

Title: **Saqqara 2008–2009**

With appendix: **conservation work in Saqqara (2008–2009)**

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## **SAQQARA 2008–2009**

**Karol Myśliwiec**

Institute of Mediterranean and Oriental Cultures, Polish Academy of Sciences

**with appendix by Zbigniew Godziejewski**

National Museum in Warsaw

**Abstract:** The objective of the campaign was to complete the exploration, clearing and documentation of archaeological structures uncovered on the site adjoining the west side of the enclosure wall of the Netjerykhet pyramid in preparation for the publication of the next two volumes in the Saqqara series. Shaft 113 proved to be of particular importance, the burial chamber containing an unfinished limestone sarcophagus and lid as left by the excavators of the ancient tomb. The scope of conservation work carried out on site and in site storage is presented in the appendix (including a unique body cover).

**Keywords:** West Saqqara, Old Kingdom, shaft tombs, sarcophagus, conservation, body cover, gypsum mask, metal conservation

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The Polish–Egyptian archaeological mission continued its activities on the site adjoining the west side of the enclosure wall of the Netjerykhet pyramid in 2008 and 2009. The goal in both campaigns was to finish the exploration, clearing and documentation of the archaeological structures, completing

the records necessary to publish the areas subject to two subsequent volumes in the “Saqqara” series: IV: *The Funerary Complex of Nyankhnefertem* (published in 2010, Myśliwiec, Kuraszkiewicz 2010) and V: Step Pyramid Complex and the Dry Moat (forthcoming).

## FIELDWORK IN 2008

The excavations needed to be extended somewhat west of the line constituting the western border of the area explored in 2007 in order to supplement and verify data prepared for publication in the volume *Saqqara* IV, devoted to the funerary complex of Nyankhnefertem. The newly investigated area, approximately

2 m (E–W) by about 8 m wide (N–S), is located in squares 1808/1908 [*Fig. 2*].

The western border of a large courtyard belonging to unfinished Chapels 15–17 (that is, one of Nyankhnefertem, an anonymous chapel with fragmentary inscription on the lintel and an anepigraphic one next to it), was found

Team

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*Season 2008*

*Dates of work:* 5 October–24 November 2008

*Director:* Prof. Karol Myśliwiec (Research Center for Mediterranean Archaeology, Polish Academy of Sciences)

*SCA representatives:* Meral Zakaria Ahmed, Ali Abdullah Mohammed El-Batal

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Acknowledgments

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May our special thanks reach Professor Dr. Zahi Hawass, Secretary General of the Supreme Council of Antiquities, whose broad knowledge and friendly attitude toward scientific creativity, contributed enormously to fulfillment of our tasks. We would also like to thank Mr. Magdy

to be a rock-hewn ledge running N–S [Fig. 1] at a maximum distance of 9.78 m from the quasi-parallel eastern ledge, in which the chapels of Fefi and Temi were hewn [see Fig. 2]. The western ledge is 6 m long and 1 m high. It constitutes the border between the courtyard and a higher rock-hewn platform, a kind of courtyard

from which two other unfinished chapels, 29 and 30, were entered. These were hewn in a rock façade, which is lined up almost exactly with that of Chapels 16 and 17 [see Fig. 1]. This façade is 1.42 m high at the most and 10.08 m long. The two chapels, 29 and 30, were never finished. The eastern one is completely anepigraphic and

