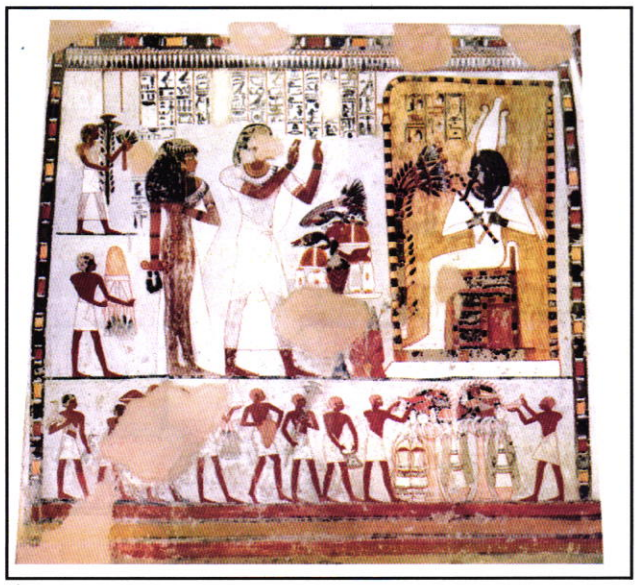
0 1 MAR 2009

AMERICAN RESEARCH CENTER IN EGYPT (ARCE)

TOMB OF MENNA (TT69) CONSERVATION AND DOCUMENTATION PROJECT

Fall Season Report

September 9-November 13, 2008



©American Research Center in Egypt (ARCE)

ARCE Agreement No. EAC-11-2007
awarded under the

Egyptian Antiquities Conservation Project (EAC)

USAID Cooperative Agreement No. 263-A-00-04-00018-00

The Tomb of Menna (TT 69) Conservation and Documentation Project -- a sponsored project of Georgia State University and the Egyptian Antiquities Conservation Project (EAC), American Research Center in Egypt (ARCE) and funded by the United States Agency for International Development (USAID), working in close collaboration with the European Center for Archaeometry at the University of Liège (ECA), University of Ghent and the Centre de recherche et de restauration des musées de France (C2RMF), and the Supreme Council of Antiquities -- completed its second season from September 11th to November 14th, 2008. The Menna Project would like to thank Dr. Zahi Hawass, Secretary General of the Supreme Council of Antiquities, Dr. Sabry Abdel Aziz, Director General for the Antiquities of the Nile Valley, Magdy Ghandour, General Director of Foreign Missions Affairs, Dr. Monsour Bouriq, Director General of Antiquities- Luxor and Upper Egypt, Dr. Ali Asfar, Director General of Antiquities in West Thebes, our antiquities inspector, Ahmed Azz, and our conservation inspector, Ahmed Yusef, for their expertise and support.

The focus of the Fall 2008 season was in four areas: conservation, digital line drawing collation, visual analysis of the painting stratigraphy, and verification of the archaeometric results taken in the tomb chapel during the Fall 2007 season. This season was undertaken with the help of six conservators: Cristina Berretta, Sasa Kosinova, Sarah Livermore, Mark Perry, Douglas Thorp, and Bianca Madden, our supervising conservator. The 2008 season in the Tomb of Menna was the second phase of a two-part conservation program that began in 2007. In 2007, the project started with emergency conservation work, cleaning and the removal of a heavy Paraloid B72 coating on the paintings, and ended with tests for new mortar repairs. A comprehensive condition survey

was also started and documented on A-3 photographs. In 2008, the season goals were to complete the layered digital condition report, to continue the cleaning and removal of Paraloid B72, and the fixing and consolidation of vulnerable areas on the walls and ceiling. The season also focused on the removal of old repairs and their replacement with new lime mortar repairs. These repairs were done to solidify voids and stabilize their vulnerable edges as well as create a unifying visual effect within the tomb that did not detract from the preserved decoration.

Fall 2008 saw the completion of the removal of the Paraloid B72 in which a great deal of dirt was embedded (**Picture 1**). The advantage is immediately visible in the colors that have returned to their original brightness (see p. 6 below). An acetone surface cleaning was also undertaken on the inner and entrance door thicknesses which were coated with century of oil from hands and arms touching its surface (**Picture 2**). In addition, graffiti in the form of pencil and chalk marks left by earlier copyists were removed, but only in cases where the decoration would not be damaged.

Areas of powdering or flaking paint were fixed and consolidated with a 1:1 solution of Plexol B500 (an acrylic dispersion) and water (**Picture 3**). To stabilize the flaking edges, a gypsum-based filler was used that later received a toned wash (aqua sporca) to reduce its visual impact (**Pictures 4 and 5**). The ancient loss of blues and greens in the tomb was also investigated. The best explanation is that the ancient binding medium was too strong and contracted, pulling off the frit-based pigment with it.

After a number of spot tests in Fall 2007, we decided to use lime putty because of its stability in mixtures and ease of use. In Turin, Italy, sand and sandstone powders were tested for inclusions that might be harmful when mixed with lime mortar. These powders

were tested with a hydrochloric acid reagent under a polarized light microscope. Thankfully, the mixture proved stable and safe for use in tomb chapel fills.

We decided to remove the majority of the older PVA/sand repairs because they were dished, cracked or didn't connect with the edges of the original plaster. The old fills were removed from the center out and repairs were made to the edges to stabilize them. Several layers of lime mortar were spread on the exposed *muna* and then cut back to be flush with the surface for visual cohesion on the wall **(Pictures 5-8)**

The ceilings were lightly dusted. Chalk graffiti as well as wasps' nests were eliminated. Staining and mortar smears along the edges were removed and stabilized. In the long hall, we investigated a 60 cm x 60 cm square that was cut out of the ceiling. At some point in the early-mid 20th century, this square was cut as part of a stabilization plan constructed around long steel plates that are still anchored into the ceiling **(Picture 9).** By carefully excavating around the edges of the square, we found several threaded pins anchored to the stone above the ceiling and a large amount of plaster of Paris that was introduced as an adhesive to hold the square section of ceiling in place. Two steel plates were placed on the ceiling face, held in place by nuts at the end of the threaded pins. These plates were padded with paper and thick yellow felt between the plate and the ceiling face. Once this modern ceiling anchoring system was revealed, we discovered an arrangement of palm wood beams that crossed the width of the ceiling every ca. 40 cm. This technique was intended as a structural base for the *muna* and plaster ceiling. In the long hall behind the ceiling, some voids as deep as 25cm remain above the plaster fill. However, the ceiling squares are well attached and structurally sound (**Picture 10**). Since the corners of the original square were hidden by poorly done modern repainting,

we decided to remove the modern paint and stabilize the square with the same lime putty and sandstone mixture that was used for the other fills on the walls (**Picture 11).**

