PROGRESS REPORT No6

May 2004-June 2004

"Documentation and Conservation of King Khasekhemwy's Funerary Monument at Abydos"

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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

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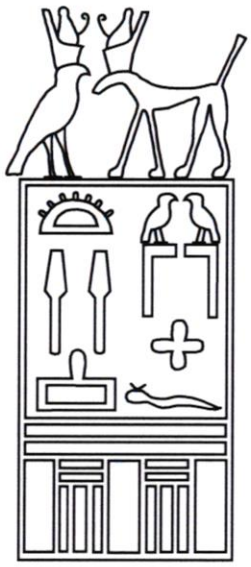
DOCUMENTATION AND CONSERVATION OF PHARAOH KHASEKHEMWY'S FUNERARY MONUMENT AT ABYDOS



Progress Report No. 6

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October, 2005

This report was prepared for
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under USAID Grant No. 263-G-00-93-00089-00 (formerly 263-0000-G-00-3089-00)

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 5, May-June, 2004. The details of the work accomplished in this field seasons are given below.

The work describe here was undertaken under the authority of and with the kind permission of the Supreme Council of Antiquities. Sincere thanks are due to the members and representatives of the SCA, Dr. Zahi Hawass, Secretary-General, Mr. Zein el-Abdin Zaki, Director General, Sohag Governorate, Miss Aziza el-Sayed Hassan, Chief Inspector, Balliana, and Mr. Sayed Abdou Abd el-Aziz Hammam, Inspector of Antiquities.

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.

Field personnel for Field Season 5 consisted of Matthew Adams, Sub-project Associate Director, Anthony Crosby, Mudbrick Conservation Specialist, and Jennifer Lavris, Archaeologist.

Field Season 5, May-June, 2004

Major Tasks

The work of the sub-project in Field Season 5 consisted of the following components:

1) Manufacture of new mud bricks to be used in the architectural stabilization of the funerary enclosure of king Khasekhemwy, the Shunet el-Zebib
2) Commencement of the implementation of large-scale architectural stabilization solutions at the Shunet el-Zebib
3) Continuation of the excavations at the Shunet el-Zebib

Results of the Work

Manufacture of new mud bricks for architectural stabilization

Approximately 50,000 mudbricks were made for use in the architectural stabilization work at the Shunet el-Zebib, of the same dimensions as the ancient bricks, 26 x 13 x 9 cm. The

Small rooms, or "cells," were dug into the walls of the Shuneh at a number of locations during late Roman/Byzantine times, when the monument was occupied by an early Christian (Coptic) monastic community. A number of these cells are visible in **Figure 6**, which shows the southwest wall of the Shuneh, viewed from the west. The cells consist of deep holes dug into the walls, and they present very serious structural risks to the wall. In order to establish structural stability, stabilization solutions are required. In preparation for the implementation of these solutions, the two cells in the southwest wall nearest the west corner were excavated and documented this season (see the discussion of the excavation of Operations 100 and 101, below). Structural stabilization work was begun in the northwesternmost of the two cells, Operation 100 (**Figures 7, 8**). As is discussed further below, at some point after the end of the Coptic occupation, a deep hole had been dug through the floor of the cell in Operation 100, completely through the brick masonry of the wall of the Shuneh, to a depth of more than 1.5 meters below the base of the wall (**Figures 9, 11**). The hole also was found to contain the burial of a horse (**Figure 10**, and see the discussion of the excavation of Operation 100, below). After documentation of the hole, three new mudbricks stamped with "PYIFA" (for the Pennsylvania-Yale-Institute of Fine Arts Expedition) were placed at the bottom of the hole, well below the base of the wall of the Shuneh, and the hole was then filled with compacted sand. This sand bed now supports the preserved foundation course of the Shuneh wall that had been undercut around the edges of the pit (**Figure 12**) and provides a stable base for new brick masonry that fills the hole in the wall's masonry (**Figure 13**). Once the hole under the floor level of the cell was filled, additional new brickwork was installed in the remains of the cell itself, to provide structural support to the large and structurally unstable overhang created by the cell's original construction and by the centuries of gradual collapse of the brickwork above the cell. At the end of Field Season 5, the cell Operation 100 had been filled with new masonry to a height approximately one meter above the level of the mouth of the deep pit (**Figure 14**), with stabilization work in this area to be completed in the subsequent season.

The approach taken by the Expedition in this and other cells that will be included in future work is to provide the structural stability required to prevent catastrophic collapses of the original fabric of the wall around the cells, but to set the new masonry back slightly from the existing wall face and to give the in-filling a slightly concave profile, both of which will provide visual indicators of the presence of each cell, reflecting the important phase of use of the monument in late antiquity.

The vertical and partly overhanging northeast end of the northwest wall of the main enclosure is shown in **Figure 2** (at right) and **Figure 15**. This area was at risk of collapse, which would have resulted in the loss of a significant volume of the original fabric of the northeastern part of the wall.

Prior to any architectural work the area was carefully cleaned by archaeological staff and examined for any traces of features relating to the Coptic occupation. There are indications of such features on the other side of the north gateway, as well as in the west gateway, and the existence of such features could have contributed to the past collapses that led to the existence of this vertical wall end. This was certainly the case on the opposite side of the

north gateway, at the northwestern end of the northeast wall of the Shuneh. Careful examination produced no indications of post-Dynasty 2 cultural features (**Figure 16**).

The structural solution implemented by the Sub-project was the construction of a mudbrick buttress against the wall end, shown at the end of Field Season 5 in **Figure 3** (at right) and in various stages of construction in **Figures 17** and **18**. The texture of the existing, eroded wall surfaces is carried into the masonry of the buttress on its northwest and southeast faces. The northeast end of the buttress has a different, more regular character, because as the stabilization work continues, this end will be incorporated into additional new mudbrick elements that will be built as part of the comprehensive architectural stabilization work around the north gateway. The vertical wall end in the new masonry (**Figure 18**, lower right) will not exist when the additional stabilization work is done in a future season. The vertical end of the buttress is temporarily required so that it can be easily incorporated into future stabilization work.

In the upper part of the southern part of the southwest wall of the main enclosure a large gap in the wall poses significant structural risks. The sides of the notch consist of vertical wall sections that are associated with at least one large structural crack. Vertical wall ends pose significant risk of collapse, particularly when they occur in combination with structural cracks. In order to mitigate the most immediate risk, in Field Season 5 the Sub-project constructed a mudbrick buttress against the northwestern of the two vertical wall sections (**Figures 19-20**). This vertical section is associated with a large structural crack. The buttress provides structural support and will prevent a collapse of the vertical wall segment. As with other areas, the texture of the surrounding eroded wall surfaces in the original masonry are carried into the new work. The southeastern end of the buttress, which now presents a fairly regular profile, will, in a future season, be joined with a buttress against the southeastern vertical wall segment. This future work will soften the visual impact of the new masonry, which will then blend well into the overall profile of the wall.