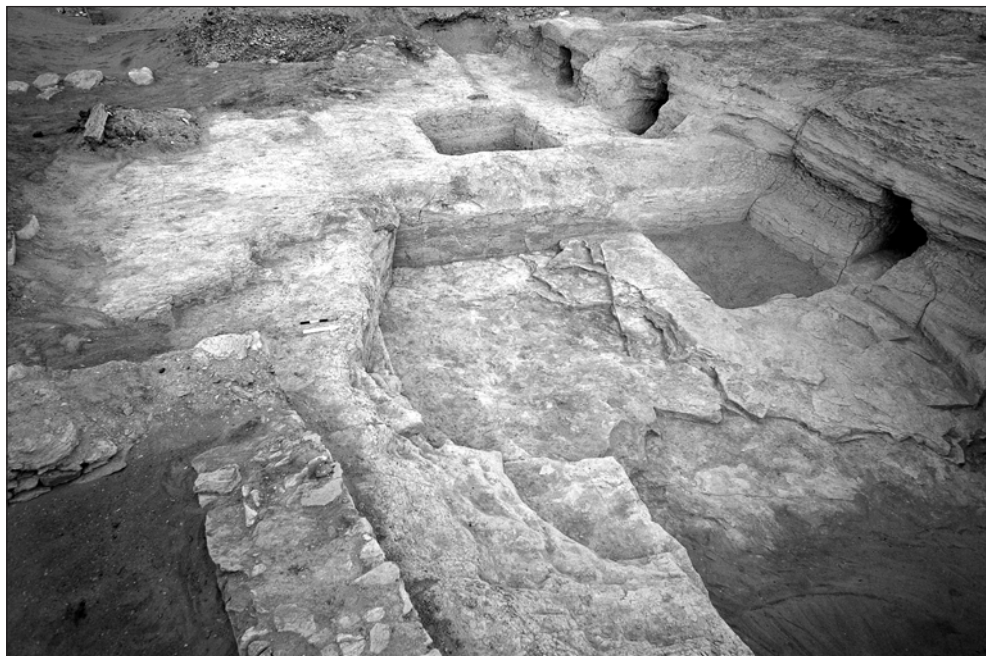


Fig. 1. Unfinished Old Kingdom structures west of the funerary complex of Nyankhnefertem (chapels 17, 29 and 30), viewed from the east (Photo W. Wojciechowski)

Ghandour and Dr. Mohamed Ismail Khaled, subsequent Directors General for Foreign and Egyptian Mission Affairs, for their help in solving problems connected with preparatory stage of our work. The mission also addresses its profound gratitude to Dr. Mahmud Afifi, Director General of the Pyramids' District, for his personal engagement in both the scientific and the organization aspects of our activities. We also feel much indebted to Mr. Osama El-Shimi, Director General of the Saqqara Department of the Supreme Council of Antiquities, as well as to Mr. Sabri Farag, the Chief Inspector in Saqqara, whose knowledge, experience and good will proved inestimable during our excavations and conservation works.

In both campaigns, the mission also profited from the practical mind and organization talents of its *rais*, Mr. Sayed Kereti.

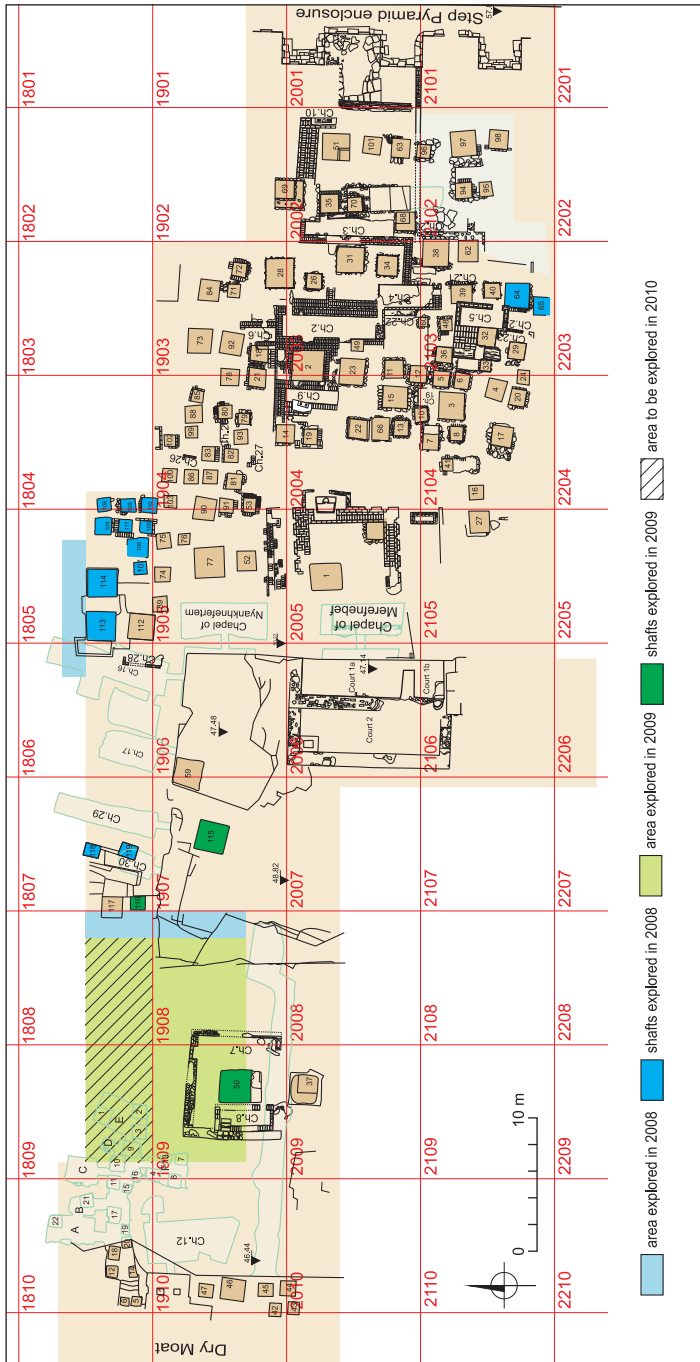


Fig. 2. Plan of the site with color-coded extent of fieldwork in the 2008 and 2009 seasons  
(Drawing K. Kuraszkiewicz)



the western one preserves traces of heavily eroded figures (tomb owner and his wife) and inscriptions sculpted in sunken relief on a rock-hewn lintel above the entrance. Both rooms are very low.

