

# EXAMINATION OF A PREVIOUSLY UNTREATED POLYCHROME COFFIN AND MUMMY

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**INTRODUCTION** : Technical investigation and stabilization treatment of a late New Kingdom (c. 1000 BC) polychrome coffin and its anonymous mummy, held in the collection of the Fine Arts Museums of San Francisco (20295/2082), was undertaken to prepare the assemblage for exhibition. The *daily life* style coffin and mummy are considered to originate from a cemetery outside Asyut, a provincial capital on the Nile's west bank in Upper Egypt. Asyut served as a coaling station for steamships at the end of the nineteenth century, as well as a Presbyterian missionary site. The conditions under which the objects departed Egypt are unknown; however, in 1895 they were gifted to the Museums by John P. Young after being featured in the 1894 California Mid Winter International Exposition. Stylistic and material comparison of this coffin to other *yellow type* examples may characterize this coffin as anomalous, possibly indicating a regional Asyuti adaptation of New Kingdom coffin manufacture.

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Fig. 1: Coffin 20295.1 lid. (190.5 x 56 x 34.3 cm)



Fig. 2: Coffin 20295.1 base. (190.5 x 54 x 28 cm)

**PIGMENT** examination was conducted using x-ray fluorescence spectroscopy (Bruker Tracer pXRF), visible-induced infrared luminescence (VIL) imaging, and examination under ultraviolet illumination. The polychrome surface is unvarnished.



Fig. 9: The figure's long garment stops above the ankles, exposing her sandaled feet. The dress depicts figurative scenes in three horizontal registers painted over a yellow background. The brushwork is unrefined. The hieroglyphic formula was initially interpreted, by one scholar, as abstract and repetitive.

A thin, white calcium-based ground layer is present over the adobe. The ground likely contains gypsum: MQuant test papers confirmed the minimal presence of sulfates (>400 mg/l SO<sup>-2</sup><sub>4</sub>).



Fig. 10: Detail of the painted stola. Note the fiber integrated in the adobe at left.

The interior head of the coffin depicts the checkered ceiling of a tomb (Fig. 2, 11). The yellow and red pigments are iron oxides, while the black is carbon-based. The green pigment is a copper carbonate, likely malachite (Fig. 12).

**WOOD** elements of various shape and size are connected by dowels (approximately 50 total) and butt joints to form the anthropoid coffin lid (23 pieces) and base (20 pieces). The grooves of rough tool marks key the adobe layer in place. The visible elements appear to be hardwood, either semi-ring porous or diffuse porous.



Fig. 3: Top of the head showing composite construction and areas of directly-painted wood.



Fig. 4: Nine wood elements converge at the unpainted base.

Six holes in the base receive corresponding phalanges extending from the lid.



Fig. 5: Interior of the base showing two types of butt joints and doweling.

**ADOBE** is thickly applied to accentuate the contours of the body on the lid, and as a skim coating to integrate wood elements at the chest and arms. The adobe contains substantial aggregate material including: sand particles, chaff, and textile fragments.

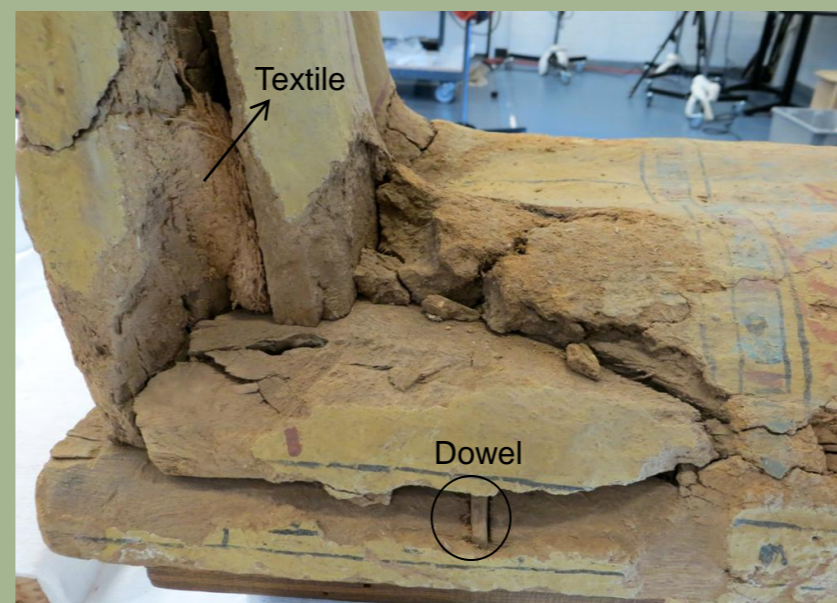


Fig. 6: Construction of the lid's foot block with adobe loss evident.