In addition to the large-scale stabilization solutions, a number of smaller-scale but still significant areas where structural risks are present and where original fabric of the monument is being lost to collapse and erosion, were also treated this season. A number of large holes in the walls were cleaned, documented, and filled with new mudbrick masonry. One example is illustrated in **Figures 21** and **22**. The new masonry will prevent the holes from causing further localized collapses of the brickwork. Holes treated this season were located on the inner and outer faces of the northwest main enclosure wall and the inner face of the northwestern half of the southwestern main enclosure wall. Extensive scaffolding was erected along the inner face of the northwestern half of the southwest wall, in order to provide access to the wall face (**Figure 23**). Besides filling holes, a large structural crack in the middle of the top of the northeastern main enclosure wall (**Figures 24-26**) was cleaned out, and new mudbrick masonry installed, incorporating horizontal reinforcing material (a geogrid textile) between courses in order to tie the masonry on both sides of the crack together.

The architectural stabilization work in Field Season 5 began using a team of experienced masons from the nearby district of Girga. These masons constructed an expansion to the Pennsylvania-Yale-Institute of Fine Arts Expedition's field house at Abydos in 2001 and at that time displayed superior skills in mudbrick construction. Within a short time after work commenced this season, however, it was determined in consultations between the Associate Sub-project Director and the Mudbrick Conservation Specialist that their performance was unsatisfactory, in terms of both the pace and general quality of the work. Consequently, the Girga team was replaced by a team of experienced masons from Quft, with the result that the level of performance was greatly improved. It is now anticipated that the Qufti masons, who have experience working on ancient monuments, and who have now been well trained by the Mudbrick Conservation Specialist in the particulars of work at the Shuneh, will continue with the Sub-project in future seasons as the key figures in the workforce dedicated to the architectural stabilization effort.

Excavations

Previous excavations at the Shunet el-Zebib have been conducted by Auguste Mariette in the mid-19th Century, by the Egypt Exploration Society in 1904, and by the Pennsylvania-Yale-Institute of Fine Arts Expedition in 1986, 1988, 1999, and 2001. The 1999 and 2001 work was part of the current EAP-funded Sub-project and was presented in Progress Report No. 1 (1999 work) and Progress Report No. 5 (2001 work).

New excavations undertaken this season were focused primarily in three areas (**Figure 1**). Operations 100 and 101 (**Figures 7, 8**) designate cells, or rooms, dug into the northwestern part of the southwest wall of the Shuneh in late antiquity, as part of the occupation and re-use of the Shuneh by a Coptic monastic community. Operation 102 was located along the inner face of the northeast wall of the main enclosure of the Shuneh and resulted in the discovery of yet another such cell (**Figures 32-34**).

Work in Operation 100 revealed that, while the primary void in the masonry of the Shuneh wall in this area was created by the removal of brickwork to create a cell, or room, in the wall during the occupation of the Shuneh by a Coptic monastic community in late antiquity, very little of the fabric of that cell remains. Only a pivot stone for a wooden door, a small area of lime plaster, and a slightly larger area of mud plaster floor are preserved from the cell, all in what would have been the cell's south corner, adjacent to the doorway (**Figure 9**). They indicate that this cell was originally similar in layout to other cells visible in the southwest wall of the Shuneh, with a doorway in the front and a floor covered in hard lime plaster. Judging from the present size of the void in the masonry of the wall, its original size was approximately 3.5 x 2 meters in plan. The cell appears to have been mostly destroyed by the excavation of a large pit that removed the floor of the cell and the underlying brick masonry of the wall of the Shuneh (**Figures 9, 11**). This pit cut not only through the wall, but more than 1 meter into the sterile natural sand and gravel deposits under the wall of the enclosure (**Figure 12**). The fill of the pit was found to consist of a mixture of brick debris and sand, with a large number of pieces of lime plaster that almost certainly represent the remains of the floor and side walls of the cell. After the pit stood open for some time, a horse was buried in it (**Figure 10**) and covered by a layer of loose

mudbricks. No artifacts were found in the pit or with the horse skeleton to determine the date of either the cutting of the pit or the interment of the horse. It is possible that the pit was cut in the 19th Century by one of the early excavators at the site of Abydos (Mariette is most likely), who may have been looking for foundation deposits under the corner of the Shuneh. There is no conclusive evidence for the date, however. A similar hole at the south corner of the Shuneh, which may also relate to a search for foundation deposits, was investigated in 2001.

Work in Operation 101 (**Figures 7, 8**) showed that this area, too, was a Coptic cell. The basic outline of this cell is better preserved than was the case in Operation 100 (**Figure 27**). It measured approximately 3.75 x 2 meters in plan. Its ceiling, though destroyed, can be estimated from traces of wall plaster to have been approximately 1.9 meters high. The front wall of the cell was formed by original Shuneh masonry that was left in place when the cell was created. Access to the interior was gained by means of an entrance at its southern end. In this entrance was a door pivot and just inside, a small ceramic bowl set into the floor. The floor and the lower parts of the walls were covered in a smooth white lime plaster, while, where preserved, the upper parts of the cell's walls were finished in a light brown mud plaster. At the north western end of the cell there was once a sleeping platform. This has been completely destroyed, but its position and size can be determined from the preserved plaster on the floor and adjacent wall. On the inner face of the exterior wall of the cell, some of the white plaster was preserved. Its upper edge, which bore traces of red line decoration, was found to be extremely fragile and was delaminating. Because of the significance of the traces of decoration, measures were taken to stabilize the edge of the plaster. First, it was carefully cleaned (**Figure 28**). Then, a solution of Acryloid B-72 was injected into the mud plaster backing of the finished lime plaster (**Figure 29**). Finally, a putty, consisting of a mixture of lime and sand, was applied (**Figure 30**) to provide physical protection to the exposed plaster edge. Excavation in Operation 101 also revealed that, mixed into the decayed mudbrick and mudbrick debris on the floor of the cell were many fragments of fallen wall plaster, some of which bore traces of black line decoration (**Figure 31**). This deposit was left in situ, so that it can be lifted as a block in a future season by archaeological conservators, who will then be able to clean and consolidate the fragments under the more controlled circumstances of the Sub-project's conservation lab.

The configuration of the cell in Operation 101, which is paralleled in other cells at the Shuneh, provides clear evidence for the process of cell construction. Removal of the fabric of the wall began with the cell doorway. Working through this narrow entrance, additional masonry was removed until the entire space for the cell was created. A bench of original masonry was left at the northwestern end of the cell, to form the sleeping platform. The entire cell was then smoothed with a coating of mud plaster, and the floor, bench, and lower part of the walls finished with fine lime plaster.

Work in Operation 102, along the inner face of the northeast wall of the main Shuneh enclosure (**Figures 32, 33**), exposed the collapsed roof of another cell belonging to the early Christian occupation of the Shuneh (**Figure 34**). At the back (northeast) of the cell, the lime plaster finish of the interior of the cell was visible. Removal of the collapsed brickwork and the excavation of the interior of the cell will be undertaken next season.