Eleven previously excavated Old Kingdom shafts (nos 32, 40, 63, 71, 75, 83, 90, 98, 101, 103, 112) were cleared again and documented, and another 16, located in previous years (nos 64, 65, 97, 104, 105, 106, 107, 108, 109, 110, 111, 113, 114, 115, 118, 119) but not explored, were excavated and documented now. The exploration of Shaft 115 was postponed for a year. Some of the shafts still contained remains of funerary equipment. The following is a brief resume of the findings.

**Shaft 64** (square 2103), approximately

1.65 m by 1.68 m at the mouth, 5.70 m deep. The chamber at the bottom on the western side, oriented N–S (about 2.23 m N–S, 1.10 m E–W, 0.90 m high) contained a skeletal burial (no. 551) with remains of a broken plaster mask and body shell (Kowalska *et alii* 2009: 107–111) [see Fig. 7], as well as remains of a wooden box or coffin. A false door stela of Ny-Pepy (inv. no. S/08/16) was found in the shaft filling (Kuraszkiewicz 2011: 185–187).

**Shaft 65** (square 2103) measures approximately 1.41 m by 1.36 m at the mouth and is 5.19 m deep. It is unfinished, a shallow (about 0.15 m deep) depression in the west wall indicating where the burial chamber was planned. There was no burial in the shaft. A limestone lintel inscribed

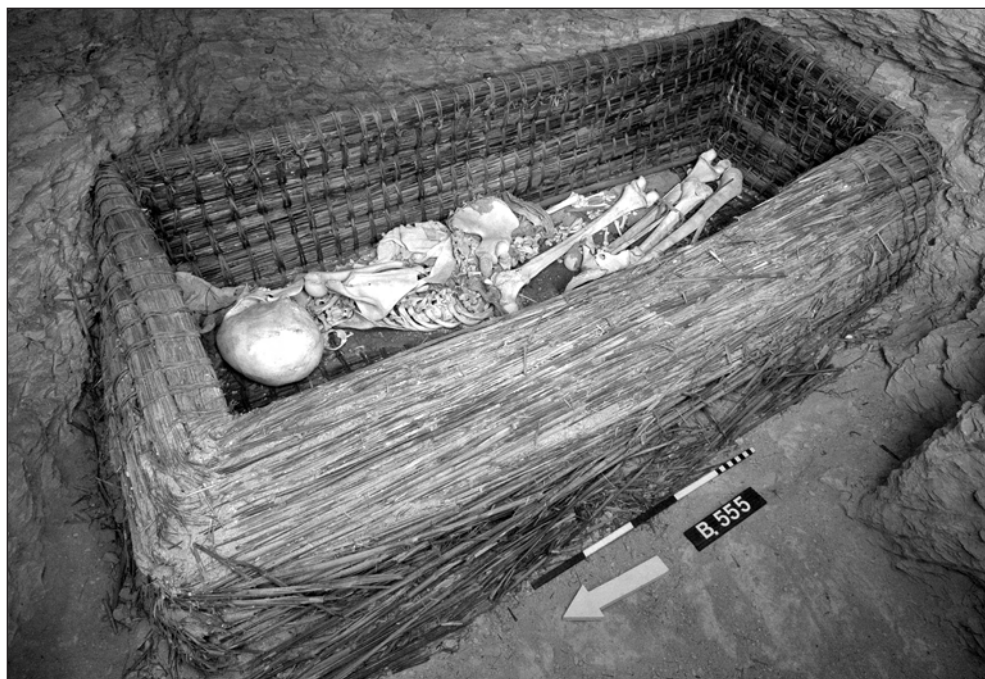


Fig. 3. Old Kingdom burial in a reed coffin (Burial 555 in Shaft 110)  
(Photo W. Wojciechowski)

