GIZA PLATEAU MAPPING PROJECT

MARK LEHNER | ANCIENT EGYPT RESEARCH ASSOCIATES

In 2023–24, Ancient Egypt Research Associates (AERA) worked with a team led by Dr. Søren Sindbæk of Aarhus University to survey the southern floor of the Great Pyramid with laser scanning. We also excavated at the Menkaure Valley Temple (MVT) and continued analysis in the AERA field lab, a Ministry of Tourism and Antiquities (MoTA) magazine near the Great Pyramid.

GREAT PYRAMID BUILDERS' MARKS—3D SCANNING

In 2015–16, we surveyed the bedrock surface on the east, west, and north sides of the Great Pyramid, documenting 2,898 postholes, lever sockets, and quarry channels that Khufu's builders cut into the bedrock (fig. 1). In 2021, the eastern wooden boat of Khufu was moved from the south side of the pyramid to the Grand Egyptian Museum (GEM). The boat had been on display in a museum built directly over the pit

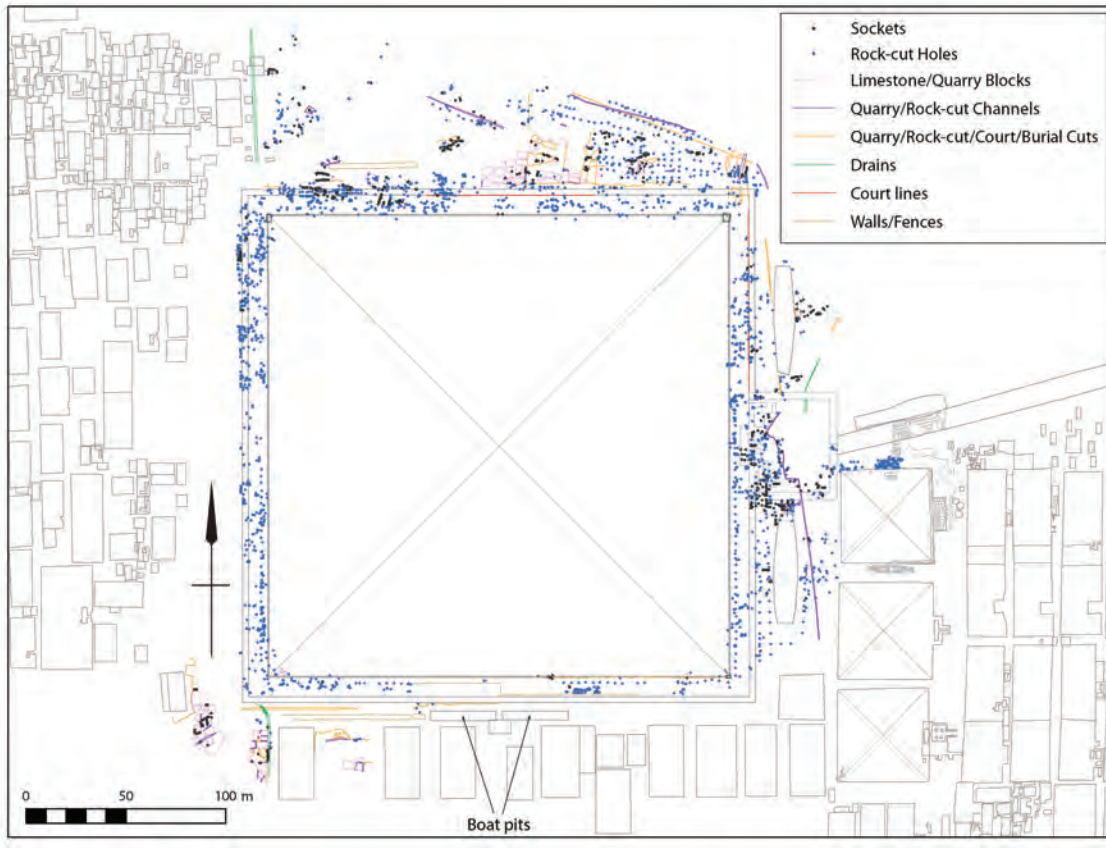

Figure 1. Plot of the holes and other features cut into the bedrock floor around the Great Pyramid, from a survey in 2015–16 by Ashraf Abd el-Aziz and Amer Zakaria. Map generated by Rebekah Miracle from AERA GIS.