The broad hall far left (BHFL) wall contains fragments of decoration except for the far left corner scenes of Menna and his wife that are complete. The last conservation intervention, before that of the Tomb of Menna Project, worked with two tones of repair plaster: a dark pink mortar applied around the fragments, and a lighter sand-toned plaster. We decided to treat the wall with a lime wash composed of lime putty and earth pigments (aqua sporca) that acted to unify the wall visually (**Pictures 12-13**). The same treatment was used on the two phases of repair plaster on the entrance hall. Aqua sporca was also used to tone out the fine surface repairs made with the white gypsum based filler to make these repairs 'disappear'.

A complete condition survey of the tomb was carried out on A-3 photographs taken of the tomb chapel before starting work in 2007. This survey was then transferred onto the computer as a digital record during the 2007 season and completed in the 2008 season. This digital documentation gives a complete visual record of the condition of the tomb before work started, in both high and low resolution format (**Picture 14**).

A sizable portion of the Fall 2007 and 2008 seasons was spent trying to reconstruct previous conservation attempts carried out in the tomb chapel. In October 1913, almost all the decorative fragments were fixed to the walls except "portions of offering scenes" probably from the broad hall far left wall.[1] This conservation phase was recorded in the 1915 Mond and the 1926 Burton MMA photographs of the tomb chapel.[2] The next phase shows white *muna* repairs on the walls completed sometime between

---

[1] Gardiner MSS 19.2, courtesy of the Griffith Institute, Oxford.

[2] Mond photos and Gardiner MSS 19.4, courtesy of the Griffith Institute, Oxford. MMA photos courtesy of the Metropolitan Museum of Art, New York, NY.

1926 and the early 1950's because these repairsare present in the photographs taken by Arpag Mekhitarian in 1954.[3] The third conservation attempt included an additional layer of pink PVA repairs that were probably carried out by the Antiquities Services in the late 1980s or early 90s.[4] The pink PVA repairs were visible before the Tomb of Menna Project began its conservation work in the tomb chapel. Additional photographic and archival documentation will be investigated to see if the conservation interventions can be dated more precisely.

Visual analysis of the painting stratigraphy was undertaken by Kerstin Leterme (University of Ghent) from September 21st to November 10th, 2008. The steps followed this season were: the plaster layering (muna-gypsum plaster-intonaco); guideline systems (squared grids, proportional systems) (**Picture 15**); preliminary drawings; the relationship between the background wash and the figures and objects; the sequence of colors applied on the walls; the transparency effects; and final outlines and corrections. All of these steps and their documentation are currently being analyzed and interpreted with the help of the data obtained from the archaeometric data and the conservator's observations to be able to obtain a complete synthesis and overview of the painting process and the pictorial practices used in the tomb chapel of Menna.

The final stage of the archaeometric analysis was done by Dr. Renata Garcia-Moreno (ECA) from October 31st - November 7th, 2008. In the 2007 season, objective color data was recorded on the palette used in the tomb chapel of Menna. Since the perception of color is a subjective process that is registered under different lighting

---

[3] Arpag Mekhitarian, *Egyptian Painting,* Switzerland: Skira, 1954, p. 78.

[4] Ahmed Yusef, personal communication. Mr. Yusef, our conservation inspector during Fall 2008 season, knew the man responsible for this work who is now retired. Ahmed believes the work was done about 20 years ago, making the latest conservation intervention sometime in the late 80s, or early 90s. It is likely that the Paraloid B72 coatings were applied at this time as well.

conditions in the brain of an individual, the Menna Project used StellarNet UV, Visible, and Near Infrared (UV-VIS-NIR) – InGaAS EPP2000C with software that calculated the CIELab (*L*a*b**) color parameters to give objective comparisons. Only large variations were taken into account because the pigment layer is usually very thin and deposited on a white substrate in Theban tombs that can reduce the color intensity.

The results of the color measurements by VIS spectroscopy from October 2007 were compared to those acquired in November 2008 to see if conservation of the pigments, binders, and plaster had altered the original colors in any way. We found that the spectra remained the same, indicating that the pigment had not been altered or changed. To the contrary, the brightness varied seen by the graph lines that are closer to the bottom of the graph, thus indicating lightness. These lighter readings of the colors are certainly the result of removing the B72 embedded with dust and dirt particles from the walls. As an example, **Picture 16** shows the points taken on the BHFR of offering of bouquet to Menna and Henuttawy, which includes the intonaco (**Picture 17**), white background **(Picture 18)**, and yellow **(Picture 19)**

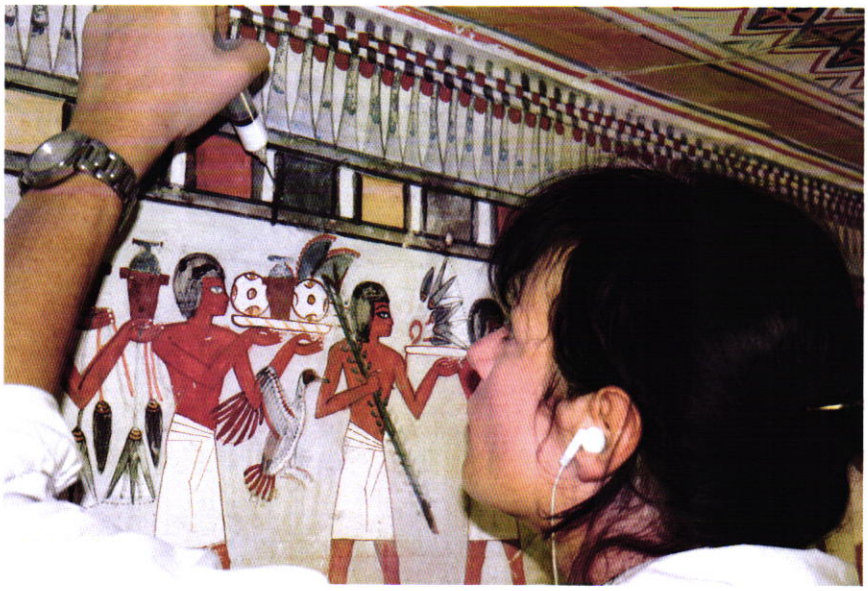
During most of the 2008 season, Dr. Melinda Hartwig collated the texts and corrected the digital vector drawings. In 2007, draftsman Pieter Collet completed the vector drawings by tracing the rectified and stitched photographs in Photoshop Illustrator (**Picture 20**). The drawings were printed out on A3 paper and checked against the wall; the resulting corrections will be entered and printed for the final publication. This proved to be an exact and non-invasive method of producing drawings to record the outlines of the texts and wall decoration.