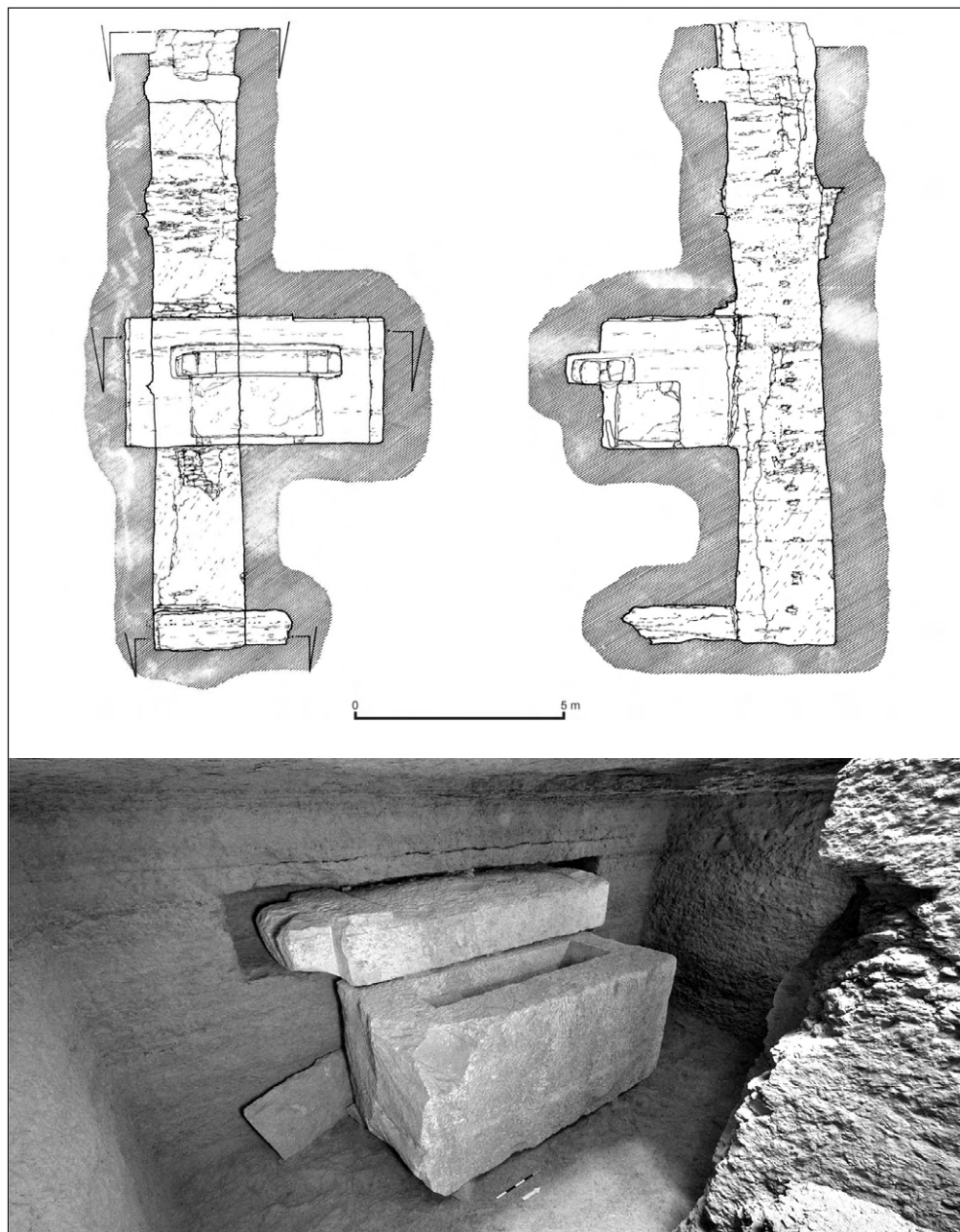


Fig. 4. Shaft 113, vertical sections through the shaft and burial chamber (top) and view of the burial chamber with the unfinished limestone sarcophagus and lid as left by the ancient tomb excavators (Drawing M. Wóźniak; photo W. Wójciechowski)

for an official named Iri (inv. no. S/08/29) was found in the fill (Kuraszkiewicz 2011: 189–190).

**Shaft 97** (square 2102), approximately 1.90 m by 1.90 m at the mouth, 14.41 m deep, a narrowing at 7.70 m depth. There is a chamber at the bottom, on the western side, oriented N–S, measuring approximately 3.34 m (N–S), 2.70 m (E–W), and 1.58 m high. The shaft contained no burial. A limestone offering basin of a lady named Merut (inv. no. S/08/4) was found in the fill (Kuraszkiewicz 2011: 183).

**Shaft 110** (squares 1804/1805/1904/1905), approximately 1.30 m by 1.22 m at the mouth, 3.79 m deep. There is a chamber at the bottom, on the eastern side, oriented N–S, measuring approximately 1.60 m (N–S), 0.97 m (E–W), and 0.84 m high. A rectangular reed coffin was found inside, containing a skeletal burial (no. 555), wrapped in multiple layers of linen [*Fig. 3*]. A simple wooden stick was found lying along the eastern side of the coffin and a rectangular tasselled piece of cloth in its southwestern corner.

**Shaft 111** (square 1805), approximately 0.98 m by 0.98 m at the mouth, 4.04 m deep. There is a chamber at the bottom, on the western side, oriented N–S, measuring approximately 2.40 m N–S, 1.10 m E–W, and 0.80 m high. Two bodies were found in the chamber lying side by side: Burial 553, which was a skeleton wrapped in numerous layers of linen, and Burial 554, a skeleton wrapped in linen, in

a rectangular reed coffin. A pair of wooden sandal soles (inv. no. S/08/41A–B) and an anepigraphic limestone offering basin (inv. no. S/08/42) were also found inside the burial chamber.