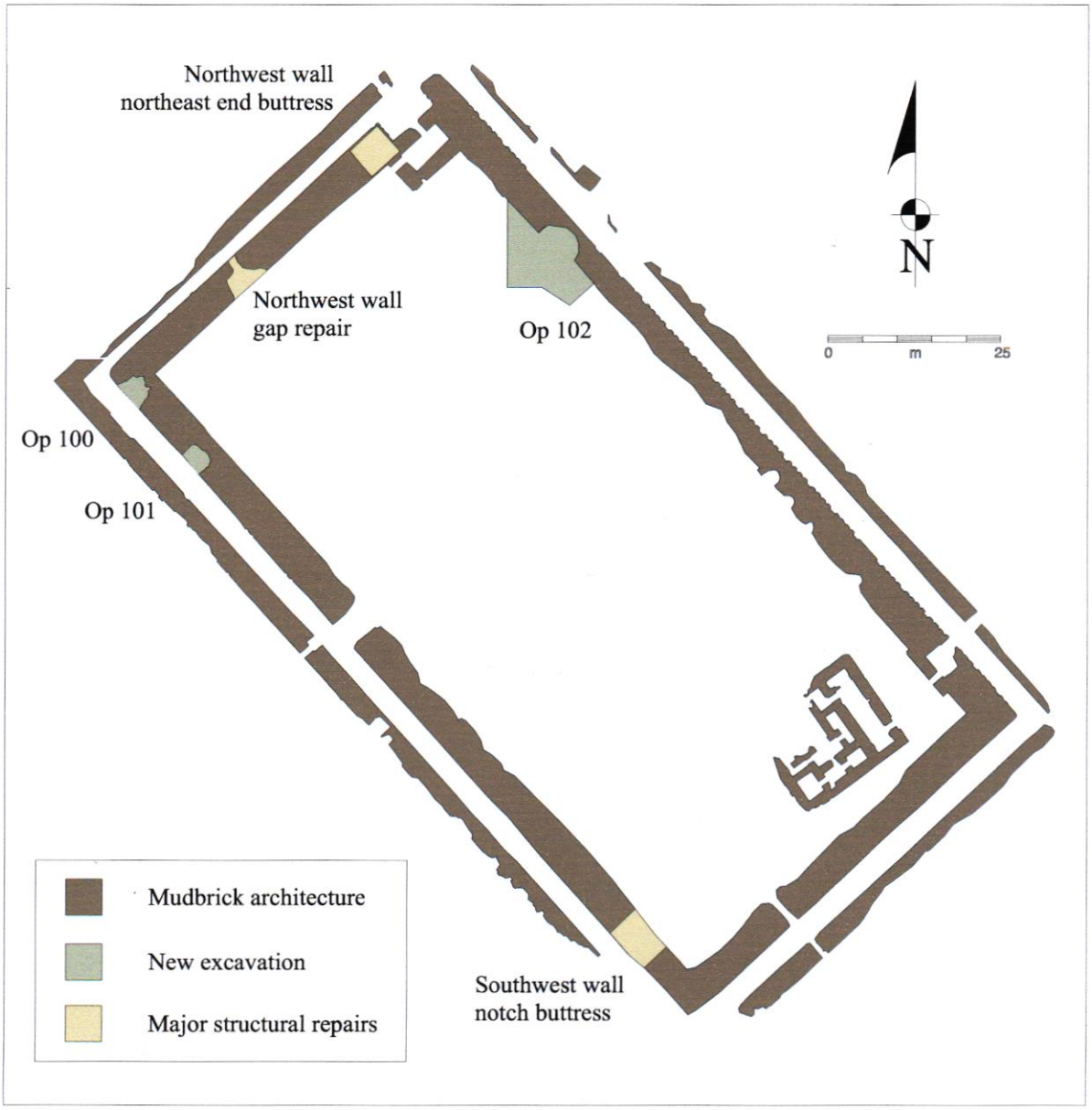

Figure 1 - Location of the new excavations and major structural stabilization work undertaken in the Shunet el-Zebib in Field Season 5.

Figure 2 – panoramic image of the interior face of the northwest wall of the Shunet el-Zebib in 1999, prior to any structural stabilization work.

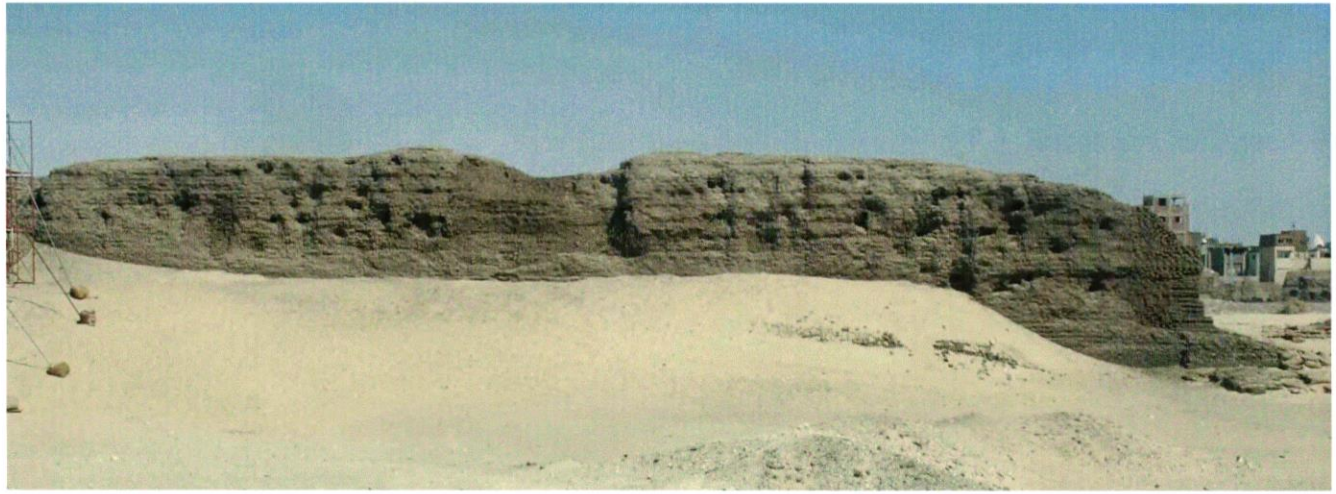

Figure 3 – the interior face of the northwest wall of the Shuneh, as of June, 2004, with the central gap filled, the northeast end buttressed, and the medium-sized hole at left filled.

Figure 4 – Completed structural repair of the gap in the middle of the northwest wall, seen from the interior of the Shuneh. This area illustrates the basic approach to be used in the stabilization of the walls.

Figure 5 – pointing the joints in the mudbrick masonry filling the gap in the north wall.

Figure 6 – view of the Shunet el-Zebib from the northwest. The two large voids in the southwest wall in the center of the photo are the two cells excavated in Field Season 5 as Operations 100 (left) and 101 (right).

