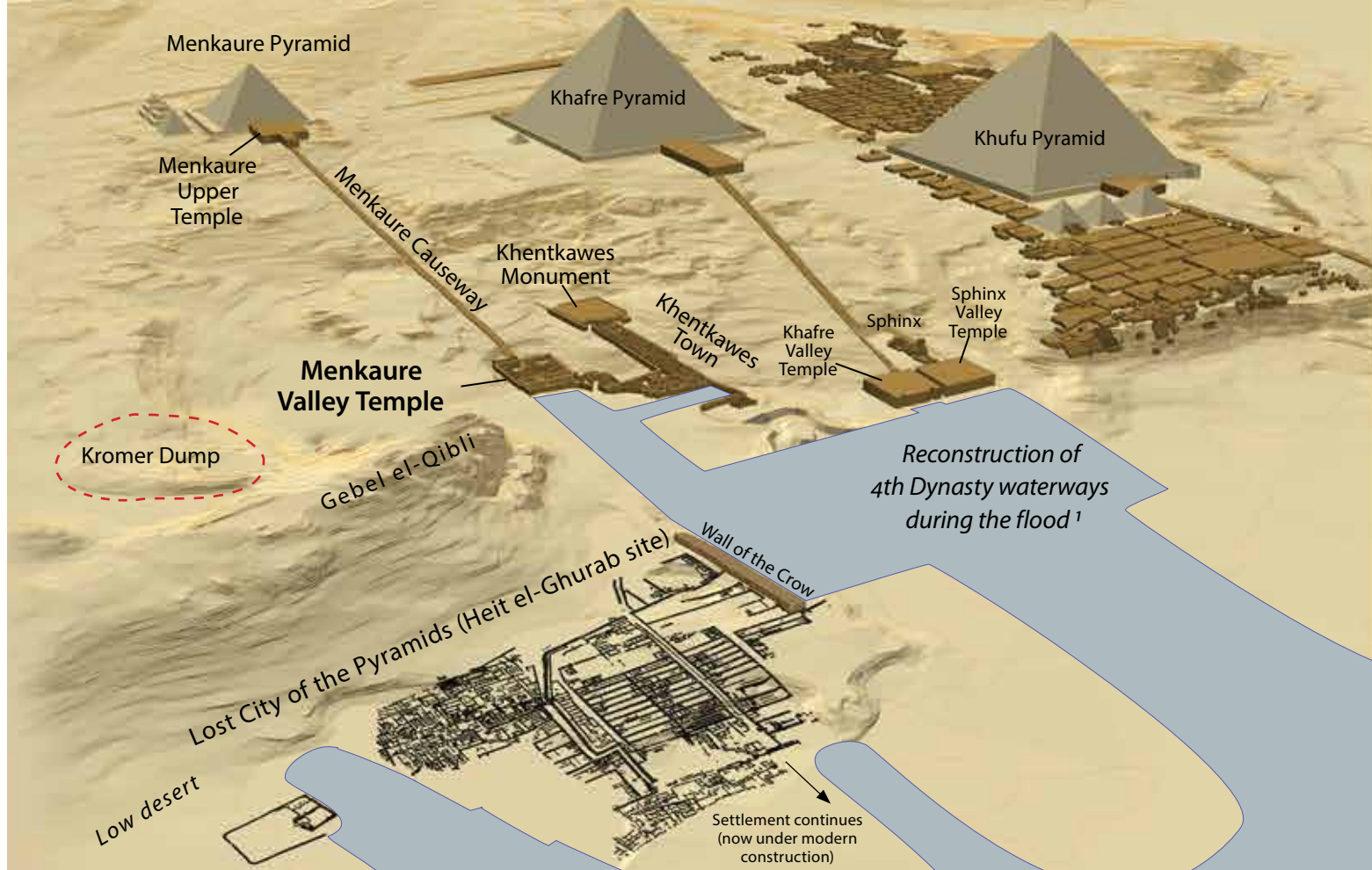
Broken, Buried—And (Often) Bewildering:
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Season 2019 excavations in the Menkaure Valley Temple (MVT). Over 100 years ago, George Reisner excavated the site. AERA is building upon his work. During 2019, our fourth season in the MVT, we focused on the south-west area of the temple. The rich trove of material culture we recovered sheds light on life in the temple. Story starts on page 2.



Return to the Menkaure Valley Temple

Can an old dig teach you new tricks? The answer is a resounding yes! You *can* learn new things by excavating a site dug many years ago. During our four field seasons (2008, 2011, 2012, and 2019) in the Menkaure Valley Temple (MVT), excavated more than 100 years ago,² we have been making important discoveries.³

We seek to build upon the work of the original excavator, George Reisner, and gain a better understanding of this important monument by looking at it through a modern archaeological lens. We re-excavate and document using current best-practice methods (MoLAS-derived)⁴ and contemporary technologies (e.g., digital photography, 3D scanning, GIS, Total Station mapping, etc.). We also have the benefit of a richer, more nuanced understanding of ancient Egypt that has developed over the last 100 years.

During Seasons 2011 and 2012 we re-cleared and mapped the eastern third of the MVT and its eastern Annex.⁵ This season, 2019, we focused on the western third—the inner sanctuary and the western magazines (map, facing page)—aiming to excavate limited, small trenches targeted to sort out stratigraphic (chronological) questions; that is, what came before and after what. During our two months in the MVT, our team of Ashraf Abd el-Aziz, Virag Pábeschitz, Martina Bardonova, Victoria Alamansa-Villatoro, and Gregory Viessman, lead by Dan Jones, dug much deeper than we had expected (see photo,

page 8) and recovered far more material culture than we had anticipated. We were able to resolve lingering questions about an intrusive occupation in the temple court and shed light on the royal decrees that endowed Menkaure's cult. We also excavated the area where Reisner found, buried in a deep hole, the world famous Menkaure dyad (photo, page 12), one of "the finest works of the Old Kingdom,"⁶ which portrays Menkaure and his queen or queen mother. The statue, unfinished, had not yet been inscribed with names and titles. So the identity of the woman is one of the MVT mysteries.

We discovered important new evidence about where and how the statue came to be buried. We determined where the dyad actually was positioned and when it was most likely buried. But we have not entirely resolved all the mysteries of the dyad and its burial.

Menkaure's Valley Temple and the Heit el-Ghurab Settlement

Menkaure, the last of the three Giza pyramid-builders, constructed his valley temple at the bottom of the southeastern slope of the Giza Plateau to serve as the gateway into his mortuary complex. From the valley temple a long causeway lead up to Menkaure's upper temple, which gave access to his pyramid. Our flagship site, Heit el-Ghurab (HeG), supported the infrastructure for building Menkaure's mortuary complex (and

Facing page: The Giza Plateau showing Old Kingdom monuments and sites and the harbors and waterways at flood stage (reconstructed by Mark Lehner).¹ Graphic by Rebekah Miracle, AERA GIS.

that of his predecessor Khafre and probably Khufu). After Menkaure's death, HeG was abandoned and dismantled. Some of the departing residents, we believe, resettled on the Giza Plateau in another type of town, communities serving the cults of the dead monarchs. The Khentkawes Town and its eastern extension that we discovered in 2009 were built to attend to the cult of Queen Khentkawes I and, probably, Menkaure.⁷

Reisner's 1908 and 1910 Excavations

After having excavated Menkaure's upper pyramid temple in 1906–1907, Reisner set out in June 1908 to locate and excavate the valley temple. At that time Egyptologists had begun to realize that Old Kingdom rulers had two temples, one next to their pyramid and a second one, a valley temple, connected to it via a causeway. Reisner was certain that somewhere to the east of Menkaure's upper temple there was a valley temple. He eventually found the back end of the temple, buried under 4 meters of sand, after projecting the axis of the causeway from its western end at the upper temple and excavating trenches crossing it at intervals.

Once he had cleared the east end of the causeway corridor and along the back of the temple's western wall, Reisner began excavations in the middle of the temple's western end, digging out debris from disintegrated mudbrick walls. In the southwestern magazines, which he believed were for storing statues, he began discovering royal statues and fragments of statues.

In corridor 4 (also called corridor III-4), running along the east side of the magazines (see map below), he uncovered the famous set of four triads (see photos, pages 10–11).

Reisner also soon recognized that the MVT had two major periods, a later temple built upon an earlier one that had been badly damaged in a flash flood. Reisner saw that Menkaure had begun the "First Temple" in massive limestone blocks. But he died after only a couple courses had been laid, and his successor, Shepseskaf (2441–2436 BC), the last king of the 4th Dynasty, was probably the one who completed it, but more cheaply, using mudbrick. Over 200 years later, a "Second Temple" arose on top of the ruins of the First Temple, probably under Pepi II (2216–2153 BC), the last king of 6th Dynasty.

After Reisner's two-month's long field season in 1908, half of which was spent trying to find the MVT, he returned 16 months later, in December 1909, to work until mid-April 1910. In his second season, he resumed digging in the western and southern areas of the temple, and gradually moved eastward toward the front, backfilling as he went along. But he also had teams working in different areas simultaneously, going down through stratified sequences, sometimes trenching to find the bases of the First Temple walls. With the information gathered in this second field season, combined with the first season's work, Reisner was able to create his composite map showing the two phases (see map below). But he never saw the whole temple exposed at one time.

AERA Excavations

When we started in early February we saw no visible trace of

our target area, the western end of the MVT. It was deeply buried in sand. But we were able to determine its location precisely by finding our 2011–2012 survey points for the northeast and southeast corners and using them to georectify Reisner's map in our GPMP grid.

We worked in two areas (see map on left), with most of our effort expended on the southwest quadrant. We started by clearing sand to the west of the temple and found the causeway wall. By the middle of our fourth week, we discovered where the causeway corridor turns a corner to run south along the back, western wall of the Second Temple. We thought we

The Menkaure Valley Temple showing AERA's excavation areas and the First and Second Temple walls mapped by Reisner.





could also see the original western wall of the First Temple, preserved perhaps half-a-meter high.

But inside the temple we did not find any walls of the First Temple for weeks after we started clearing, prompting us to wonder if they had disintegrated. We were clearing in the southwest quadrant where Reisner had found the world famous dyad and we expected to uncover the dyad's hole. Instead, we were only finding sand and settlement debris that Reisner had dumped into the back of the temple when he excavated the central court. So, much of our 2019 efforts went into removing the sand and spoils.

When we finally reached architecture, we realized that Reisner's excavation spoils and sand were a blessing for both the MVT and us. The many layers of fill had preserved the archaeological remains exceptionally well. Rather than eroded stumps, the walls looked very much like the ones in Reisner's excavation photos standing tall. And the spoil layers were chockablock with material culture, which proved to be among our greatest treasures of Season 2019.

The Village in the Court

The court from which Reisner's team dug out this material was not the pristine court that Shepseskaf built. Reisner found it "filled with small structures, rooms, and granaries of crude brick."⁸ A village had invaded the temple within 50 years after Shepseskaf finished the monument, and it had grown over time, through three occupation phases alternating with debris layers. The mudbrick structures were built one upon another, across the court. "The general appearance was that of a poor modern village..."⁸ What was a "village" doing in the temple?

Royal decrees endowed the Menkaure Pyramid temples with people and provisions. Shepseskaf issued the initial decree, probably when he inaugurated the First Temple, and then Merenre, a 6th Dynasty king issued two more decrees. Pepi II, the last 6th Dynasty king, issued a decree when the temple was rebuilt and service renewed. The successive decrees kept the temple services going for over 300 years.

Reisner found Shepseskaf's and Merenre's decrees in Menkaure's upper temple, and the Pepi II decree in the valley temple entrance vestibule. According to Egyptologists' interpretation⁹ of the fragmentary texts, the royal decrees mandated exemptions from duties—the residents



Top: Clockwise from left: Dan Jones, Greg Viessman, and Manami Yahata in the MVT causeway corridor where it turns south to run along the back, western wall of the MVT, on the right. The rubble pile standing against the temple wall in the background is the wall built to protect the temple from floods, after it had been badly damaged by a flash flood. View to the north. Photo by Mark Lehner.

Left: Excavators remove Reisner's backfill in the southwest area of the MVT. The alternating deposits of clean sand and dense, dark settlement material from the MVT southern court can be seen in the section cut through the deposits in the foreground. The baskets loaded with settlement backfill go to the sieves, shown in the left middle photo, to recover material culture. View to the southwest. Photos by Sayed Salah Abd el-Hakim.

did not have to pay taxes to the crown. The decrees also mandated that reigning kings should provide offerings, or *pekher*, to Menkaure's pyramid. And these offerings would in turn revert in shares to the officials in charge of the pyramid town and its purpose and to the people who carried out their duties. In other words, after the food was offered to sustain Menkaure in the Netherworld, it would go back to the living who attended the dead king.

Ground Truth Tests the Decrees: Did Those Decrees Mean Anything?

The settlement trash in Reisner's spoil layers provided some answers. We applied our intensive, fine-grained recovery methods to those layers and retrieved a wealth of material, artifacts that Reisner had missed using the coarser recovery methods of his day. Next to the excavations, we dry-sieved all the trash layers and collected the material caught in the screen, carefully picking out large pieces of bone, pottery, and other artifacts. We then sent the remainder of the sieve contents off-site for wet-sieving, washing, and further sorting.

What we found was a remarkably rich collection of pottery, flint tools, tool fragments, animal bone, ash, charcoal, worked stone, pigment, wood, bits of copper, statue fragments, and clay sealings, including at least one with Menkaure's cartouche.