**Shaft 113** (square 1805), approximately 2.10 m by 2.10 m at the mouth [*Fig. 4*, top]. The burial chamber is situated on the western side, oriented N–S, measuring approximately 6.30 m N–S, 3.05 m E–W, and 3.00 m high. At its western wall there is an unfinished sarcophagus (3.00 m long, 1.45 m wide and 1.45 m high), with the lid (4.05 m long, 1.40 m wide, 0.55 m thick, placed partly inside a niche in the wall, both carved of fine, white limestone [*Fig. 4*, bottom] (Welc 2010: 179–211). The exploration of the shaft was continued in 2009 (see below).

**Shaft 114** (square 1805), approximately 2.20 m by 2.19 m at the mouth, 9.20 m deep. A niche was located in the west wall at 5.13 m depth and there was a burial chamber at the bottom, on the eastern side, oriented N–S, measuring approximately 3.50 m N–S, 1.75 m E–W, and 1.10 m high. A skeletal burial (no. 552) was found in the chamber together with remains of a rectangular wooden coffin decorated with carved *wedj't*-eyes and painted offering formula. A fragment of Netjerykhet's "boundary stela" (inv. no. S/08/14) and a piece of a limestone false door inscribed for Fafa (inv. no. S/08/21) were found in the shaft fill (Kuraszkiewicz 2011: 184–185, 187–189).

## FIELDWORK IN 2009

Fieldwork in the 2009 season aimed at completing the exploration of two deep shafts, nos 113 and 115, started in the previous season, and exploring

archaeological strata between the western border of the area excavated in 2008 and the east edge of the west branch of the feature called the "Dry Moat".





*Fig. 5. View of the western part of the excavations before (top) and after clearing work in the 2009 field season (Photos W. Wojciechowski)*



*Fig. 6. Old Kingdom chapel (no. 8) and shaft (no. 50), viewed from the northeast (top); anepigraphic false door and offering table after reconstitution in original position (Photos W. Wojciechowski)*

**Shaft 113** was part of a group of three large rock-cut shafts (nos 112–114) without any traces of a superstructure. Exploration in 2009 continued down from a depth of 9.20 m (see above). The shaft turned out to be 15.25 m deep and proved to contain a highly unusual feature: a second burial chamber below the first one. The upper one with a huge limestone sarcophagus, uncovered in the previous season, had been hewn in the west wall at 7.20 m depth [see *Fig. 4*]. The second burial chamber started at 14.25 m below the rock surface and was likewise hewn in the west wall of the shaft. This L-shaped burial chamber (3.34 m N–S, 2.50 m E–W, 1.00 m high) extended northward, cut roughly into crumbling rock. Dispersed human bones were found inside (Burial 558), as well as fragments of decayed wooden planks, probably from a coffin.

Exploration of the area situated between Chapel 30 and the edge of the Dry Moat (the grid squares 1808, 1809, 1908 and 1909) aimed at clearing some structures that had been partly unearthed during previous fieldwork, that is, the northern parts of Chapels 7 and 8, Shaft 50, as well as the western extremity of the rock shelf with Chapels 29 and 30.

Analysis of rock surface features, combined with geoarchaeological study of accumulated deposits, proved that this rock massif had originally been a stone quarry connected with the construction of the Step Pyramid. A few centuries later, after the quarry had been abandoned, it was reused as a necropolis, the rock steps being changed into courtyards from which the various tombs and chapels were cut in the sides of the rock ledges (Welc 2011).

Clearing of the surface sand layer and *dakka* accumulated over the Old Kingdom structures revealed 42 new burials of the Upper Necropolis (Ptolemaic Period). Most of them contained mummified bodies deposited in rectangular or ovoid pits cut in the *dakka* [*Figs 2, 5*]. Seven mummies found intact (Burials 564, 580, 581, 582, 540, 541 and 597) were wrapped in well preserved bandages. Among the burials discovered during this campaign were four children (Burials 566, 575, 584 and 585), two of them buried together with an adult (Burials 566 and 575). Four double burials (565–566, 574–575, 581–582 and 592–593) were found, where the mummified bodies shared a burial pit.

The number of excavated burials requiring recording and anthropological examination led to the decision to restrict the area explored this season to grid squares 1908–1909. The northern part of this area will be completed in the next campaign. Remains of some Old Kingdom structures were found in the western part, including the northern end of a large mud-brick chapel (Chapel 8), which contained an anepigraphic false door made of limestone (0.55 m in width, preserved up to 1.20 m of the original height) and a simple offering table constructed of two roughly-cut limestone blocks [*Figs 2; 5; 6*]. These were situated at the northern end of the chapel. No evidence of any offering place in the southern part of the chapel was found. The false door was found toppled, lying on the chapel floor. It was conserved and reinstalled in its original position, that is, in a niche in the west wall of the chapel. A protective wall was constructed around it.