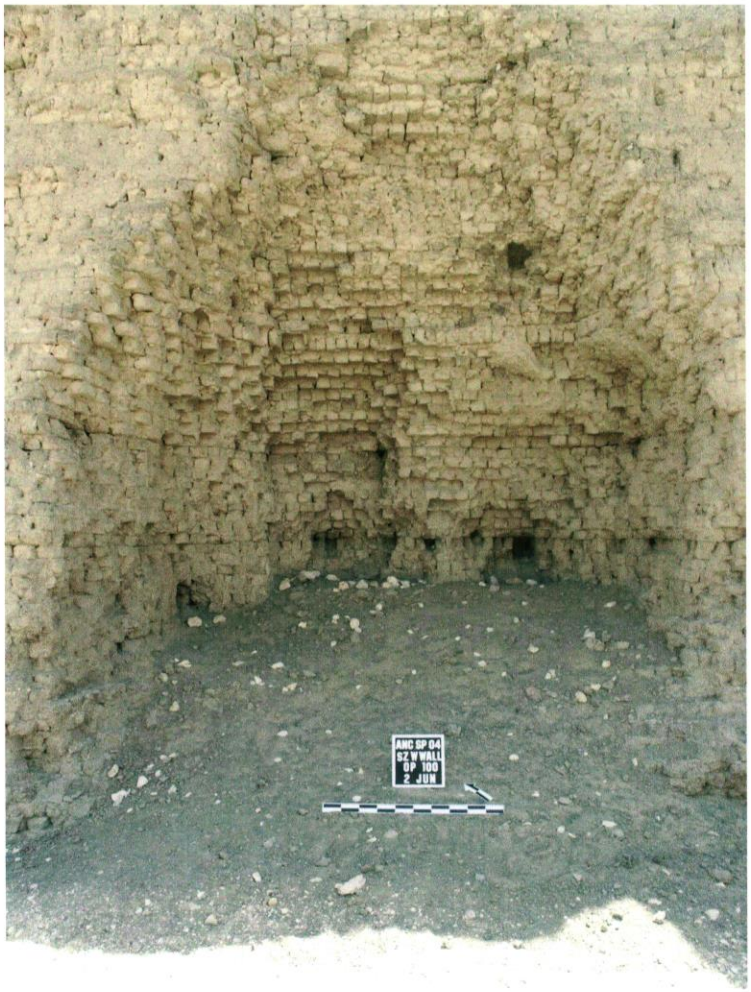

Figure 7 – Operations 100 (left) and 101 (right) before excavation.

Figure 8 – Operations 100 (left cell) and 101 (right cell) in Field Season 5. Protective scaffolding was in place during all excavation and architectural stabilization work, to protect workers from the risk of falling bricks and fragments.

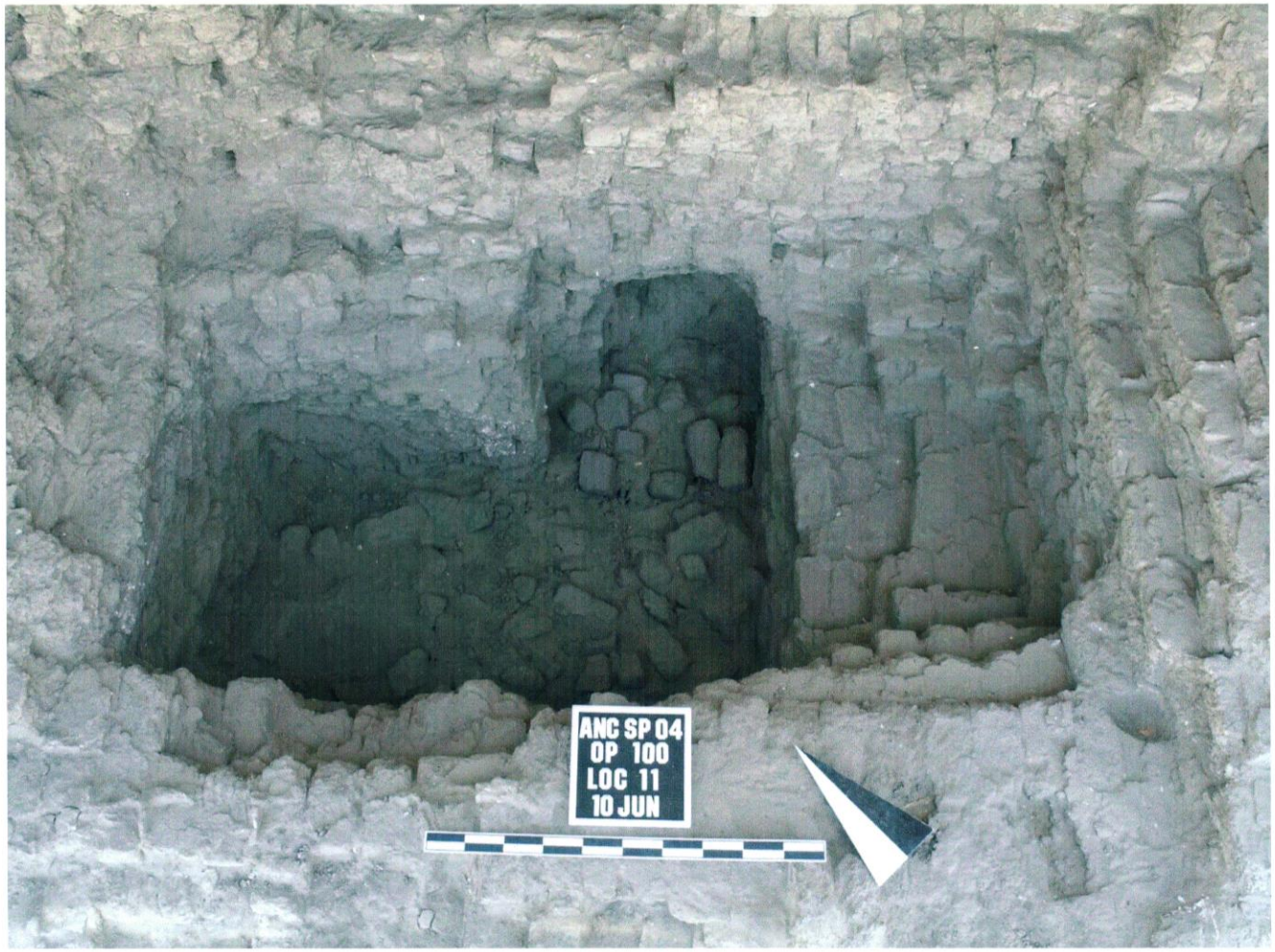

Figure 9 – Operation 100, during excavation. The only area of preservation of the features of the Coptic cell is in the lower right of the photograph, where a small area of lime plaster is visible, along with some of the mud plaster that originally underlay the lime plaster floor, as well as a circular depression in the floor that once held a small ceramic bowl, a feature common to most of the cells constructed at the Shuneh. This bowl set into the floor would have been just inside the doorway into the cell.