Figure 2. View of the pavement on the south side of the Great Pyramid in 2018 showing the boat museum and, immediately to its right, the tentlike building covering the second boat pit where the Japanese team and MoTA conservators worked on the second boat.

where its pieces were found in 1954. From 2011 to 2021, a Japanese team conserved and extracted the wooden pieces of a second boat, in its pit immediately to the west. After both boats went to the GEM, the MoTA removed the boat museum and Japanese buildings (fig. 2), leaving exposed the southern bedrock surface, which had never been mapped in detail. A further 5,961 m^2 were now available for survey. Using a Trimble SX10 Scanning Total Station, the team produced a digital facsimile of this surface. Figure 3 provides a vector map extraction based on a scan of the Great Pyramid's southeast corner.

MENKAURE VALLEY TEMPLE EXCAVATIONS

This year we wanted to learn more about the foundations of the MVT. In our previous work, we found three major phases of building and occupation. Where Reisner saw his First and Second Temples, we see three. Two mudbrick temples were cut down and rebuilt. The First Temple was, as Reisner saw, the finishing in mudbrick of the temple Menkaure had started with limestone core blocks (our MVT0). People or natural forces truncated his First Temple (our MVT1). But this truncation was not the one that Reisner saw. People substantially rebuilt this Middle Temple (our MVT2), which functioned for about thirty years. This is the phase that a flood damaged, as Reisner saw, before people rebuilt the MVT a third time—Reisner's Second Temple, which is our Third Temple (MVT3).

MVT-West

We confirmed these four phases in most of our 2024 sondages (fig. 4). We excavated Sondages 144, 187, and 186 along the west side of the temple. Sondage 144 gave the clearest testimony of all four phases—a profile through 301 years of deposits, from the block foundation set by Menkaure (ca. 2551 BCE) to the