We have yet to process most of this material, but the predominant items, by far, appear to be animal bones, flint tools,

and waste flakes from tool-making—a trove that proved to be one of the most informative and important finds of the season—all the product of intensive screening and meticulous sorting.

The irregular, knobby ends of cattle long bones dominated the faunal material and caught our eye. Last season we had hypothesized that people broke off the ends of long bones to make “knuckle bone soup” or “gelatin soup”—*shorbet kawara* in Arabic—a hardy concoction. Loaded with nerve endings and collagen, knuckle bones and the soft tissues adhering to them are full of fat and protein. Local soccer teams consume *shorbet kawara* to, literally, “beef up.” This soup would presumably have been just as good for men beefing up to build pyramids. Knuckle bone soup might also have been a good use of lesser animal parts for lesser folk, while higher status people took the choicest cuts.

Are the knuckle bones related to the royal decrees? Are they the remains of actual *pekher* that were offered to the deceased Menkaure and then passed on to the staff sustaining him? It seems very likely, as these bones show a curious, significant bias. They were not chopped off from front and hind legs equally. Rather they came predominantly from the forelegs, the part that is “most frequently shown being offered to the gods as well as to the deceased” in tomb scenes.¹⁰ (See tomb butchering scene on page 23).

The MVT central court in a photo by Reisner's expedition photographer Bishari Mahfud on February 28, 1910. View to the north. Photo A341P_NS-1, courtesy of the Museum of Fine Arts Boston.



Since we found predominantly the ends of foreleg long bones, we have to wonder what happened to the rest of the leg. Most likely the temple officials took the long bone shaft sections and left the ends for their subordinates, members of their household estates. It's likely that these lower-status individuals were stationed in the court's mudbrick village, perhaps in rotation, to ensure the shares for their masters. The profusion of flint knives and flint chips that we recovered from the trash layers suggests that the foreleg offerings were butchered in the court, probably by the residents, the lower-ranking individuals.

The mundane trash that Reisner discarded in his spoil layers helped clarify both the nature of the court village and probably of the royal decrees. Mark Lehner had questioned whether anyone had actually lived in the village. He thought the houses were "token" residents.¹¹ But the spoil layers bursting with household trash point to people living and working in the court over a long time span. The trash layers provide physical manifestations of what kings intended with their decrees on behalf of the temple: real bovine forelegs offered to the deceased Menkaure, divvied up amongst the temple staff. Moreover, the offerings and butchering were not rare ceremonial gestures. The vast quantity of bones and tools point to lots of meat processing.

The Dyad Mystery: A Tale of Two Holes

In January 1910, Reisner discovered the famous dyad, a pair-statue of Menkaure and a woman, probably the queen mother, at the bottom of a deep hole dug down into corridor 4 "by treasure-hunters of the Moslem Period."¹² It was "apparently thrown into the hole by the treasure-hunters before they began the next hole on the west."¹²

Because of the great depth of the temple remains here, it took us weeks to clear Reisner's backfill from the enormous pit, which Reisner had lined with a retaining wall, thinking he would return—but never did. After we located the upper rim, we plunged deeper and deeper and eventually arrived at the dyad find spot, 3 meters below the First Temple floor level (photo, facing page).

We were removing great volumes of Reisner's backfill from "Thieves' Hole," as Reisner called it, when Drs. Florence Freedman and Walter Gilbert¹³ joined us, just in time to scrutinize the hole and ponder Reisner's story about the dyad, which became more and more suspect.

All of us who spent time each day on site shared the feeling that Reisner's story of the dyad and Thieves' Hole just didn't add up. We spent hours poring over every Reisner photograph, plan, profile drawing, and diary entry, and the details in his published report. We studied the shots of the dyad at the moment of discovery, and on site we matched the points of view to what we were seeing. It did not make sense that thieves—"Arab treasure-hunters"—had cast a very heavy statue into



Left: cattle bones, mostly the ends of long bones; Right: a flint knife. Both from Reisner's spoils from the MVT central court. Photos by Mark Lehner.

this hole so that it landed precisely upright, supported by a huge limestone block, facing east, 3-meters deep into the First Temple foundation (photo, page 11). And why would the robbers leave the dyad until later? Why hadn't Reisner discovered the dyad during his first season when he uncovered the triads, especially since he had already found Thieves' Hole as early as June 1908?

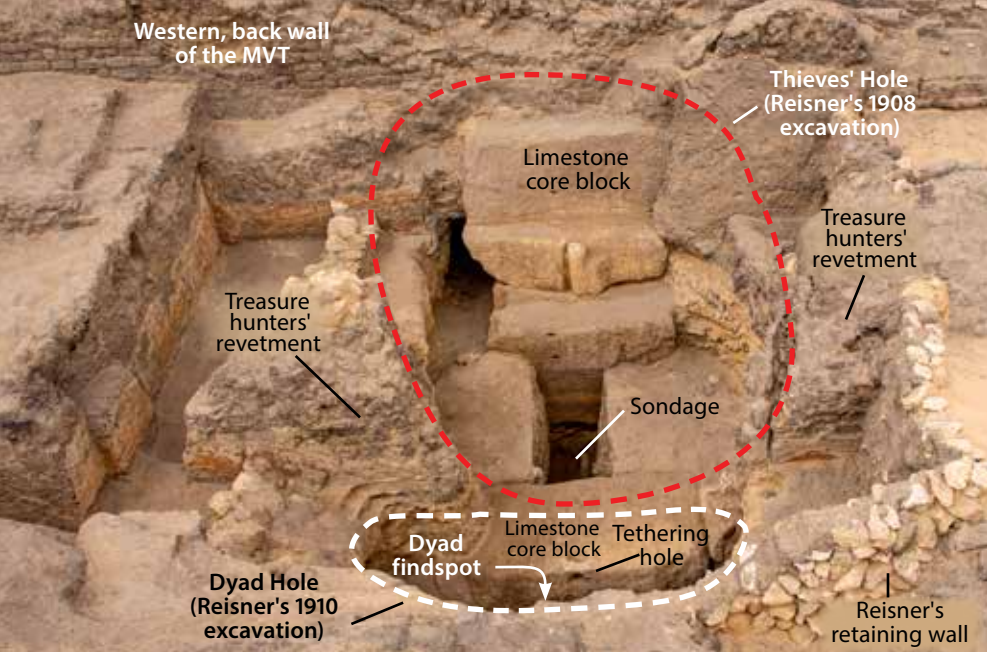
Dan Jones discovered why Reisner, in 1908, had missed the dyad. After a meticulous review of Reisner's published report, his unpublished diary, and especially his archived photographs, Dan found that the dyad was never in Thieves' Hole, but stood in a deeper, older pit, a little farther east. Reisner discovered this second hole in January 1910. On the last work day before uncovering the dyad, he wrote in his diary: "Next to the thieves' hole in room of slate triads opened 1908, there is another hole filled with such debris (yellow gravel) that it also must be a thieves' hole. This is now being cleared."¹⁴

Reisner had missed the second pit in 1908 because it was buried behind and under a semicircular retaining wall of limestone rubble against the eastern side of Thieves' Hole and under the ancient debris it retained. Once Reisner's men removed the retaining wall and cleared all the deposits behind and under it, the two holes became one big oblong pit, which Reisner conflated as "Thieves' Hole" in his 1931 monograph.

Having discovered where Reisner actually found the dyad, we solved one mystery, but far more questions lingered: When was the dyad deposited? Who buried it and why did they place it in this particular spot? How were they able to position it? What was the dyad's purpose in Menkaure's mortuary complex? And why was the statue not finished?

The Dyad Hole

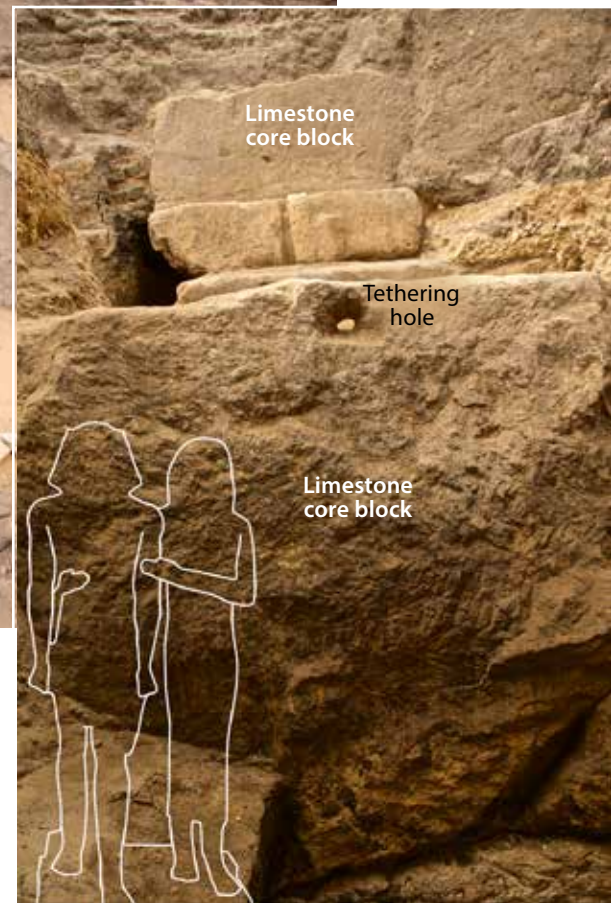
In our excavation photo on the facing page, top right, an outline of the dyad is shown in the location where we deduced



Above: The southwestern area of the MVT where Reisner found the dyad. In 1908 he excavated Thieves' Hole. In 1910 he discovered the dyad, buried in an older, deeper hole. View to the west. Photo by Dan Jones.

Right: An outline of the dyad positioned where we determined that Reisner found the statue, based on the tethering hole and other features on the massive limestone core block that appear in Reisner's photo of the statue in situ. Photo by Mark Lehner.

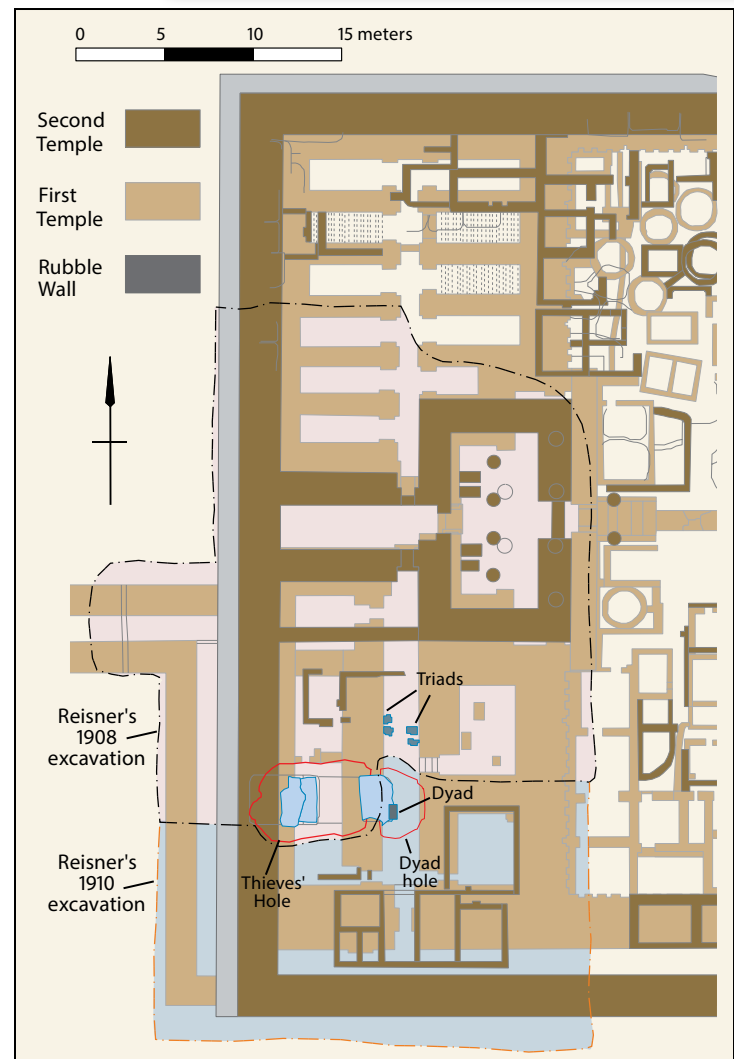
Below right: Map showing the location of Thieves' Hole and the Dyad hole and Reisner's approximate excavation limits for this part of the MVT. Map by Rebekah Miracle, AERA GIS.



that it was found. The statue stood in front of a core block, one of the blocks that Menkaure had laid to form the cores of the walls, which the builders would sheath in hard granite. It was our key to determining the exact location of the statue. A hole cut into the top of the block, which we dubbed the "tethering hole," appears in the photo that Reisner's photographer took when the dyad was fully cleared for the first time. In that photo, shown on page 10, the tethering hole appears as a cup shape at the top of the block to the right of the statue. By comparing this photo with the irregularities on the stone just below the tethering hole and the angle of the upper, left-hand corner of the core block, we were able to position the dyad in our photo.

The location where the dyad was actually buried gave us a clue as to when it was buried. The statue was positioned very deeply in the temple, below the First Temple floor, two meters deep into a foundation of crushed limestone that Shepseskaf used to fill in the spaces between the massive core blocks—which can be seen in the photo, above left—and build up the foundation for the temple. The dyad might have served as a foundation deposit for the temple, perhaps like *serdabs*—blind statue chambers in tombs—to receive the deceased's souls. Was it in fact buried during the construction of the First Temple?