The Fall 2008 season ended earlier than the original target date of December 21, 2008. The Menna Project photographer, Katy Kobzeff, encountered post-operative complications that kept her in the US under medical supervision. After consultation with Michael Jones and Janie Abdul-Aziz at EAC/ARCE, the photography season was postponed until March 1st-April 9th, 2009 when Ms. Kobzeff was able to work. This necessitated a change in the schedule for Dr. Kai Bruhn, digital consultant, and Dr. Melinda Hartwig who will come to Luxor to help with the digital workload of the photography season. The final site presentation in the tomb of Menna will be completed by Dr. Nicholas Warner in November/December of 2009.

Dr. Melinda Hartwig
Director, Tomb of Menna (TT 69) Conservation and Documentation Project

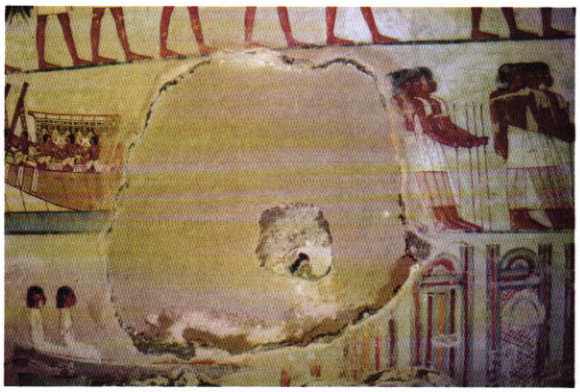
Picture 1: *Paraloid B72 removal in progress, right (Sarah Livermore)*

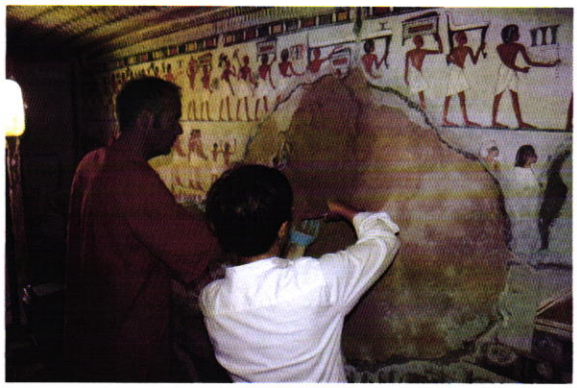
Picture 2: *Inner Door right, showing cleaning line with upper part cleaned.*



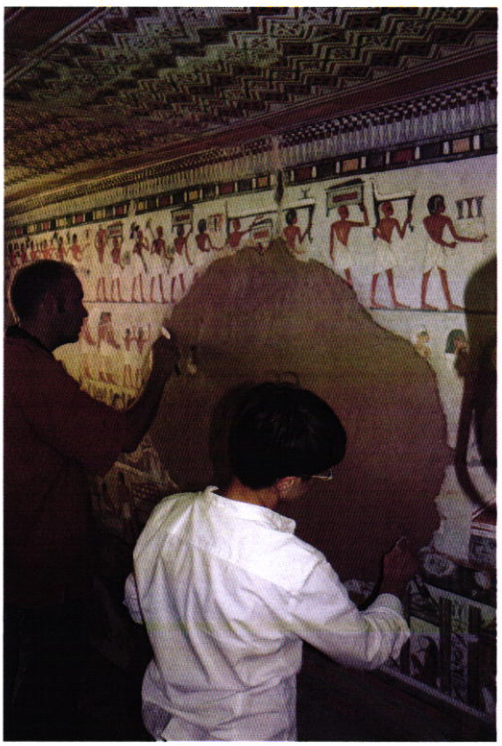
Picture 3: *Flake fixing Long Hall Left (LHL) (Bianca Madden)*

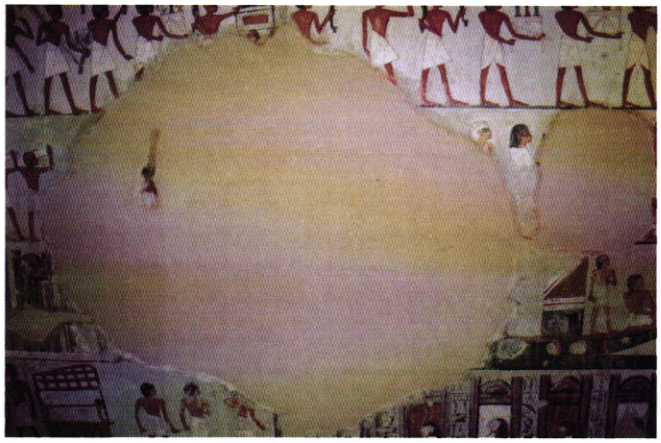
Pictures 4 & 5: Fine surface edge repairs on the greens, before toning with aqua sporca (left) and after (right).