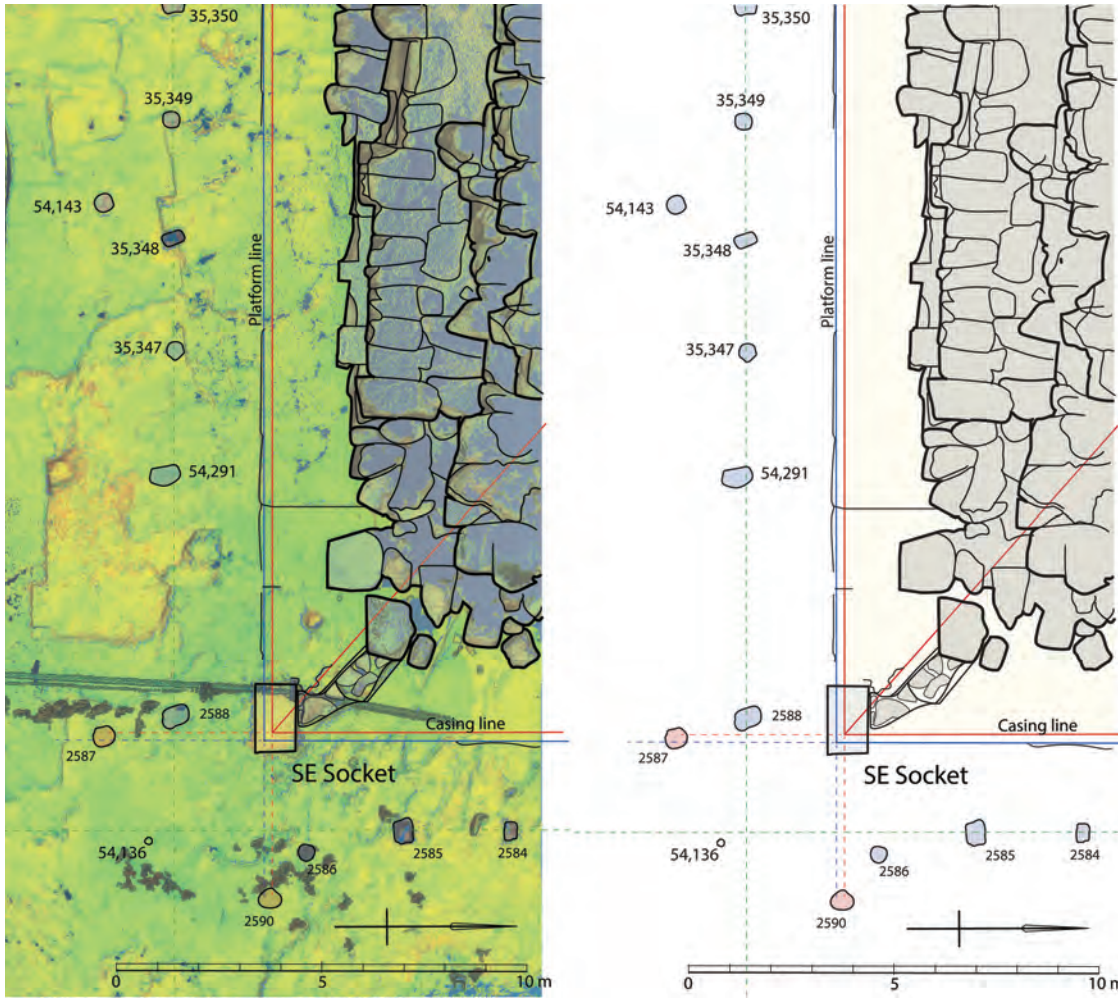

Figure 3. Left: Preliminary plot of the scan of the floor off the southeast corner of the Great Pyramid. Right: Plan of the holes and corner socket on the southeast floor of the Great Pyramid traced from the scan.

"Water Wall" glacis, built for flood protection at the end of the last MVT3 occupation, which probably corresponds to the end of the reign of Pepi II or maybe Merenre II (ca. 2250 BCE), after which the MVT seems to have been abandoned (fig. 5).

Most of the profile consists of intercalated aeolian sands and gravel, culminating in the heavy stone debris carried by a flood that broke through the temple's west wall and across the causeway corridor. MVT3 builders placed their west wall directly on this debris. Under it we found a clay floor that extended over the trench, the exterior floor during MVT2 times. It was placed on stone-quarry debris (*dabsch* in Arabic) that the builders used to raise the level over an MVT1 floor. Underneath more *dabsch*, we exposed eight MVT0 core blocks. Some bore black and red grid patterns and lines, painted either in the quarry or during transport as guides for workers.

In Sondage 187 (fig. 6), we found the outlet of the limestone drain that Reisner had exposed inside the causeway corridor. Since we did not find the drain in Sondage 144, its purpose must have been to drain rainwater from inside the corridor (fig. 7)—curious, given that we have evidence the MVT2 builders covered this part of the corridor with a vaulted roof. The corridor roof and walls collapsed, and then gravel and sand filled the corridor along the west of the MVT, rendering it unusable, before the end of the MVT2. Under

Figure 4. Detailed plan of the Menkaure Valley Temple (MVT) showing our areas of work in spring 2024. Map generated by Rebekah Miracle from AERA GIS.

the floor with the drain outlet, we found *dabsch* as leveling, then the older MVT1 floor below this debris, and then MVT0 blocks.

In Sondage 186, we widened a cut that Reisner had made into the ruins around the southwest corner of the MVT. Here he left a testimonial column retaining the foundation that builders had cut for the south MVT3 wall, which they built flush with the south face of the old MVT1 and MVT2 south wall of the corridor. As Reisner recognized, by MVT2 (his Second Temple) times, the corridor was filled and buried. He left a subtrench that showed the foundation trench of the MVT1 south corridor wall, which builders cut into a *dabsch* foundation. All three major phases show in the south face of the south wall. Not finding the bottom of the *dabsch*, we found neither bedrock nor limestone foundation blocks.

Sondage 186 revealed how MVT1 people cut a channel into the truncated west corridor wall to conduct floodwaters around the southwest corner of the MVT. They saw the threat and tried to manage it. The channel filled with gravel and debris left by the flood that ended the MVT2 occupation.

