Conservation of a tomb house with wall paintings in the necropolis of Tuna el-Gebel, 2019–2021

Tamer Mohammed Maher, Hisham el-Sheik, Heike Pfund, Alexandra Winkels, Björn Bühler

Campaign of 2021

It was in 2018, when the directors of the Egyptian Museum Cairo, Sabah Abdel-Razek, and Katja Lembke, Lower Saxony State Museum Hanover, signed a *Memorandum of Understanding* «to encourage visits for the purpose of engaging in cooperative activities, to support the exchange of scientific staff (e. g. curators), to support the exchange of museum staff (e. g. conservators), to develop joint research activities and to promote joint exhibition projects».

In addition to the mutual visit of employees, the current focus is on cooperation in the field of conservation. In 2019, conservator-restorers from the Egyptian Museum collaborated on a cultural preservation project in Tuna el-Gebel funded by the German Foreign Office. The project continued in 2021, again with funding from the German Foreign Office by their Cultural Preservation Programme.

Works of 2019 - Repairing the architecture and pre-consolidating wall paintings

To safeguard the tomb house, and as precondition for the conservation of wall paintings inside, the architecture of the Roman tomb house GB 33 (M 20/SE) had to be repaired. This included construction work on the damaged roof of the antechamber, through which the main tomb can be accessed, and the adjacent chamber. The ancient mud brick walls (adobe masonry) were excavated in the 1930s and are since then exposed to the elements. Erosion by wind and sand is in constant progress, and wild animals like birds, bats, snakes and insects seek refuge in dilapidated walls. Closing gaps in the masonry strengthens the walls, and was part of the project. In the aftermath of the 1930s excavation, some tomb houses were fitted with new roofs, as most of the roofs had been collapsed earlier. Many roofs were constructed with metal beams, burned bricks and plaster, only some received a wooden ceiling like the antechamber and the adjacent chamber of our tomb house.

Repairing the ancient mud brick masonry under the roof from the 1930s (2019)

Taking out rotten beams in the antechamber by sliding them sideways (2019)

The antechamber of the tomb with adjacent chamber had a common roof made of wooden beams and boards, covered by a layer of burnt bricks and cement. Two ceiling beams were broken, and the entire roof became a danger for the delicate painted mud brick walls. Also, visitors to the site were in danger, because they often climb up on roofs, if easy access is given. The broken roof was step-by-step dismantled and a new roof set up. An illustrated report about the renewal of the roof can be found on this website under “conservation” [1].

[1] Conservation of architecture, 2019.pdf (tuna-el-gebel.com)

Before the roof could be touched, emergency conservation measures were required on the wall paintings inside the antechamber and the adjacent chamber. Areas of loose mud plaster and lime washes were consolidated and, in addition, protected by a facing - Japanese paper was applied by a reversible cellulose glue to keep loose patches in place.

This helped to secure the painted wall plaster during vibrating roof works. A report can be found on this website under “conservation”.[2]

Works of 2021 – Conservation of the wall paintings

The preservation of the Roman tomb house GB 33 (M 20/SE) could be continued in 2021 with further funding from the German Foreign Office. This time the conservation of the wall paintings were in focus. Members of the team were, Tamer Mohammed Maher, Hisham el-Sheik, Heike Pfund, Alexandra Winkels and Björn Bühler, supported by the inspectors for restoration of the Egyptian Ministry of Antiquities, Saber Mohammed and Mustafa Mohammed Gamal. A huge thank you to Dr. Sayed Abdel Malik for organizing a scaffolding and helping tremendously with translation.

The tomb house has two floors, but the ceiling between the two floors is lost, thus wall paintings on both levels are visible from the ground floor. The paintings were created in different styles and in different techniques.

Painting techniques

The ground floor decorations are the older ones, painted on thin lime washes on a mud plaster. As lime washes are slightly harder and stiffer than the soft mud plaster, separations between these layers can be seen in many places. Motives of the paintings refer to the Egyptian funerary tradition. The wall paintings of the antechamber and the small adjacent chamber also belong to this period.

Painting on the dividing wall between antechamber and adjacent chamber, before (left) and after pre-consolidation of 2019 (right)

[2] Pre-consolidation of wall paintings 2019.pdf (tuna-el-gebel.com)

Later, Roman styles and techniques were introduced to Tuna el-Gebel, and since then, wall paintings were done in fresco technique. Mud brick walls were rendered with lime plaster, and the paint was applied to the fresh and damp plaster. Wall decorations imitate an *opus sectile* made of precious stones. Technically the fresco technique bears disadvantages in this context. The painting itself is strongly connected to the plaster and in most cases stable, but the lime plaster is harder and stiffer than the adobe masonry. This leads to the effect of separation between lime plaster and wall, endangering wall paintings in many places in Tuna el-Gebel.

Conservation

Ground floor

Delicate mud plasters with fine painted lime wash layers on ground floor had to be consolidated.

