

PROGRESS REPORT No9

November 2005-April 2006

“Documentation and Conservation of King Khasekhemwy’s Funerary Monument at Abydos”

David O’Connor, Matthew Douglas Adams

Egyptian Antiquities Project

USAID Agreement No. 263-G-00-93-00089-00

Awarded to

THE AMERICAN RESERCH CENTER IN EGYPT (ARCE)

Address: 909 North Washington Street, Suite 320, Alexandria, VA22314

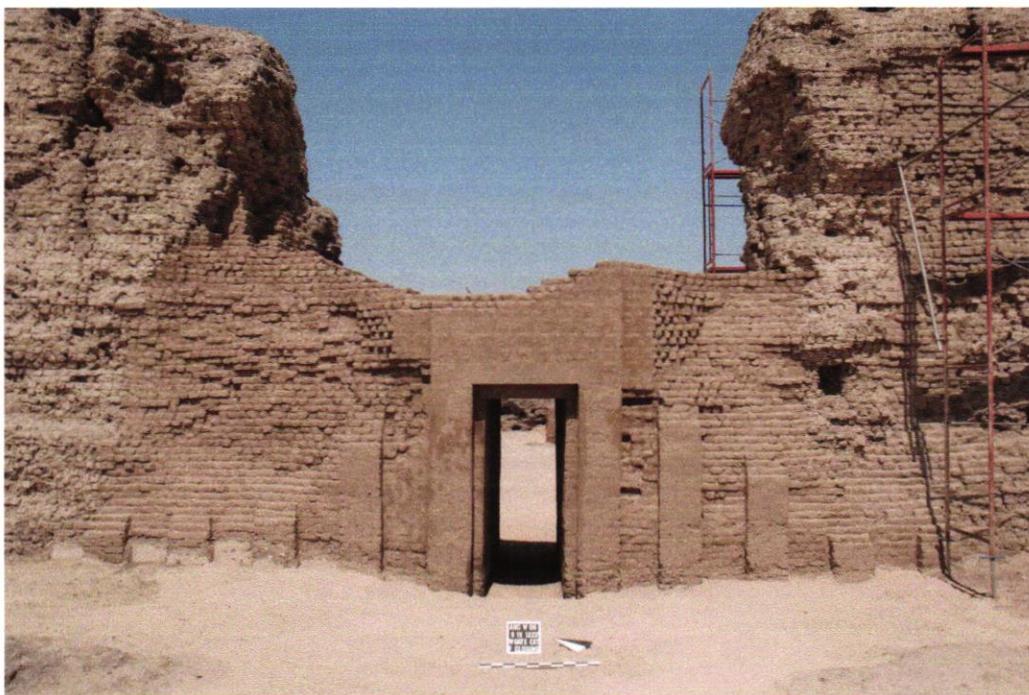
By the

**USAID Program Office of Productive Sector Development / Office of the Environment /
USAID / Egypt**

**In collaboration with the United States Agency for International development and the Egyptian Ministry of
State for Antiquities.**



DOCUMENTATION AND CONSERVATION OF PHARAOH KHASEKHEMWEY'S FUNERARY MONUMENT AT ABYDOS



Progress Report No. 9

David O'Connor, Sub-Project Director
Matthew Adams, Sub-Project Associate Director
Institute of Fine Arts, New York University

April, 2007

This report was prepared for
The Egyptian Antiquities Project of the American Research Center in Egypt, Inc. (ARCE)
2 Midan Kasr Al Dubara, Garden City, Cairo, Egypt
tel. and fax (20-2)794-8622, E-Mail: arceap@internetegypt.com
under USAID Grant No. 263-G-00-93-00089-00 (formerly 263-0000-G-00-3089-00)
© American Research Center in Egypt, Inc. 2007

Introduction

This report presents the results of fieldwork undertaken by the EAP funded Sub-project "Documentation and Conservation of Pharaoh Khasekhemwy's Funerary Monument at Abydos" in Field Season 7, November 27, 2005 – April 19, 2006. The details of the work undertaken in this field season are given below.

The work described here was undertaken under the authority of and with the kind permission of the Supreme Council of Antiquities. Many thanks are due to the officials and representatives of the Supreme Council of Antiquities, for their very kind consideration and assistance, including Dr. Zahi Hawass, Secretary General, Mr. Zein el-Abdin Zaki, Director General of the Sohag Antiquities District, Miss Aziza el-Sayed Hassan, Chief Inspector, Balliana, Mr. Sayed Abdou Abd el-Aziz Hammam, Mr. Magdy el-Bedry, and Mr. Baracat Eed Ahmed, Inspectors of Antiquities and Mr. Mahmoud Hassan Mohammed and Madame Reda Mohammed Mohammed Mahmoud, SCA Representatives for Conservation.

Thanks are due also to the administrators and staff of the Egyptian Antiquities Project of the American Research Center in Egypt, in particular Robert K. Vincent, Jr., Director, Janie Abdelaziz, Grant Administrator, Michael Jones, Project Manager, and Jaroslaw Dobrowolski, Technical Director.

Mention should also be made of the essential support provided to the sub-project by the administration and staff of the American Research Center in Egypt, in particular Director Dr. Gerry Scott, Deputy Director Madame Amira Khattab, Finance Manager Hussein Abdel Raouf, Assistant Finance Manager Madame Nadia Saad, and Office Manager Amir Abdel Hamid.

The members of the Expedition in Field Season 7 included Matthew Adams, sub-project associate director and field director, Anthony Crosby and William Remsen, architectural conservation, Elizabeth Hart and Rut Ballesteros, excavation supervisors, Alexander Makovics and Timothy Sandiford, surveyors, Robert Fletcher, Jason Goodman, and Kathelene Knight, photographers, Damon Cassiano, Joseph Griffin, and Allyson McDavid, architectural documentation, Jerrie Clarke and Diane Kagoyire, materials processing and analysis, and Sanchita Balachandran, Ina St. George, and Julie Trosper, archaeological conservators.

Field Season 7, November 2005 – April 2006

Major Tasks

The work of the sub-project in Field Season 7 consisted of the following components:

- 1) Continuation of the manufacture of new mud bricks

- 2) Continuation of the implementation of large-scale architectural stabilization solutions at the Shunet el-Zebib
- 3) Continuation of the documentation of significant cultural and architectural features at the Shunet el-Zebib that will be impacted by conservation interventions
- 4) Continuation of archaeological excavations at the Shunet el-Zebib

Results of the Work

Manufacture of new mud bricks for architectural stabilization

Approximately 102,300 mudbricks were manufactured and used in the architectural stabilization work at the Shunet el-Zebib in Field Season 7. As previously, the newly made bricks are of the same dimensions as the originals, 26 x 13 x 9 cm. The constituent materials used are the same, namely soil and sand, in approximately the same proportions as in the ancient bricks, approximately two parts soil to one part sand. The aim remains to manufacture and use bricks similar in character and physical properties to the originals used in the construction of the enclosure.

Architectural Stabilization

The program of architectural conservation and structural stabilization of the Shunet el-Zebib continued in Field Season 7. Large-scale stabilization solutions were implemented in ten problematic areas in the Shuneh: (1-4) four "Coptic" cells in the exterior side of the southwest wall of the main enclosure, (5) the west gateway, (6) the south corner of main enclosure, (7) the interior side of the southwest wall of the main enclosure, (8) the exterior side of the southwest perimeter wall, (9) the "Coptic" cell in the interior side of the northeast wall of the main enclosure, and (10) the northwest end of the northeast wall, adjacent to the north gateway.

As has been reported previously, significant structural weaknesses exist in the walls of the enclosure where monastic cells, created during the occupation of the Shuneh by a monastic community in late antiquity, have created large voids in the brick masonry. These voids are structurally unstable and endanger adjacent parts of the wall, due to the risk of large-scale collapse. Four cells in the exterior side of the southwest wall of the main enclosure were stabilized in Field Season 7: Operations 119, 120, 121, and 122 (**Figure 2**).

The basic methodology used in the stabilization is the same in each case. New masonry is added to the wall where it had been removed at the time of the creation of the cells and where it has been lost due to subsequent collapses. The new masonry restores structural stability to the wall and eliminates the danger of catastrophic collapse in the area of the cell void. The new masonry is designed to reflect the texture and color of the original masonry adjacent, such that, from a distance, it will blend visually with the rest of the wall, while

close inspection will permit it to be easily distinguished from original fabric. The new masonry in the area of each cell is constructed with a slightly concave profile, and is set back slightly from the plane of the original wall face. In this way the presence and general dimensions of the areas affected by the cells in the wall are represented, maintaining a visual reference to this important part of the history of the monument.

The monastic cell void excavated as Operation 119 actually consisted of two rooms (**Figures 3-5**). The rooms were fully documented in Field Season 6. Architectural stabilization began with filling the small pits in the cell floor (**Figure 6**). A protective barrier layer of fine sieved sand was laid down over all original surfaces (**Figure 7**). The sand was wetted and compacted and provided a level base for the first course of new brick masonry. As the level of the new masonry was raised, a space was left along the walls where original finish was present, which was filled with sand as work progressed (**Figures 8-9**). Layers of geogrid were used to provide horizontal reinforcement (**Figure 10**). As the level of the new masonry reached the upper part of the concavity (**Figure 11**), eroded bricks in the overhanging original masonry of the wall were removed (**Figure 12**), and these spaces were used to key-in the new masonry to the old. In the case of Operation 119, a hole in the wall above the cell void was found (**Figure 13**), which, when cleaned, was found to have been a typical hornet nest hole, still filled with the remains of the paper nest (**Figures 14-17**). The finished, stabilized, cell void is shown in **Figure 18**.

The cell Operation 120 was not as large as Operation 119, and, consequently, the void it created in the wall was not as large (**Figures 2-3**). It was excavated in Field Season 6 and fully documented architecturally in Field Season 7. The basic process of stabilization was the same as in other cell voids. In this case when the level of the brick infilling reached the upper part of the wall void, a large mud wasp nest was removed, in order to allow the new masonry to key with the original fabric of the wall (**Figures 19-20**). The stabilized cell void is shown in **Figure 21**.

Operations 121 and 122 represent two adjacent cells (**Figures 2, 22**). The northwesternmost, Operation 121, was the substantially larger of the two. Both were excavated in Field Season 6 and documented architecturally in Field Season 7, prior to the start of architectural stabilization work. The plaster floors in both cells were covered with a protective barrier layer of sand (**Figures 23-24**). A large pit had been cut through the floor at the northwestern end of Operation 121 (**Figure 24**), and this was filled with new brick masonry first. The original masonry of the southwestern wall of the main enclosure had collapsed long ago, and, as the brick infilling of both cells rose, the new masonry spanned the space between them (**Figure 25**). As in other cells, horizontal reinforcement was provided by layers of geogrid geotextile (**Figure 26**). The finished, fully stabilized cells are shown in **Figure 27**.

Architectural stabilization work continued in Field Season 7 at the gateway in the southwest wall. The state of the gateway at the close of Field Season 6, and as it was at the start of this season's work is shown in **Figure 28**. The most significant condition problem in the gateway area is represented by the high vertical wall ends on either side of the

gateway, which are structurally unstable. The structural risks are greatly exacerbated by deep vertical cracks that run through the wall 2-3 meters behind the vertical face on each side of the gateway. The solution to the structural problems is that this part of the wall is being partly rebuilt, in order that new brick masonry will support the existing wall fabric. In order to provide sufficient support to the higher parts of the adjacent original walls, the new masonry will ultimately be built to a level near the height of the original. To support the new masonry over the gateway, the gateway opening itself is being partly rebuilt.

The design of the partial reconstruction was the subject of extensive consultations between the Mudbrick Conservation Specialist, Anthony Crosby, Architect William Remsen, and the Sub-project Associate Director (**Figure 29**). After consideration of the proportions of the existing opening (two cubits¹), the design of the gateway of the most closely related preserved architectural complex, the Step Pyramid complex of Netjer-khet Djoser, Khasekhemwy's successor, at Saqqara, as well as representations of doorways in niched façade architecture in the iconography of the Early Dynastic Period and Old Kingdom, it was decided that the most likely proportion of the original gateway opening would have had proportions of 3:1, i.e., 6:2 cubits height:width.

Although the gateway would have been roofed with wood originally, wood is not an appropriate material to use in the stabilization effort, as it is too vulnerable to insect damage. Instead of wood, the opening was spanned with members of cast reinforced concrete. The concrete was tinted, in order that it should blend visually with the surrounding masonry (**Figure 30**), although upon close inspection it is easily distinguishable. Two types of architectural elements were cast. At each end of the gateway opening, a rectangular lintel was set, approximating the wooden lintels that would have been used originally (**Figures 31-32**). The remainder of the gateway was roofed with pole-shaped members that evoke the wooden poles that would probably have been used in the original construction (**Figures 33-38**). It should be noted that in the Netjer-khet complex at Saqqara the gateway has representations, in stone, of a wooden pole roof. Once the gateway opening was fully roofed, construction could continue above (**Figures 39-40**). The state of the gateway area at the close of Field Season 7 is shown in **Figures 41-42**. The comprehensive stabilization of the gateway area is not yet complete, and work will continue in future seasons.