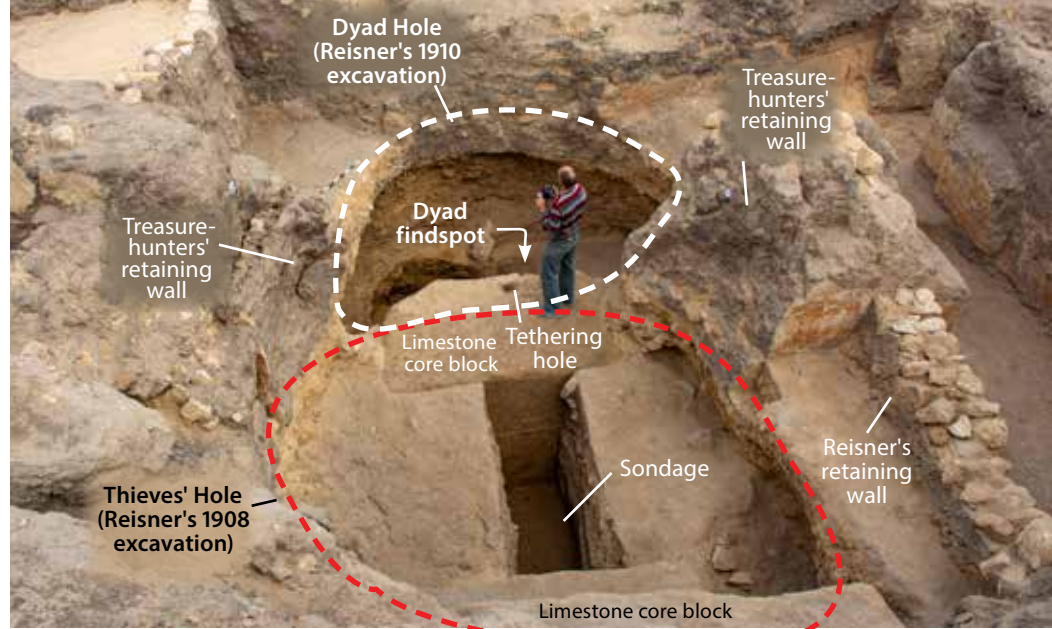
Probably not. Other evidence in the dyad hole suggests the burial took place much later. Reisner found a broken triad statue deeper in the hole, below the dyad. He specified that this piece was "Found in thieves' hole ... below the water-level, about 50 cm. below base of the slate pair (the dyad)."¹⁵ If the fragments were actually under "the slate pair," the dyad would not have been part



of a First Temple deposit because the fragments would have been deposited when the temple was probably in ruin. (See Friedman's article starting on page 10 for more on statue fragments and their significance.)

Some of Reisner's photos also suggest a later burial. In one key shot, the dyad hole appears to have been started from the surface of the First Temple ruins. In other words, it looks like the hole was dug as the First Temple fell into ruin, perhaps soon after a flash flood destroyed the sanctuary. The hole could have been intentional, dug expressly for placing the undamaged dyad upright, for safe keeping, deep in the temple foundations.

Why someone would do so, and who and what the dyad represents, must await further discussion, perhaps with more news from AERA's forthcoming Season 2020, when we plan to return to the deep end of the MVT.



Another view of Thieves' Hole and the Dyad pit, looking east-south-east. Dan Jones provides scale. Photo by Sayed Salah Abd el-Hakim.

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12. Reisner 1931 (see footnote 2), page 110.

13. Dr. Florence Friedman has written more than anyone else on the Menkaure statues and so was a most welcome addition to our 2019 team. See her article starting on page 10. Dr. Walter Gilbert helped make the 2019 season in the MVT possible and also brought his sharp mind to bear on the mysteries of the dyad. See facing page for more about him.

14. Reisner excavation diary, January 17, 1910.

15. Reisner 1931, page 110.

Sad News

It is with great sadness that we report the passing of AERA team members Glen Dash and Rabea Shehat and of major donor David Koch. Glen first joined AERA in the field to carry out remote sensing and went on to conduct survey work at the Great Pyramid and the Sphinx. He regularly contributed articles to *AERAGRAM*, covering the results of his field work for AERA and other studies, such as how the pyramid-builders found true north. Glen was a donor and an engaged, active AERA board member, serving most recently as Secretary. He will be greatly missed. Rabea Shehat was a beloved member of the AERA-Egypt family and staff. He first worked with AERA field teams as one of the expert excavators from his home

village near Qift. When we acquired our property and villa in Giza in 2009, Rabea joined the staff and managed the property with Sayed Salah Abd el-Hakim up until his passing.

David Koch supported AERA's first field season, in 1988-1989, and continued to contribute a sizable share of AERA's budget every field or study season thereafter. We are extremely grateful for his generosity that made so much of our work possible. Our many discoveries and contributions to an understanding of ancient Egypt will be part of David's legacy. We will miss his unwavering support and interest.

Please watch for our in-memoriam tributes to David, Glen, and Rabea in our next issue.

Walter Gilbert Takes on New Challenges with AERA

Our work in the Menkaure Valley Temple (MVT) in Season 2019 was made possible by a generous grant from Dr. Walter Gilbert as well as by the major support of Charles Simonyi and Microsoft, Cameron and Linda Myhrvold, and Howard and Louise Phanstiel. Dr. Gilbert—Wally to us—was also able to join us in the field. It was an honor.

Perhaps best known as a Nobel laureate and later an artist, Dr. Walter Gilbert carved a deep, indelible swath through the fields of physics, molecular biology, and biotechnology (having co-founded three companies, including Biogen) over more than four decades, with major contributions to each. Dr. Gilbert helped find a way to determine the sequence of bases in RNA and DNA and shared the 1980 Nobel Prize in Chemistry with Frederick Sanger, and Paul Berg.¹

Upon his retirement from Harvard University in 2001, where he initially served as Professor of Physics and later of Molecular Biology, he began delving into digital photography, turning it into a new career. Where most amateurs took low-quality snapshots with the consumer digital cameras of that time, Wally saw potential for much, much more, just as he had in his work in science:

I began making digital images as art when I discovered that I could make large prints from images taken with a small digital camera and that these prints carried an emotional and aesthetic impact.²

By 2004 he had his first one-person gallery show, which included a 4×6-foot image. Wally turned his unique images—stressing form and texture and exploring color space—into a business and continued showing his work in galleries. He now has 40 shows to his credit, more than 30 documented in catalogs.

Before retirement, Wally turned his attention to another of his passions: archaeology and ancient art. In 1995 he joined the Boston Museum of Fine Arts (MFA) Board of Advisors. He is also on the MFA Visiting Committee for Art of the Ancient World and a member of the Visiting Committee for Classical Art, Harvard University Art Museums.

From those involvements Wally turned his attention to the work of his good friend Dr. Florence Friedman. A scholar who has published more than anyone on the statuary of Menkaure, Florence

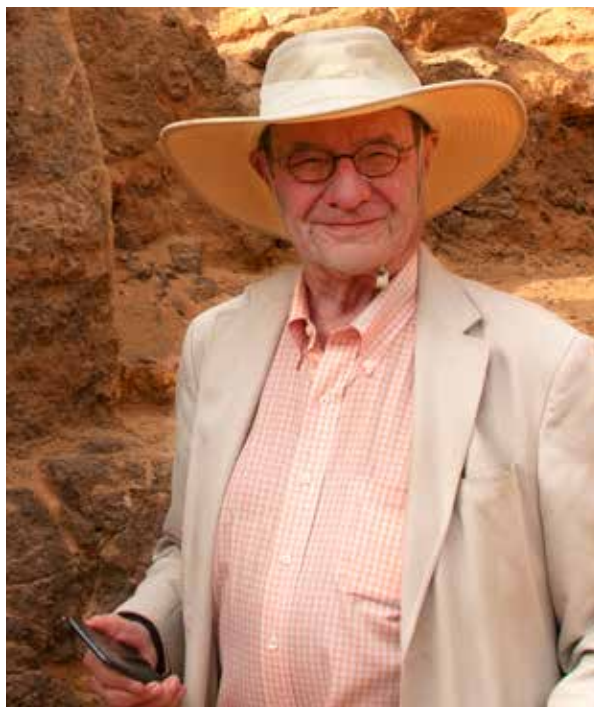
joined our team this past season as Egyptologist and art historian. Her expertise was needed, as we were planning to excavate the southwestern quadrant of the Menkaure Valley Temple (MVT), in an area with magazines expressly built to store the king's statues. We believed we might find more statues or statue pieces. It was in this area where George Reisner discovered the world famous dyad of Menkaure and his queen (or queen mother) and the triad statues (photo, pages 10–11).

Wally saw the importance of learning more about the context of the statues, which rank among the greatest pieces in the history of art. So, with Wally's support, we dug deep into the MVT and re-cleared "Thieves' Hole," where Reisner found the dyad (photo, page 11).

Wally and Florence joined us while we removed huge volumes of sand from the hole. As we came down to the findspot, things became more and more curious. Reisner's account of the dyad discovery did not add up. But his documentation of the dyad and the context where he found it was very good for his time, and so each day after work on site, Wally, Florence, and team members spent hour after hour going over every Reisner photograph, plan, profile drawing, diary entry, and the details in his published report.

Who put the dyad down into the temple foundations? Why? What did it mean? In this issue, Florence Friedman provides insight, old and new, from Season 2019 (page 10, and see article starting on page 2.)

Thanks once again to Wally's keen interest and support, we return during our 2020 field season to the mysteries of the dyad and Thieves' Hole, and expand our explorations of the deepest and oldest parts of the MVT.



Dr. Gilbert standing in the depths of the Menkaure Valley Temple during AERA's 2019 field season. Photo by Sayed Salah Abd el-Hakim.

1. Bibliographic information from Dr. Gilbert, the Nobel Prize website, and the Cold Springs Harbor Archives website.

2. From "Artist's Statement" on Walter Gilbert's art business website: <http://wallygilbert.com>



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Science & Arts Editor: Dr. Wilma Wetterstrom
Managing Editor: Alexandra Witsell

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Ancient Egypt Research Associates
26 Lincoln St. Ste. 5, Boston, MA 02135 USA
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Broken, Buried—And (Often) Bewildering by Florence Dunn Friedman

Egyptologist Dr. Florence Friedman teamed up with AERA this past season in our work at the Menkaure Valley Temple (article starting on page 2). She has extensively studied the statues of Menkaure in his pyramid complex at Giza and here she discusses the sometimes puzzling treatment of the statuary.



Alabaster colossal statue of Menkaure, from the pyramid temple, MFA 09.204. * Photo by Michael Fredericks. *Courtesy, Museum of Fine Arts, Boston.

George Andrew Reisner, Director of the Harvard University-Boston Museum of Fine Arts Expedition, excavated King Menkaure's 4th Dynasty pyramid and valley temples in the early years of the 20th century, recovering some of Egypt's greatest Old Kingdom masterpieces. From the pyramid temple, in 1907, he discovered scattered remains of an alabaster seated colossus of Menkaure, now reconstructed (photo at left),¹ which, given its size, was surely once a major cult statue of the temple and would most likely have faced east.² Fragments, like a pig tail, uraeus, big toe, and an eye and nose characteristic of Menkaure, show that there was at least one more colossus, which I posit may have stood in the valley temple.³ These matching

fragments have no provenance other than "Giza," however, demonstrating that fragments, over time, migrated from the Menkaure temples to other areas of the plateau.⁴

Four Triads and More

From the valley temple, in 1908, Reisner found four under-life-size greywacke (a variety of hard, dark sandstone) triads of the king, shown striding or standing with Hathor and different nome personifications, each with a different nome insignia on his or her head (photo, right).⁵ These triads were not shattered fragments, however, but intact statues found encased in mud in a corridor.⁶ Nothing like this series of triads had ever been seen before.

The triads appear in two formats. Type 1 (a–c) shows Menkaure striding at center, flanked by Hathor on his right,

and the nome personification, male or female, on his left. Type 2 (d) shows him standing with Hathor, seated on his right, with the nome personification standing beside her. In Type 2 the king holds in his left hand the *mekes*, a document that signals his *heb sed* ritual of rejuvenation. Provisions cited in the inscription should be understood as issuing from the designated nomes to Menkaure from his divine mother, Hathor, through the vehicle of the nome personifications.