Figure 10 – Operation 100, horse burial in the fill of the pit cut into the main enclosure wall of the Shuneh.

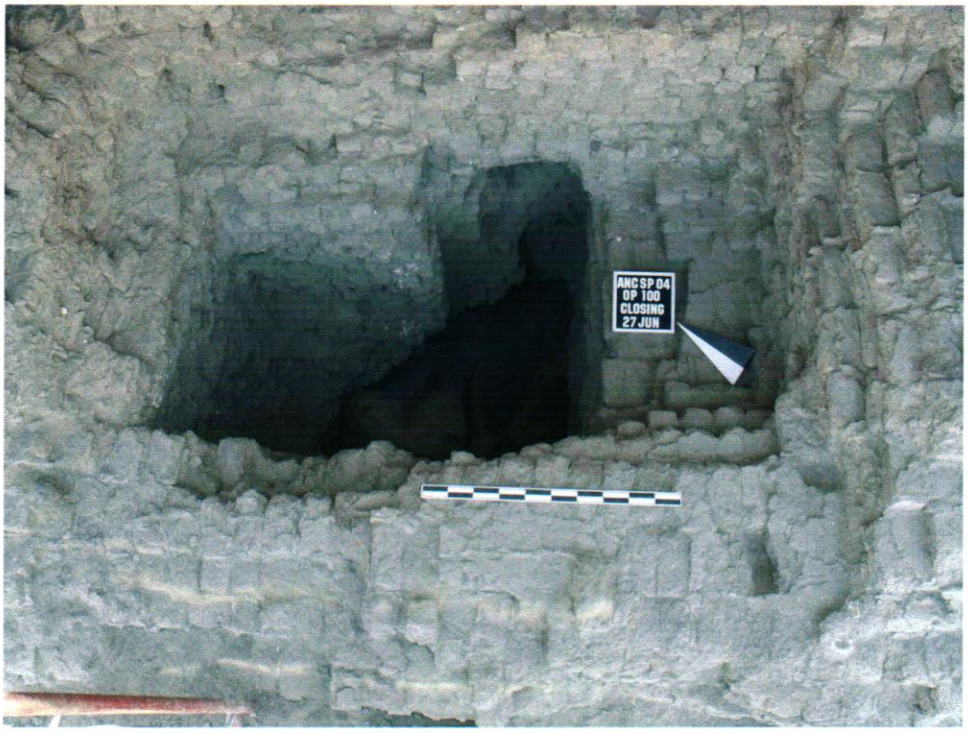

Figure 11 – Operation 100, completely excavated, with the sterile sand deposits underlying the walls of the Shuneh visible in the bottom of the pit.

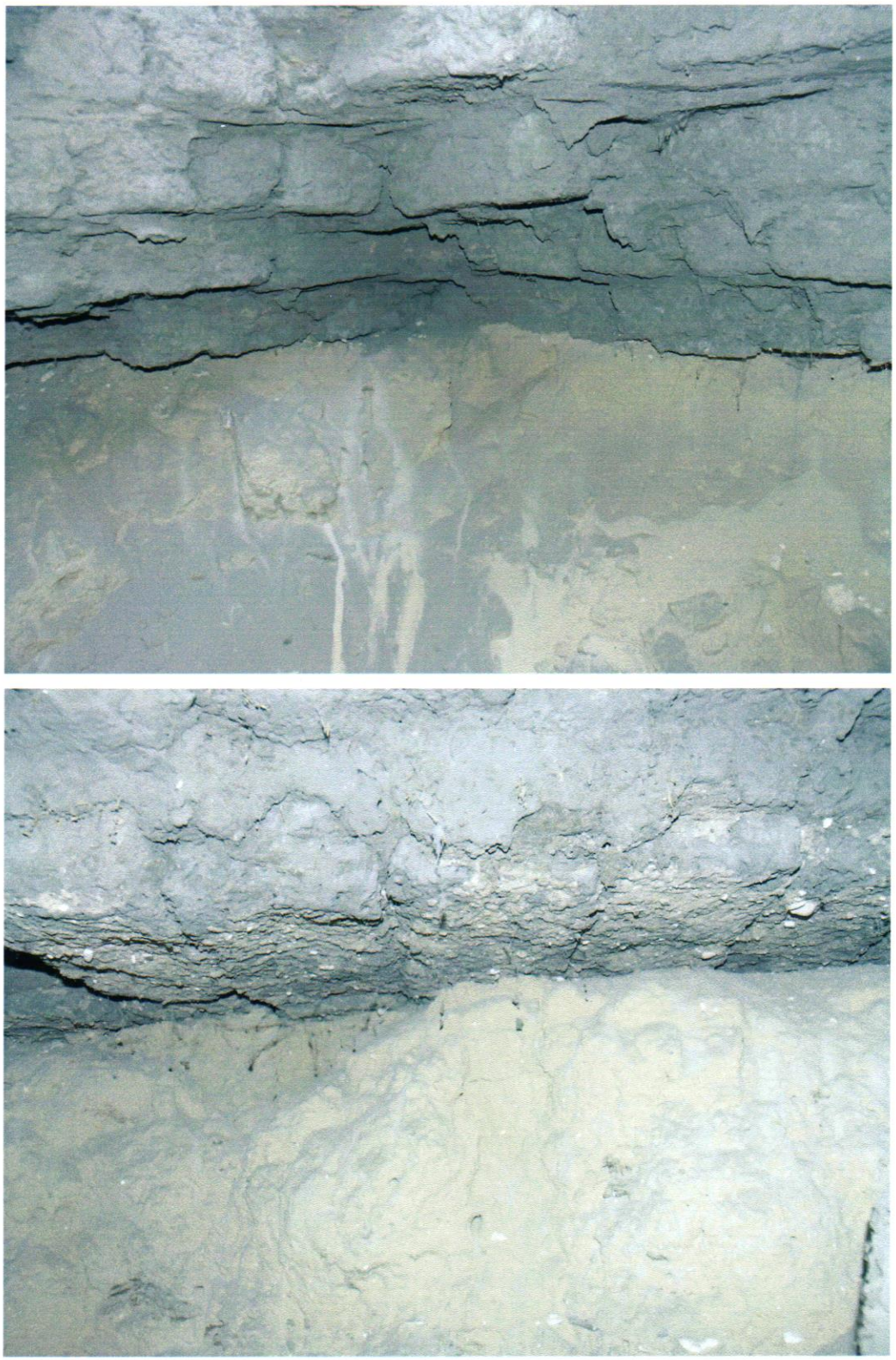

Figure 12 – Operation 100, two views of the base of the main enclosure wall of the Shuneh, exposed by the cutting of the deep pit. The sterile compact sand deposit on which the wall was constructed is clearly visible.

Figure 13 – Operation 100, showing the deep hole partly filled with new mudbrick masonry.