Important is, that consolidants are not harder or stronger than the rather weak adobe bricks and the soft mud plaster. Therefore, consolidants were based on cellulose ethers in low concentrations, dissolved in ethanol. Ethanol contains only a minimum of water and was thus used to treat the water sensitive earthen materials. In many places in Tuna el-Gebel cellulose ethers had been used for conservation from 2010 onwards, so the endurance of them can be evaluated (further information on this website under “conservation”).[3]

Securing mud plaster by rendering the edges, western walls on ground floor

[3] Pre-consolidation of wall paintings 2019.pdf (tuna-el-gebel.com)

Main room, during (left) and after conservation (right): consolidation of paint layer, rendering plaster edges and grouting were the appropriate measures carried out

First floor

Nobody had been close to the first floor paintings before. The main reason was, that there was no floor to step on. Another reason was, that the tomb had been used as storage for different artefacts. Huge stone pieces of a column lay on the floor, making it difficult to place a scaffolding.

With lots of man-power the pieces were moved to the side and a small scaffolding could be set up in front of the south wall. Here the bulging plaster indicated, that it had separated from the wall and was about to fall.

Examination of the actual condition of the plaster at south wall, first floor

After examination of the situation it became obvious, that the condition was worse than assumed. In the graphical documentation, the mapping, this condition of 2021 is recorded.

Mapping of the condition, 2021

Huge hollow spaces between detached Roman lime plasters and the adobe masonry had to be reconnected to prevent further losses. As a first step, edges of plaster were secured by rendering with a conservation plaster. Fragile areas were pre-secured by a Japanese paper facing.

Rendering plaster edges after the facing had been applied

Because the situation here was different to other areas, new testing of materials was necessary. In many places in Tuna el-Gebel, plaster separations had caused hollows between plaster and masonry. Usually, they are treated with a technique named “grouting”, injections of tailored grouts (fluid mortar). Two different types of grout had been developed for Tuna el-Gebel. A first recipe for fine gaps, and a second recipe for bigger hollows. The binding medium for the second grout is a slightly stronger binding agent, also used for the consolidation of plaster and soft stones, it contains an aqueous silica acid dispersion.

In our case the hollow areas were so big, that it was impossible to fill them with liquid grout. Huge amounts of grout filled in the hollows would have a dissolving effect on the masonry made of earthen materials. To reduce the amount of grout and thus reduce the amount of water, tests with “space-holders” were made, in order to fill the hollows by using less grout. Locally available are Luffa sponges, which were cut in small pieces, formed to balls and filled alternately with the grout between two mud bricks, which we had found laying in the desert. Results were good and the method was adopted. Nevertheless, all preparative work took time, and the grouting had to be done in layers, letting each layer dry out before continuing. So we could achieve a stabilization of the painted plaster at south wall, but not a complete consolidation.

Grouting tests with Luffa pieces, filled between two mud bricks found in the desert

Support system set up before grouting

The Roman wall paintings on East and West walls could be examined from a ladder, and the condition was documented. Areas with loose plaster pieces were secured by a Japanese paper facing.

Percussion examination of Roman plaster

As in all previous wall painting conservation campaigns and field schools in Tuna el-Gebel, the conservation concept by Prof.Dr.Nicole Riedl-Siedow and Dipl.Rest Alexandra Winkels was followed. All details about materials, recipes and techniques can be found on this website under “conservation”. [4]

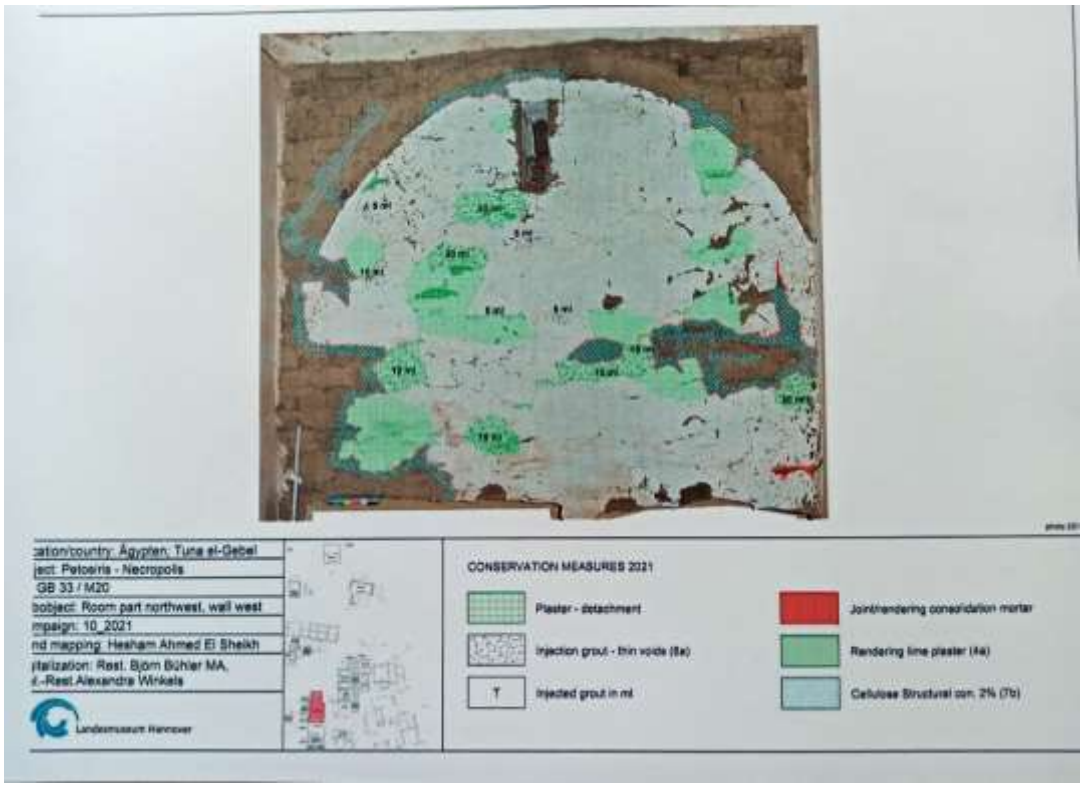
All of the team members participated in practical conservation work as well as the documentation of it. First, we looked at the concept and material list. Some of the materials used are well known, others are less known in Egypt, because they are difficult to get.