While Reisner found pieces of the colossus dragged out of their original location in the pyramid temple, he found the triads neatly placed inside the rear, southwest valley temple corridor designated III-4 (see map, page 13), and set almost at right angles to the walls, two facing north and two facing south. Were they placed there for safe-keeping? Stored there when not in use for rituals that presumably would have taken place in the temple court? Or is this corridor where the triads were used (which seems unlikely to me)? And why would they have been arranged to face in two directions, as though in procession to the north and south? A fifth triad, exquisite but damaged (photo, far right center), was found not far below the surface in the northwest court,⁷ possibly, Reisner thought, having been taken from corridor III-4.⁸ In his only surviving diary, which begins 18 months after finding most of the triads,⁹ Reisner mentions finding more greywacke fragments scattered throughout

Right: Four intact greywacke triads from the valley temple

Type 1:

a. JE 40678**

b. JE 46499**

c. JE 40679**

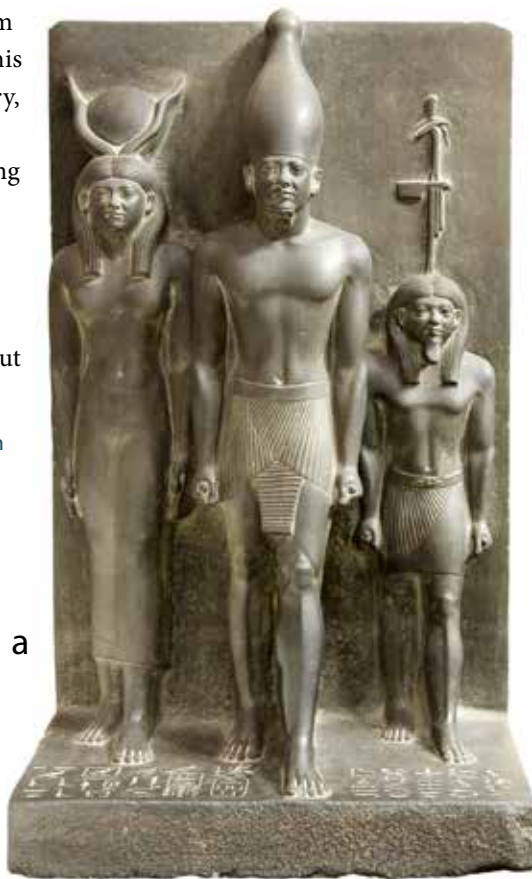
Type 2:

d. MFA 09.200*

Photos by Michael Fredericks.

*Courtesy, Museum of Fine Arts, Boston.

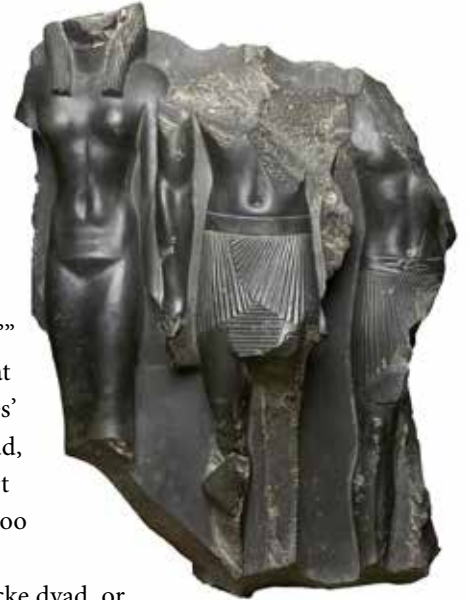
** Courtesy, Egyptian Museum, Cairo.





Left: Excavation photo of the greywacke dyad in the valley temple hole, MFA 11.1738.* G. A. Reisner, *Mycerinus: The Temples of the Third Pyramid at Giza*, Cambridge: Harvard University Press, 1931, plate 54c. *Courtesy, Museum of Fine Arts, Boston.

Below: Greywacke triad fragment from the valley temple, MFA 11.3147.* Photo by Michael Fredericks. *Courtesy, Museum of Fine Arts, Boston.



the temple (though, unfortunately, he rarely describes them); he assumed they were from more triads.

Using many of these excavated greywacke fragments stored at the Boston Museum of Fine Arts—it's only through fragments that we can try to recreate the statue program—I suggest there were at least eight (possibly ten) triads originally. And more fragments continue to surface. In March 2019, AERA found a greywacke royal beard.

The Dyad in the Pit

Reisner's most famous discovery came from corridor III-4 but south of the four triads, much deeper and oriented east. On the evening of January 18, 1910, he records in the diary that "a

small boy from the gang...appeared suddenly ... and said 'come,'" for appearing out of what Reisner termed a "thieves' hole" was a woman's head, and, once "a block of dirt fell away," a male head, too (photo, above).¹⁰

This was the greywacke dyad, or pair statue (photo center, page 12), unfinished and without inscription, but partially painted (though almost no paint remains) and showing a striding Menkaure,



b



c



d

who glances to his right,¹¹ embraced by a queen who turns very slightly to her left (photo, bottom center). Her advanced left leg and a height almost equal to the king's denote a woman of high status, and her facial features, size, and two-handed embrace of the king suggest she is assimilated to Hathor, as seen in the triads, most specifically the Type 2 triad (d, page 11), where the king holds the *mekes* of the *heb sed*. But while the queen wears a wig imitating Hathor's divine hair, the queen's human hair peeks out at the forehead and sweeps into sideburns from beneath the wig, showing she is not a deity. (Interestingly, Hathor in the Type 2 triad—the triad with the *heb sed* rejuvenation iconography—correspondingly shows a bit of “human” hair at the forehead and temples, visually allying her, I think, with the dyad's queen.) The queen is also to the king's left, while in the triads, Hathor is always to his right. Reisner assumed the woman was the king's wife. But subtle marks of age, like dropped nipples, first noted by Dorothea Arnold,¹² breast sag, and a slight tummy,¹³ suggest the woman may be his mother—and possibly the lady next door: Mark Lehner convincingly argues that this queen mother may be Khentkawes I,¹⁴ whose prominent monument and town to the north draw remarkably close to, without quite touching, Menkaure's valley temple.¹⁵

But why would anyone insert the dyad of Menkaure and a queen into a 5-meter-deep hole?¹⁶ Reisner said the dyad was “apparently thrown into the hole by the [Arab] treasure-hunters before they began the next hole on the west.”¹⁷ But at two-thirds life-size, and almost 1500 pounds (1492.1 pounds, to be exact¹⁸), this was not a statue “thrown” anywhere, much less by treasure-hunters. It had been lowered (maybe on a sand ramp?) so carefully that its only real damage was what had happened to it long before the statue was moved to the hole. For example, worn breaks along the proper left front corner of the dyad, even evident in Reisner's excavation photo, suggest the statue had a life of use, perhaps in temple ceremonies, long before landing in that hole. And worn breaks at the back corners (facing page, top center)

suggest the statue had been repeatedly pivoted and rocked, with the breaks having come from numerous strikes against a hard surface, suggests Conservator Mimi Leveque—perhaps, I propose, the result of repeatedly moving the piece in ceremonial use.¹⁹ The only significant damage to the dyad's figures was the king's beard, the lower half having been knocked off, but this probably happened not in antiquity but after the statue was discovered.²⁰ (Beard fragments, in 1937, were identified at

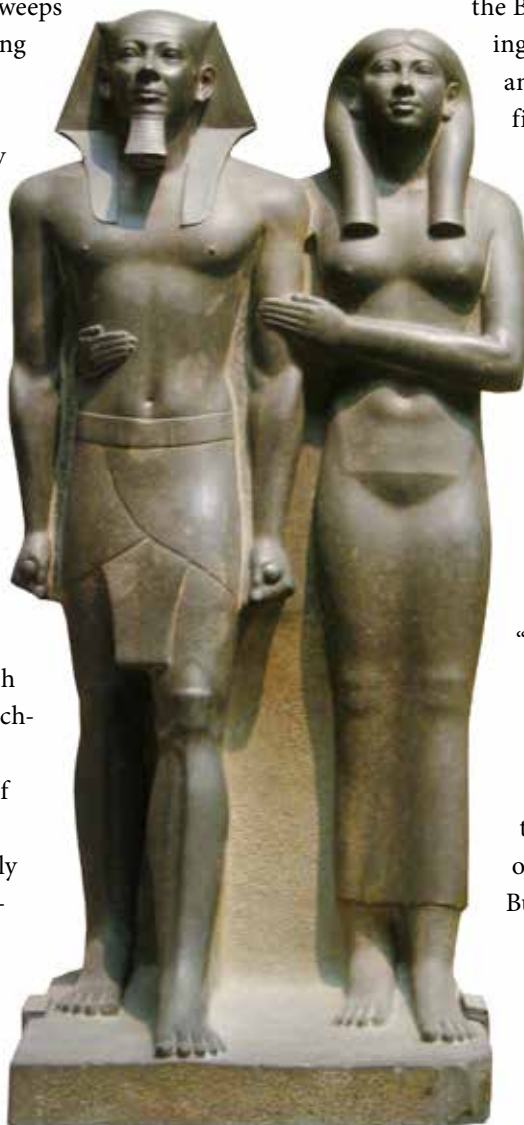
the Boston Museum of Fine Arts—suggesting Reisner had gathered them up in 1910—and were reattached to the statue with fills.²¹) And the statue was not alone in that hole—the older, deeper hole buried beneath the rubble wall and the dirt it retained on the east side of what Reisner called “Thieves' Hole.”

The Battered Triad

Beneath the dyad was a sixth triad, though battered almost beyond recognition (facing page, right top). There are two accounts of this find.

In his 1931 publication, Reisner said a large fragment of a nome triad of the same material as the others was “[f]ound in thieves' hole in room (III-4) in sand below the water level, about 50 cm below base of the slate pair,”²² meaning the dyad. We know for certain that he means the triad in the photo on the facing page, because he gives a photo of the fragment in his 1931 publication.²³ But Reisner's 1910 diary account from the day of excavation differs from his 1931 account. In 1910, he says:

A gang were set to work to bail out the water and penetrate deeper in the hole where the pair-statue was found in III-4. They got down about a meter below the present ground water level and



Above: Greywacke dyad, MFA 11.1738,* from the valley temple. Photography by Michael Fredericks. *Courtesy, Museum of Fine Arts, Boston.

Left: Greywacke dyad, MFA 11.1738.* View from below to illustrate slight turn of queen's head to her left and marked turn of king's head to his right. Photography by Michael Fredericks. *Courtesy, Museum of Fine Arts, Boston.

took out a number of fragments of a slate triad—different from all fragments found as yet.²⁴

Oddly, he does not mention working specifically below where the dyad was found (though one assumes that's where he was), nor does he single out the large triad fragment.²⁵

In 1910 he also remarks that the fragments he saw were “different from all fragments found as yet,” though by 1931 he correctly understands that the “large fragment” was from a triad, “probably” of the same design as what I show here as Type 2 (d, page 11), with Hathor seated in the center and Menkaure standing at her left.²⁶ My hypothetical reconstruction of this large fragment is shown on the right, and should, like its mate, Type 2, d, be understood as originally showing the king holding in his left hand the *mekes* document of the *heb sed* rejuvenation ritual.

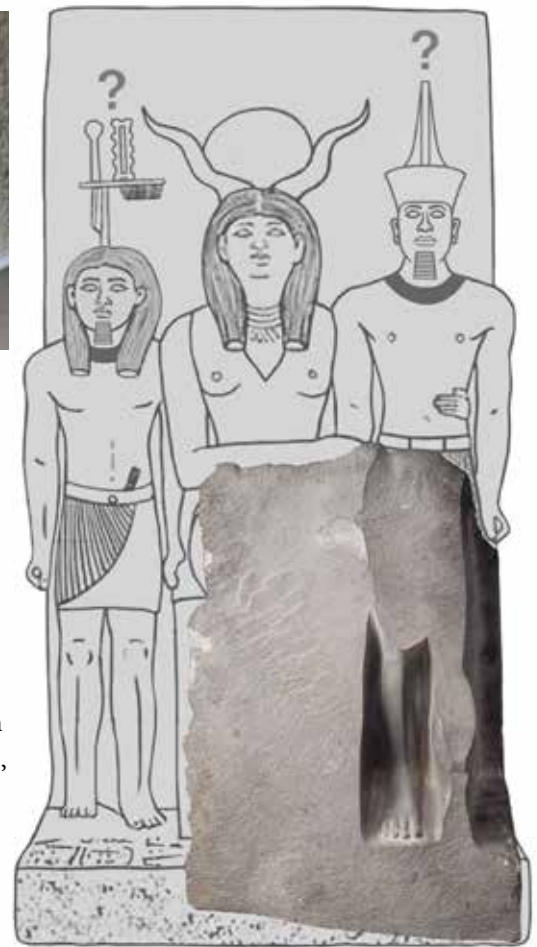
Why Hidden Together?

But a question remains: If Reisner’s 1931 report is correct, why were these two pieces, the dyad, an almost pristine masterwork, and the triad, a pitiful fragment, secreted in that hole together—and when? And by whom? Depositing the triad fragment, and then on top of it the dyad, would have involved considerable labor, time, and feats of engineering. And while we might wonder why two statues of such disparate artistic quality would have been purposely buried together, it’s important to remember that depictions of the king, a queen, and even fragmentary remains of Hathor were sacred images with ritual value—and they were worth saving.



Above: worn breaks at the corner of a greywacke dyad, MFA 11.1738.* Photo by author. *Courtesy, Museum of Fine Arts, Boston.

Right: Fragmentary greywacke triad, MFA 12.1514.* Photo by Michael Fredericks. New hypothetical reconstruction by author, drawn by Michelle Pisa. *Courtesy, Museum of Fine Arts, Boston.