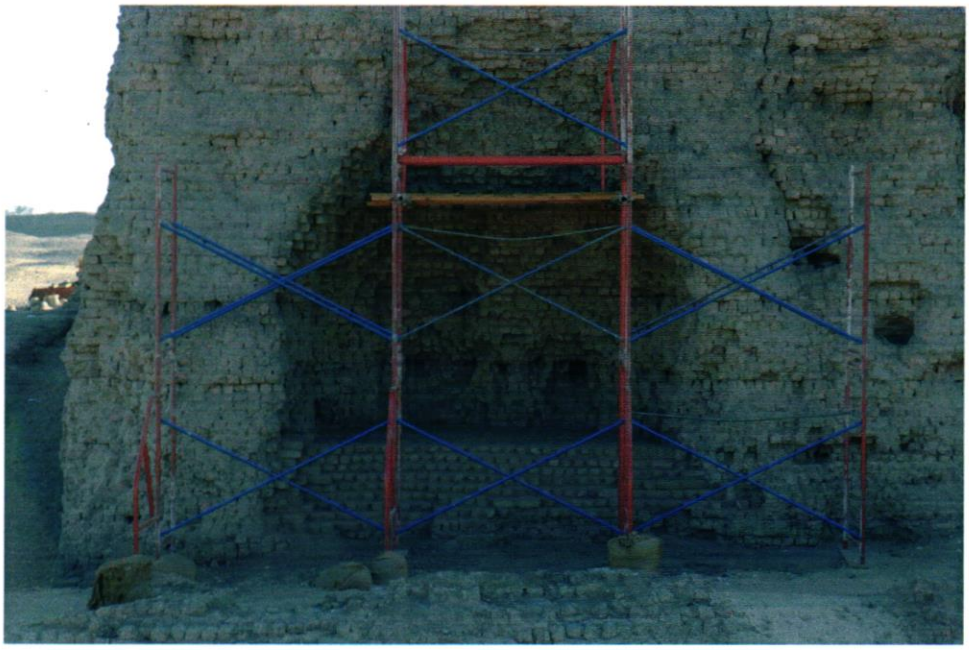

Figure 14 – Operation 100, with the stabilization work partly completed, as it stood at the close of Field Season 5. The new mudbrick masonry rises approximately one and a half meters above the mouth of the deep pit.

Figure 15 – three views of the vertical northeast end of the northwest wall of the main enclosure in 1999, prior to any stabilization interventions, seen from the southeast (left), the northeast (center), and the northwest (right).

Figure 16 – the surface of the northeast end of the northwest wall of the Shuneh, adjacent to the vertical wall end, after cleaning but before any new construction. No traces of a cell or other features relating to the Coptic occupation of the Shuneh were detected.

Figure 17 – filling the uneven lowest areas of the northeast end of the northwest wall with new masonry, in order to provide a level surface for the construction of the buttress.

Figure 18 – stages in the construction of the buttress at the northeast end of the northwest wall of the Shuneh. The buttress as shown in the lower right photograph provides essential structural support but remains unfinished, as it is but one component of a comprehensive stabilization of the entire north gateway area. Once the remainder of the overall north gateway work is done, the sharply defined ledges and vertical faces will disappear.

Figure 19 – stabilization work in progress in the gap in the upper part of the southeastern end of the southwest wall of the main enclosure.

Figure 20 – the buttress constructed against the northwestern vertical wall section represents half of the structural solution to be implemented in this area. At the close of work in Field Season 5, surface texturing remained to be done in the next season.

Figure 21 – inner face of the northwest wall of the Shuneh in January, 2000, with a number of medium-sized holes visible. The largest hole, just left of the vertical scale, was stabilized in Field Season 5 (see Figure 26, below).

Figure 22 – stages in the stabilization of the hole in the northwest wall, inner face. Loose and decayed bricks were removed (left) below the hole, in order to allow the construction of a stepped base (center) for the additional masonry to be added above, filling the hole (right). As can be seen in the lower part of the view at right, once dry, the color of the new masonry blends well with the original. Additional finish techniques will be applied to blend the texture of the new work with the old.

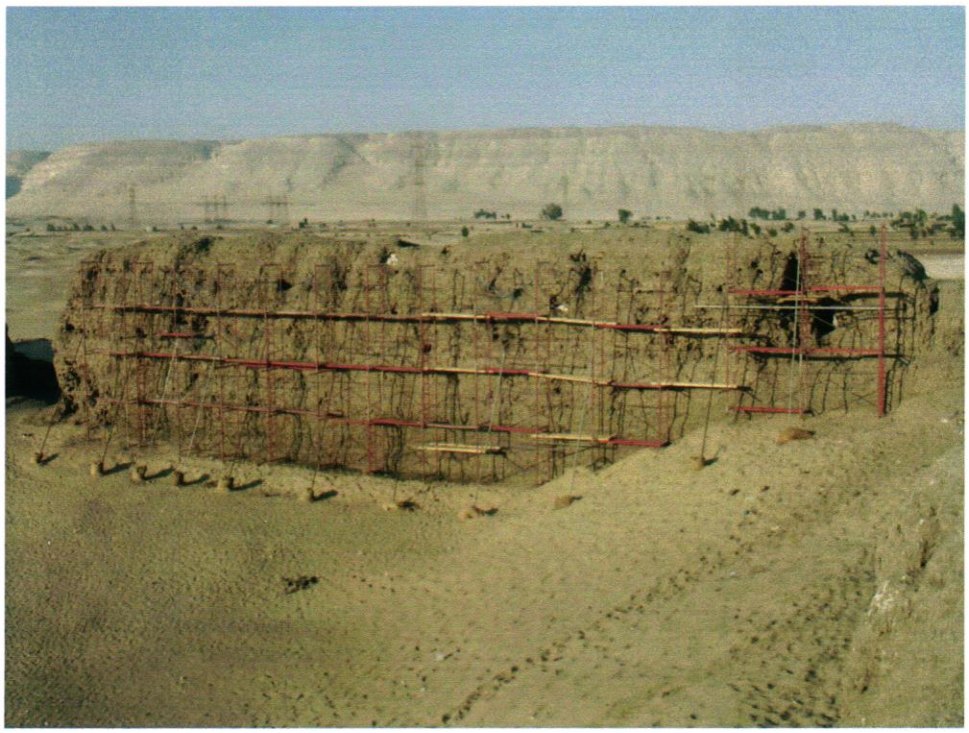

Figure 23 – inner face of the northwestern part of the southwest wall of the main enclosure, after the erection of scaffolding to provide access to the wall face for the repair of the many holes present.