Burials unearthed in the Upper Necropolis in 2008 have been published in *Saqqara IV* (Myśliwiec, Kuraszkiewicz 2010: 27–80, Pls I–XXXI), while those discovered in 2009 will be included in *Saqqara VI* (publication planned for 2015). *Saqqara V* (to appear in 2013)

will include primarily the Old Kingdom funerary structures extending between the step pyramid enclosure and the western section of the Dry Moat (except for the tombs of Merefnebef and Nyankhnefertem which have been published separately in *Saqqara I* and *Saqqara III*, respectively).

## APPENDIX

### CONSERVATION WORK IN SAQQARA (2008–2009)

Zbigniew Godziejewski

National Museum in Warsaw

During these campaigns the restoration work took place both on the site and in the storerooms of the Supreme Council of Antiquities. The latter focused on objects discovered during the previous campaigns and was a continuation of our previous work.

#### CLIMATE CONDITIONS IN THE CHAPELS OF OLD KINGDOM TOMBS

Data provided by the thermohygrometers installed in both chapels (that of Merefnebef and that of Nyankhnefertem) display considerable differences of climatic conditions between them. The degree of humidity during the period following the campaign 2007 until the beginning of the campaign 2008 (11 months) was higher in the latter chapel (n° 15) than in the former one: 49–66% RH (Chapel 15) and 40–63% (that of the vizier). The latter chapel denotes, however, a greater differentiation of humidity levels in monthly, weekly, and especially daily (day-and-night) scale, than Chapel 15.

During the period from January till March 2008 this differentiation (both humidity and temperature) denoted the following levels: Chapel 15 48/62% RH; Merefnebef 40/61 % RH, with the greatest span in mid-February (respectively 40.5–48.5% RH and 51–57% RH).

Changes of temperature inside both chapels reached comparable levels. Within the past eleven months, they denoted following parameters: 16.5–26°C (Chapel 15) and 18–27°C (the vizier); its daily differentiation, particularly in the latter chapel, turned out to be noticeably higher in the first half of this period.

Inside Chapel 15, a higher level of humidity has been noticed, as well as bigger salt efflorescences, both of which seems to have its origin in the heavy reigns of 2005. A higher humidity level of the rock, into which this chapel had been hewn, was confirmed experimentally. The humidity level of the rock is 58% RH, while that of the chapel's interior is 55.5% RH (as checked on 8 November 2008). In Merefnebef's chapel, the respective values

were 53% and 52.7% RH (checked on 9 November 2008). The latter difference is insignificant.

Another factor contributing to this differentiation is the much larger space inside the shelter of the vizier's chapel. This results in a generally lower degree of relative humidity and temperature.

#### CONSERVATION OF THE RELIEFS AND PAINTINGS IN THE CHAPELS.

The preservation state of the reliefs and paintings decorating the walls of these chapels appeared once again diagnostic for the dangerous implications of the rains causing crystallization of water-soluble salts on their surface. It is worth emphasizing, however, that the preservation means applied until now, and particularly the construction of the shelter over Chapel 15, have considerably ameliorated the situation, the degree of salinization diminishing progressively from year to year.

The chapel of Nyankhneferem: preservation state of the sculpted and painted decoration, as well as that of its rock matrix, was much better at the beginning of the campaign 2009 than in the year 2008. Salt efflorescences were much less numerous and their density diminished. They appeared mainly on the walls' upper part in the form of a thin layer of down and hard concentrated crusts ("brushes"). This concerns particularly the west wall's southern part, as well as the east and north walls. In these walls' lower sections, stiff concentrations came to being, especially on nondecorated rock surface. Large parts of the ceiling were covered with efflorescences in the form of down and sharp "brush", particularly in places void of polychromy.

The diminished presence of salt efflorescences signifies progressive stabilization of general condition inside the chapel. In spite of the fact that the level of humidity in the first half of 2009 fell below 50% RH more frequently than in 2008 (the lower humidity, the higher salt concentration risk), the number of efflorescences was now considerably lower. This proves that the problem should be considered in a broad context of our activities on the site. Our procedure of refilling shafts, pits and other cavities after excavations resulted in stabilization of humidity equilibrium in the rock, which ameliorated the situation inside the chapels.

Salt efflorescences on the walls' upper part and on the ceiling were removed with hard brush and scalpels, while hard concentrations on their lower part necessitated water compresses on lignin. The hardly soluble salt layer was thus softened and removed with scalpels. The efflorescences on the façade and lintel (insignificant quantity of salt down), were removed with brushes.

Some detachments of the polychromy layer were observed on the ceiling, on the east and north walls, and on gypsum fillings in the chapel's southern half. They were mounted with PRIMAL E 330 in a ca. 8% water solution, applied with syringes. The affected areas were first softened with 1:1 mixture of water in ethyl alcohol.