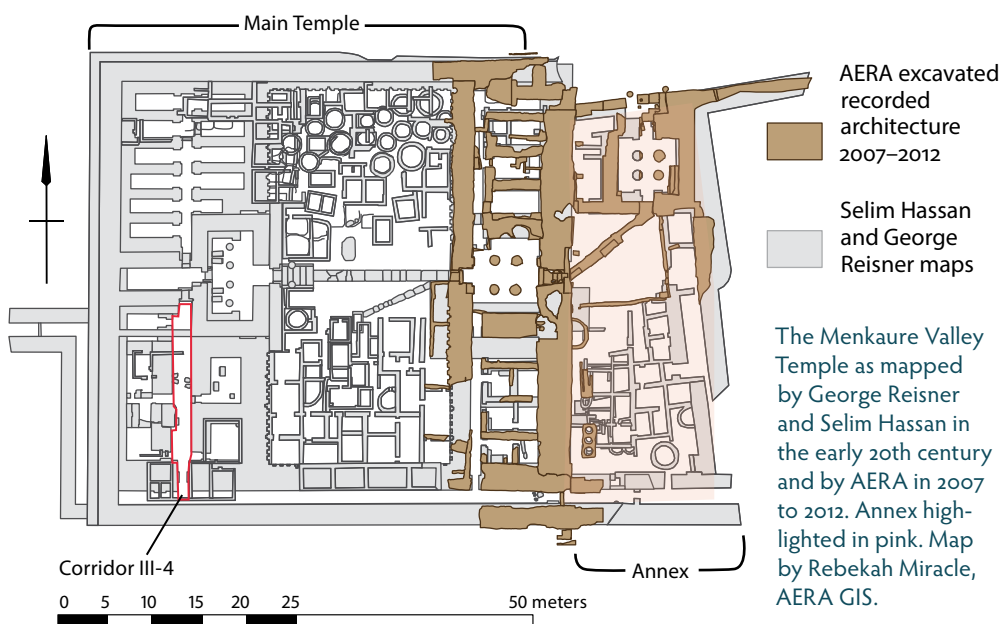
More Dyads

I find evidence for more dyads. Given the multiple triads, colossi, and seated figures of the king (discussed below), one should, in fact, expect more than one dyad. Most stone statue types seem to appear in multiples, though their sizes can differ. Some greywacke fragments that Reisner thought went to triads, I show cannot fit triads and suggest went to at least two more dyads, one the same size as the famous Boston example.²⁷ With evidence for three dyads, I suggest a fourth for symmetry, making two of the Boston dyad type and two that are smaller. Only the Boston dyad, however—without final carving or inscription—survived.

In terms of where these dyads would have stood in the temple, I offer one very provisional thought. My hypothetical four dyads might have appeared in the valley temple court or even the Annex, facing east, with the queen mother very slightly glancing to her left toward her Khentkawes town and monument, and the king glancing right, possibly toward Heit el-Ghurab (the settlement site to the southeast of the Menkaure Valley Temple), where Mark Lehner, supported by the work of John Nolan, suggests there might have been a palace or more probably, part of a palace layout, a *setep za*.²⁸

Alabaster Fragments and Seated Statues

While the triads and dyad(s) appeared in greywacke, the bulk of Menkaure’s



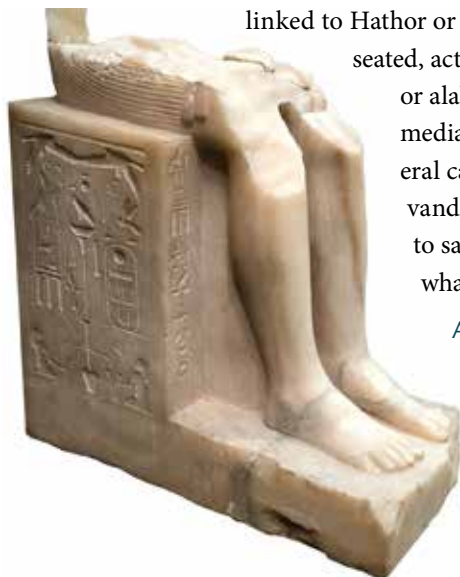
The Menkaure Valley Temple as mapped by George Reisner and Selim Hassan in the early 20th century and by AERA in 2007 to 2012. Annex highlighted in pink. Map by Rebekah Miracle, AERA GIS.

statuary, based on remains, seems to have been alabaster. In storage at the Boston Museum are hundreds of alabaster fragments, many from seated statues of Menkaure, mixed with some of Khafre's, from under-life-size to colossal.²⁹ And more alabaster Menkaure fragments were recently found by AERA at the valley temple. Reisner also made an important find of alabaster seated statues, which, unlike the colossus, triads, or dyad, were found in situ: four enthroned figures of the king, life-size to a little over life-size, facing east, and acting as participants in his ongoing offering cult in the valley temple offering hall (shown at right and below).

Like the colossi, triads, and dyads, the seated statues also appeared in multiples. All were severely damaged, however, and only the throne of one is fully inscribed (see below). (I think it was also the only one in the Menkaure Valley Temple finished in Menkaure's reign). My ongoing research of alabaster fragments of titulary from the pyramid temple, stored at the Boston Museum of Fine Arts, gives increasing evidence for a comparable set of enthroned figures in the pyramid temple, some perhaps even larger than those in the valley temple and fully inscribed.

The iconography and inscriptions of the one fully inscribed statue from the valley temple (below) (and the other inscribed statues that I posit for the pyramid temple on the basis of the titulary fragments),³⁰ I suggest, brought the king into the solar sphere of his divine father, Re, where the king became the young sun seated atop a microcosm of the world, embodied in the throne. And the iconography and inscriptions of the greywacke triads, I suggest, linked the king to Hathor, his divine mother, who ensured his eternal kingship through sanctioning his *heb sed* ritual of rejuvenation and provisioning it from Hathor-related estates in the designated nomes. Regarding the dyad(s)' meaning, it may relate to the *heb sed* or, by virtue of the statues' hypothetical placement, to a ritual association with Khentkawes.³¹

But almost all of Menkaure's statuary—whether linked to Hathor or Re, whether striding or seated, active or passive, in greywacke or alabaster (as well as other media)—was smashed over several campaigns of vandalism. Is vandalism why someone tried to save an unfinished dyad and what was left of a triad?



Alabaster throne base of seated statue of Menkaure from offering hall, second from right in photo on the right above, MFA 09.202. * Photo by Michael Fredericks. * Courtesy, Museum of Fine Arts, Boston.

Mark Lehner and the AERA team are now, over a century after Reisner's excavations, shedding new light on these and other questions (see article starting on page 2).

Acknowledgements

My thanks to Dr. Mark Lehner, President, Ancient Egypt Research Associates, for inviting me to join the AERA team at the Menkaure Valley Temple in March 2019 and to Dr. Walter Gilbert, Chair of the Society of Fellows, and Carl M. Loeb University Professor Emeritus, Harvard University, for making the season possible. I offer gratitude as well to the following, for their ongoing help and advice: to the curators in the Department of Art of Ancient Egypt, Nubia and the Near East, at the Museum of Fine Arts, Boston: Dr. Rita E. Freed, John F. Cogan, Jr. and Mary L. Cornille Chair; Dr. Lawrence M. Berman, Norma Jean Calderwood Senior Curator; Dr. Denise Doxey, Curator; Susan J. Allen, Dr. Barbara Bell Research Associate for Egyptian Expedition Archives; LeeAnn Barnes Gordon, Associate Objects Conservator at the Museum; and to Dr. Peter Der Manuelian, Barbara Bell Professor of Egyptology, Harvard University, Director, Harvard Semitic Museum, and Founding Director, The Giza Archives, Museum of Fine Arts, Boston; Diane Flores, former Research Associate, The Giza Archives; Mimi Leveque, Conservator, Peabody Essex Museum; and Michelle Pisa, graphic designer and assistant.



1. Reisner, G. A., *Mycerinus: The Temples of the Third Pyramid at Giza*, Cambridge, MA: Harvard University Press, pages 22–24, plates 8, 12–16a, 1931. The volume can be downloaded for free at <http://giza.fas.harvard.edu/public-docs/130/full>.

2. Specific locations of the fragments are given by the Museum of Fine Arts, Boston: "In January 1907, George Reisner found fragments from the shoulder and torso in a pit in that room [the deep niche at the back of the temple] and the large fragment comprising the hands, legs, and throne base in an adjacent corridor. Two months later, while excavating what proved to be a robber's trench nearby, Reisner found the head in nearly perfect condition" (<https://collections.mfa.org/objects/138532/colossal-statue-of-king-menkaure-mycerinus>, accessed December 15, 2019). For theories on placement of the statue, see *Giza and the Pyramids* by M. Lehner and Z. Hawass, Chicago: University of Chicago Press, page 255, 2017.

3. These are not pieces that go to the colossus found in the pyramid temple.

4. Friedman, F. D., "The Names of Menkaure," in *The Perfection that Endures, Studies on Old Kingdom Art and Archaeology*, edited by K. O. Kuraszkiwicz, E. Kopp, and D. Takács, Warsaw: University of Warsaw, pages 114–115, 2018. That fragments migrated far from MPT (Menkaure Pyramid Temple) or MVT (Menkaure Valley Temple) means that careful examination of all fragments is required even when fragments are listed in collections as unprovenanced other than Giza.

5. Friedman, F. D., "Reading the Menkaure Triads, Part I," in *Palace and Temple*, 5th Symposium on Egyptian Royal Ideology, edited by R. Gundlach and K. Spencer, Wiesbaden: Harrassowitz Verlag, pages 23–41, 2011; "Reading the Menkaure Triads: Part II (Multi-directionality)," in *Old Kingdom, New*



Excavation photo of offering hall ("portico") in the Menkaure Valley Temple.* G. A. Reisner, *Mycerinus: The Temples of the Third Pyramid at Giza*, Cambridge: Harvard University Press, 1931, plate 47a. *Courtesy, Museum of Fine Arts, Boston.

Perspectives: Egyptian Art and Archaeology 2750-2150, edited by N. Strudwick and H. Strudwick, Oxford and Oakville: Oxbow Books, pages 93-114, 2011.

6. See especially Reisner, *Mycerinus*, 1931, plate 36c.

7. Reisner, *Mycerinus*, 1931, page 37 (January 19).

8. Reisner, *Mycerinus*, 1931, page 49.

9. His diary can be found at <http://giza.fas.harvard.edu> and hereafter referred to as the diary.

10. Diary, Tuesday, January 18, 1910.

11. Arnold, D., *When the Pyramids Were Built: Egyptian Art of the Old Kingdom*, New York: The Metropolitan Museum of Art, page 68, 1999.

12. Arnold, *When the Pyramids Were Built*, 1999, page 68.

13. Friedman, F. D., "The Menkaure Dyad(s)," in *Egypt and Beyond, Essays Presented to Leonard H. Lesko upon his Retirement from the Wilbour Chair of Egyptology at Brown University, June 2005*, edited by S. E. Thompson and P. der Manuelian, Providence, RI: Department of Egyptology and Ancient Western Asian Studies, Brown University, page 135, 2008.

14. Lehner, M., "The Monument and the Formerly So-called Valley Temple of Khentkawes I: Four observations," in *Royal Versus Divine Authority: 7th Symposium on Egyptian Royal Ideology*, edited by F. Coppens, J. Janák, and H. Vymazalová, Wiesbaden: Harrassowitz, pages 267-8, 271-4, 2015.

15. Lehner, "The Monument and the Formerly So-called Valley Temple of Khentkawes I," 2015, page 271.

16. I thank Mark Lehner for the approximate depth of the hole. The AERA team has now discovered that the dyad was actually found in an older hole, adjacent to but farther east than Reisner's "Thieves' Hole."

17. Reisner, *Mycerinus*, 1931, page 110 (17).

18. <https://collections.mfa.org/objects/230/king-menkaure-mycerinus-and-queen>; accessed 12/15/19.

19. My thanks to Mimi Leveque, Conservator, Peabody Essex Museum, for discussing the condition of the dyad with me, including evidence of wear and usage.

20. When the beard was broken and the implications of that chronology for the meaning of the dyad will be the subject of a future article.

21. I thank Larry Berman and LeeAnn Barnes Gordon (see Acknowledgments) for sharing information on the MFA, Boston's 1937 repair of the beard.

Florence Friedman at the Menkaure Valley Temple in March 2019. Photo by Sayed Salah Abd el-Hakim. Dr. Friedman is Visiting Scholar, Department of Egyptology and Assyriology, Brown University, and Curator Emerita of Ancient Art at the Rhode Island School of Design Museum.

22. Reisner, *Mycerinus*, 1931, page 110 (14). Since this account differs from Reisner's diary account of February 8, 1910, which does not single out the large triad fragment and does not mention that it lay 50 centimeters below the dyad, there's a bit of a mystery: from what now-lost record was Reisner drawing for his account in the 1931 publication?

23. Reisner, *Mycerinus*, 1931, plate 64h, accessioned two years later by the Museum of Fine Arts, Boston, as MFA 12.1514.

24. Diary, Tuesday, February 8, 1910. In the diary, Reisner provides no drawings of the fragments.

25. Reisner, *Mycerinus*, 1931, page 110 (14).

26. My suggested reconstruction for this triad (top, page 13) is explained in F. D. Friedman, "Economic implications of the Menkaure triads," in *Towards a New History of the Old Kingdom. Perspectives on the Pyramid Age. Papers from a Symposium at Harvard University, April 26, 2012* (Harvard Egyptological Studies 1), edited by P. der Manuelian and T. Schneider, Leiden-New York: Brill, pages 18-59, 2015.

27. Friedman, F. D., "Evidence Suggesting Another Boston Dyad of Menkaure and a Queen," in *Statues in Context: Production, Meaning and (Re)uses, Proceedings of the Sackler Colloquium Organised in July 2016 at the British Museum*, edited by A. Masson-Berghoff, D. Rosenow, and M. Marée, Leuven: Peeters, forthcoming 2019.