Significant philosophical aspects of the partial gateway reconstruction should be considered. At the most basic level, the enclosure of Khasekhemwy, like the Abydos enclosures of his predecessors, was constructed to create an interior ritual space that was defined by the walls and both physically and visually separated from what was outside. Based on the archaeology of the enclosures, this space was the setting for ceremonial connected with the cult of the king. Before the collapse of the masonry around all four gateways, there would have been very limited visibility into the interior from outside and

¹ An ancient Egyptian cubit in the third millennium had an approximate value of 52cm. Khasekhemwy's enclosure was constructed using cubit dimensions. For example, the lengths of the bricks, 26cm, represents one-half a cubit, and the width of the bricks, 13cm, one-quarter of a cubit.

vice versa. Originally, lines of sight through the gateway openings may have been blocked by wooden doors. The sense of the total boundedness of the interior space, of the complete physical separation of the interior from what was outside, was lost when large gaps were created in the walls with the progressive collapses around the gateways. Although it is not the intention of the sub-project's efforts at the Shuneh to recreate the monument as it was, since such an attempt could only ever be a modern interpretation of what it may have been, the effect of the partial gateway reconstruction of reestablishing something of the original boundedness of the interior should be noted. In addition, in recreating the orthogonal gateway opening and its adjacent defining features, something of the original formality of the monument can be perceived by visitors. Looking at the eroded masses of the walls, it is very difficult for any visitor to the site today who is not a specialist, to gain any sense of the original formal character of the structure. In this quite limited area around the gateway, a suggestion of this formality of design is conveyed. Finally, the recreated gateway opening introduces a recognizable human element into the perception of the monument that may not be evident in the rough eroded walls. These considerations are not the primary reasons for the approach adopted at the gateway, however they have informed aesthetic design choices and should be acknowledged as effects of the work done at the gateway. Similar issues will be presented by work at the other gateways.

Another area in which architectural stabilization work was done in Field Season 7 was the south corner, exterior, of the main enclosure, where the wall was seriously undermined at its base and had sustained damage from hole-digging hornets and from an old tunnel dug into the masonry of the wall, probably by Mariette's workers in the mid-19th Century (**Figures 43-44**). The major areas of missing masonry were replaced with new brickwork. In order to provide a stable base for the new masonry, below grade, the footing extends somewhat beyond the line of the wall (**Figure 45**). Above grade, the new construction follows the original wall line (**Figure 46**). The lower part of the wall has been stabilized, and work will continue in future seasons on the upper part. The stabilization incorporated the filled tunnel and several adjacent hornet nest holes (**Figures 47-48**). The lower part of the wall at the corner has now been stabilized (**Figure 49**). Additional work will be required in a future season to stabilize the upper part of the wall.

Architectural stabilization work continued along the interior side of the southwest wall of the main enclosure. Along much of the length of the wall, southeast of the gateway, a significant amount of the original masonry is missing. The masonry losses are due to a combination of animal burrowing, insect holes, and perhaps human activity as well, including the undermining of the wall base by ancient pitting, all of which have interacted to create a series of unstable concavities and overhangs, which are at risk of further collapse. The method of stabilization was consistent along the length of the wall, which has been stabilized in stages. All holes were cleaned out and any areas of loose brickwork removed. A solid base was established and new masonry installed, following the line of the original face of the wall above grade (**Figures 50-51**). The new brickwork was built up until it met and supported all overhanging areas, providing structural support to the wall above (**Figures 52-57**). As elsewhere, the new masonry is designed to blend visually with the old when seen from a distance, but to be easily distinguishable with careful inspection

(**Figure 58**). The stabilization of the lower part of the wall is now complete, and work on the upper parts of the wall will continue in future seasons.

Another major area of architectural conservation work was the exterior face of the perimeter wall, northwest of the gateway through the southwest wall. In the central part of this section of the perimeter wall, damage from burrowing animals, hornets, and wind erosion created an extremely unstable situation (**Figures 59-60**). In order to prevent further losses to the perimeter wall, new masonry was used to support what remained of the original fabric of the wall in the most unstable area (**Photos 61-62**). A temporary sandbag buttress was constructed to support another unstable area. Substantial additional work on this section of the perimeter wall will be required in a future season to stabilize the wall fully.

Operation 102, excavated in Field Season 6, focused on a suite of monastic rooms partly dug into and partly against the face of the northeast wall of the main enclosure. The collapse of the upper part of the wall in this area contributed significantly to the instability of the vertical wall end adjacent on the northwest (**Figure 63**). In order to provide a stable base for the masonry that will be required to support the wall end, it was necessary to infill the main interior room with new masonry. Before this could be done, however, the heavily undermined section of the wall adjacent on the southeast had to be stabilized. It is remarkable that much of the middle part of the northeast wall of the main enclosure has not completely collapsed, as the base of the wall is honeycombed with animal burrows (**Figure 64**). The stabilization of this area can be considered a test of the method that will be used in a future season over much of the interior side of this wall, the area currently supported by the temporary sandbag buttresses constructed in 2001 in Field Season 3. As in other monastic cells, a protective barrier layer of sand was used (**Figures 65-68**). Because the outer room or court of the suite in Operation 102 lay completely outside the line of the wall, it was left unencumbered by new masonry. The masonry infilling of the interior room was stepped in to provide a visual reference to the location of the doorway from the court into the cell. The walls and floor of the court and other features outside the line of the wall were reburied with sand. The state of the area at the close of Field Season 7 is shown in **Figures 69-70**. Additional work will be required in future seasons to complete the stabilization of the vertical wall end adjacent on the northwest and the remainder of the interior side of the wall to the southeast.

Stabilization work continued at the northwest end of the northeast wall, beside the north gateway. Architectural work began here in Field Season 6, in 2004-2005 (**Figure 71**). The vertical end of this wall, the result of ancient collapses of the gateway and of a monastic cell beside it, was inherently highly unstable and was made more so by the existence of a deep vertical crack about one meter behind the wall end. In order to provide structural support to the end of the wall, and thus protect it from the risk of further collapse, the wall in this area is being rebuilt. This work was begun in Field Season 6, and in Field Season 7 additional work was done (**Figure 72**). Work in this area will continue in future seasons, as part of the comprehensive stabilization of the north gateway area.

In addition to the major areas of architectural conservation work, many small and medium sized holes, which are localized sources of structural instability and collapse, have been filled with new mudbrick masonry. This season this work focused primarily on the outer face of the southwest wall of the main enclosure (**Figures 73-82**).

Architectural Documentation

Operations 102, 119, 120, 121, and 122 were excavated in Field Season 6 (2004-2005). After excavation, all cells are fully documented by photography, as well as by detailed architectural plans, sections, and elevations, prior to architectural stabilization. The documentation of Operation 119 was completed in Field Season 6. In Field Season 7 detailed recording was done in Operations 102, 120, 121, and 122, prior to the commencement of stabilization work in each area. In each case, the original finish and details, such as floor and wall plaster, were only partially preserved. All remaining fabric of each cell was carefully and systematically observed and recorded.

Excavation

This season excavations were undertaken in a number of areas at and adjacent to the Shuneh (**Figure 1**).

Inside the enclosure, excavation in Operation 113, which was started last season, was completed, preparatory to architectural conservation work on the lower part of the wall adjacent. This area was characterized by a series of intercut pits dug originally for the deposition of ceramic vessels containing the remains of ibises (**Figures 83-84**). In the first millennium BCE, the enclosure was used as a burial place for sacred ibises, at a time when animal cults were popular throughout Egypt. Most of the ibis burials in the enclosure were made in large ceramic jars, which were placed, usually in groups, in large pits cut down into the sand inside the Shuneh. The excavation results in Operation 113 and the adjacent areas excavated in Field Season 6 suggest that there were multiple pitting episodes and that later pits were cut into earlier ones, with the result that many of the jars were dislodged from their original positions, cracked or completely broken, and the remains of the ibises they contained disturbed.

An additional area of work inside the Shuneh was in the interior of the south corner (**Figure 85**), where over the centuries sand had built up quite high (more than 7 meters above the original Dynasty 2 floor) against the inner face of the wall of the main enclosure. Three excavation units, Operations 136, 137, and 138 were located here. The stratigraphic sequence encountered during the excavation of this sand deposit illustrates very clearly the known history of the use of the Shuneh.

The latest phase of ancient activity in the Shuneh is represented by a featured discovered near the top of the sand deposit. In the late Roman/Byzantine ("Coptic") period, a small

room was built in the corner of the enclosure (**Figure 86**), on top of what was, by that time, a high mound of sand. Two thin dry-laid mudbrick walls were built perpendicular to the southwest and southeast walls of the Shuneh and comprised the northwest and northeast sides of the room. The interior of the room had a thick mud plaster floor. The northwest wall contained a painted block of wood that had been used just like a brick. This wall was dismantled during the course of excavation, allowing for removal and closer examination of the block. It appears to have been originally a stand for some object, perhaps a statuette. Associated with this room were ceramic amphorae, one of which was found still stoppered, with its contents intact (**Figure 87**). Upon removal of the stopper, the vessel was found to contain a mass of woven fiber (**Figures 88-89**). Fragments of similar material were found loose in the sand during the excavation (**Figure 90**). At some point the front wall of the corner room collapsed down the sand slope along the face of the adjacent southeast wall of the Shuneh (**Figure 91**).

In the sand under the Coptic room were found a series of features that represent the preceding major phase of use of the monument and dating to the first millennium BCE: pits containing primarily ibis burials in ceramic jars. One deposit was unusual in that it was associated with a small mudbrick chapel that contained a painted limestone stela (**Figures 92-94**). The stela had been covered with a thick coating of mud, and, as a consequence, the decoration on the stela is poorly preserved. It is clear, however, that it depicted opposed pairs of figures. One of the figures is that of the god Osiris, who is also named in the only partially preserved text. The stela and chapel were the first such finds associated with ibis cult activity in the Shuneh. Some deposits of jars in this area contained, unusually, the remains of canids (**Figures 95-96**). Although many of the deposits of vessels found in the south corner were types already familiar from elsewhere in the Shuneh associated with the ibis cult (**Figure 97**) and probably dating to the first half of the first millennium, others were atypical forms (**Figure 96**). Some of these forms appear to be earlier than the typical ibis forms and to relate more closely to the Egyptian ceramic corpus of the New Kingdom. Judging from the ceramics, the activity in the south corner may represent the earliest incidence of animal cult activity in the enclosure. One large deposit of ibises contained no jars, the ibises having been placed in a single layer in a rectangular pit in the sand (**Figure 98**).

In Operation 136 near the deposits of ibis burials but not directly associated with them was found another type of ritual deposit. Eight small figurines modeled in beeswax were found, along with eight mud bases (**Figures 99-100**). Each figurine appears to represent a deity. Two had hawk or falcon heads, and one had a jackal head. Two of the figurines may represent female deities. Several of the figures show evidence for heat discoloration. Given the low melting point of wax, it is possible that some additive was present in the wax to make it less susceptible to heat. These are the first examples of such figurines found in the Shuneh, and they appear to be evidence for additional ritual activities in the enclosure at the time it was being used as a place of burial for sacred ibises.

In Operations 137 and 138 the original Dynasty 2 floor was reached (**Figure 101**), which represents the original phase of construction and use of the enclosure. As has been the case

with the Dynasty 2 floor in other parts of the enclosure, the floor consisted of a somewhat rough layer of mud plaster. On the floor were found a number of broken beer jars.

The state of the south corner area at the close of Field Season 7 is shown in **Figure 102**. Additional excavation will be required in a future season to reach the Dynasty 2 floor level over the entire area. This will permit evaluation of the condition of the southeast wall adjacent, prior to the large-scale work that will be required for the stabilization of the south gateway area.

In the eroded top of the southeast wall of the Shuneh, between the corner and the gateway, excavation revealed that a Coptic cell had been cut into the wall from the exterior side (**Figures 103-105**). The structural weakness created by the cell void eventually resulted in the collapse of a large section of the wall, which fell onto the surface of the sand deposit inside the south corner. Although the cell was very poorly preserved (**Figure 106**), evidence was found that the walls and possibly floor of the cell had been covered with the same hard white lime-based plaster used in most other Coptic cells at the Shuneh. Pieces of fallen wall plaster were found inside the cell, and some of these had traces of inscriptions and drawings in red (**Figures 107-108**). A few scattered small fragments of papyrus and parchment documents, with traces of Coptic inscriptions in black ink, were found loose in the brick debris inside the cell.

In addition to the work done inside the Shuneh, excavations were undertaken in the southeast perimeter corridor, preparatory to the future stabilization of the southeast gateway area. Operation 133 was located in the perimeter corridor southwest of the southeast gateway (**Figure 109**). Excavation reached the original Dynasty 2 floor level and found that the mud floor had been cut by a series of parallel holes spanning the entire width of the perimeter corridor (**Figure 110**). The pattern seen here is identical to that in the northwest perimeter corridor (see below), and the parallel holes probably are the sondages of earlier excavations, most likely those of E. R. Ayrton on behalf of the Egypt Exploration Society at the beginning of the 20th Century and published in *Abydos, Part III* (1904).

Along the exterior side of the southwest perimeter wall, a number of excavation units (Operations 56-59) in which work was done in the Fall 2001 season were re-opened and excavation completed, preparatory to architectural conservation work on the wall (**Figure 59**). A number of disturbed burials in wooden coffins were found along the base of the perimeter wall (**Figure 1**). Most were plain rectangular box coffins and appear to date to the Middle Kingdom (**Figures 111-112**). All the burials were disturbed, probably anciently, and the coffins damaged. Most of the wood of the coffins was completely reduced to frass by insects.