MVT–East

In Sondages 128, 172, and 173, we expanded 2012 trenches to obtain a section across the east end of the causeway corridor, where it meets the southeast corner of the MVT.

Sondage 128 exposed an east–west mudbrick wall and surface that was cut down and leveled before builders made the causeway's north wall, which they abutted to the plastered face of the east wall of the MVT. Digging deeper, we found only *dabsch*, with tip lines showing that people dumped it from the south and east.

Figure 5. Foundation blocks appear as team members excavate below the First Temple floor in the corner between the north causeway wall and the west MVT wall. View to the east.

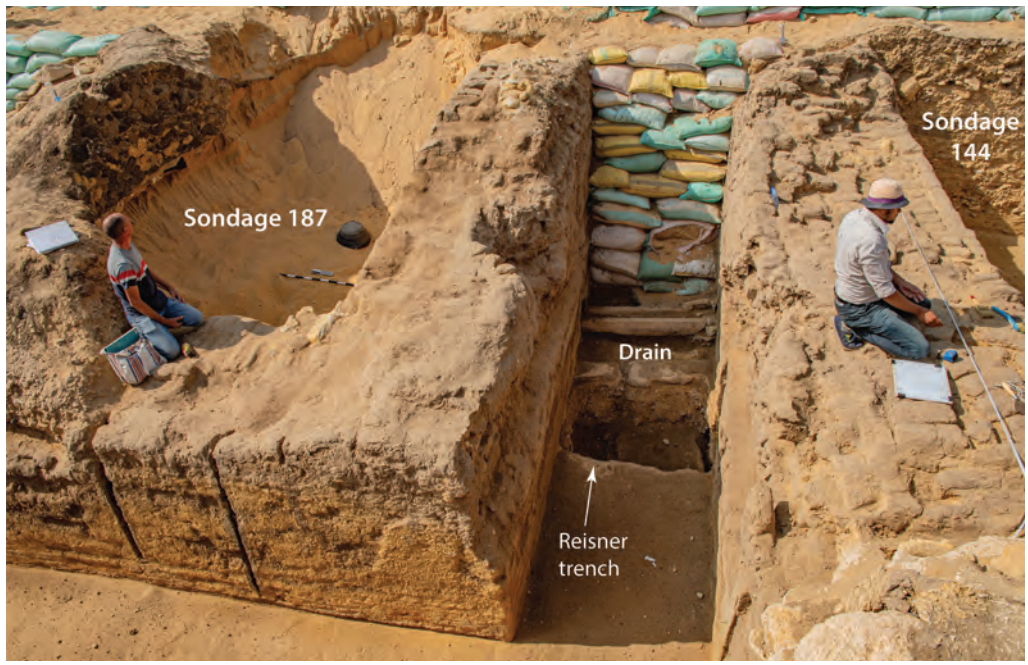

Figure 6. The causeway corridor during the 2021 season, showing the drain formed as a limestone trough and Reisner's trench below the floor. On the left is the sandy fill of Sondage 187. On the right, the top of the north causeway wall is being mapped. View to the west.

Figure 7. Top: The carved limestone outlet for the drain running from inside the causeway corridor through the south wall and into Sondage 187. Bottom: View of the limestone drain in the west causeway corridor. The drain extends through both the south wall of the corridor (at left, where it exits in Sondage 187) and the north wall (at right) but does not go all the way through.

In Sondage 172, people resurfaced the interior floor and walls many times. At one point, two thin perpendicular walls formed a small chamber (fig. 8). Two other walls blocked the corridor and show that the corridor was no longer functioning as a pathway to the west but had turned into a closeted space for a settlement of houses and silo granaries in the south end of the Ante-Temple, thus leaving open the question whether the south wall of the MVT ran east over the corridor, as Reisner believed. More likely, the east end of the corridor remained unburied but was compartmentalized as back spaces of the Ante-Temple settlement.