28. Lehner, M., "Giza Plateau Mapping Project," in *Oriental Institute Annual Report, 2017-2018*, Chicago: The Oriental Institute, The University of Chicago, pages 90-94, 2018. Lehner, in suggesting the site for a palace, notes as one possibility that, "All the major structures we have been exposing, including the HeG barracks and bakeries, could have been parts of one gigantic palace, a kind of Old Kingdom Egyptian equivalent of Versailles, or better, New Kingdom Amarna or Malkata..." (page 94). For this reference, I thank Mark Lehner, who also suggests Building M in Khentkawes Town as a possible palace location. See also M. Lehner's "Kromer in Context: Biography of an Ancient Dump," *AERAGRAM* 19-2, page 12, Fall 2018.

29. Friedman, "The Names of Menkaure," 2018, pages 114-115, 131, 132.

30. Friedman, "The Names of Menkaure," 2018, pages 114-115, fig. XX, 2. Slight revisions to these fragments will be forthcoming.

31. Lehner notes that Khentkawes I was probably "worshipped within the valley temple of Menkaure in the guise of Hathor." Lehner, "The Monument and the Formerly So-called Valley Temple of Khentkawes I," 2015, page 273. For further articles on the Menkaure statuette, see Florence Dunn Friedman in academia.edu or in Google Scholar.



"Freelance" Farmers at HeG? by Elizabeth Hart



The Heit el-Ghurab (HeG) settlement was a "company town" created to support pyramid-building at Giza that thrived during Khafre's and Menkaure's reigns—and probably Khufu's—and was dismantled at the end of Menkaure's reign. The crown provided both pyramid-building materials and many necessities of daily life for the town, such as food. Most meat was provisioned, according to AERA archaeozoologist Richard Redding.¹ Cattle, sheep, and goats were delivered to the town, on the hoof. AERA archaeobotanists Claire Malleson, Mary Anne Murray, and Wilma Wetterstrom¹ likewise determined that wheat and barley were supplied to Heit el-Ghurab (HeG).

But not everything came through the administration. Redding found that pigs were not part of the state economy. They were procured through less formal channels, probably raised nearby, or in the Eastern Town on the eastern edge of HeG. What about cereals? Is it possible that some residents raised their own emmer wheat and barley crops?

Elizabeth Hart, a specialist in flaked stone tools and a research fellow at the Metropolitan Museum of Art, joined the AERA team this past season asking this very question: were some HeG residents farmers? Here she answers the question through her study of sickle inserts recovered from HeG excavations.*

Ancient Egyptians used sickles to reap the grain that they made into bread and beer for daily consumption and for funerary offerings. There are many tomb reliefs showing sickles and the grain harvest (see above). The sickles themselves were made by first flaking flint or chert² into small pieces that could then be set into wooden hafts and held in place with an adhesive (above left). The stone inserts formed the cutting edge of the sickles. While the wooden parts of the sickles rarely preserve, the flint inserts survive very well in the archaeologi-

cal record. By studying their attributes and distribution, we can learn about how ancient Egyptians made and used the sickles, gaining insight into one aspect of the lives of the farmers who relied on these tools.

The presence of sickles can help us answer the question of whether some people at HeG grew their own grain, and details about the sickles can tell us how they were made. In February, I joined the AERA lab team and studied the flaked-stone material from six areas at HeG (map, page 18) to answer these questions. Though it is possible that sickle inserts were used

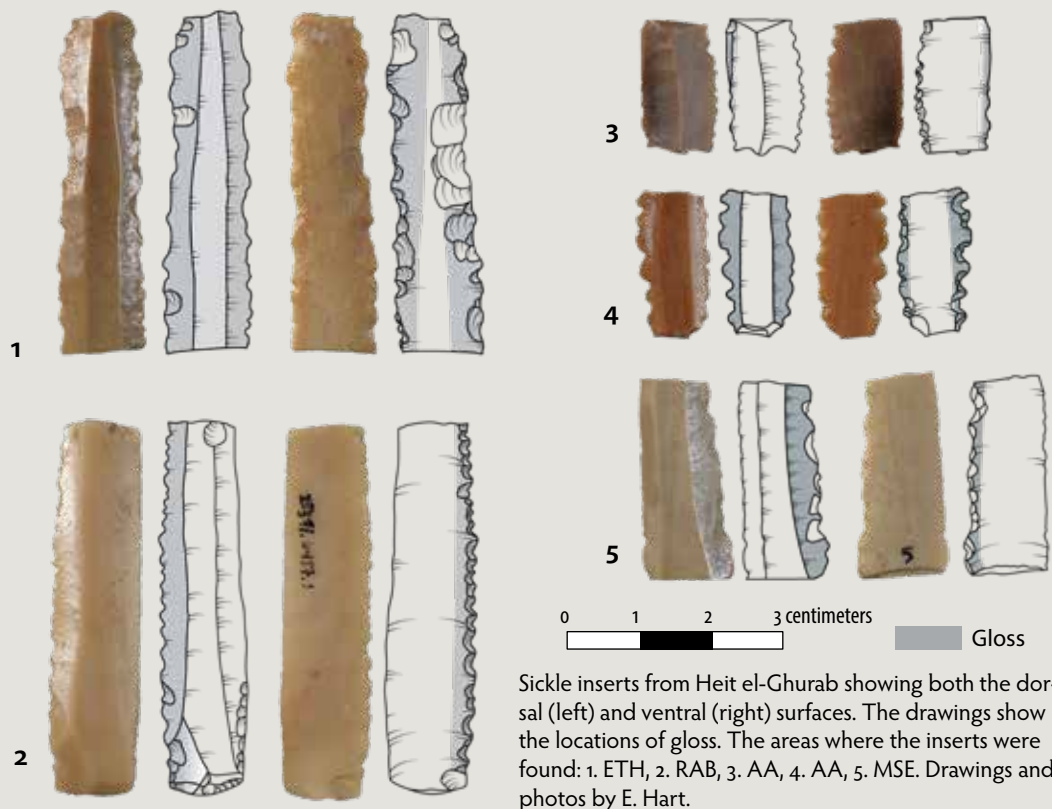
Top: Harvest scene from the tomb of Mereruka, Saqqara. Old Kingdom, 6th Dynasty. Photo by Claire Malleson.

Above: Wooden sickle retaining some flint inserts. BM EA 52861. 28.5 × 20.5 × 11.5 centimeters. Photo: CC BY-NC-SA 4.0 © Trustees of the British Museum.

* This study is part of a larger project, supported by a J. Clawson Mills Research Fellowship at the Metropolitan Museum of Art, aiming to study how the production of flint sickles changed over time from the 5th to the 1st millennium BC.



From the top: Artifact without sickle gloss (Metropolitan Museum of Art, Rogers Fund, 26.2.261). Sickle Insert with gloss (Metropolitan Museum of Art, Rogers Fund, 48.105.39a). Photos by E. Hart, courtesy of the Metropolitan Museum of Art.



Sickle inserts from Heit el-Ghurab showing both the dorsal (left) and ventral (right) surfaces. The drawings show the locations of gloss. The areas where the inserts were found: 1. ETH, 2. RAB, 3. AA, 4. AA, 5. MSE. Drawings and photos by E. Hart.

for other purposes, I considered the presence of sickles to be an indication of agricultural activities, based on representations of sickle use and patterns of use wear (see sidebar, page 20, for more details).

Identifying Sickles

To find the sickles, I examined over 25,000 flaked-stone artifacts from HeG. The material included tools like scrapers, knives, and retouched blades, along with the remains from producing tools, like cores and flakes (also known as debitage), and very small chips/debris.

Fortunately, identifying which of these many pieces were parts of sickles is relatively easy. Reaping grain leaves a kind of use-wear called sickle gloss that is visible to the naked eye. The sickle gloss forms when microscopic structures called phytoliths, which are found in many plants, abrade the edge of the flint—like the finest sandpaper imaginable—resulting in a highly glossy edge. The photos on the left above show the difference between a lithic artifact with and without sickle gloss.

Sickle Inserts at HeG

First, I looked at the site overall. Are there any sickle inserts at HeG? Other researchers studying HeG have shown that the site was provisioned with animals and grain,³ so it was possible that there would be no sickle inserts at HeG at all. However, in a sample of ~25,000 lithic artifacts, I did find 44 sickle inserts, which is less than 0.2% of all lithic artifacts, and less than 6% of all tools. Four of these inserts clearly dated to the earlier Neolithic–Predynastic periods, and they mostly come from

mudbrick wall-tumble contexts, so they were probably brought into the site accidentally with the mud construction materials. (They do hint that the Giza builders were probably getting the mud and soil for construction from an earlier settlement in the area!). This leaves 40 Old Kingdom sickle inserts (examples shown above), which could have made at least four to eight complete sickles.⁴ So, the presence of 40 sickle inserts at HeG indicates that some people at HeG were farming.

This farming was probably to simply supplement the provisioned grain. For comparison, at Kom el-Hisn, a roughly contemporary site in the Nile delta, excavators found hundreds of sickle inserts in a much smaller sample. Out of 453 tools, 53%, or 240, were sickle inserts with sickle sheen.⁵ Clearly the inhabitants of Kom el-Hisn were doing a lot of farming and supplying themselves with grain, very different from what was happening at HeG. Though low in frequency, the presence of sickle inserts at HeG is an exciting find, adding nuance to our view of grain supply at HeG.

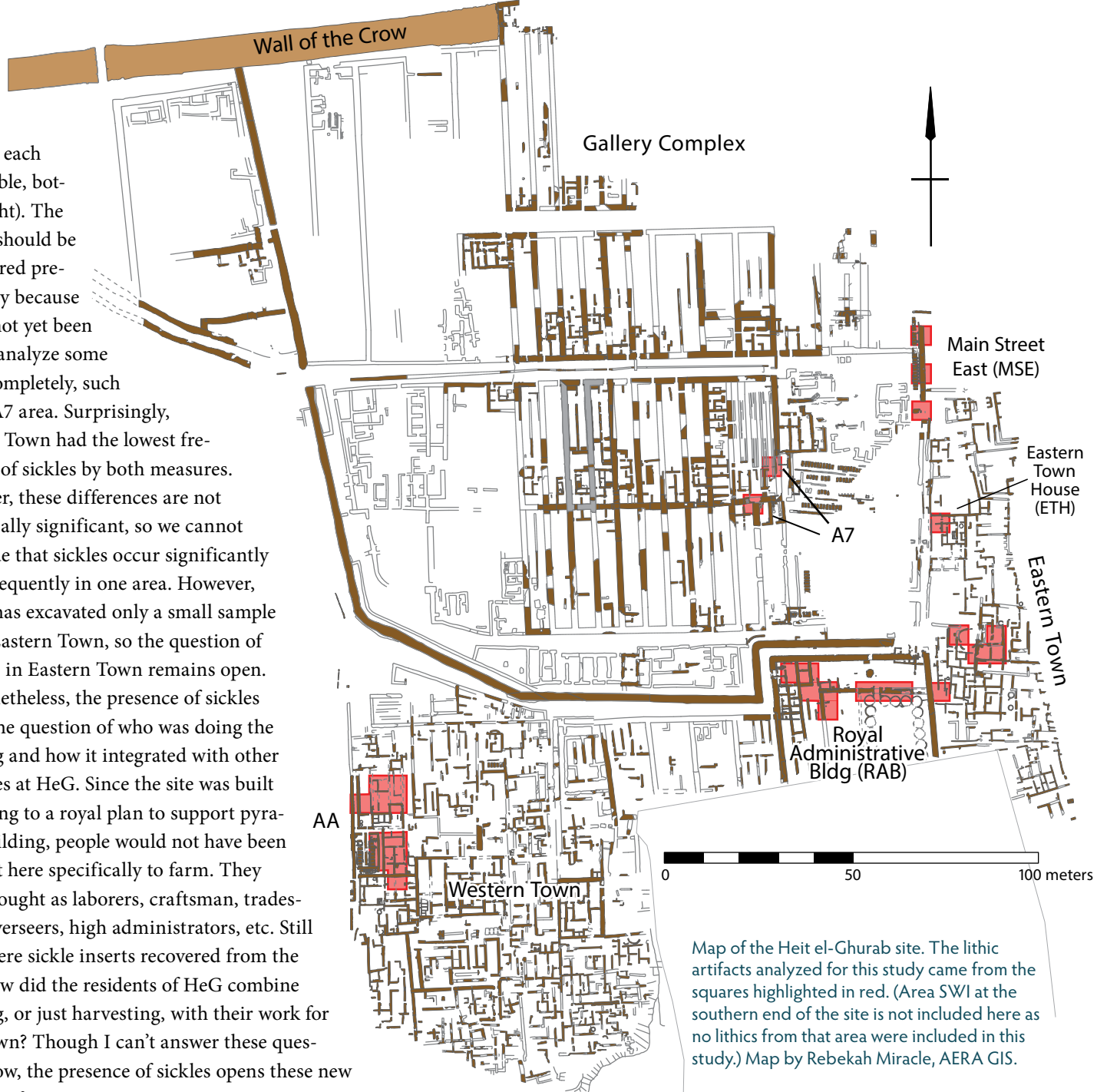
Differences Across HeG?

Even though evidence for farming was rare, I still wanted to see if some inhabitants of HeG might have been doing more farming than others. Studies of the animal remains indicated that people in the Eastern Town reared their own pigs, so I wondered if they might have also grown their own grain. If so, we might find sickles more frequently in Eastern Town than in other areas of the site.