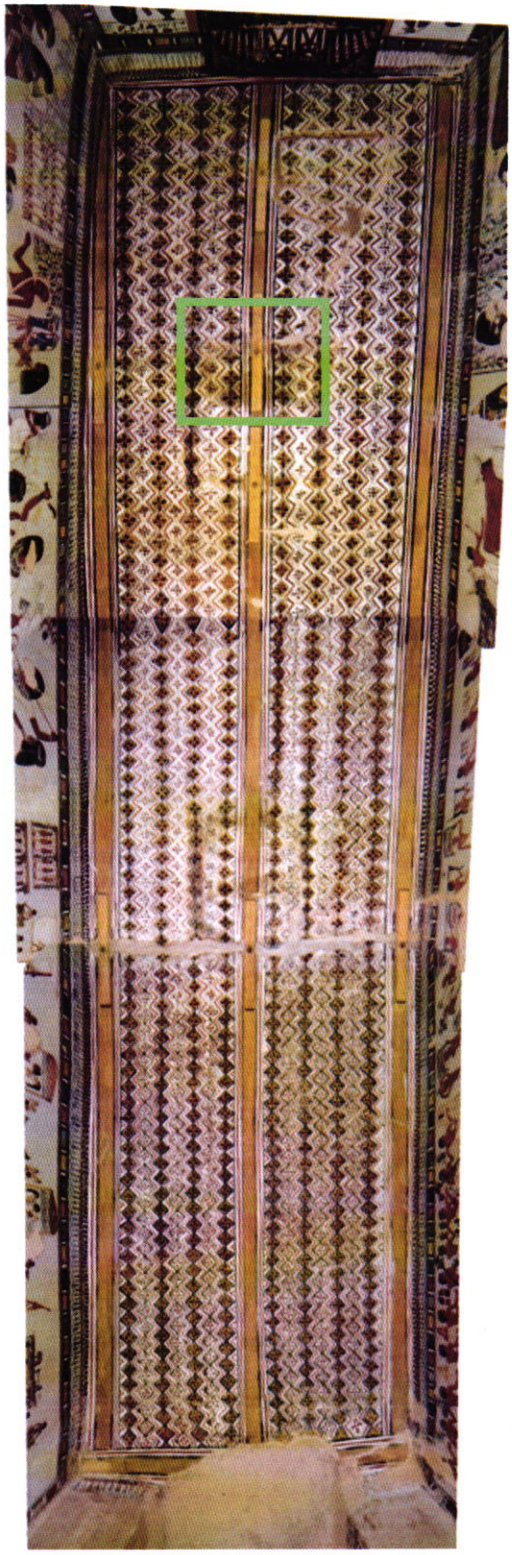


Pictures 5 & 6: First layer of repair mortar, with adhesive repairs to the edges (right), applying the top layer of mortar (left) (Mark Perry and Cristina Berretta).





Pictures 7 & 8: Left, cutting back the final layer (Mark Perry and Cristina Berretta). Right, the finished repair

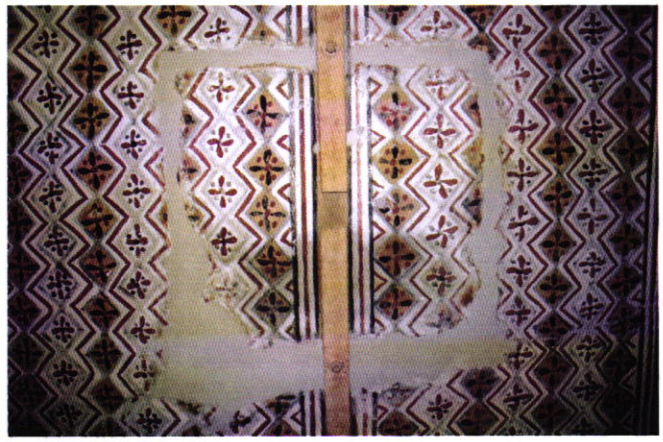


Picture 9: Long hall ceiling with seven (7) steel plates fixed to it. The areas investigated are indicated in the red squares. The bend in the ceiling is due to the stitching of the photographs and does not exist.

Picture 10 (below right): The square with repainting removed showing the plaster of Paris (lower left and right) and the remains of the wooden beam (lower left).

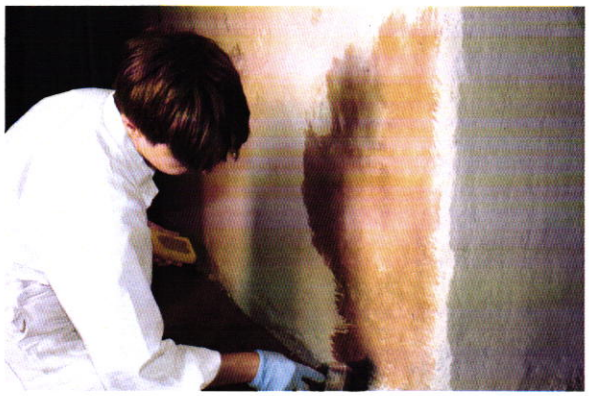
Picture 11 (lower right): The square stabilized with a lime mortar fill with no repainting.