The other major excavation area this season was the northwestern side of the exterior of the Shuneh, comprised of excavation units Operations 124, 134, 135, 139, and 140 (**Figure 1**).

In the northwest perimeter corridor of the Shuneh, excavation revealed a situation similar to what was encountered in the southeast perimeter corridor this season. The original Dynasty

2 mud floor of the perimeter corridor had been systematically trenched by earlier excavations, presumably those of Ayrton (**Figure 113**). The façade of the main enclosure wall, as revealed in the perimeter corridor, retained a significant amount of its original finish, although this appears to have suffered significant losses after exposure by the earlier excavations (**Figure 114**).

In the corridor-like space between the Shuneh perimeter wall and the southeastern wall of the Peribsen enclosure, the Dynasty 2 mud floor was found to have been trenched in a manner similar to that seen elsewhere this season (**Figures 115-116**). A mud floor was laid down in this corridor associated with the perimeter wall. This was deposited atop a layer of sand and brick debris that had been put down over the original exterior surface of the Peribsen enclosure and that raised the ground level by as much as 25cm.

The Peribsen enclosure was built following the pattern seen in the Shuneh and the other royal funerary enclosures at Abydos. The exterior was characterized by a niched, or "palace," façade (**Figures 115-116**). The exterior face of Peribsen's enclosure wall was mud plastered, and then a thin whitewash was applied directly to the mud plaster. At a height of slightly less than meter above the base of the wall, a broad horizontal red stripe was painted, which appears to have run continuously around the entire exterior of Peribsen's enclosure. This situation is paralleled in the Khasekhemwy enclosure, where drops of red paint have been found on the lower part of the wall in a number of locations, having dripped down during the application of red decoration somewhere higher on the wall where the original finish is no longer preserved. Peribsen's enclosure is unusual in that its walls, on average only 1.5m thick, are significantly thinner than those of any of the other known royal enclosures at Abydos.

Like the other Abydos enclosures, that of Peribsen had a gateway at the east corner (**Figure 115**) and a small cult chapel in the southeastern part of the interior. The gateway and the area immediately adjacent to the gateway on the east were investigated in Field Season 6 (2004-2005) in Operation 124. In Field Season 7, work continued in this unit, including study of the architecture of the gateway itself and the stratigraphic relationships between the large deposit of offering pottery, the walls of the Peribsen enclosure, and the walls of the Shuneh.

On the interior of the Peribsen enclosure, excavation revealed large deposits of brick debris against the wall. This debris is clearly the result of the deliberate demolition of the enclosure wall. All other known enclosures at Abydos, apart from the Shuneh, appear to have been deliberately demolished. The situation at the Peribsen enclosure generally fits this overall pattern.

The relationship between the Khasekhemwy and Peribsen enclosures may be illuminating as to the history of the later monument. On the plan **Figure 1** it appears that the line of the northwest perimeter wall of the Shuneh has been shifted to fit it into the space between the main enclosure wall and the southeast wall of the enclosure of Peribsen. Excavations in Operations 102 and 114 in Field Season 6 found evidence that the perimeter wall may have

been a secondary feature, added to the monument some time after the start of construction of the main enclosure. The arrangement of the walls on the northwest side of the Shuneh appears to support this suggestion.

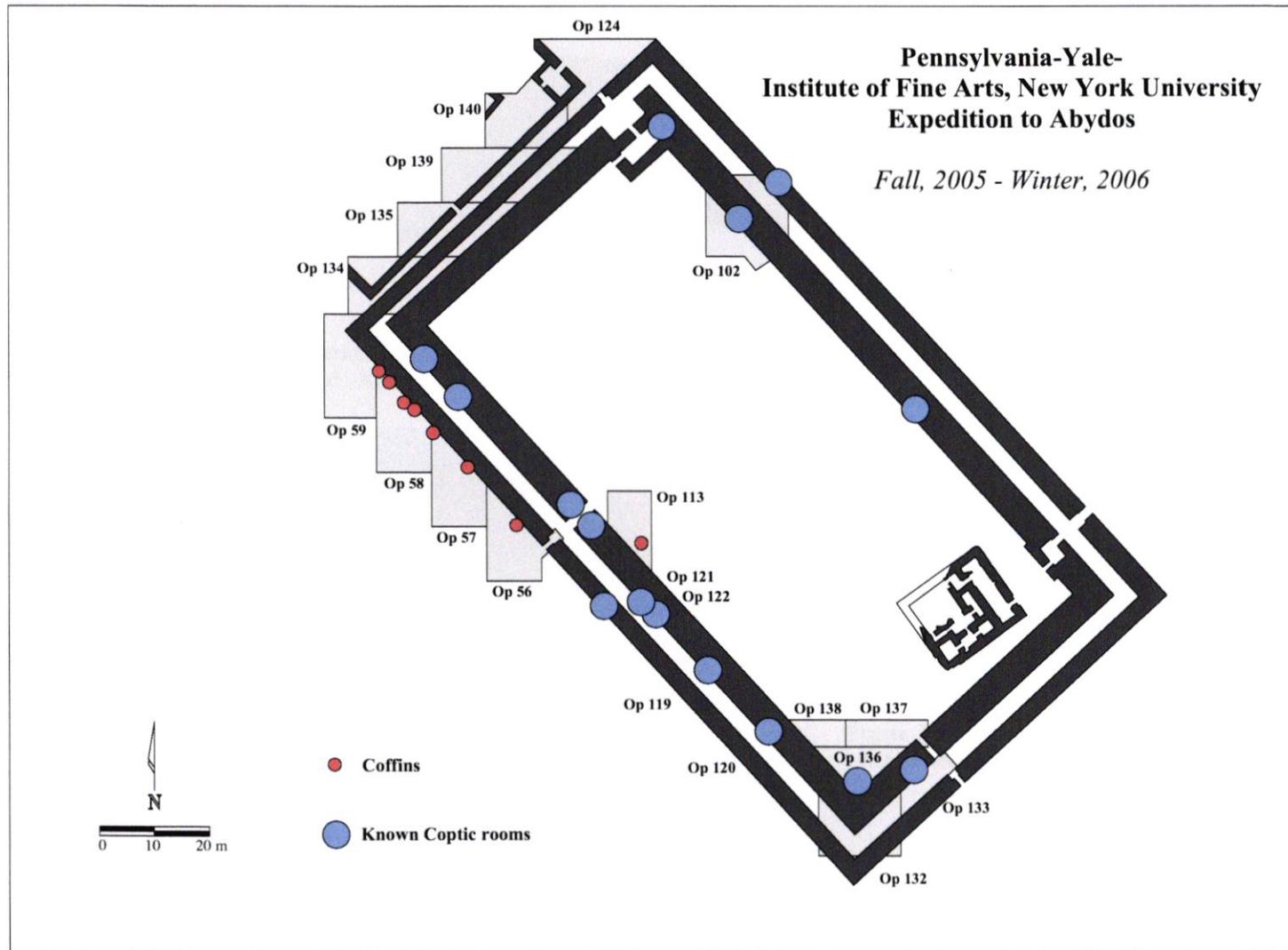


Figure 1 – Plan of the funerary cult enclosure of king Khasekhemwy, the Shunet el-Zebib, showing the locations of the excavations in Field Season 7, as well as the human burials in wooden coffins, as well as all known rooms related to the monastic occupation of the enclosure in late antiquity.

ARCE Egyptian Antiquities Project
PHARAOH KHASEKHEMWHY'S FUNERARY MONUMENT AT ABYDOS, 2005-2006 work

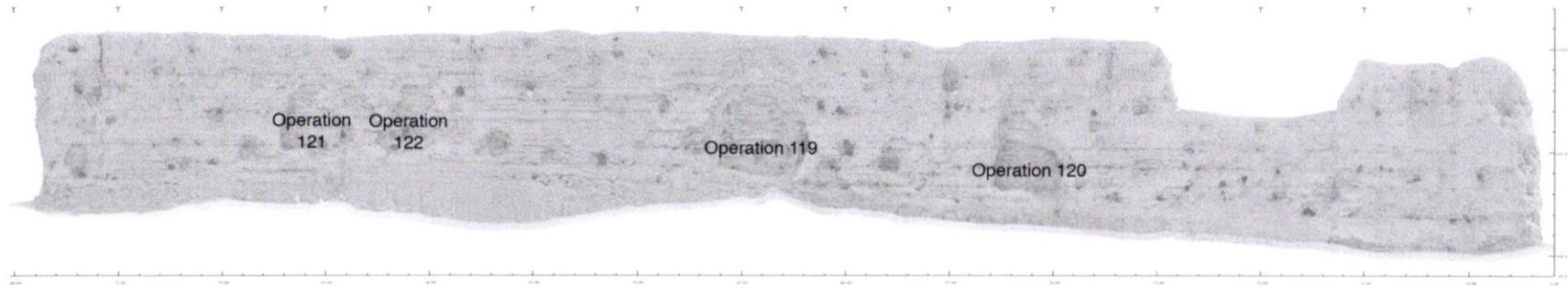


Figure 2 – Rectified photoelevation of the exterior side of the southwest wall of the main enclosure, southeast of the west gateway. The cell voids excavated as Operations 119, 120, 121, and 122 are indicated. All four of these voids were stabilized in Field Season 7.

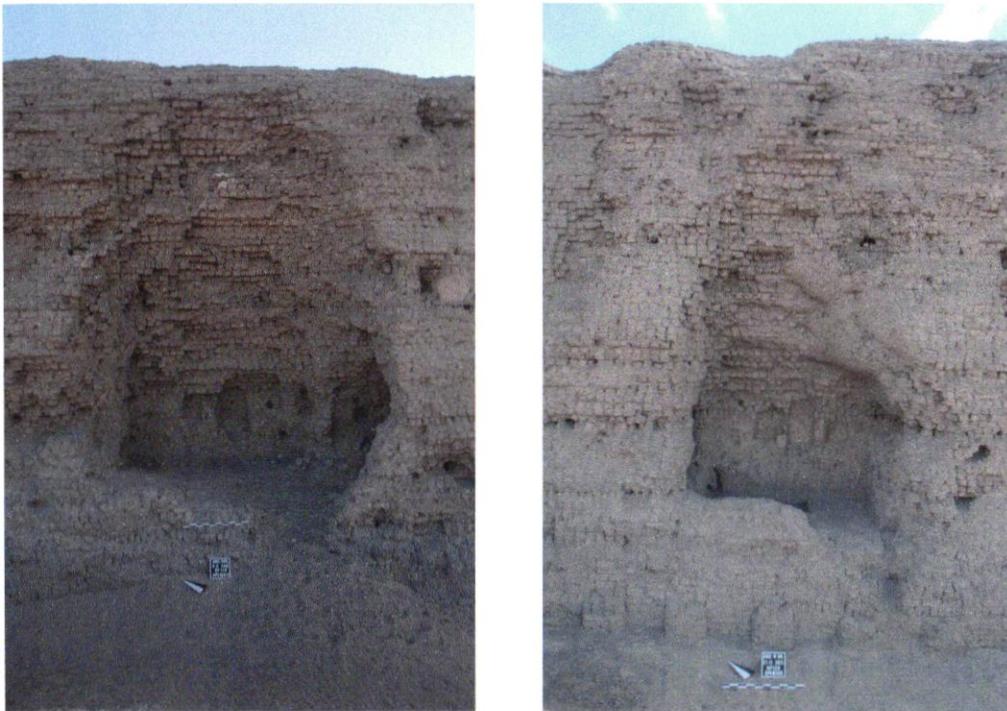


Figure 3 – Cell voids Operations 119 (left) and 120 (right), prior to excavation in Field Season 6 (2004-2005).



Figure 4 – Interior of the main chamber of cell Operation 119, prior to the start of stabilization work. The entrance to the cell is at lower right, just in front of the photo board. The entrance to a smaller ancillary chamber is at far right.



Figure 5 – View into the smaller ancillary chamber of cell Operation 119. Unlike the main chamber, this one was finished in mud plaster only.



Figure 6 – The first step in the stabilization of the cell void was filling the holes in the cell floor with new bricks.



Figure 7 – All original surfaces in the cell were covered by a protective barrier layer of fine sieved sand. This sand was wetted and compacted prior to the installation of new masonry.



Figure 8 – As new masonry was installed, a gap was left around the edges as the level of the infilling rose.



Figure 9 – The gap was filled with fine sieved sand, to provide a protective barrier layer between the new masonry and any original surfaces or features of the cell.



Figure 10 – Layers of geotextile were used to provide horizontal reinforcement in the new masonry.



Figure 11 – Stabilization work in Operation 119 in process. The new masonry was set back from the existing wall face so as to create a concavity that creates a visual reference to the presence of the cell in the wall.



Figure 12 – In the upper part of the cell void, the depth of the infilling became gradually less. Eroded bricks were removed, and holes were filled as part of the comprehensive stabilization of the cell void.



Figure 13 – Hole and crack above the cell void in Operation 119. A large mass of masonry in the center of the photo was in danger of falling.



Figure 14 – Closer view of the apparently small hole shown above. The loose bricks at the right of the hole mask a large void behind.



Figure 15 – Removal of one of the loose bricks revealed that the hole was created by the burrowing hornets that infest the Shuneh. Inside they built a large multi-layered paper nest.