I compared the frequency of sickles among all flaked-stone artifacts, and the frequency of sickles among just the flaked

stone tools in each area (table, bottom right). The results should be considered preliminary because I have not yet been able to analyze some areas completely, such as the A7 area. Surprisingly, Eastern Town had the lowest frequency of sickles by both measures. However, these differences are not statistically significant, so we cannot conclude that sickles occur significantly more frequently in one area. However, AERA has excavated only a small sample of the Eastern Town, so the question of farmers in Eastern Town remains open.

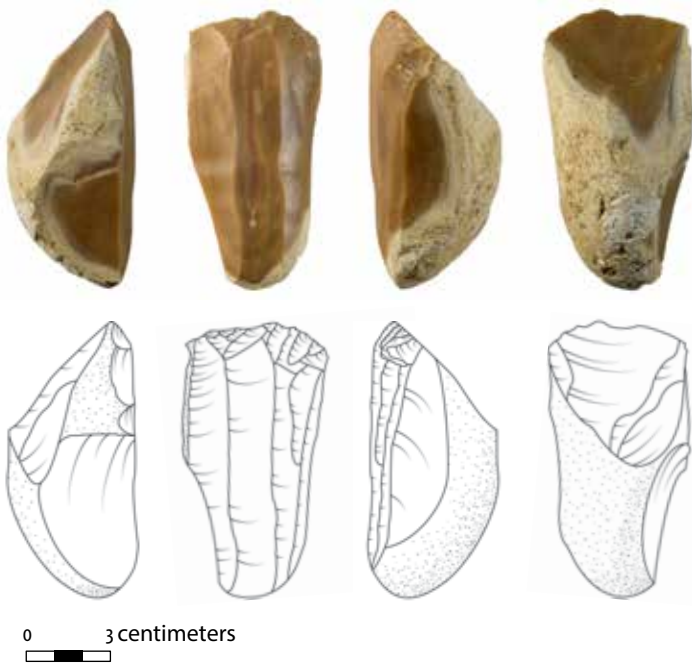
Nonetheless, the presence of sickles raises the question of who was doing the farming and how it integrated with other activities at HeG. Since the site was built according to a royal plan to support pyramid building, people would not have been brought here specifically to farm. They were brought as laborers, craftsmen, tradesmen, overseers, high administrators, etc. Still there were sickle inserts recovered from the site. How did the residents of HeG combine farming, or just harvesting, with their work for the crown? Though I can't answer these questions now, the presence of sickles opens these new avenues of inquiry.



Did the HeG Residents Make Their Own Sickles?

The production technology of the sickle inserts gives us an indication of whether specialized craftsmen made the inserts, or if the HeG residents could have made them. Among scholars who study flaked-stone, “blade” is a technological term that refers to a long narrow piece of stone detached from a core piece of stone (facing page, top far right), and it is differentiated from “flakes,” which are wider pieces of stone removed from a core (facing page, top right inset). Blades and flakes are separated because different techniques and skill levels are required to make them. Flakes are relatively simple to make, but blades are more complex: the ancient flintknappers first had to modify a core into a certain shape so that when they

	Royal Admin Bldg	Eastern Town	Eastern Town House	AA	A7	Main St East
Number of All Lithic Artifacts	9472	6108	389	3806	870	TBD
Number of Tools	213	196	29	214	21	91
Number of Sickles	15	5	2	7	2	6
Percent of All Lithic Tools	0.16	0.08	0.51	0.18	0.23	TBD
Percent of All Tools	7.04	2.55	6.9	3.27	9.52	6.59



Above: Acute-angled core for the production of blades, found in Area AA. Photos and drawings by E. Hart.

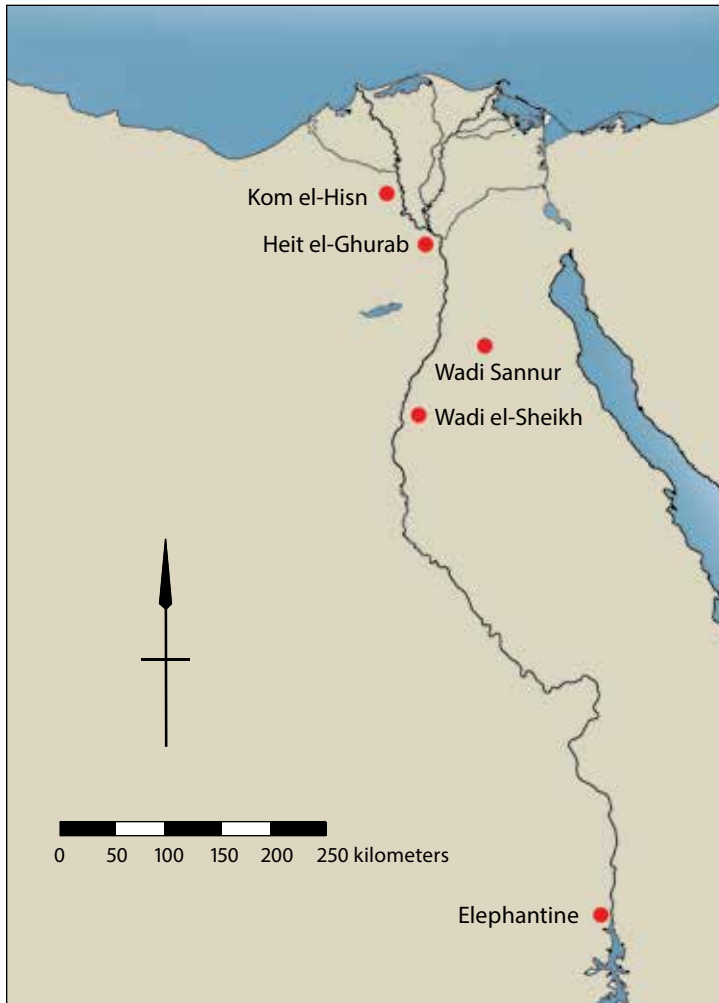
detached the blade it would be long and narrow. All of the Old Kingdom sickle inserts at Giza were made from blades, a technology that requires a degree of expertise. Sickle inserts from other Old Kingdom sites, including Elephantine and Kom el-Hisn, were also made on blades (map, page 20).⁶



Archaeologists have found massive quantities of production remains for such blades at desert flint mining sites like Wadi el-Sheikh⁷ and Wadi Sannur⁸ (below and map, page 20)

Below: Flint mining trench filled with sand at Wadi el-Sheikh Locality 21. Photo by M. Klaunzer. Inset: Numerous blade cores visible on the surface of Wadi el-Sheikh Locality 28. Photo by E. Hart.





Locations of sites referenced in this article. Map by Wilma Wetterstrom.

including hundreds of thousands of blade cores. However, I only found one blade core among all of the lithic artifacts sampled from Heit el-Ghurab. Considering this distribution of the production remains, and the expertise needed to make blades, it seems likely that specialized craftsmen made the blades, rather than the residents themselves.

Once the craftsmen made a blade, the edges could be shaped with additional flaking, called retouch, so that it would fit into a wooden sickle haft along with other inserts. However, the sickle inserts from HeG had very little retouch or shaping. Usually, the ends were simply snapped to make the pieces the right length, and the back edges of the blades were almost never retouched. Although the HeG sample of sickle inserts is small, Old Kingdom sickle inserts from other sites also show little shaping retouch.⁹ The implication is that the craft producers who made the sickle inserts focused on making blades that were pretty much the right size and shape, so that they did not need a lot of retouch to fit into the hafts. This is important because it means that harvesters could just get the inserts from the flint craftsmen, and then put the inserts into the wooden sickle hafts themselves. They were partially, but not completely, reliant on others for their tools.

Sickle Repair?

I also looked at whether the farmers re-sharpened and re-used the sickle inserts, or simply discarded and replaced them once they became dull. In some cases, I could see small regular scars that cut through the sickle gloss, showing that the insert was re-sharpened after it had been used long enough to develop sickle gloss. In other cases, there was gloss on both edges of the insert indicating that the insert had been used, then taken out, flipped over, and put back into the sickle. In total, approximately 30% of the inserts had at least two phases of use, showing that harvesters regularly re-used the sickle inserts. Re-use of sickle inserts is also reported at other Old Kingdom sites such as Elephantine and Kom el-Hisn.¹⁰ The regular re-use of sickle inserts implies that they were somewhat valuable, it was worthwhile to try to repair them rather than just replace them, or at least that it was not always simple or “cheap” for farmers to obtain new inserts.

Although the inhabitants of Heit el-Ghurab overwhelmingly relied on farmers in other parts of the country to provide grain, some people at HeG harvested grain. Those people, and farmers at other sites, relied on specialists for the sickle inserts needed to harvest grain. This look at sickles underlines the economic complexity and interconnectivity of ancient lives in Old Kingdom Egypt.

1. Redding, R., “The OK Corral: Standing Wall Island Mystery, Solved.” *AERAGRAM* 12-1, pages 2–5, Spring 2011; Editor’s introduction to “Stews, Meat, and Marrow,” *AERAGRAM* 12-2, pages 13. Issues of *AERAGRAM* are available for free download from aeraweb.org. Lehner, M., “The Giza Plateau Mapping Project,” *Oriental Institute Annual Report 2014–2015*, edited by G. Stein, Chicago: The Oriental Institute, The University of Chicago, pages 90, 92, 2015.
2. The terms “flint” and “chert” are both often used to refer to microcrystalline quartz. Geologically they are the same, and the differences in use are historical and regional, so here they are considered interchangeable.
3. See footnote 1.
4. Assuming five to nine inserts per sickle, based on finds of complete sickles in: Emery, W. B., *Excavations at Saqqara. The Tomb of Hemaka*, Cairo: Government Press, 1938.
5. Kobusiewicz, M., “Chipped and Ground Stone Assemblages from Kom el-Hisn.” In *Kom el-Hisn (ca. 2500–1900 BC): An Ancient Settlement in the Nile Delta*, edited by R. J. Wenke, R. W. Redding, and A. J. Cagle. Atlanta, GA: Lockwood Press, pages 327–341, 2016.
6. Hikade, T., *The Lithic Industries on Elephantine Island During the 3rd Millennium BC*. Wiesbaden: Harrassowitz 2013; Kobusiewicz, *Kom el-Hisn*, 2016.
7. Köhler, E. C., E. Hart, and M. Klaunzer, “Wadi El-Sheikh: A New Archaeological Investigation of Ancient Egyptian Chert Mines,” *PLOS ONE* 12, no. 2, pages 1–38, 2017.
8. Briois, F., and B. Midant-Reynes, “Sur Les Traces de Georg August Schweinfurth. Les Sites d’exploitation Du Silex d’époque Pharaonique Dans Le Massif Du Galàla Nord (Désert Oriental).” *Bulletin de l’Institut français d’archéologie orientale* 114, pages 73–98, 2014.
9. Hikade, *Elephantine*, cat. no. 139–158, plates 14–15; Kobusiewicz, *Kom el-Hisn*, 2016, page 328; Midant-Reynes, B. *Le silex de ‘Ayn-Asil: Oasis de Dakhla - Balat*. Le Caire: Institut Français d’Archéologie Orientale, pages 23, 75, 1998.
10. Hikade, *Elephantine*, 2013; Kobusiewicz, *Kom el-Hisn*, 2016.



Inset: A handful of cereal straw at a farm in Upper Egypt. Photo by Wilma Wetterstrom. Right: A worker cuts down reed stems at Memphis during AERA's 2015–2017 Memphis Development Project. Note how large these stems are compared with the cereal stems. It is not likely that the thin sickle inserts found at HeG were used to cut reed stems as they would have worn down very rapidly. Photo by Sayed Salah Abd el-Hakim.

SICKLE INSERTS: GRAIN VS. REED HARVESTING

How do we know that the sickle inserts from HeG were primarily used to harvest grain and not for other activities such as cutting down reeds? First, ancient Egyptians frequently depicted sickles being used to harvest grain (page 16), but I know of no representations of sickles being used on other plants (though of course, many aspects of ancient Egyptian life were not depicted). Depictions of flax show it was harvested by uprooting. Threshing appears to have been done by trampling, and threshing sledges (which can utilize flint inserts) only came into use in Egypt after the Pharaonic period.¹

Secondly, scholars have done experimental work harvesting reeds and grain to look at the resulting patterns of wear and interpret how ancient tools were used. Based on such studies, the very thin inserts found at HeG would not be ideal for cutting reeds because they would wear down very quickly.² Additionally, gloss that is very invasive, about 0.25 inches (around 0.5 centimeter) or more, is more common when harvesting cereals than when cutting reeds.³ The gloss on the inserts from HeG reaches 0.17 inches (0.42 centimeters) from the edge on average, with almost half of the examples having gloss that reaches 0.5

centimeters or more, a pattern in-line with cereal harvesting. Furthermore, gloss that develops from reed cutting tends to be very clearly demarcated, whereas with grain harvesting the gloss fades out gradually from the edge.⁴ The gloss on the HeG inserts fades, particularly on the ventral surfaces. Micro-wear studies could add valuable data for answering this question, but given the current evidence from representations and macroscopic use-wear, it is likely that the inserts from HeG were used mainly to harvest grain.

1. Murray, M. A., "Cereal Production and Processing." In *Ancient Egyptian Materials and Technology*, edited by P. T. Nicholson and I. Shaw, Cambridge: Cambridge University Press, page 524, 2000.