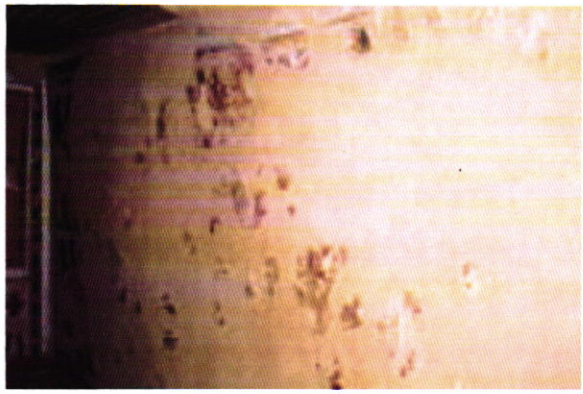
Picture 10



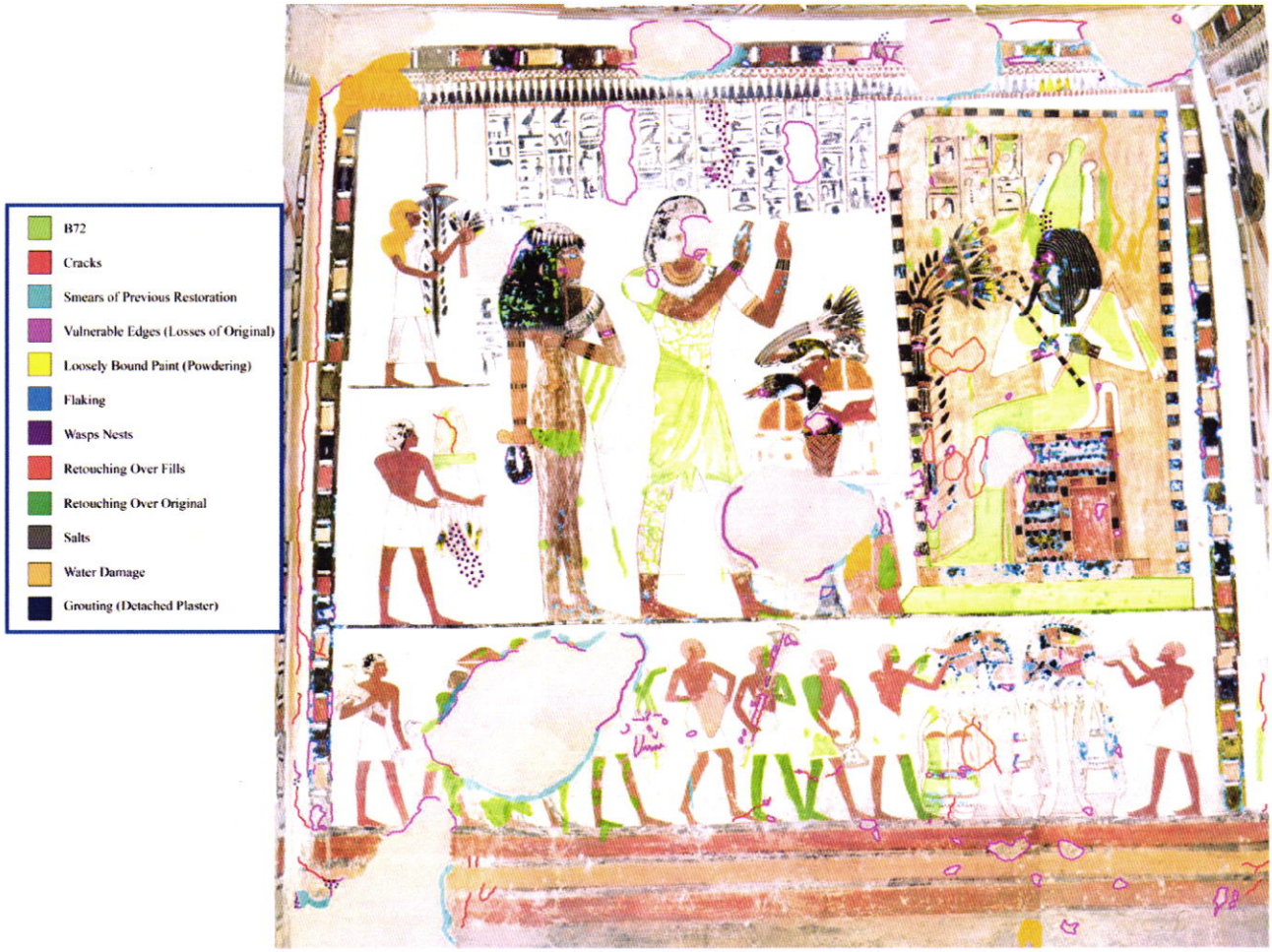
Picture 11

Picture 9

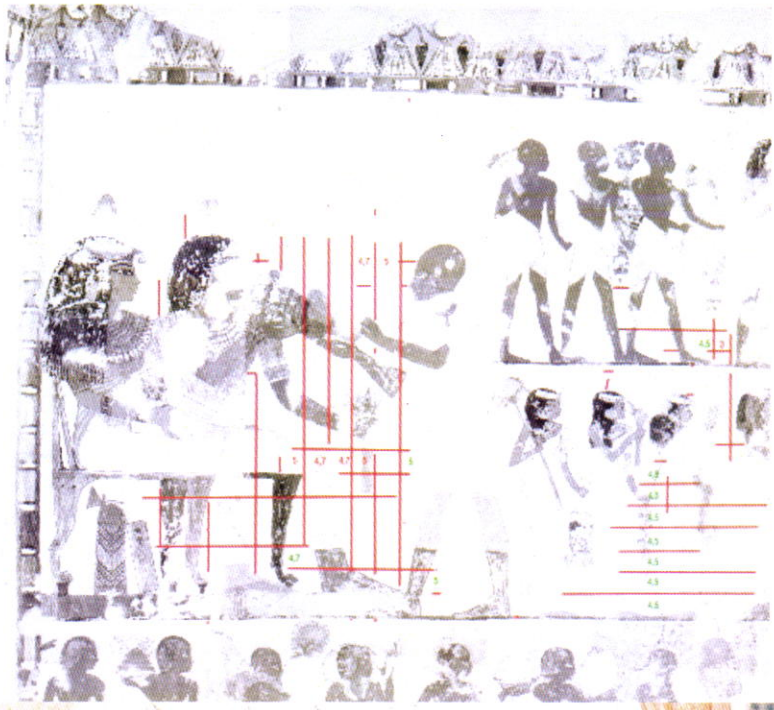




Picture 12: Left, applying lime wash to the broad hall far left wall (Cristina Berretta)
Picture 13: Right, the lime washed wall