Figure 16 – Removal of additional bricks revealed more of the paper nest and the size of the hole.



Figure 17 – The remains of the paper nest were removed, as well as all loose and eroded bricks around the hole, the full extent of which was revealed.



Figure 18 – Monastic cell, Operation 119, after stabilization. The new masonry infilling of the cell void has a concave profile to provide a visual cue to the presence of the cell in the wall.



Figure 19 – Operation 120, stabilization of a monastic cell in progress. Note the massive mud wasp nest at upper right.



Figure 20 – Operation 120, stabilization work in progress. As the level of the new masonry rose, the mud wasp nest was gradually removed, to allow the new brick masonry to be keyed into the original wall sufficiently.



Figure 21 – Operation 120, after stabilization.



Figure 22 – Monastic cell voids, Operations 121 (left) and 122 (right), prior to the start of stabilization work. A large structural crack, related to the presence of these voids, is visible in the upper part of the wall to the right of Operation 122.



Figure 23 – Operation 122, in progress. All original surfaces were covered by a layer of fine sieved sand, which provides a protective barrier between the new brickwork and preserved original features of the cell.



Figure 24 – Operation 121, in progress. The deep hole at the northwestern end of the cell was filled first.



Figure 25 – Operations 121 and 122, in progress. Given that the masonry dividing the two cells had collapsed and was mostly missing, the infilling in this area comprised a single construction.



Figure 26 – Geogrid was used to provide lateral reinforcement over the entire length of the new masonry infilling in Operations 121-122.



Figure 27 – Operations 121 and 122, with stabilization work of the cell voids complete.



Figure 28 – The west gate, at the end of Field Season 6. Work continued with the comprehensive stabilization of this area in Field Season 7.



Figure 29 – Mudbrick conservation specialist Anthony Crosby and Architect William Rensen consult with Sub-project Associate Director Matthew Adams about the dimensions of a mock-up of the partial reconstruction of the west gateway.



Figure 30 – Because the roofing of the gateway was to be made of reinforced concrete, a range of test panels in different shades were produced, in order to find the color that would blend best with the surrounding brickwork.



Figure 31 – Wooden forms for the lintels on the exterior and interior sides of the gateway were constructed.

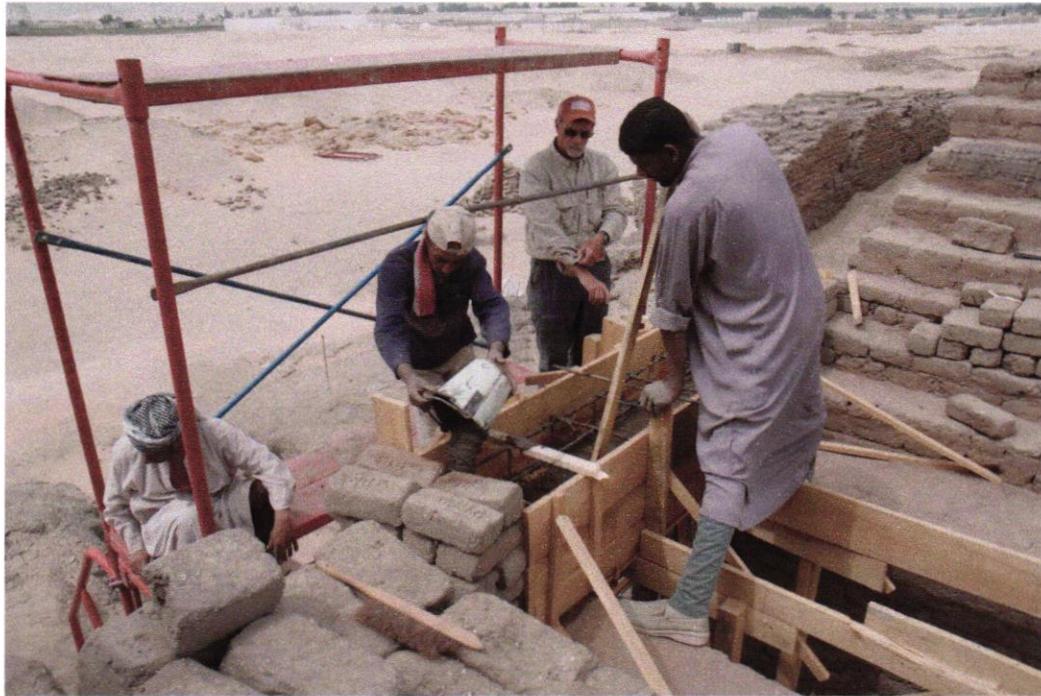


Figure 32 – Steel reinforcement was placed inside the forms and the concrete for the lintels poured.



Figure 33 – The interior of the gateway was spanned with reinforced concrete “poles,” inspired by the representation in stone of a wooden pole roof in the gateway to the Step Pyramid complex at Saqqara. The “poles” were cast vertically in segments of heavy plastic pipe, which was cut away when the concrete was fully set.



Figure 34 – Each of the concrete roofing “poles” was manually raised and set in place above the gateway opening.



Figure 35 – Each of the roofing “poles” was maneuvered into place and set into mud mortar. Geogrid was placed under the poles on each side of the gateway opening, to provide a secure base for the mortar.

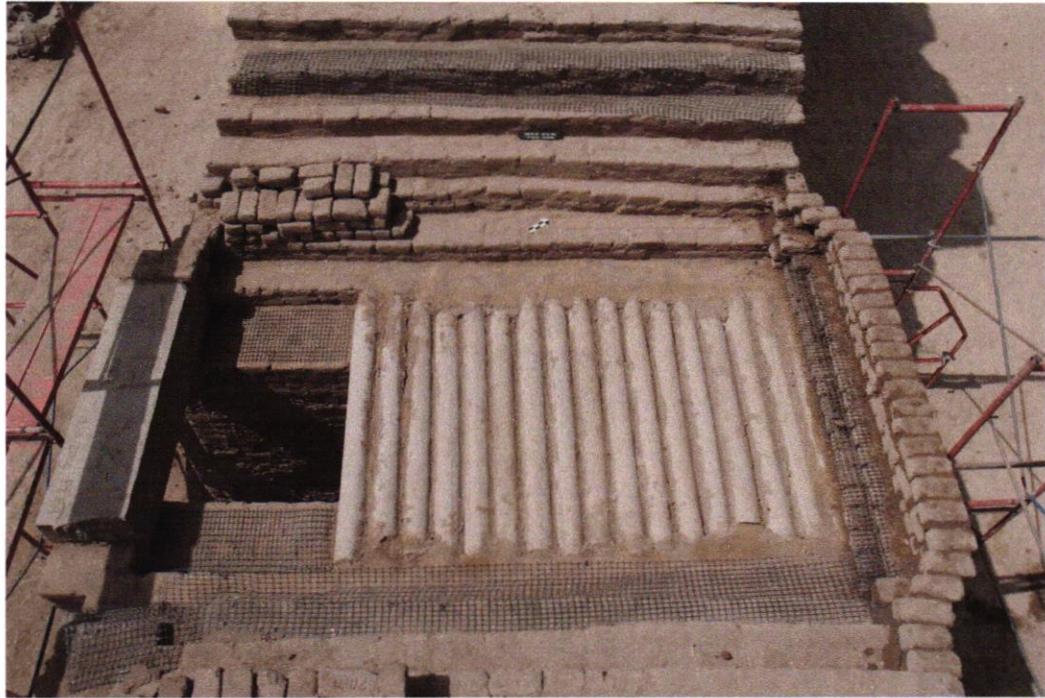


Figure 36 – The seams between the “poles” were sealed with mud mortar, which was also used to fix the ends in place.



Figure 37 – Placing one of the “poles” of the roof. Even placement on the underside was maintained by means of string lines.

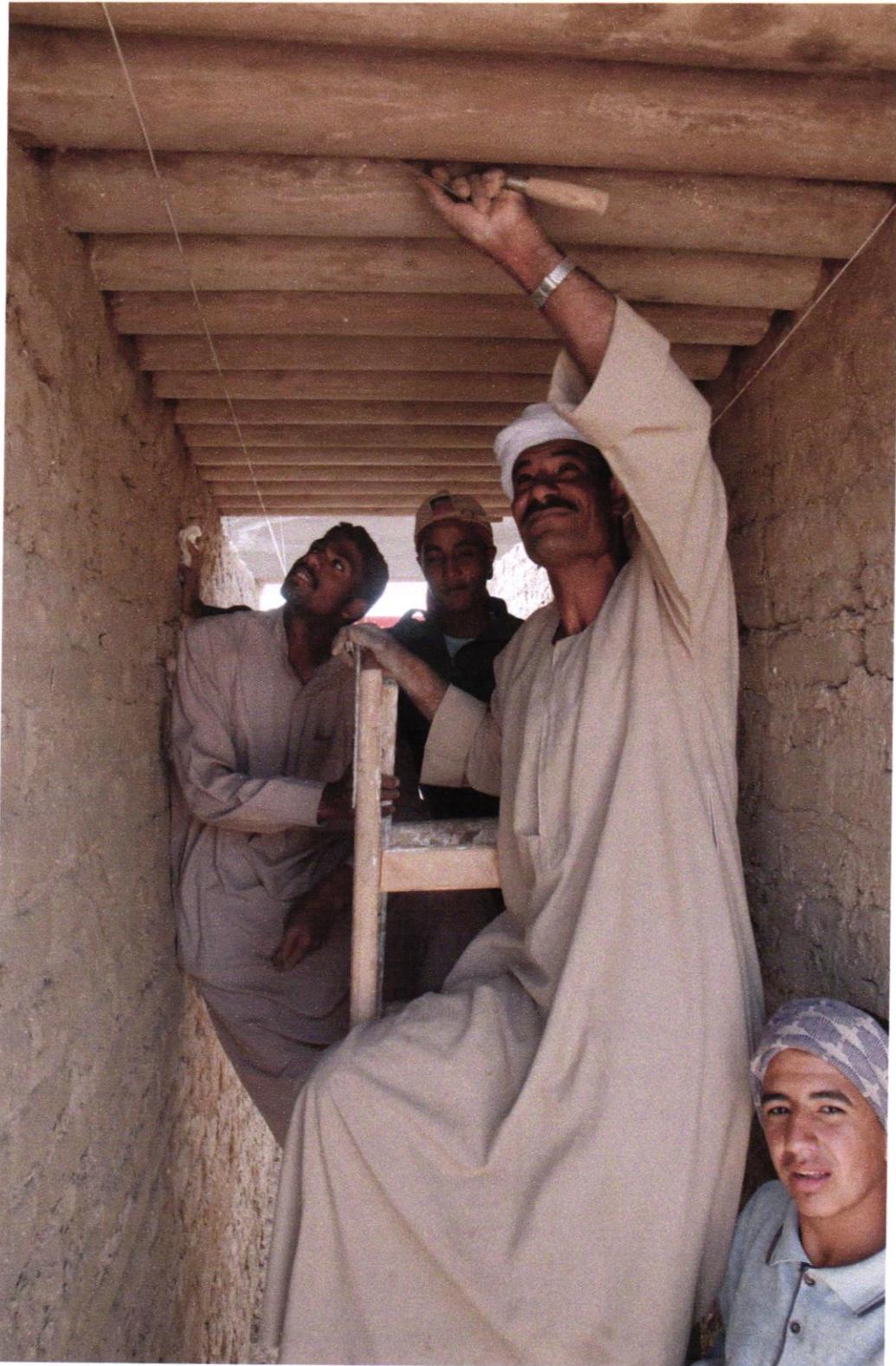


Figure 38 – The underside of the “pole” roof of the gateway, during construction. The underside of each seam was carefully pointed.



Figure 39 – Once the gateway was fully roofed, construction of the new masonry above could begin. Geogrid was used to provide horizontal reinforcement.



Figure 40 – Top of the new masonry above the west gate, at the end of Field Season 7.



Figure 41 – The partial reconstruction of the west gateway, exterior side, as it stood at the close of Field Season 7. The upper parts of the vertical wall ends adjacent to the gateway remain to be stabilized in a future season.



Figure 42 – Partial reconstruction of the west gateway, interior side, as it stood at the end of Field Season 7. Several meters of additional masonry will be required to support adequately the adjacent vertical wall ends.



Figure 43 – Operation 132, at the south corner of the enclosure, exterior, at the close of excavation in Field Season 6. The base of the wall was significantly undermined, particularly the corner and to the left along the southwest wall. The corner itself was unstable, due to the extent of missing masonry.



Figure 44 – Exterior side of the southeast wall, between the south corner and the southeast gateway (at far right). Just right of the corner, the large hole in the wall was the result of deliberate tunneling, probably by Mariette in the mid-19th Century, in a search for foundation deposits under the wall. The smaller holes nearby are the result of hornet activity.



Figure 45 – In order to create a strong and stable base for the new masonry needed at the south corner, several courses were laid below grade and outside the plane of the wall. These will not be visible when the stabilization of this area is complete.