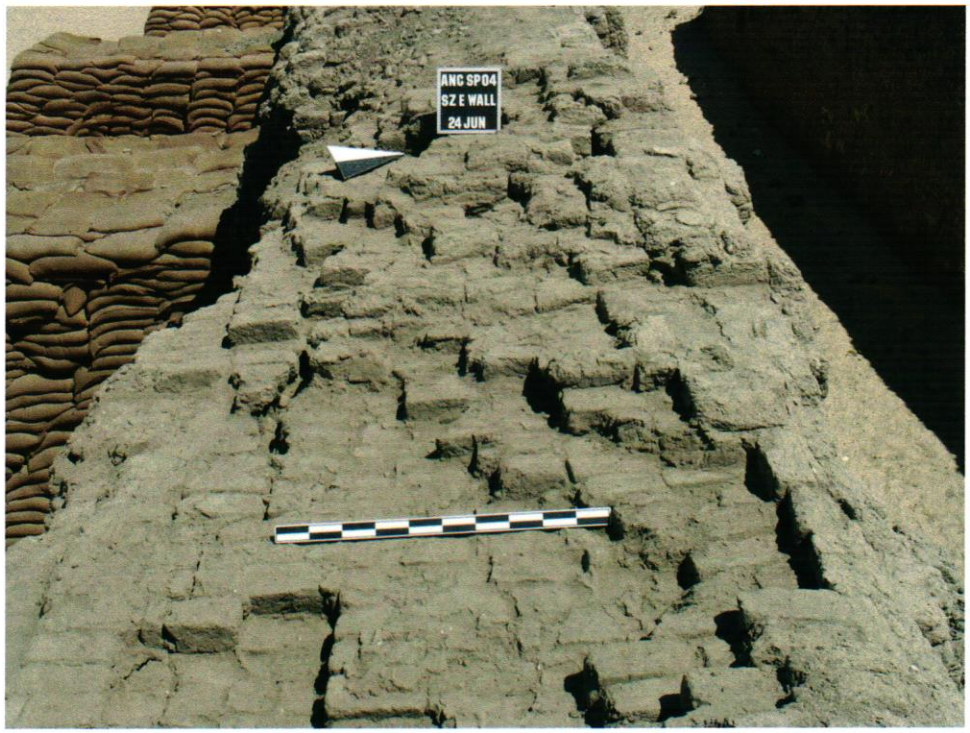

Figure 24 – top of the central part of the northeast wall of the main enclosure of the Shuneh, after cleaning. The structural crack is partly visible, just to the left of the meter scale.

Figure 25 – the same area as in Figure 23, after the removal of some masonry adjacent to the crack, at left.

Figure 26 – the area of the top of the northeast wall, after the repair of the crack and capping.

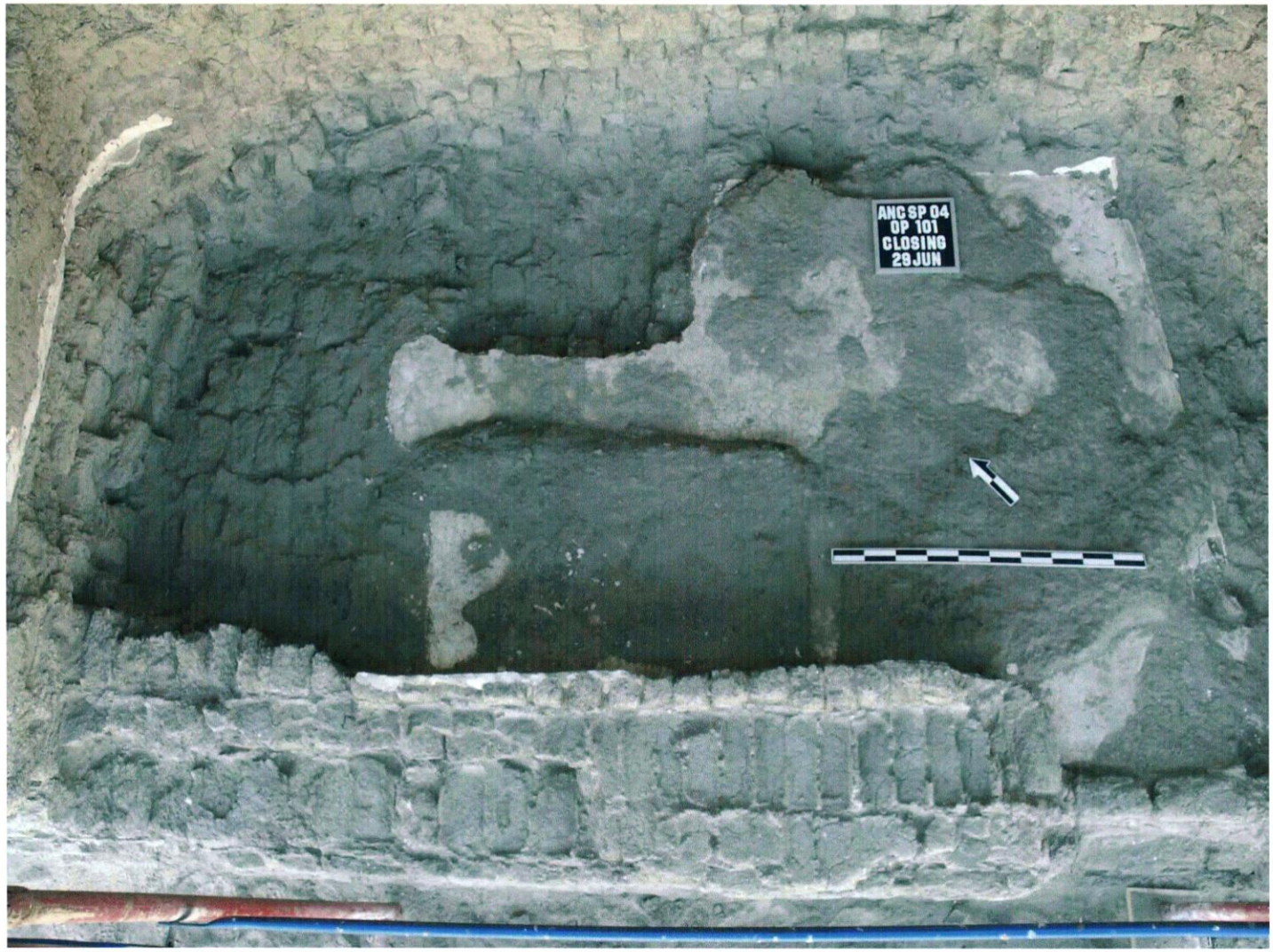

Figure 27 – Operation 101, at the close of excavation. The brickwork in the foreground is original Dynasty 2 masonry, left in place when the cell was created to serve as the front wall. The sleeping platform, or bench, that has been robbed out, is at left. The entrance to the cell is at the lower right.

Figure 28 – Operation 101, cleaning the fragile edge of wall plaster on the inner face of the front wall of the cell. Note the trace of red painted decoration along the broken top edge.

Figure 29 – Operation 101, stabilizing the mud plaster behind the fragile broken edge of the lime wall plaster using a solution of Acryloid B-72.

Figure 30 – Operation 101, backing the broken, delaminating edge of the Coptic wall plaster with a lime-sand mixture.