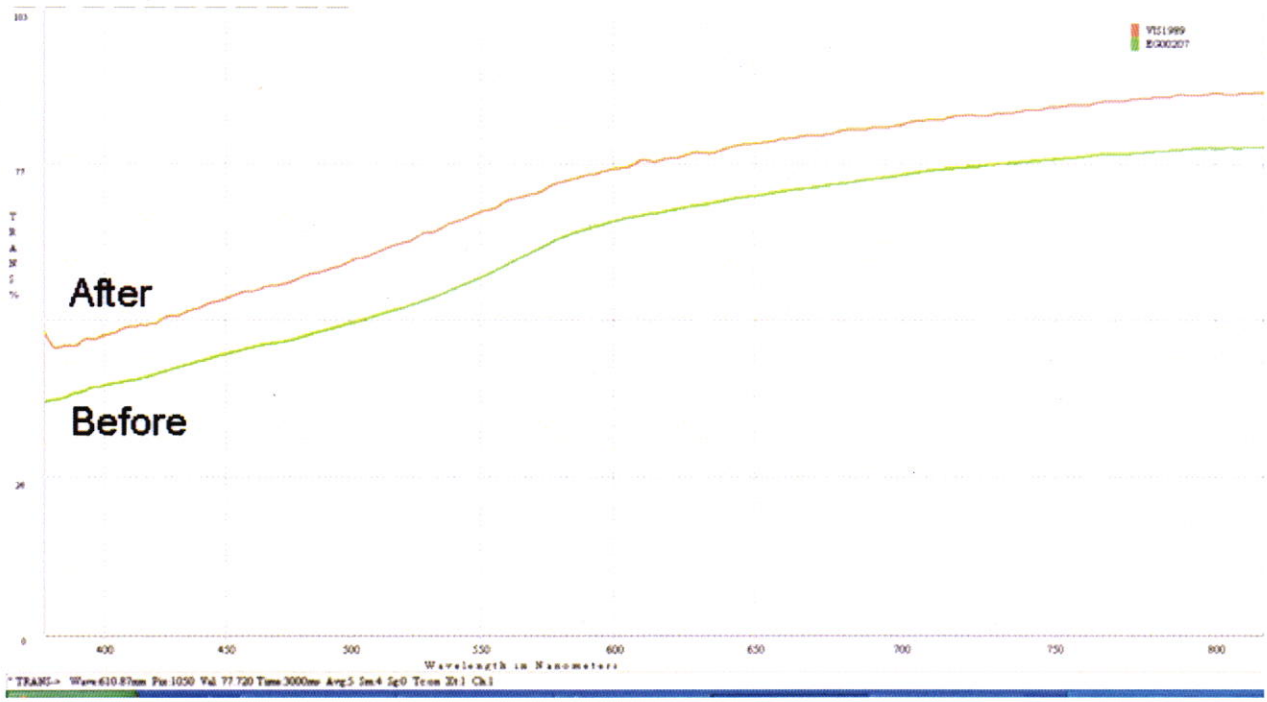
Picture 14: Digital condition survey of broad hall small left wall with color key (Doug Thorp)

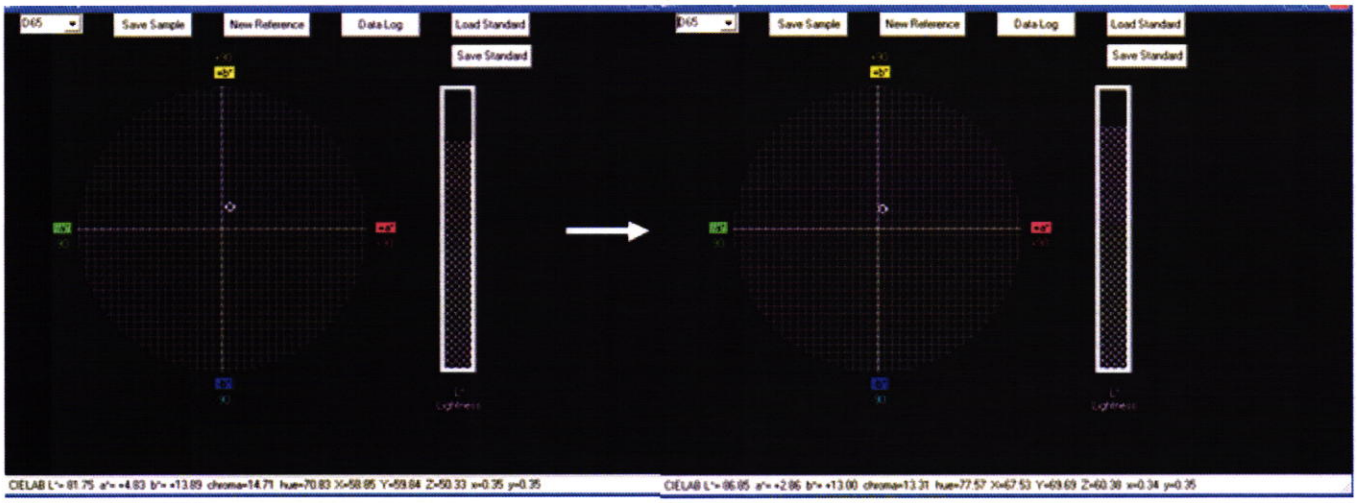


Picture 15:
Documentation of grid lines remaining on Broad Hall Near Right wall (BHNR) (Kerstin Leterme)