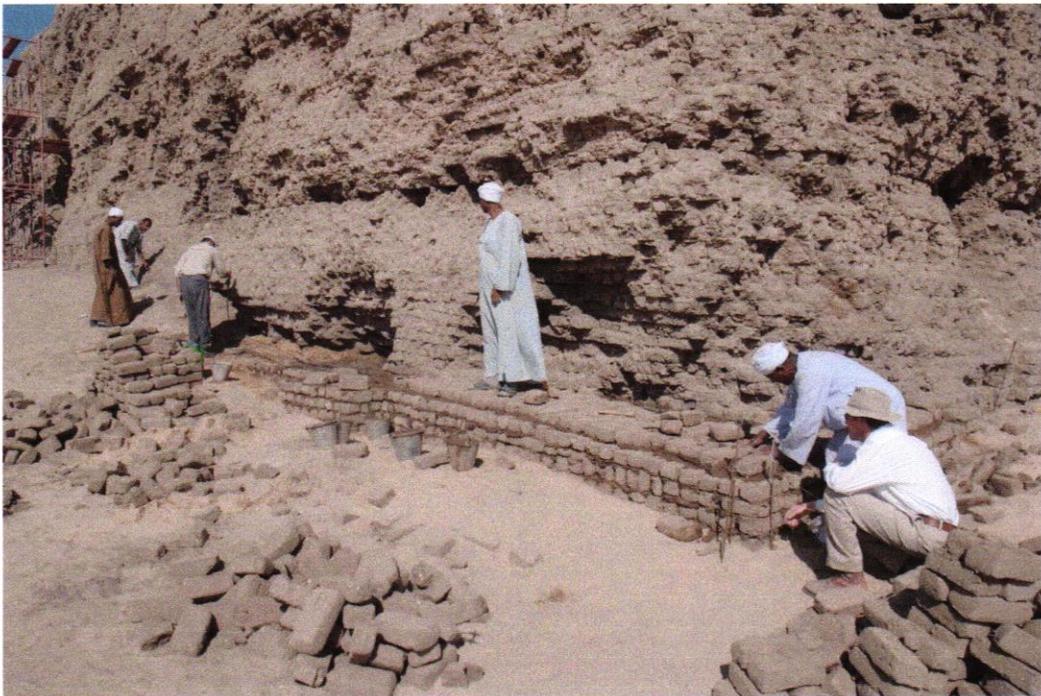


Figure 46 – The above-grade masonry follows the original line of the wall. Here, Anthony Crosby and Matthew Adams are setting out the line, assisted by Egyptian workers.



Figure 47 – South corner of the main enclosure, with stabilization work in progress. The tunnel has been filled. The extent of missing masonry at the corner can be judged by the thickness of the new construction.



Figure 48 – South corner, with stabilization work in progress.



Figure 49 – The south corner, exterior, of the main enclosure, at the close of Field Season 7. The lower part of the wall has been stabilized. The upper part remains to be completed in a future season.



Figure 50 – Interior side of the southwest wall of the main enclosure, with stabilization work in progress. This area was begun in Field Season 6.



Figure 51 – The extent of missing masonry along the wall face can be judged, based on the line of the wall in the background. Note the overhang in the foreground.



Figure 52 – Interior side of the southwest wall of the main enclosure, with stabilization work in progress. The entire lower part of the wall was missing and had to be reconstructed, in order to fill the many voids and to provide adequate structural support for the large and irregular overhangs above.

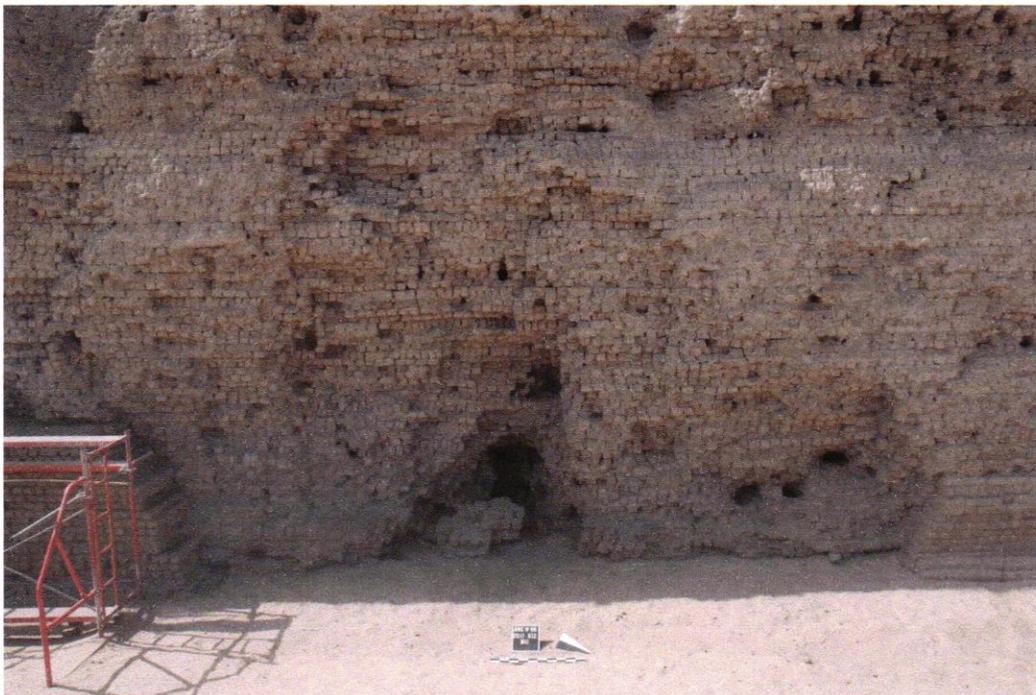


Figure 53 – A typical area of undercutting, overhanging masonry, and animal burrowing along the interior side of the southwest wall of the main enclosure. This photograph shows the section of wall just to the right (northwest) of that shown in Figure 51.

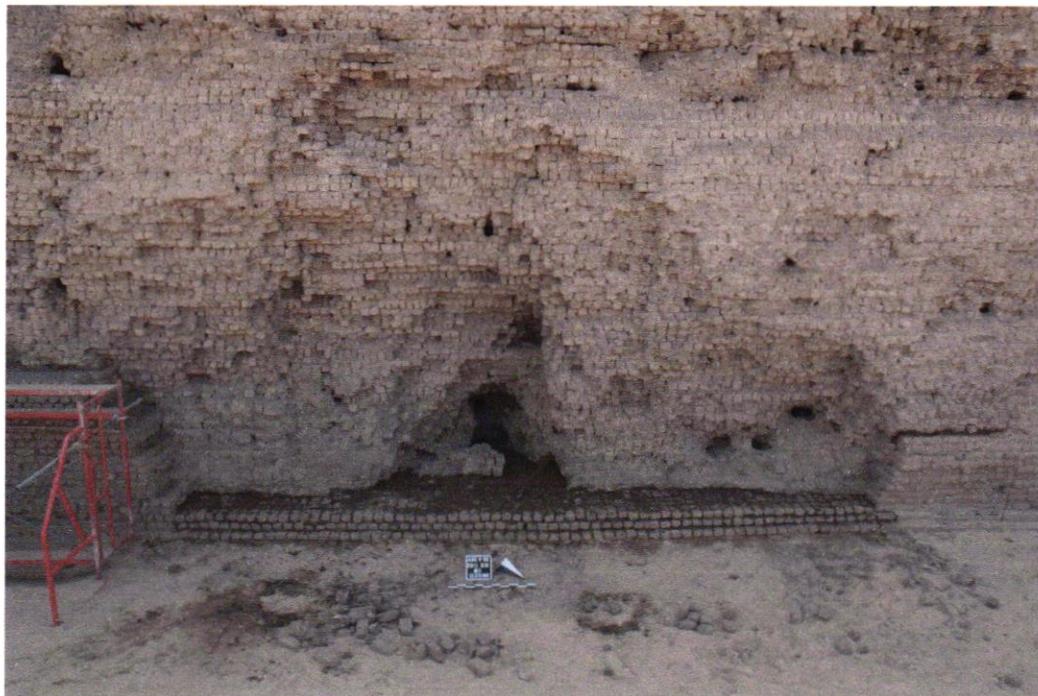


Figure 54 – The same area as in Figure 53, after the start of stabilization work. The lowest course of new brick masonry, which will be below grade when stabilization work is completed, extend slightly out from the line of the finished wall.



Figure 55 – The same area shown in Figures 53 and 54, with stabilization work in progress.



Figure 56 – The same area as in Figures 53-55, with stabilization work nearly complete. New masonry is built as high up the wall as necessary to fill fully the voids and support overhangs.



Figure 57 – Stabilization work in progress along the interior side of the southwest wall of the main enclosure.



Figure 58 – Interior side of the southwest wall of the main enclosure, at the close of Field Season 7. The lower part of the wall has been stabilized. Work on the upper part of the wall will continue in a future season. The west gate is at right.



Figure 59 – Exterior side of the northwest half of the southwest perimeter wall, prior to stabilization. The outer side of the wall has been severely wind eroded. It has also been heavily damaged by animal burrowing, as well as by hornet activity.



Figure 60 – Central part of the section of the southwest perimeter wall shown above. The extent of the damage from animal burrowing is clear. This was the most structurally unstable part of the wall examined in Field Season 7.



Figure 61 – Southwest perimeter wall, with stabilization work in progress.

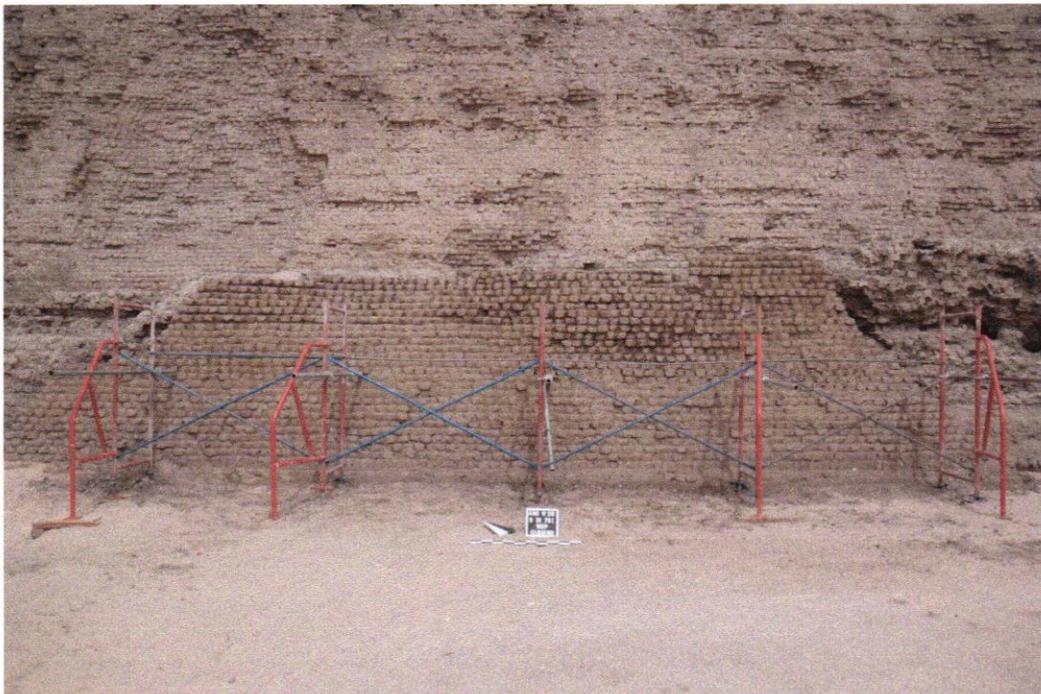


Figure 62 – The same area shown in Figures 60 and 61, at the close of stabilization work in Field Season 7. Substantial additional work will be necessary in future seasons to complete this part of the wall.



Figure 63 – Suite of rooms excavated in Field Season 6 as Operation 102, before the start of stabilization work. The main, plastered, room, or cell, had been excavated into the northeast wall of the main enclosure. A court was constructed against the front wall of the cell. The walls and floor of the court, as well as some associated features, have been artificially truncated, probably by early excavations in the Shuneh.



Figure 64 – The base of the enclosure wall adjacent to the cell was heavily undermined and highly unstable, requiring stabilization.

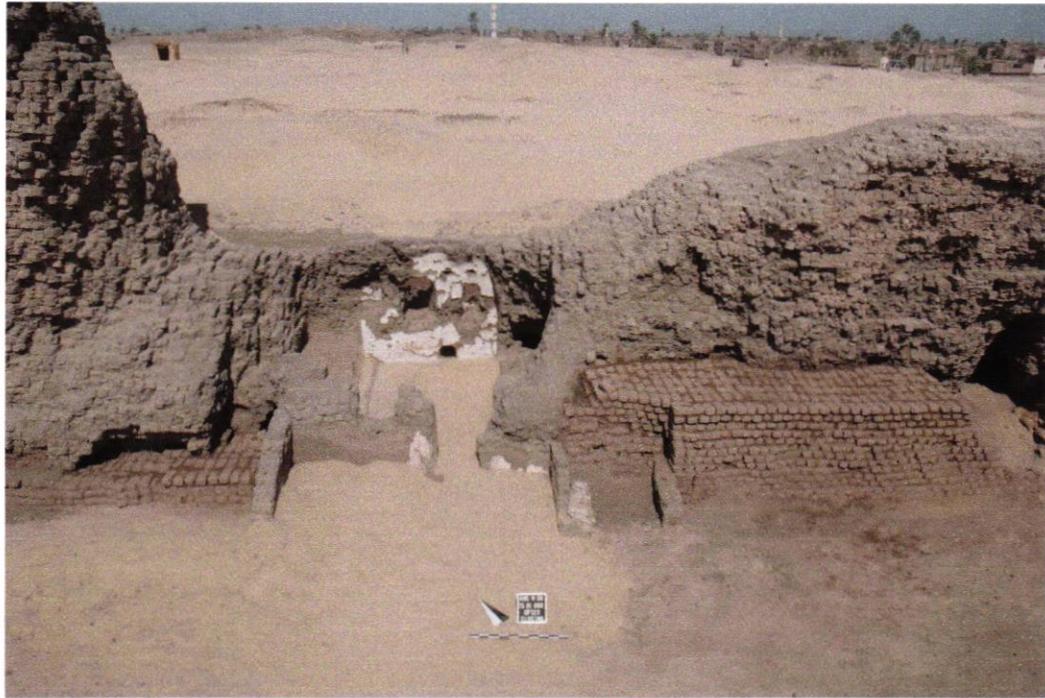


Figure 65 – Once the base of the wall was stabilized on both sides of the cell, work could proceed in the cell itself.