The team worked enthusiastically and harmoniously together. Communication had its own challenges, and sometimes it was necessary to involve a translator. The conservation concept and the daily tasks were discussed within the team. The daily talks about materials and techniques triggered fruitful discussions and an exchange of experiences and ideas.

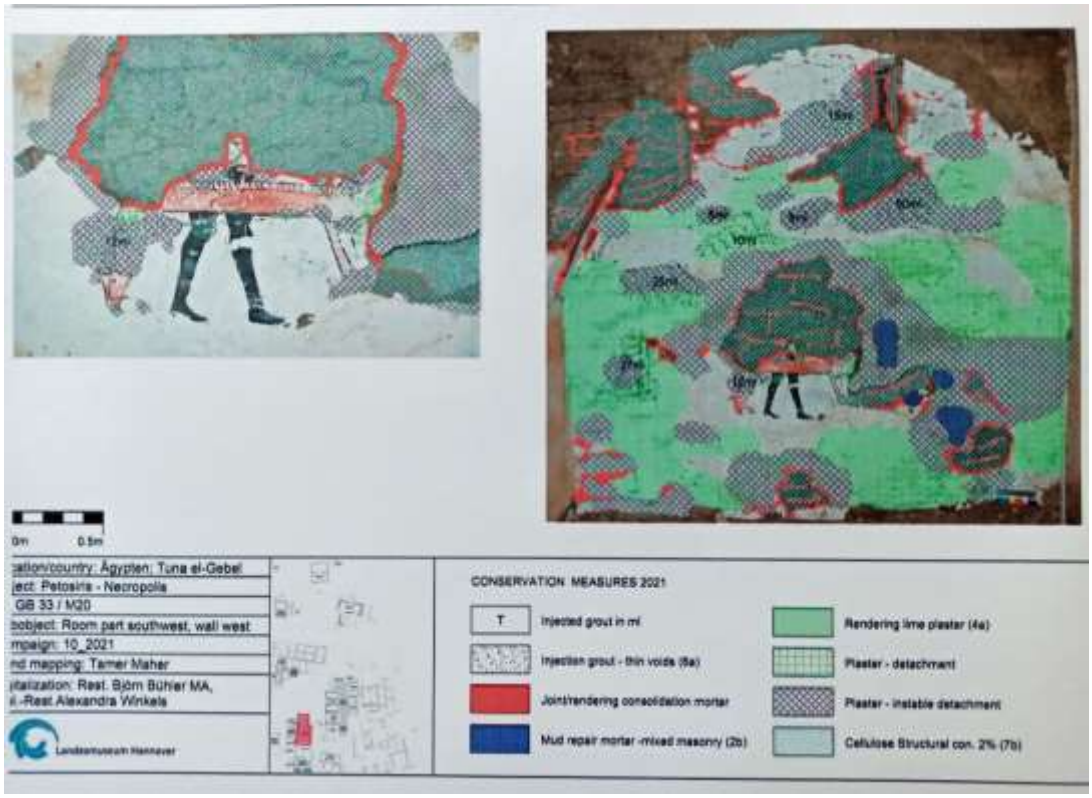
[4] Microsoft Word - A Tuna website conservation concept and treatment wiederherstellung abga.docx (tuna-el-gebel.com)

Conservators and inspectors are preparing conservation materials

Documentation is a very important part of a conservation project. Measures and materials have to be documented, so that the next conservators involved will find all relevant information in this report. Photos and graphical documentation (mapping) is an indispensable part of the documentation report.



Mapping of conservation measures, 2021



In this project, every team member had a particular task in accomplishing the final report: Tamer Mohammed Maher and Hisham el-Sheik did all the graphical documentation by hand-mapping on site, Björn Bühler and Alexandra Winkels digitized these mappings, photos were taken by all team members and Heike Pfund wrote the narrative part.