2. Yamada, S., "Development of the Neolithic: Lithic Use-Wear Analysis of Major Tool Types in the Southern Levant," Ph.D. dissertation, Harvard University, 2000, page 240.

3. Gijn, A. van, "The Use of Bronze Age Flint Sickles in the Netherlands: A Preliminary Report," In *Industries lithiques: tracéologie et technologie*, edited by Sylvie Beyries, Oxford: B.A.R. page 205, 1988; Yamada, Use-wear, 2000, page 241.

4. Pichon, F., "Exploitation of the Cereals during the Pre-Pottery Neolithic of Dja'de-El-Mughara: Preliminary Results of the Functional Study of the Glossy Blades," *Quaternary International*, 427 (January), page 142, 2017; Unger-Hamilton, R., "The Epi-Paleolithic Southern Levant and the Origins of Cultivation." *Current Anthropology* 10 (1), page 92; Yamada, Use-wear, 2000, page 238, 1989.



A. Metal cut mark, 33× magnification

Old Bones Viewed with New Methods: Did Giza Butchers Use Copper Knives *by Eleuterio Luther Sousa*

We recover animal bones from all of our excavations. At the Kromer Dump site, a massive 4th Dynasty trash midden on the Giza Plateau, we retrieved enormous quantities of cattle and sheep/goat bones during our 2018 excavation, far more than the lab team could analyze at that time. This past season, Eleuterio Luther Sousa, a grad student from University of Manitoba, joined the team in our Giza field lab to study a sample of the bone, aiming to determine how the animals were butchered and if flint or copper blades were used. Here he presents his preliminary findings and discusses his method for identifying cut marks made by copper blades. This work is part of a larger study to resolve the issue of whether copper blades were used for everyday butchering during the Old Kingdom.

Stone and metal tools were used in ancient Egypt for butchery, but most of the metal knives from the Old Kingdom derive from funerary contexts. Was metal used in mundane matters of daily life, such as animal butchery? My goal is to determine if copper knives were used in everyday contexts.

Analyzing the Bone

I used the methods pioneered by a number of scientists who have looked at the diagnostic signatures of butchery marks on bone. Stone and metal tools leave different diagnostic traces that can be best distinguished under high power microscopes (such as the Scanning Electron Microscope). Typically, chipped flint blades create a jagged V-shaped groove with lateral striations. In contrast, metal tools create a symmetrical V-shape without any lateral grooves (see facing page, upper right).¹

My samples came from three deposits in the Kromer Dump (KRO).² I separated the bones containing cut marks from the assemblage, then identified them according to standard zoological criteria (e.g., species, element, size, age, etc.) and recorded any evidence of human alteration (e.g., burning, boiling, tool use, etc.). Next I identified the locations of the butchery marks in order to determine the butchering process (e.g., skinning, filleting, disarticulation, dismemberment, etc.). I entered all this informa-

tion into a database. Then, selecting only sheep/goat and cattle for research, I studied each butchery mark under a light optical microscope, recording the shape of the groove (profile) and associated striations (lines in the cut mark) and a preliminary identification (stone or metal) of the butchering implement. I recorded a microscopic image of the butchering mark with a DinoLite Digital Microscope provided by AERA (photos, above and facing page).

Different Strokes, Fast Processing

I can offer some preliminary observations here. First, most of the elements that I analyzed contained butchery (slice) marks that were located on the mid-shaft of the bone (photo facing page, far right center). These cut marks resemble filleting (meat stripping). At times, they are concentrated in areas that contain muscle markings or where muscle attachments may be found on the bone. The concentration of marks on the mid-shaft is very different than that seen in all other contemporary assemblages already examined outside of Egypt. And AERA archaeozoologist Richard Redding has never “noted this high level of shaft markings;” “there are more marks [from KRO] than I have seen in any other area we have excavated” (personal communication).

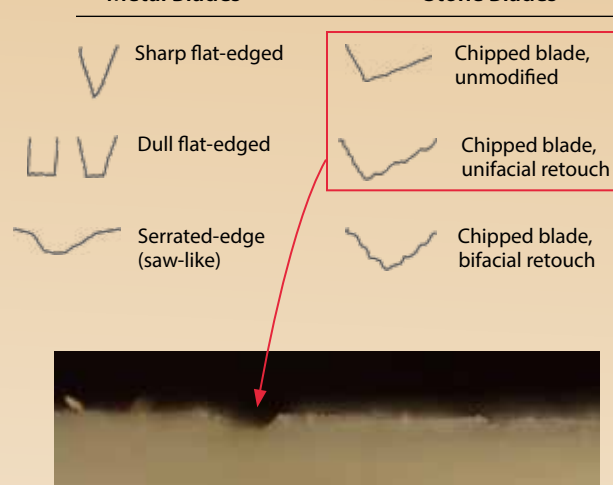


B. Metal cut mark, 220× magnification



C. Stone cut mark, 33× magnification

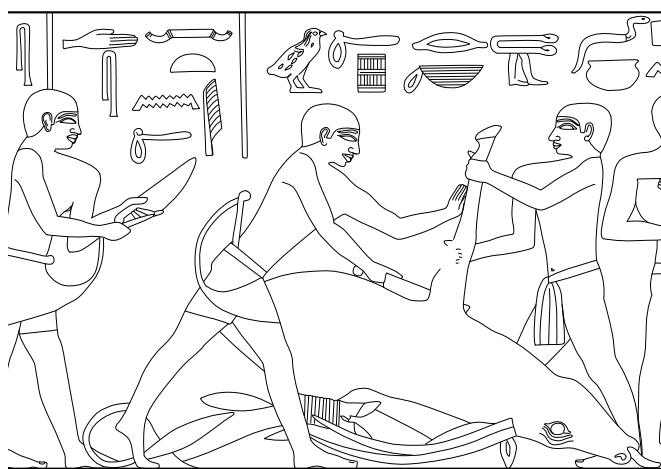
Profiles of Characteristic Metal and Stone Tool Cut-marks



D. Stone cut mark profile, 220× magnification

Facing page: Luther photographs cut marks on a bone using the DinoLite Digital Microscope. Inset: the DinoLite Digital Microscope. A and B above: Photos of metal cut marks taken by the DinoLite at 33× and 220× magnifications. The metal cut was identified on the basis of the shape shown in the chart above right. C and D above: Stone cut marks on bone. The profile view of the cut (D) resembles the two cuts made by stone blades, shown top right. The cuts were made by a sharp stone blade and one that had been sharpened, presumably after dulling, by retouch, pushing off flakes, in this case, on one side. Cut-marks diagram after Greenfield, 1999, figure 8, page 803.¹

Right: Butchering scene in the 5th Dynasty tomb of Ti at Saqqara. Here the butchers are using flint knives. The butcher in the center has a tool tucked in his belt that is used to sharpen flint blades. The butcher on the left sharpens his knife with the same kind of tool by pressure-flaking (pushing off flakes). After L. Épron, *Le Tombeau de Ti*, fascicle 1, plate XIV, Cairo: Institut Français d'Archéologie Orientale, 1939. Far right: Cut marks on the mid-shaft of a sheep/goat rib.



The bones in this sample display a unique method for animal butchery and meat processing. Given the large numbers of butchery marks on specimens, it would appear that the butchers were either inexperienced or just sloppy because they had to process so much meat very quickly. Richard Redding suggested, “It is likely that we are seeing high intensity, quick processing” (personal communication).

Copper Blades

I found some possible metal slice marks—4.5% of all identified butchery slice marks—based on my preliminary analyses. These results could lead to exciting new information on the use of metal in ancient Egypt, but it is important to note that further analyses must be conducted before any firm conclusions can be made.

The use of scientific techniques to analyze butchery marks can help close the gap between the few metal objects found in funerary contexts and the absence of such objects in settle-

ments. Further research is planned to determine if metal knives were used for butchery during the Old Kingdom.

Acknowledgements

I would like to thank AERA, particularly Richard Redding and Mark Lehner, for the opportunity to work on the assemblage, the Ministry of Antiquities for their continued support, and the AERA Egyptian team members. I thank Haskel Greenfield for his support and for funding he received through a University of Manitoba Tri-Agency SSHRC Bridging Fund.

1. Greenfield, H. J., “The Origins of Metallurgy: Distinguishing Stone from Metal Cut-marks on Bones from Archaeological Sites,” *Journal of Archaeological Science* vol. 26, pages 797–808, 1999.

2. The bones were recovered from Kromer deposits of trash that originally derived from two different sites: Heit el-Ghurab, the early phase, which was probably Khufu's pyramid-building town, and a site near the Menkaure Valley Temple that appears to have been a “roadhouse” for the king, dating prior to construction of the temple. See “Kromer in Context: Biography of an Ancient Dump,” *AERAGRAM* 19-2, pages 2–13, Fall 2018, for information about the Kromer Site. The newsletter can be downloaded for free from aeraweb.org.

AEF Grants for Khufu's Temple and AERA Objects

We are delighted to announce that the American Research Center in Egypt (ARCE) awarded AERA team members two Antiquities Endowment Fund (AEF) grants, the fourth and fifth that we have received.* Financed by USAID, these grants support one- to three-year professional projects “that serve the conservation, preservation and documentation needs of Egyptian antiquities.”

The Great Pyramid Temple Project

Few if any tourists who visit the Great Pyramid realize that they may be trodding on the remains of Khufu's mortuary temple, a magnificent structure which once stood on the eastern side of the pyramid. Over the centuries most of it was demolished, brought down to bedrock, and now the scant remains continue to deteriorate under foot traffic, carriages, camels, and horses. Losing the last remnants of the temple would be a great loss. Once a major component of Khufu's mortuary complex, the temple still offers information that helps us to understand the Great Pyramid, the last survivor of the Seven Wonders of the Ancient World.

With the AEF grant, awarded to Zahi Hawass and Mark Lehner, we will enclose the temple remains with a protective low wall of Tura limestone and conserve the surviving parts, such as the sockets that held columns. Through our efforts tourists will no longer meander around Khufu's pyramid oblivious of his temple. We will install wooden walkways and a viewing platform where visitors can survey the traces of the structure that once stood there. Signage for the temple and adjacent boat pits will help them understand these ancient structures and what they tell us about the Great Pyramid. The temple will be presented to visitors in a way that promotes understanding of the pyramid itself as a major hallmark of Egypt's ancient cultural heritage.

We will be carrying out this project in tandem with the Egyptian government's Giza Heritage Plan, which aims to revitalize tourism and protect the cultural resources of the plateau. The Great Pyramid Temple project will be the first stage of our Eastern Field Project, an effort to conserve and present some of the structures on the east side of the pyramid.

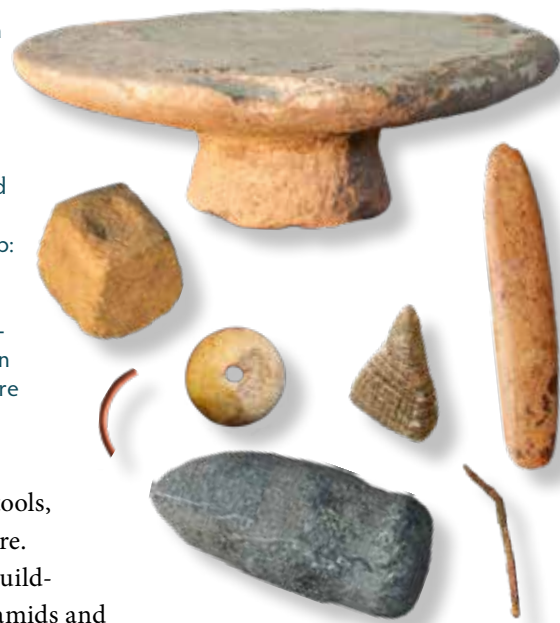
Giza Objects Database Project

After 30 years of work on the Giza Plateau, we have amassed a vast assemblage of artifacts, from the Heit el-Ghurab site, the Menkaure Valley Temple, and Khentkawes Town, including more than 7,000 objects, such as hammers, scrapers, grinding



Above: Horse and camel traffic on the remains of the northern part of the Great Pyramid Upper Temple, 2019. Photo by Mark Lehner.

Right: A selection of objects found in AERA excavations at the Heit el-Ghurab site. Clockwise from top: table, weaving tool, gaming piece, copper needle, hammer, spindle whorl, bracelet, and furniture support. Photos by Mark Lehner, Jason Quinlan, Yukinori Kawae, and Claire Malleson.



stones, weaving tools, and even furniture.

Used by people building the Giza pyramids and maintaining mortuary cults, these everyday objects offer valuable insights into Old Kingdom economy, administration, technology, and daily life. Our records include drawings, hand-written documents, and photographs, as well as an Access objects database. Over the coming year we will review our records, check for accuracy and consistency, prepare new photos and drawings as necessary, digitize where need be, and add to our database any objects that are missing. We will be joined by four Ministry of Antiquities Inspectors, all AERA field school graduates, who will receive additional training by working with the illustrator and photographer. The updated database should allow us to work toward publication and will make it easier to compare our three sites.

Watch for a report on the results of these two AEF-funded projects in a future issue of the newsletter.

*“Sphinx Archive Grant Update,” *AERA Annual Report 2016–2017*, page 4; “AERA Awarded Two Grants,” *AERAGRAM 18-1*, page 19, Spring 2017. *Annual Reports* and *AERAGRAMs* are available for free download at aeraweb.org.



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