The chapel of Merefnebef: efflorescences on the façade had the form of down "islands", mainly on the lintel, much less on the wall below it. They caused the polychromy layer to crack and crystals to appear underneath. No new efflorescences were observed inside the chapel. Those



have been removed with small brushes. Some considerable detachments of the polychromy layer were found on the chapel's east wall, but they did not endanger the decoration. Concerned was particularly the wall's northern part and the fowling scene. Tiny detachments occurred on the other walls as well. Weakened and crumbled spots of the wall surface were also identified. These areas were reinforced by trickling them with an approximately 5% water solution of PRIMAL E 330. The method used for mounting them was the same as in Chapel 15.

#### OTHER OBJECTS

##### Gypsum cover

Found in Shaft 64 (campaign 2008) were 103 fragments of a gypsum wrapping that

originally covered the body of the deceased, including its mask with remains of black paint emphasizing the plasticity of the eyes (Kowalska *et alii* 2009). It was made of a gypsum mortar containing mineral particles, mainly sand grains of various gradation.

The wrapping broke into fragments of various size and thickness. Prints of

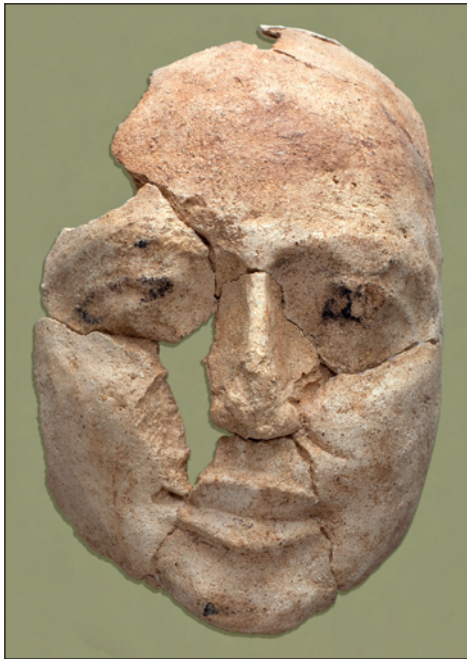


Fig. 7. Gypsum plaster modeled mummy mask (left, after conservation) and body shell from Old Kingdom Burial 551 in Shaft 64 (Photos W. Wojciechowski)

bandages that originally covered the body, are preserved on the wrapping's inner face. They reveal that the bandages were of various quality and density. After evaporation of humidity from the humus filling the shaft and removal of impurities from their surface, all the fragments were repeatedly dripped with a solution of PARALOID B-72 in acetone enriched with ethyl alcohol in proportion 1:1 (density of the solution approx. 3%). This procedure was required by the weakened coherence and hardness of the fragments.

58 fragments could be reconnected into larger entities, which enabled us to reconstruct most of the original wrapping, including the mask (which is almost complete) and the body from the shoulders down to the knees [Fig. 7]. The hands are missing, as are some other

parts of the wrapping, doubtless destroyed by ancient robbers. The remaining 45, predominantly very small, fragments could not be connected with the reconstructed part.

Used in the process of mounting was a solution of MOWILITH 50 (PVA) in acetone (20 %). Some missing parts had to be completed by use of a gluing mass, for the edges of the original fragments were worn out. Used for this was a solution of MOWILITH 50 in acetone, enriched with quartz flour and pigments.

The reshaped part of the wrapping was subsequently placed upside down on sand surface, overlaid with aluminium foil and propylene foil, then filled with polyurethane foam increasing its volume. A stainless metalnet was placed inside the foam. This three- dimensional copy



Fig. 8. *Cartonnage fragments from Burial 564 in situ*  
(Photo W. Wojciechowski)



*Fig. 9. Cartonnage fragments from Burial 564 after restoration  
(Photo W. Wojciechowski)*



of the dead body was wrapped in a self-sticking propylene foil, and, afterwards, in a bandage. It is on this background that the reconstructed part of the gypsum wrapping was placed. Such a solution guarantees the object's secure transportation and stable preservation.

### Cloth

A large piece of tissue, multiply folded and crumpled, has been found in Shaft 110 in 2008. Its shape is rectangular (90 cm x 230 cm after conservation) with fringes alongside one of the longitudinal borders. It has first been placed on a melinex background. Its preservation state is poor. The fibre was attacked by mildew fungi, which made it smoldered and brittle. Holes pierced by insects, as well as other damages, including ancient reparations, seams and darns, are visible. Loose dirt was removed from its surface. After stretching it out, the tissue was sprinkled with a solution of KLUCEL GF in ethyl alcohol (ca. 3 %). The creases have been straightened by pressing them delicately with hands through a cover of melinex. The threads of the weft and the warp in disintegrated and torn up places have been aligned and separated from each other.