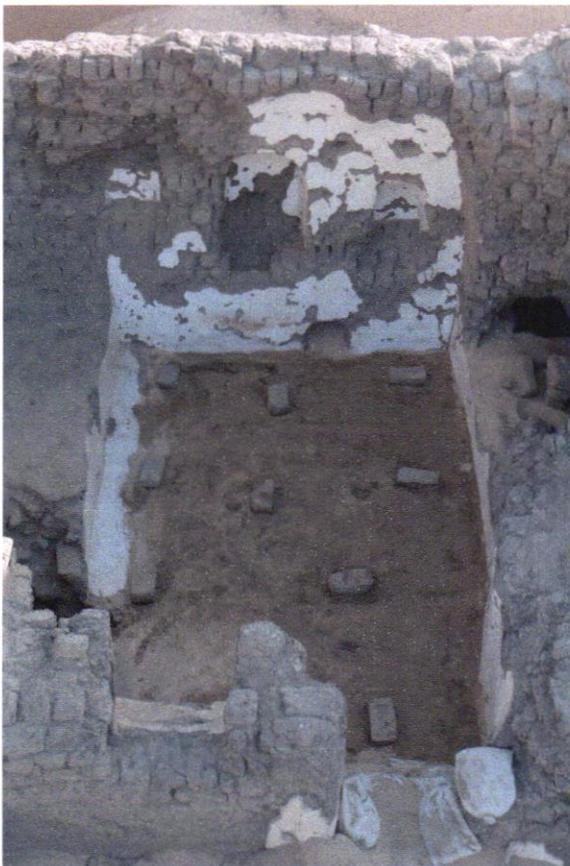


Figure 66 – As in other monastic cells, in Operation 102, all original surfaces and significant features were covered by a protective barrier layer of fine sieved sand.



Figure 67 – As the level of the brick infilling rose, a gap was left adjacent to any plaster surfaces.



Figure 68 – This gap was filled with sieved sand, to maintain a barrier layer between new masonry and original surfaces.



Figure 69 – Operation 102, at the close of work in Field Season 7. A solid base has been created for the additional masonry that will be required to support the unstable vertical wall end at left.



Figure 70 – The same area as in Figure 69, viewed from outside the Shuneh, from the northeast.

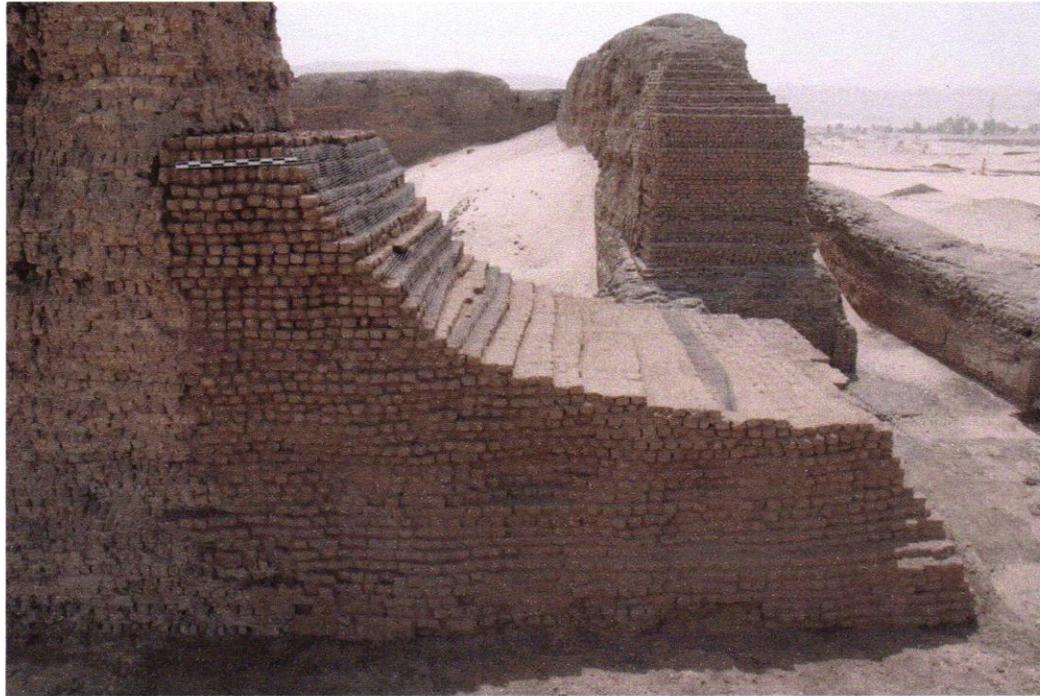


Figure 71 – Northwest end of the northeast wall of the main enclosure, at the close of Field Season 6.



Figure 72 – Northwest end of the northeast wall, at the close of Field Season 7. Additional work will be done in this area in future seasons, as part of the comprehensive stabilization of the north gateway area.

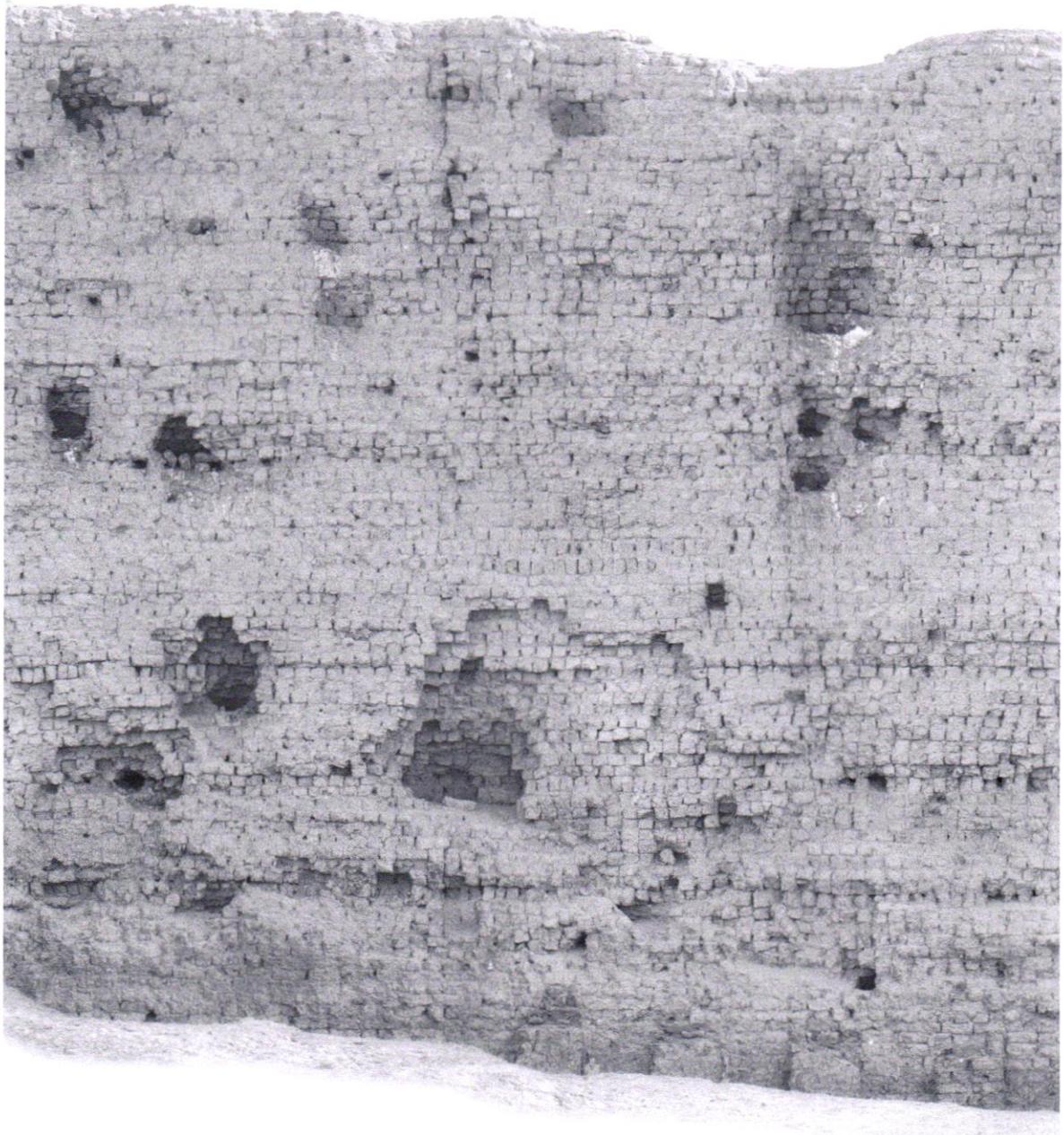


Figure 73 – Section of the exterior side of the southwest wall of the main enclosure, showing a typical distribution of medium-sized and small holes. Most of these holes were, initially, the result of hornet activity.



Figure 74 – A typical medium-sized hole in the exterior side of the southwest wall of the main enclosure.



Figure 75 – The same hole in Figure 74, after cleaning. Frequently, cleaning reveals that a hole that appears to be relatively small at the wall face is actually much larger.



Figure 76 – The hole shown in the preceding figures, filled with new brick masonry.

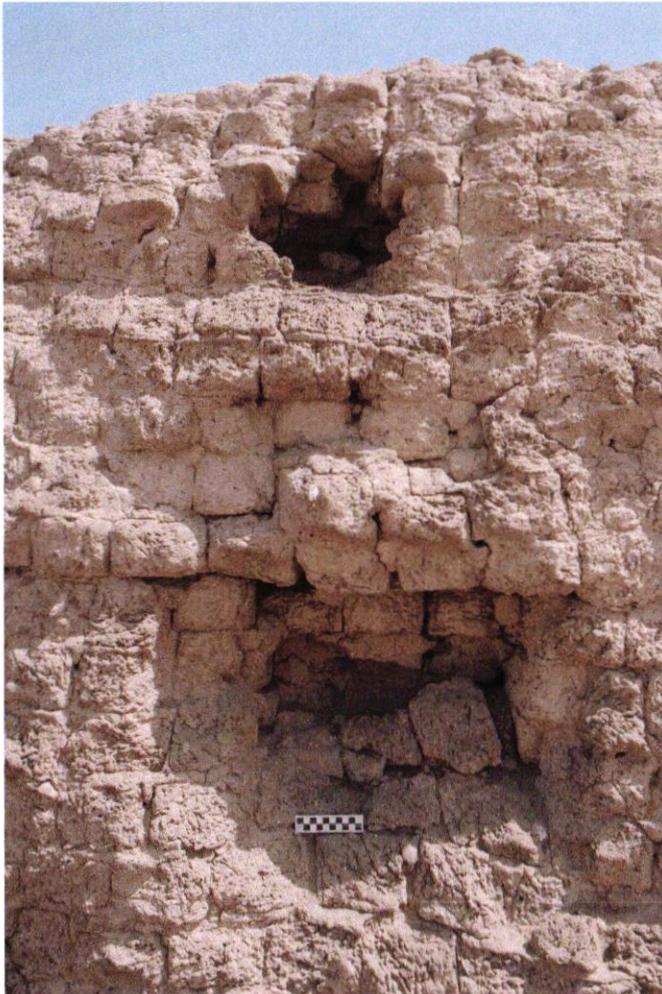


Figure 77 – Two holes near the top of the southwest wall of the main enclosure, exterior side.



Figure 78 – Cleaning revealed that the upper of the two holes shown in Figure 77 was filled with the remains of a paper hornet nest.

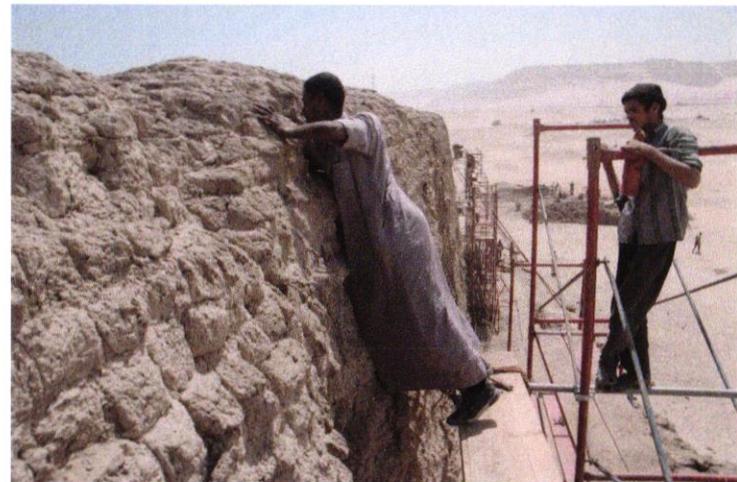


Figure 79 – In many cases, as here, the hornets excavated more than one meter into the wall, greater than the reach of the workman's fully extended arm.



