

SAQQARA 2005: CONSERVATION WORK

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THE FUNERARY CHAPELS

The funerary chapels of Merefnebef, Nyankhneferem and Chapel 16 were reopened in order to survey the general conservation state of wall decoration and bedrock. Thick and wide salt concentrations were observed on the walls of Chapel 15 (Nyankhneferem). Their form varies, both inside the chapel and on the façade: either easily removable stiff crust, tiny grains or down. Multiple concentrations of efflorescence typical of gypsum crystallization were noted on the northern part of the east wall. This differentiation is due to stratification and physico-chemical particularities of the rock.

A similar situation, though on a much smaller scale, was found in the chapel of Merefnebef. Salt concentrations were less numerous and of reduced size. They appeared both inside the chapel and on the façade, particularly in their southern parts. Long and intensive rains during the past winter could be responsible for this.

Precautions were undertaken to avoid similar danger in case of future rains. The roof of the shelter above the facades of Chapels 15 and 16 was extended eastward, the general aim being to protect all of Chapel 15.

Data from the thermohygrometer for the period between November 2004 and August 2005 demonstrated a constant high degree of humidity inside the chapel during the time in question (from 69% RH in November to 72% RH in July/August). A significant drop in relative humidity level

was observed in the months of February-March (minimum of 62% RH). The greatest daily variations (between 62 and 67% RH) occurred during this period; during the rest of the time they were minimal.

Observations concerning the temperatures during the time in question were similar. It varied from 26°C in November to 18°C (minimum) in February/March. These two months also witnessed the greatest fluctuation of daily temperatures. Later on the temperature increased slowly but steadily up to 28°C at the turn of August/beginning of September (minimal daily fluctuations). Increased temperature inside the chapel caused intensified migration of the humidity gathered in the rock, which implies migration of salts contained in it towards the inside of the chapel, as well as their crystallization on the rock surface.

Salt concentrations observed in Chapel 15 occurred, with a few exceptions, on undecorated surface. Those on polychromed surfaces appeared usually in the form of down which is easily removed with a brush.

Multiple hard crusted fragments, which cause the rock surface to peel, can be seen on the lower part of walls, up to 1 m above the floor. They tend to make relief outlines less clear. Few insignificant detachments of polychromy (bubbles) were observed.

Salt crystals found on the ceiling surface have caused fragments of the polychromy and tiny layers of the rock to crumble. This

process is particularly well visible on the surface extending between the east wall and the crevices crossing the ceiling diagonally from NE to SW. On the east wall, at the edge of the reliefs (e.g. those showing the tomb owner), some cracks have been observed on the rock, necessitating immediate conservation intervention.

The present check, which revealed no fallen fragments of the decoration of the eastern wall on the chapel floor, confirmed the efficacy of conservation work done in Chapel 15 in 2003-2004.

In the chapel of Merefnebef, increased humidity had led to numerous detachments of the polychromy. These have taken on the form of elastic creases. This type of deterioration is particularly frequent on the surface of the background on the north and east walls, as well as on the upper part of the façade, under the architrave with inscription and on the north jamb. Also visible are detachments in the form of isolated bubbles, rigid cracked convexities (e.g. in the scene of fowling) or stiff flakes necessitating fixing to the ground (e.g. the wigs of figures on the northern inside jamb of the doorway). Powdering and peeling parts of the polychromy were noticed in the decorated frieze running around the chapel below the ceiling. Most of these damages are caused by the migration and crystallization of salts dissoluble in water. Salt concentrations in the form of numerous tiny powdering bubbles were observed on red-colored surfaces (representations of the vizier). This type of salt concentrations cannot be removed without intervention into the paint layer. They require special treatment: blocking and attachment to the paint layer.

Hard salt efflorescences are also observed in the same chapel. Concentrations are located c. 1-1.20 m above the floor. This concerns, e.g., the register on both false

doors, where salinity had destroyed the painting even before the chapel was discovered. Salt concentrations appear in such places every year.

Most of the salt concentrations were removed mechanically with the help of brushes and scalpels. Many of them were fully eliminated. Others, specifically the particularly hard concentrations, were first softened by applying water and alcohol-dripped wood-wool poultices, and then removed with scalpels. The end effect was mainly aesthetic.