The fringed edges of the piece have been set straight. The process of stretching and reinforcing the tissue was repeated several times on its both sides, after which the item was rolled on a tube made of PCV, with a sheet of a blotting paper dripped in a solution of PCMC in ethyl alcohol (1 %). The enrolling was performed after the blotting paper had dried out. The solution containing PCMC neutralizes the activity of mildew fungi and prevents their reappearance.

### Cartonnage

Burial 564, unearthed in 2009, contained, among others, fragments of the cartonnage striped off the mummy [*Figs 8–9*]. Bound and rolled, they were laying below a thick layer of debris. Unearthed gradually, the fragments were trickled with a ca. 5%–7% solution of PARALOID B-72 in acetone. Once the dissolvent having evaporated, the decorated surface of subsequent fragments was glued to the 'Japanese blotting paper' using polyalcohol. The most distorted fragments were subjected to this kind of treatment in the laboratory, after their unfolding and leveling. Smaller fragments were first straightened by dripping them with a ca. 3%–5 % solution of KLUCEL GF in alcohol, then reinforced by mounting on a layer of gauze, using a ca. 10% solution of PRIMAL AC 33 in water. The 'Japanese blotting paper' was then removed by damping its surface with water. This procedure was repeated for the two largest fragments. Considering their poor preservation state, their restoration will take a long time.

### Metal Objects

(section contributed by Władysław Weker)

A total of nineteen metal objects (figurines and bracelets made of bronze (?), bowls made of copper alloy), most of them highly corroded and very fragmented, were subjected to conservation works in 2009. During the previous campaigns, some of the objects were restored by joining the fragments using an acetone solution of MOWILITH 50. The corrosion was removed from the surface of the objects mechanically (using a milling cutter (with polycrystalline diamond

(PCD) coating), a scraper, and a glass brush), as well as chemically in a solution of VERSENE (EDTA), which was applied for approximately three hours. A VERSENE solution could not have been used in case of several objects without a metal core and, therefore, a mechanical cleaning (as abovementioned) only was performed. In order to stabilize the corroded objects, the bowls were kept for several hours in a solution of sodium hydrogen carbonate ( $\text{Na}_2\text{CO}_3 + \text{NaHCO}_3$ ). All object, after drying and degreasing, were treated with an alcohol solution (3%) of benzotriazole as an inhibitor to prevent the corrosion. The surface of the objects was covered with a thin layer of a solution (5%) of acrylic resin (PARALOID B-72). The bracelet fragments were joined using epoxy-based glue.

#### WORKS IN THE STOREROOMS OF THE SUPREME COUNCIL OF ANTIQUITIES IN SAQQARA

Contributing to the general transfer of all registered objects from the excavation storeroom to the SCA storerooms (located behind the Imhotep Museum) in 2008, the conservation team supervised

this process and prepared appropriate wrappings for various items. This concerns particularly wooden statues and bronze figurines. Many figurines or their fragments were fixed in nests cut in a layer of styropian which secured their integrity both during the transfer and afterwards.

The restoration works carried out in the SCA storerooms in Saqqara in 2009 comprised three groups of objects:

- 1) Stone (limestone) objects: the stela of Hetepu and stela S/99/11P; the offering tables S/05/15, S/07/20F, S/08/15; a door jamb from the chapel of Ikhi-Meri (CH15-PR-02-2); a door jamb S/01/20; a piece of a double-sided decorated stone S/04/10a.
- 2) Wooden objects: figurine of the Ptah-Sokar-Osiris (with a crown and on the base) from burial no. 529; canopic box S/07/8A from Burial 529; anthropoid coffin S/98/3p from Burial 53.
- 3) Cartonnages: gilded mask from Burial 534; feet cover from Burial 37; shin panel from Burial 37; shoulder and feet decorative pieces, a shin panel and a fragment decorated with the representation of a winged goddess from Burial 406.

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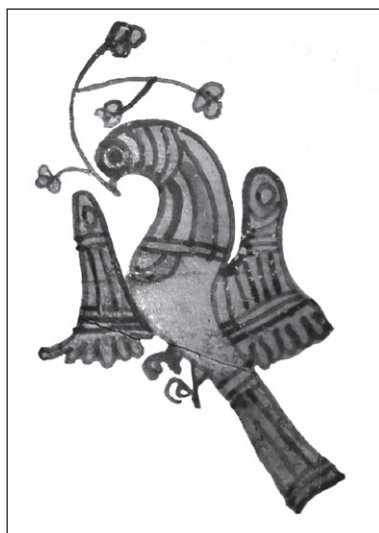
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POLISH CENTRE OF MEDITERRANEAN ARCHAEOLOGY  
UNIVERSITY OF WARSAW

# POLISH ARCHAEOLOGY IN THE MEDITERRANEAN

## XXI

RESEARCH 2009



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