Picture 16:
Points used for visual (VIS) color spectroscopy

Intonaco: before and after cleaning

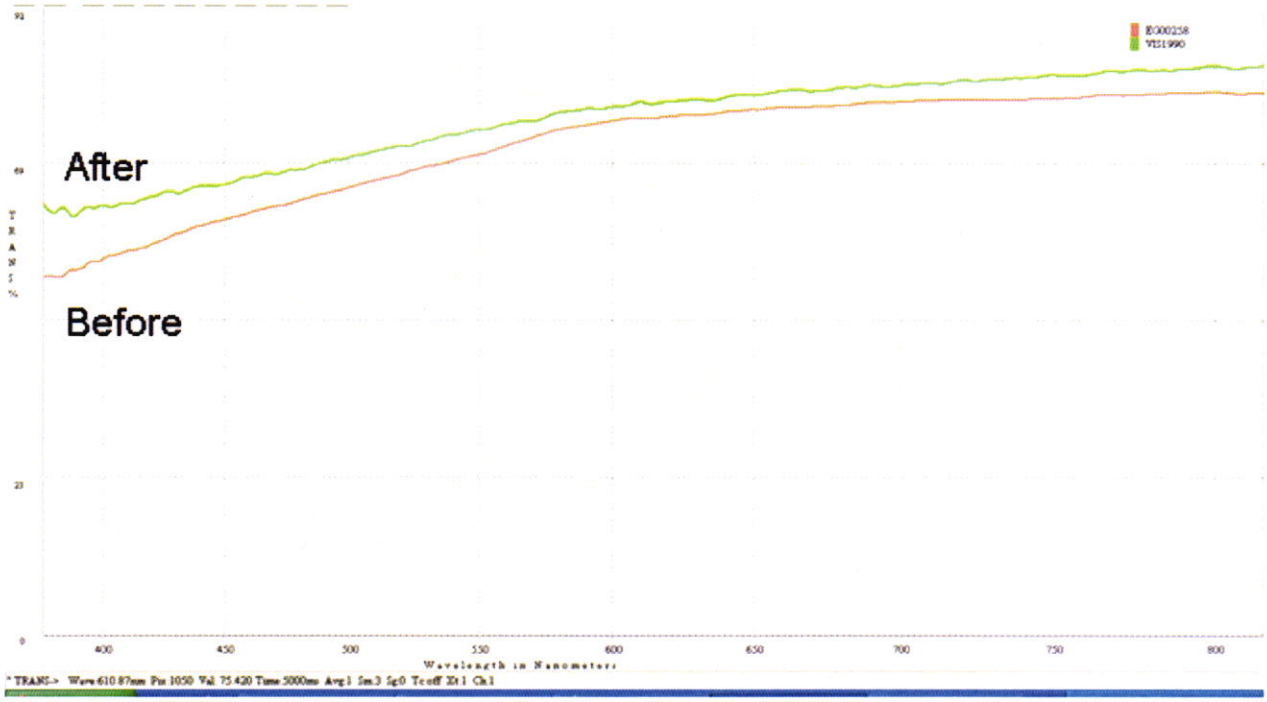


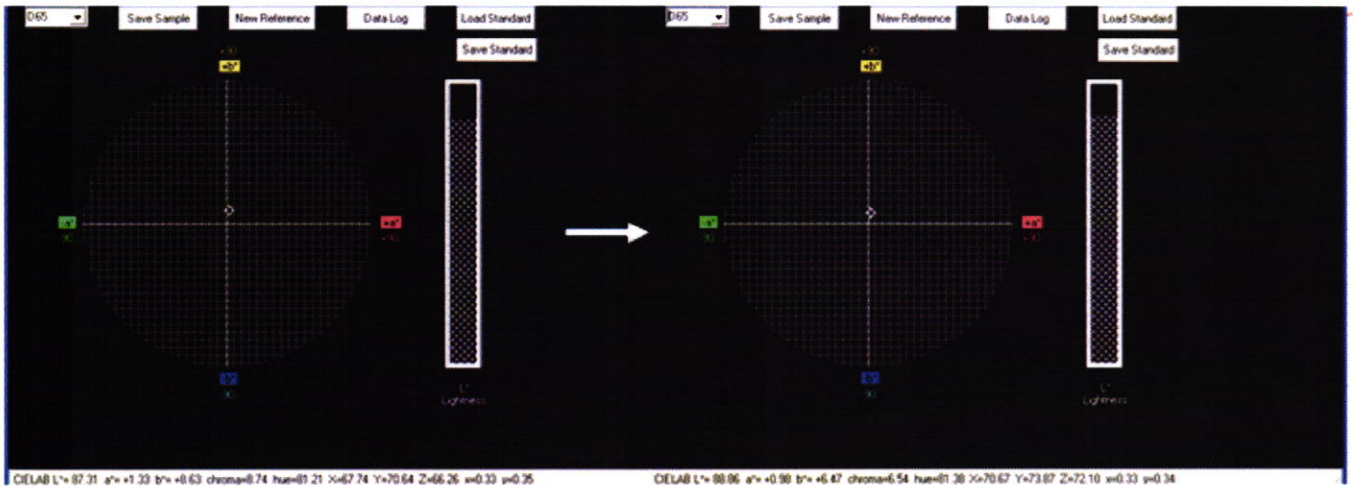


Same colour specta, slight differences, mainly in lightness L*.