Detached parts of decorated surfaces in both chapels were mounted to their bedding with a water solution (8%) of PRIMAL E330. In order to intensify penetration by the viscous substance and (wherever necessary) to elasticize stiff cracked detachments (convexities), a mixture of water with ethyl alcohol (99.6%) in 1:1 ratio was used. Both alcohol and the PRIMAL solution were applied with syringes. After the glue was absorbed, the detached surfaces were tightened to the bedding with cotton wool swabs.

In places necessitating the filling of empty spaces under the polychromy covering thin flexile rock plate (e.g. chapel of Merefnebef, east wall, southern part, and the southern part of the façade), the substance used was a suspension made on the base of a water solution (8%) of PRIMAL AC33 and mineral fillers (FUNCOSIL FÜLLSTOFF A and B - mineral flour and quartz powder made by Remmers) with pigments (natural sienna and black) for a coloristic homogeneity at the edge of the filling.

Rifts of the rock at the edge of reliefs in Chapel 15 were mounted with the aid of a water solution (8%) of PRIMAL AC33.

In places where the rock had become fluffy and crumbling, injections of PRIMAL B-72 solution in acetone (6-7%) were applied, e.g. in the chapel of Merefnebef, on

its east and south walls. PARALOID B-72 solution in acetone (6-7%) was also used for powdering surfaces and in order to block salts on the red paint used in the representation of the vizier.

The ceiling in Chapel 15, covered with salt crystals and powdering, was dripped with a solution of PARALOID B-72 (c. 5%), applied with a low-pressure sprayer.

The rock structure in Chapels 15 and 16 was reinforced. The process concerns a layer hardly more than 10 cm thick and varies, depending on layer compactness and quantity of material used. Efforts focused on the inscribed surfaces of the lintels and the most eroded middle parts of

the façade. The procedure took place in two phases: first, the rock surface was dripped with FUNCOSIL ANTIHYGRO (made by Remmers) in order to limit the hydrating heaving of loamy minerals contained in the rock (and constituting up to 20% of its substance).

FUNCOSIL KSE 300E, a preparation based on esters of silica acid, was used. Further treatment will be necessary wherever the rock structure has been particularly loosened. A suspension based on FUNCOSIL KSE 500 STE and fillers, FUNCOSIL FÜLLSTOFF A and B, with color additions should be used to fill empty spaces between sections of the rock.

OBJECTS

Conservation work in this campaign also concerned small objects discovered in earlier campaigns (1998-1999, 2004 – cartonnages) and in 2005.

CARTONNAGES

Six elements, parts of a cartonnage discovered in 1998 (Burial 37), were subjected to consolidation work. These are: mask with traces of gold on the surface; necklace; panel with *djed*-pillar and the four sons of Horus; panel with mummification scene; openwork fragment covering the legs; and the wrapping of the feet. The fields covered with Egyptian blue were mounted first because the binder of this pigment had almost completely disintegrated and total disintegration of loose grains was imminent. These fields were dripped with a c. 7% solution of KLUCEL GF with ethyl alcohol and, subsequently, stabilized with a solution of MOVILITH 50 in ethyl alcohol (c. 5%). The other fields were cleaned: loose concentrations of dirt were removed from the surface, and they were dripped with a 3-7% solution of KLUCEL GF in ethyl alcohol, the density

varying according to the degree of disintegration. Detaching elements were mounted with MOVILITH 50 (c. 10% solution in ethyl alcohol).

A similar procedure was applied in the treatment of three other fragments coming from a cartonnage that was discovered in 1999 (Burial 75): necklace with Horus-figures; winged goddess Maat; leg panel. A fourth element was the covering of the head of a cartonnage discovered and treated in 2004.

WOOD

The wood of objects found during this campaign is in very bad condition, the surface having been deeply corroded (fragments of two figurines from Shaft 77) or broken (a staff in many fragments, also from Shaft 77). The finds included two small fragments of planks originating from Shaft 89, distorted and cracked alongside and across the veins, with elements of joints (dowels), traces of polychromy on one of them (blue and red colors, and a headrest from Shaft 80).

After the loose dirt was removed mechanically, objects were reinforced by immersion in a solution of PARALOID B-72 in toluene (c. 7-8 %). The surface of the headrest being in relatively good condition, it was secured against powder-

ing by brushing with a solution of PARALOID B-72 in acetone (c. 7-8%). Fitting fragments (planks, detached corner of the base of the headrest base) were connected using a solution of MOVILITH 50 in acetone (c. 20%).