Figure 80 – The two holes shown in Figure 77, after cleaning preparatory to infilling.



Figure 81 – The same holes as in the preceding figures, after stabilization.



Figure 82 – The same section of wall as shown in Figure 73, after the stabilization of the medium-sized and smaller holes. The eroded wall top in the foreground is the southwest perimeter wall.



Figure 83 – Operation 113, along the interior side of the southwest wall of the main enclosure. Although excavation in Field Season 6 was completed along most of the length of this part of the wall, a portion of Operation 113 remained to be finished in Field Season 7. As was demonstrated by the previous excavations, the area had been repeatedly pitted in ancient times for the deposition of ceramic vessels containing the remains of sacred ibises.



Figure 84 – Operation 113, with the ibis deposits fully excavated. The yellow sand surface is the sterile geological substrate on which the Shuneh was built and into which the ibis burial pits were cut.



Figure 85 – Interior south corner of the main enclosure, prior to the start of excavation.



Figure 86 – Mud floor and remains of dry laid walls of a small room constructed in late antiquity into the corner of the enclosure, atop an already considerable sand deposit. Based on the ceramics, this room appears to be contemporary with the monastic occupation of the Shuneh.



Figure 87 – Amphora found near the small room in the south corner of the Shuneh.



Figure 88 – The amphora shown in Figure 87 was stoppered with a base broken from another vessel. The stopper was removed to allow observation of the contents.



Figure 89 – The amphora shown in Figures 87 and 88 was found to contain a mass of woven fiber, in the form of what appeared to be strings, ringlets, and bands.



Figure 90 – Fragments of similar material were found loose in the sand around the small corner room.



Figure 91 – The front wall of the corner room, which was dry-laid, collapsed anciently down the slope of the underlying sand deposit.

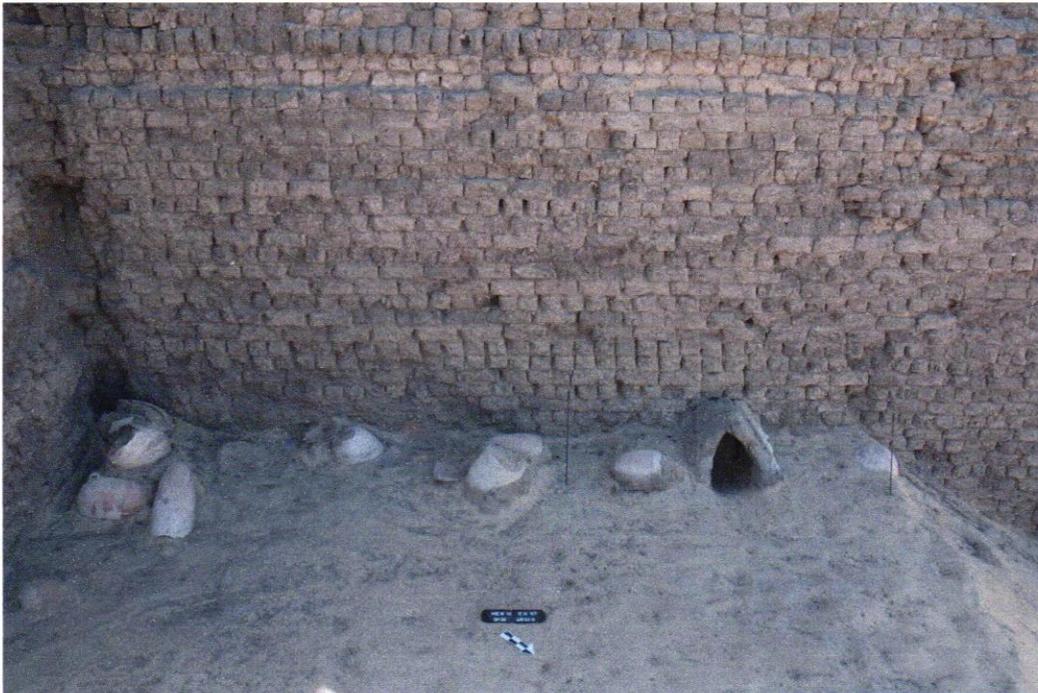


Figure 92 – Once the floor of the late antique room shown in Figures 86 and 91 was removed, a series of deposits of ceramic vessels and other artifacts were found, most of which relate to the cult of the sacred ibis. The vessels shown here appear to have been deposited into a shallow trench dug along the face of the wall. On the right is a small mudbrick chapel apparently contemporary with the vessel deposit.

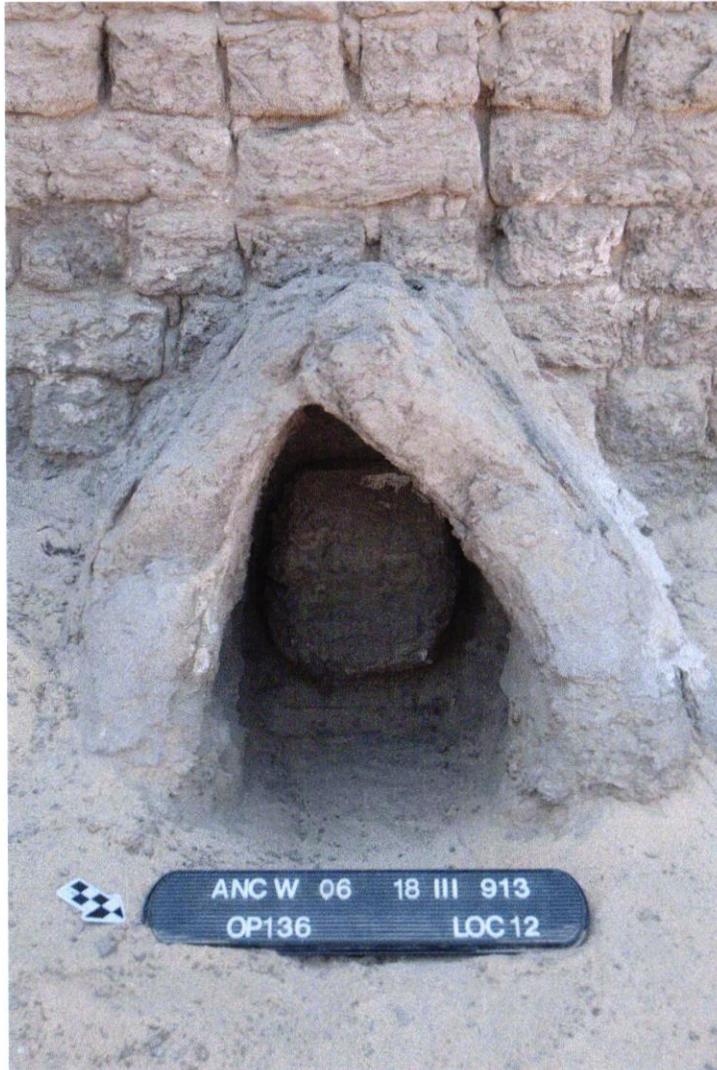


Figure 93 – The chapel was found to have a limestone stela still *in situ*, the first such discovery associated with the ibis cult.

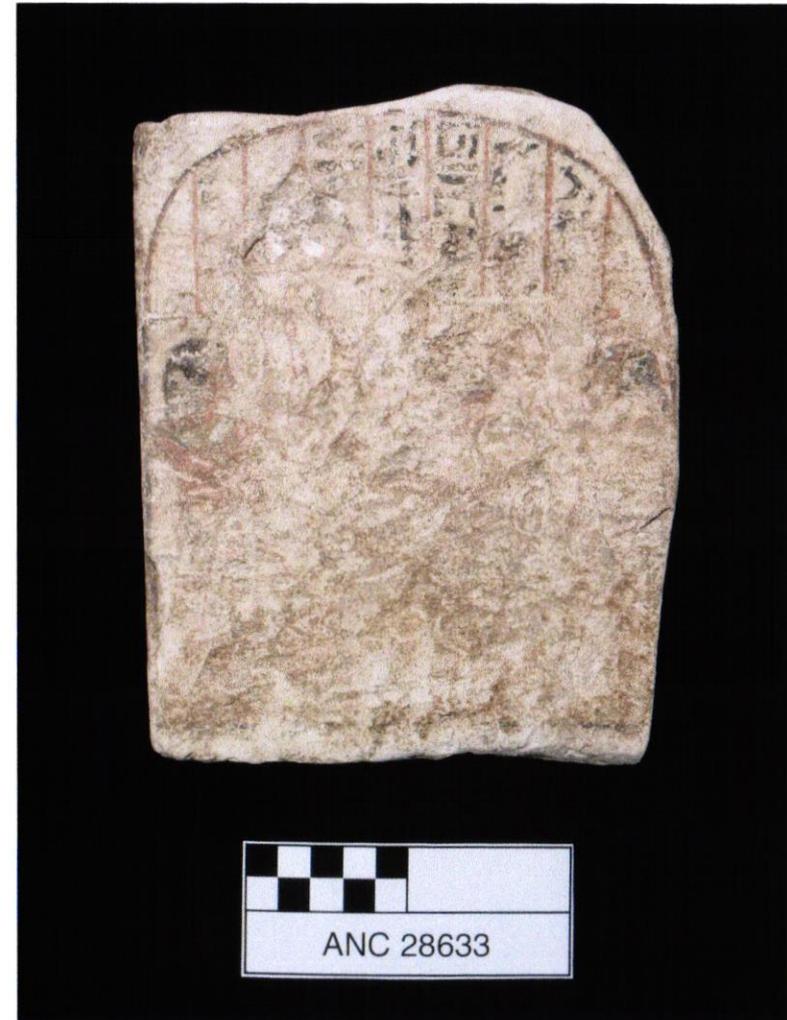


Figure 94 – After cleaning by the sub-project's archaeological conservators, traces of the stela's painted decoration were revealed. There are four standing figures, two opposing pairs, and the god Osiris, who is also named in the text, is second from left.



Figure 95 – Deposit of ceramic vessels in Operation 136. A number of the forms found deep in the sand deposit in the south corner of the Shuneh are atypical of the types of ibis burial jars found elsewhere in the enclosure.



Figure 96 – Some of the atypical forms contained the remains of dogs or other canids.



Figure 97 – This deposit of typical “torpedo-shaped” ibis burial jars appears to have been exposed on the surface for some time in the past, judging by the heavily eroded state of a number of the vessels.



Figure 98 – Mass of ibis remains that appear to have been deposited in a pit wrapped in reed matting, the decayed remains of which were found over the bones.

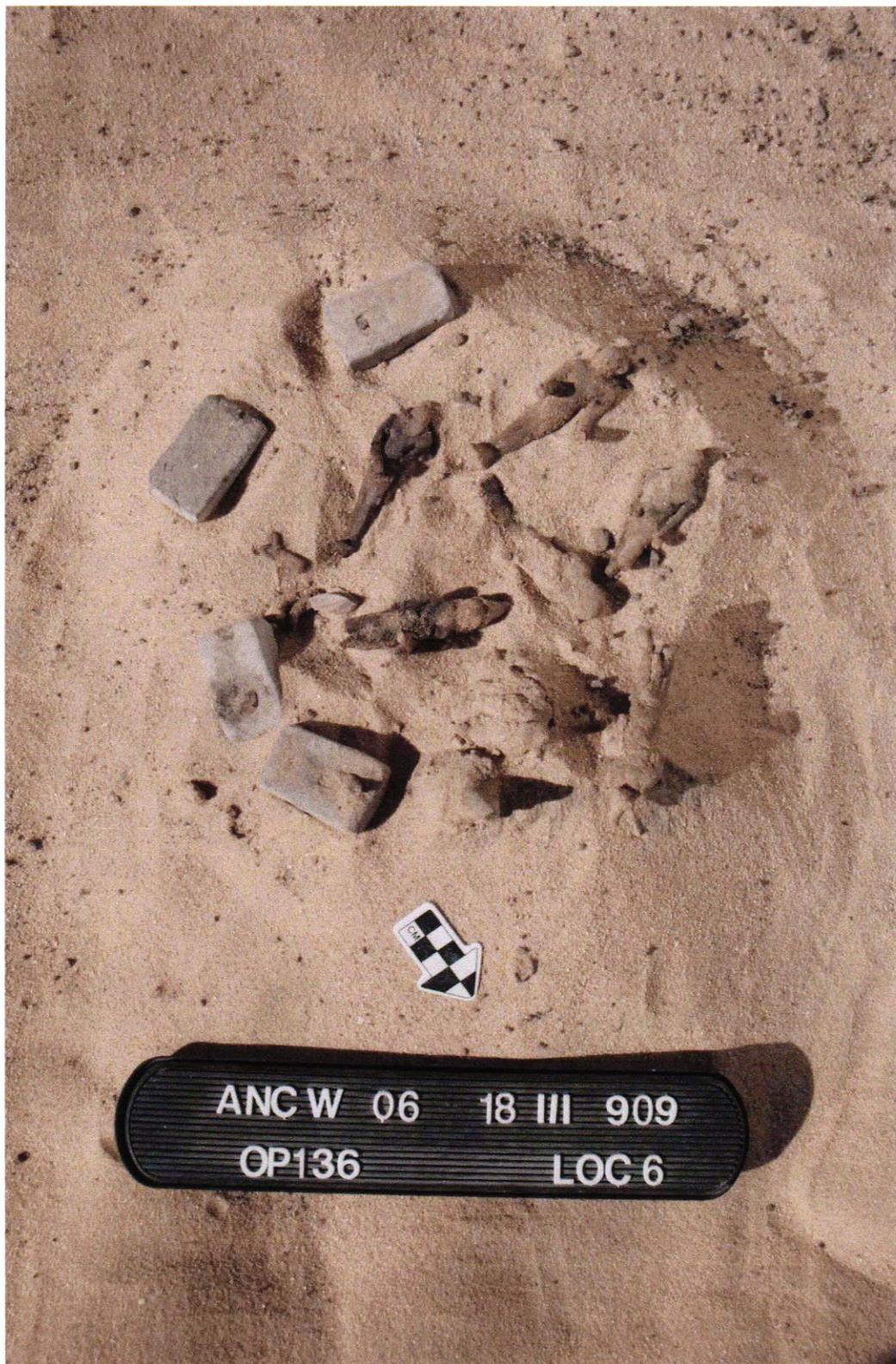


Figure 99 – Deposit of wax figures with mud bases in Operation 136, as found. Many of the figures had been pulled off their bases, and the arrangement appears to have been deliberate.