In Sondage 173, we found a layer of trash with beer jars, bread molds, and miniature votive pottery vessels not far from an opening in the causeway's south wall that gave access into the corridor, and thence to the Ante-Temple settlement. Underneath, we found the foundation trench for the south wall of MVT1, cut into *dabsch*. The oldest feature was a single course of mudbrick forming a corner and extending under the corridor wall. It lines up with the east wall of the MVT. It is possible this corner served as a guide for a temple plan that was modified during the construction of MVT1.

We expanded Sondage 114 eastward to examine the Ante-Temple in relation to the MVT proper, the extent of the terrace below it, and how the terrace was constructed. We revealed an intact limestone drain (fig. 9) and two floor surfaces that predated the diagonal pathway and corresponding floor of the courtyard (11,121 in fig. 4). Evidence suggests that the pathway and floor date to MVT2. The drain is formed with a lower course of blocks with a channel cut out of the middle and an upper course of capping blocks. The drain runs from below the temple threshold on the west on a decline toward the east, where it continues beyond

Figure 8. Our excavation in Sondage 172 in the east end of the MVT south causeway corridor. Left: Sondage 172 excavated to the phase of two thin mudbrick walls forming a chamber east of a limestone threshold. A round hole is probably a socket for a ceramic pot. Right: Under the floor with the mudbrick walls we found a clean, well-preserved marl (yellow desert clay) floor, the same kind of marl plaster as that on the corridor walls. This surface was one of a series of floors above the floor contemporary with the limestone threshold. View to the east.

Figure 9. Left: Drain discovered in the 2024 season, running under a limestone pavement and threshold of the Middle Temple, at the east entrance to the main MVT. Remains of mudbrick blocking screen the entrance. Right: The drain to the west, in the main south-central MVT courtyard, shows the same composition. Views to the west.

the limits of excavation. Mud packed around the drain made it into a crude pipe. Reisner found a drain leading from a basin in the main south-central MVT courtyard to the center pathway across that courtyard—doubtless the same drain running under the pathway, the columned vestibule, and the threshold of the main entrance.

We expanded Sondage 161 from a 2008–9 trench across the broad ramp leading to the north entrance of the Ante-Temple. Here we excavated several ramp surfaces, which overlay *dabsch* dumped against the north wall of the Ante-Temple to raise the ramp. We did not reach the bottom of the *dabsch*. We excavated the south part of Sondage 161 between the south wall of the ramp and the east wall of the Ante-Temple and came down onto a marl floor that continued east beyond our limits of excavation (fig. 10). We found that the east wall of the Ante-Temple was built after the southern ramp wall.

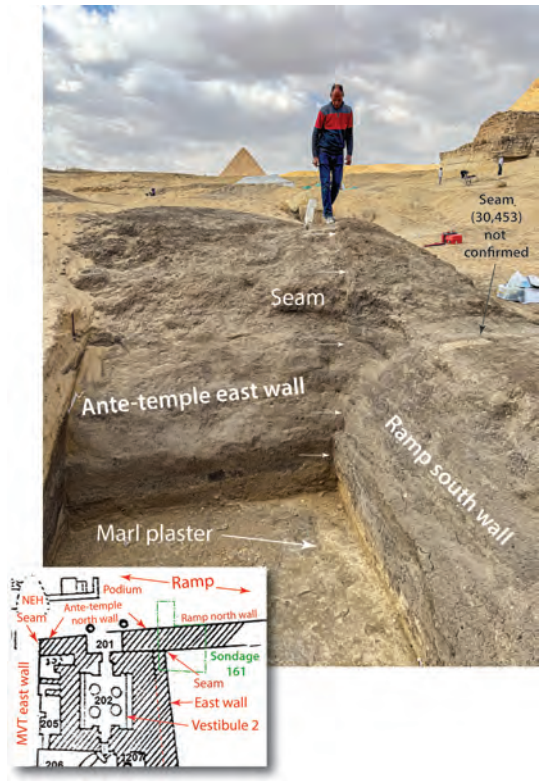

Figure 10. Inspecting a seam (arrows) marked by a thin line of marl plaster. Builders raised the ramp wall and plastered its south face before they built the east wall of the Ante-Temple. View to the west. Inset: Detail from Selim Hassan's map corrected with the newly found join between walls.

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