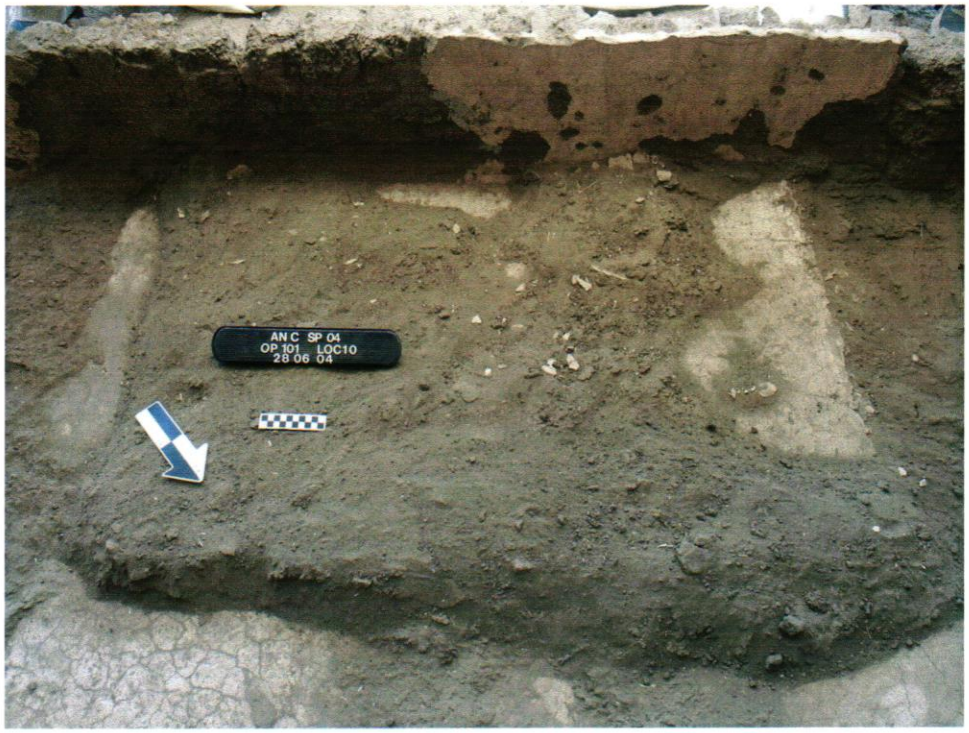

Figure 31 – Operation 101, deposit of decayed mudbrick on the floor of the Coptic cell containing many fragments of fallen wall plaster with decoration. This deposit was left *in situ* in anticipation of consolidation and lifting by an archaeological conservator in the next field season.

Figure 32 – northeast wall of the main enclosure, northwest part, near the north gateway (the low walls at left). The low area at right, adjacent to the vertical wall end, was the location of Operation 102.

Figure 33 – Operation 102, at the close of excavation in Field Season 5.

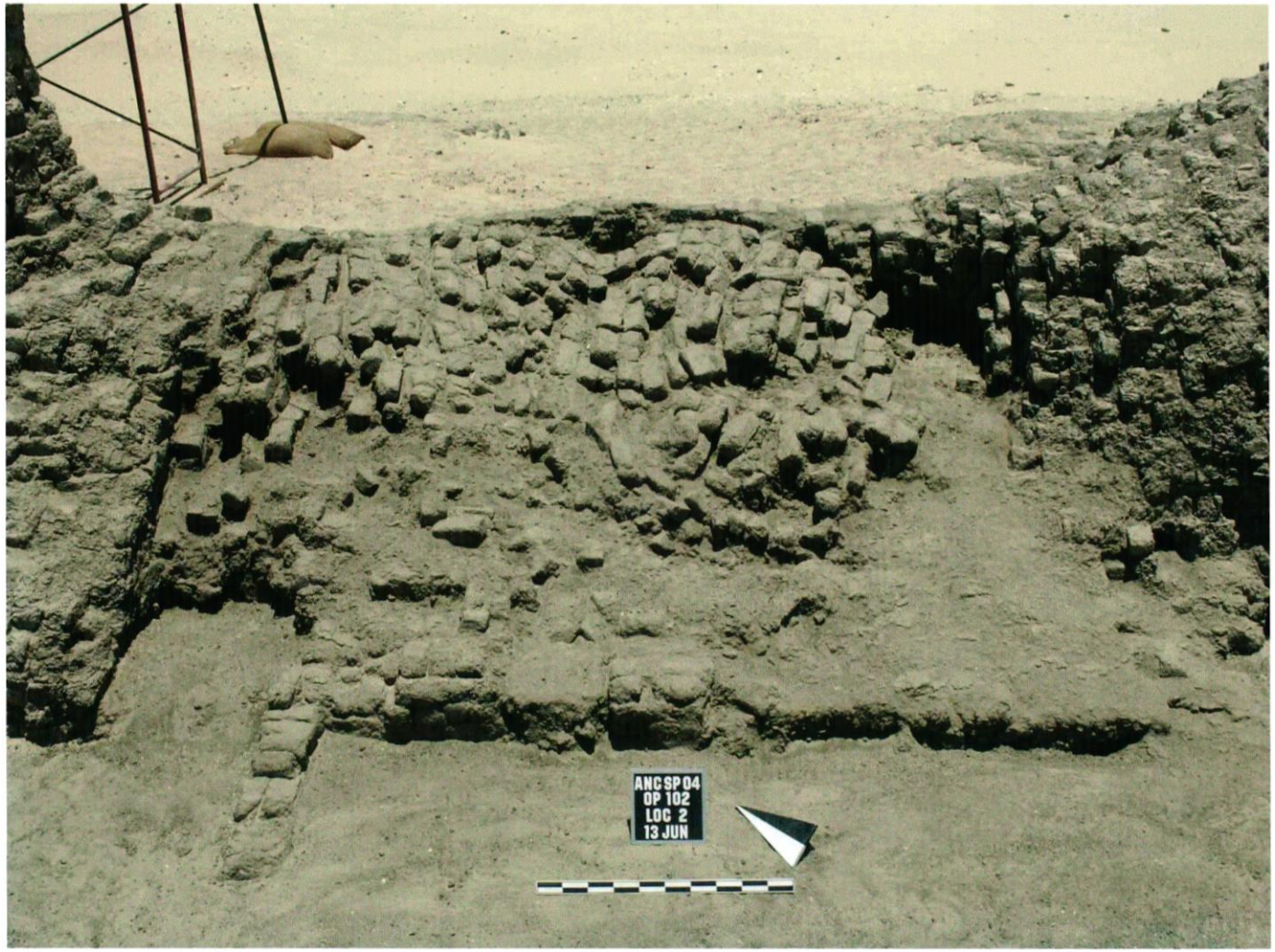

Figure 34 – Operation 102 at the close of excavation in Field Season 5. The collapsed mudbrick represents a fallen section of original Dynasty 2 masonry that served as the roof of the cell.