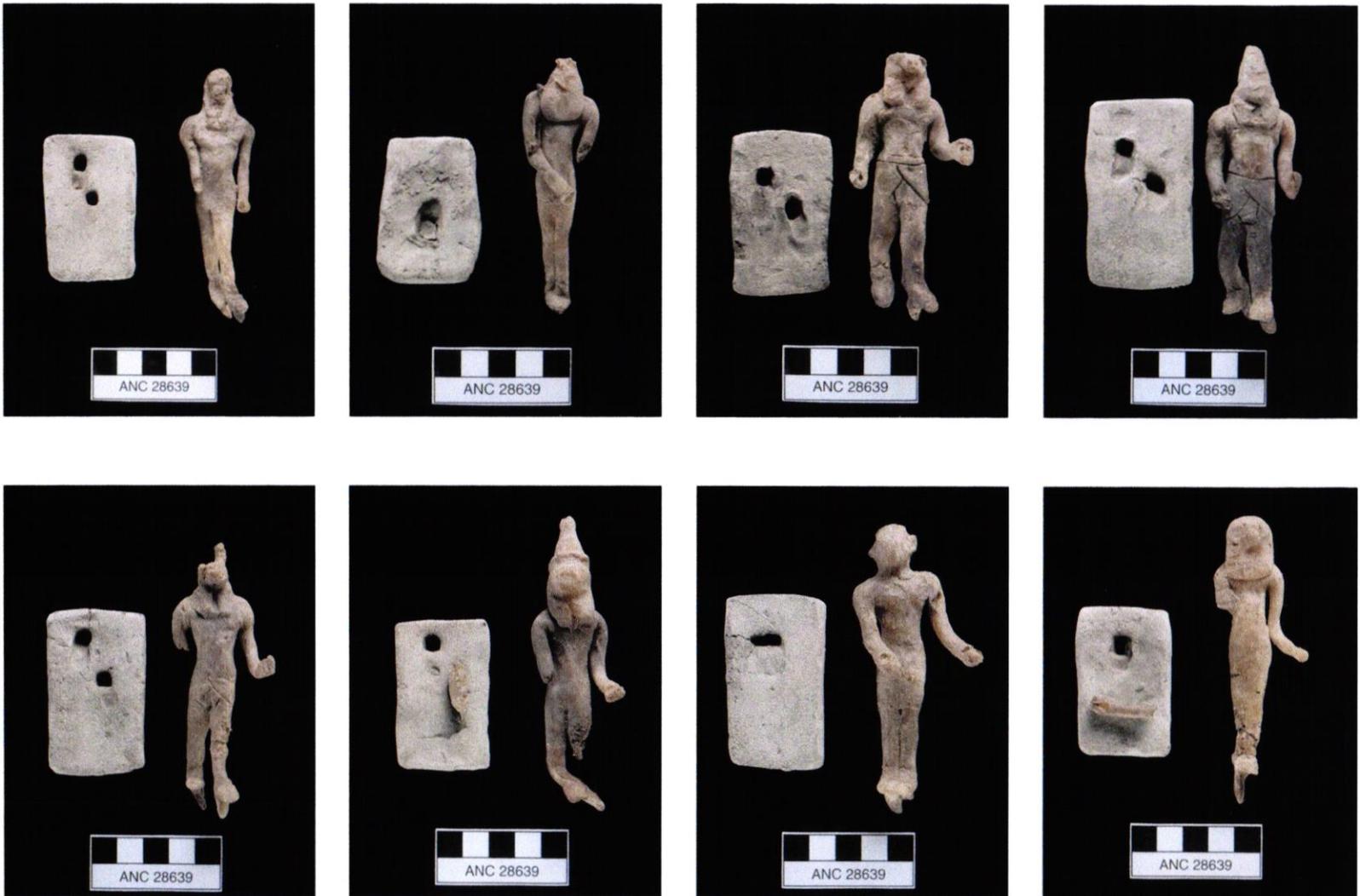


Figure 100 – The eight wax figures from Operation 136, after cleaning and consolidation by the sub-project's archaeological conservators.



Figure 101 – Preserved section of the Dynasty 2 mud floor of the Khasekhemwy enclosure. On the floor is a deposit of broken offering pottery, of the “beer jar” type.



Figure 102 – South corner, interior, of the main enclosure of the Shuneh, at the close of excavation in Field Season 7. The Dynasty 2 mud floor of the enclosure is visible in the lower center and lower right of the excavation area. The erosion line on the adjacent wall face shows the profile of the sand deposit. Excavation will continue here in a future season.

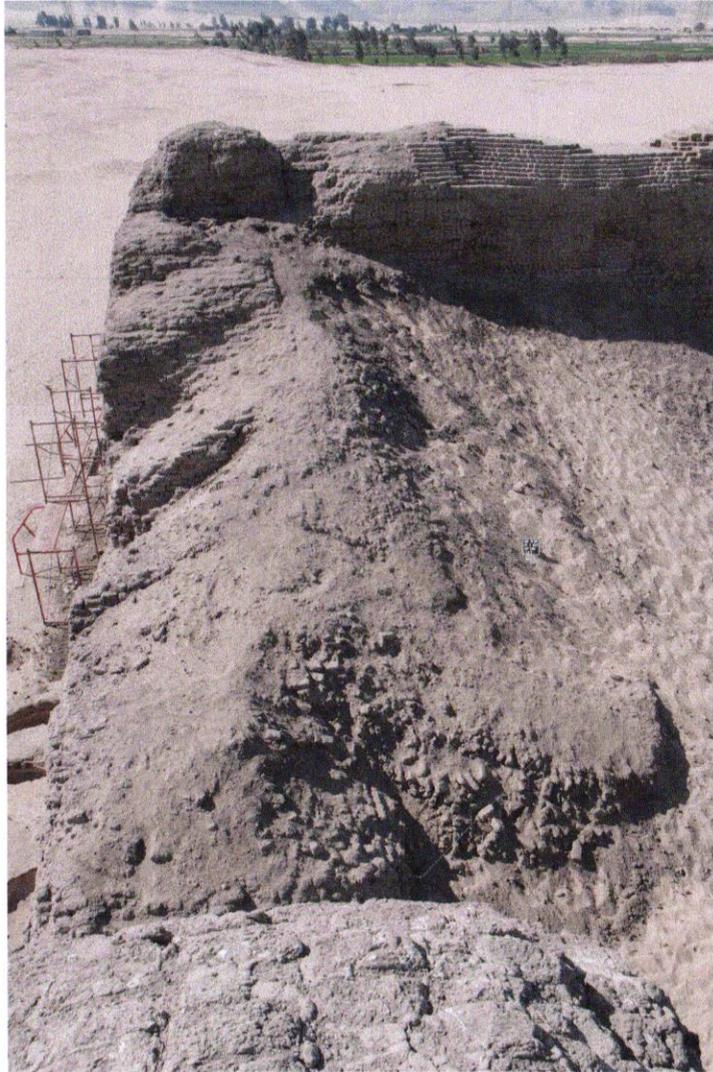


Figure 103 – Top of the southeast wall of the main enclosure, between the southeast gate and the south corner, prior to excavation.

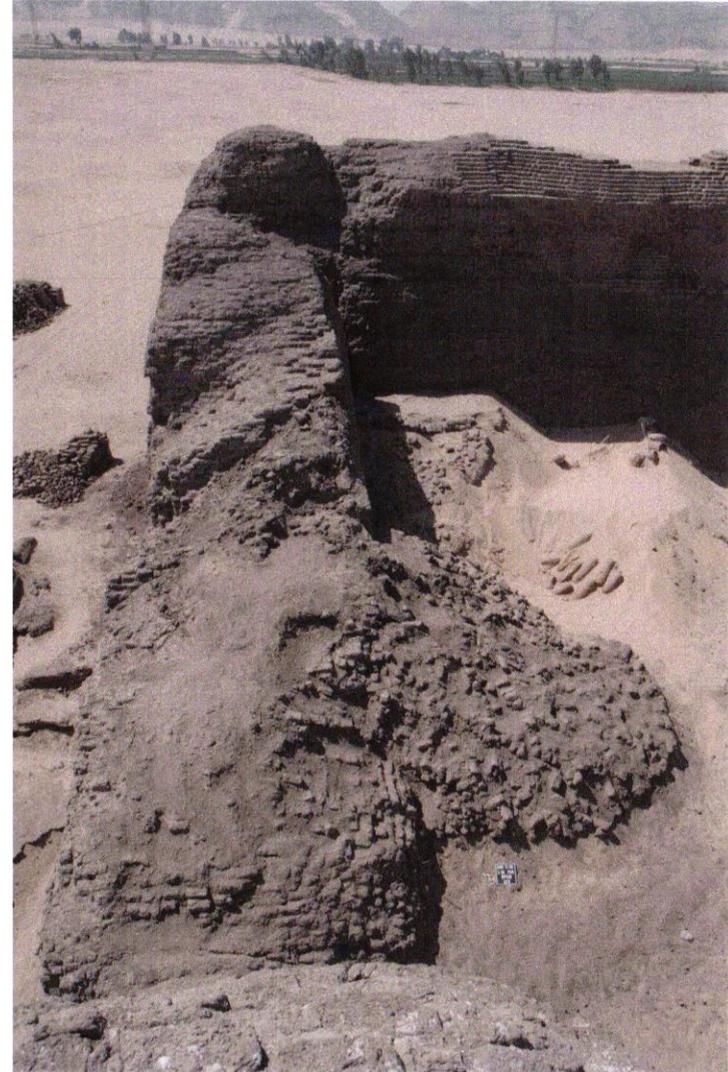


Figure 104 – A large section of the wall collapsed to the northwest at some point in the past.



Figure 105 – Excavation revealed that the collapse of this part of the wall was due to structural instability created by a monastic cell void. The remains of the cell are visible in the wall top at left.



Figure 106 – The cell in the southwest wall of the main enclosure, excavated as part of Operation 136, although poorly preserved, contained a large number of pieces of fallen wall plaster.



Figure 107 – Some of the fallen plaster had traces of Coptic inscriptions, as does the fragment at left, while others appear to have had abstract or geometric designs.



Figure 108 – Other fragments had traces of more distinctive designs, in bolder lines.



Figure 109 – Operation 133, the southeast perimeter corridor between the southeast gateway and the south corner, prior to excavation.



Figure 110 – Operation 133, with the remains of the Dynasty 2 mud floor of the perimeter corridor. Much of the pitting of the floor appears to have been the result of early excavations. The original plastered and whitewashed finish of the main enclosure wall is preserved along the lower part of the wall in this area.



Figure 111 – Two disturbed coffin burials, probably of Middle Kingdom date, in Operation 56 along the exterior of the southwest perimeter wall.



Figure 112 – Another disturbed coffin burial, likely Middle Kingdom, in Operation 57 along the exterior of the southwest perimeter wall.



Figure 113 – The northwest perimeter corridor of the Shuneh, after excavation. The regular pitting appears to be the result of early excavations.



Figure 114 – One section of the Dynasty 2 floor appears to have been left intact, covered by mudbrick erosional debris. The original niched design and plastered and whitewashed finish of the main wall of the enclosure is preserved here.



Figure 115 – General view looking southwest of the northwest wall of the main enclosure of the Shuneh, far left, northwest perimeter wall, left, and the southeast wall and east corner gateway of the funerary cult enclosure of king Peribsen, center. The corridor between the Peribsen enclosure and the perimeter wall of the Shuneh has been trenched like the perimeter corridor, probably by Ayrton.



Figure 116 – General view looking northeast, with the northwest wall of the main enclosure of the Shuneh at the far right, the northwest perimeter wall middle right, and the southeast wall and south corner of the enclosure of Peribsen, middle and left.



Figure 117 – General view of the northwest side of the Shunet el-Zebib and the southeast end of the enclosure of king Peribsen. Despite that the perimeter wall has been much more heavily eroded than the main wall, much remains of its original plastered and whitewashed finish.