Picture 17: Intonaco color before and after cleaning

White background : before and after cleaning

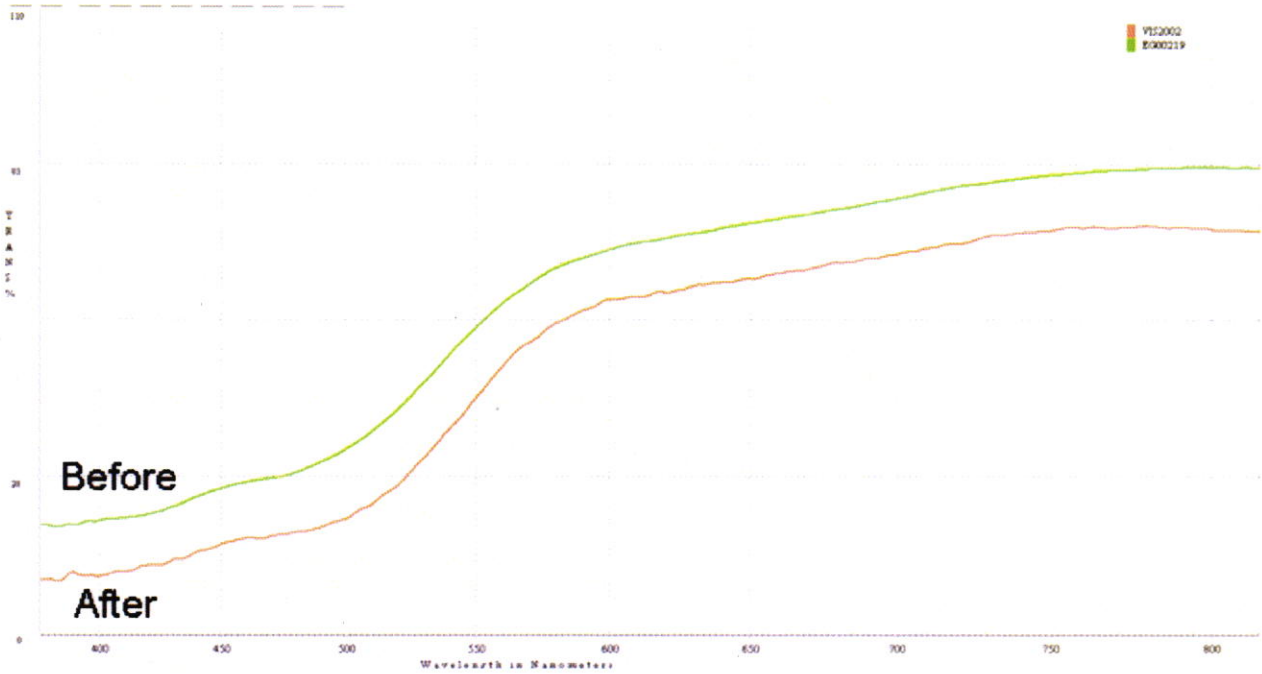


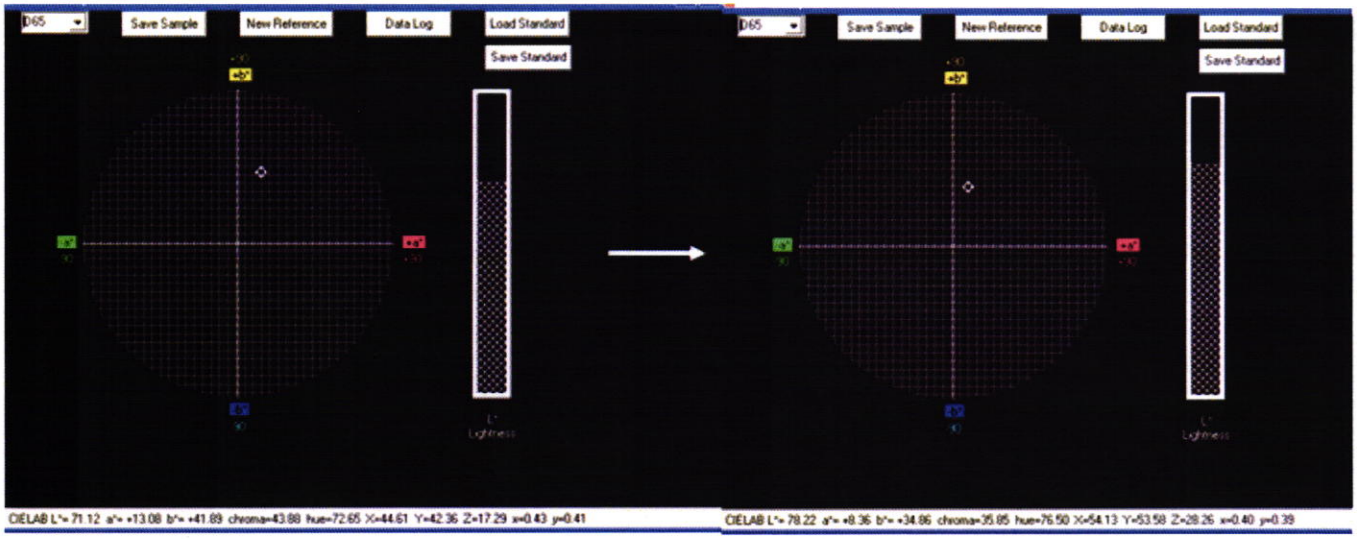


Same colour specta, slight differences, mainly in lightness L*.

Picture 18: White background before and after cleaning

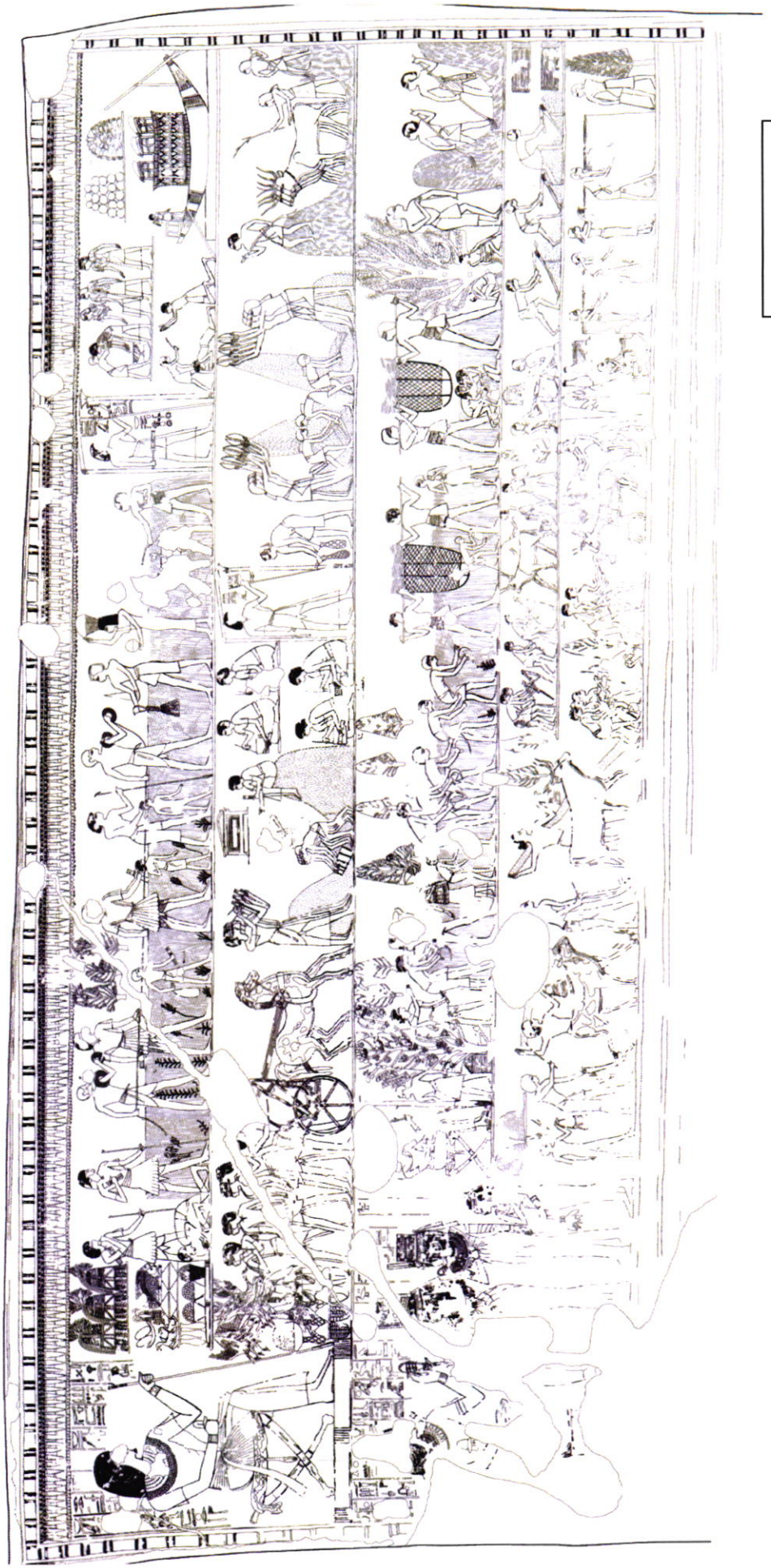
Yellow: before and after cleaning





Same colour specta, slight differences, mainly in lightness L*.

Picture 19: Yellow before and after cleaning



Picture 20:
Digital vector drawing of Broad Hall Near Left (BHNL)
(Pieter Collet)