Textile sections are incorporated in the adobe at the head and the feet, as well as wedged into joints along the perimeter of the coffin's base.



Fig. 7: The stola is painted over a 2mm adobe layer.

Egyptian blue is widely employed in surface detailing throughout the decorative motif. Additionally, loss at the eyes and eyebrows (Fig. 13) reveal the coarse blue pigment beneath the black outlines. Egyptian blue was identified by the pigment's characteristic luminescence under infrared radiation.

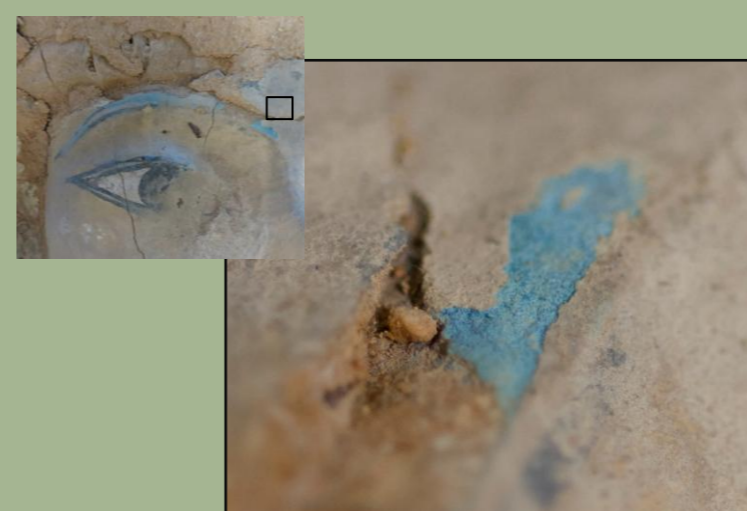


Fig. 13: Detail of blue at the PR eyebrow.



Fig. 11: Red stripe and yellow background exhibit nearly identical pXRF results: Ca, Fe (K, Ti, Zr, Sr)

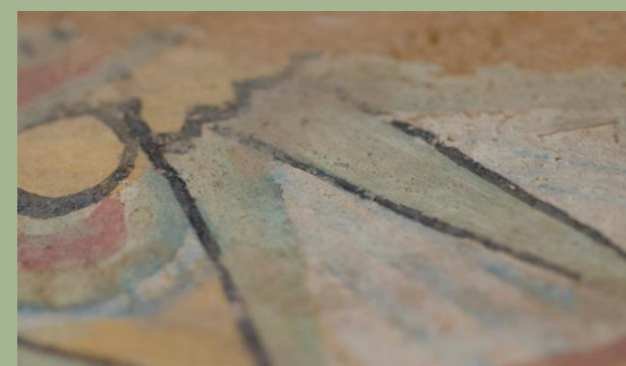


Fig. 12: Green floral detailing on the stola, pXRF: Cu, Ca, Fe, (As, Sr, Zr)

The mummy is amply wrapped in linen **TEXTILE** of at least two unique weave structures. No shroud is present. Significant holes (Fig. 14) in the wrapping were caused by removal of the mummy from the coffin at an undocumented date.

Remnants of textile are bound to the interior of the coffin base (Fig. 2), and these visually correspond to linen on the mummy's reverse. Samples were taken from each area to confirm that the mummy indeed inhabited this coffin. Results of C14 analysis conducted by the University of Arizona Accelerator Mass Spectrometry Laboratory are forthcoming.



Fig. 14: Holes in the mummy wrapping.

Fluorescence under UV illumination of exudates on the coffin's interior walls signal the body's incomplete desiccation before burial. Based on their location, the mummy was located 45 centimeters short of the coffin's head. Such a difference in length possibly indicates reuse of the coffin or its constituent elements.



Fig. 15: Orange fluorescence of body exudates.

The coffin will be exhibited with the lid mounted horizontally above the base to show its interior polychrome surfaces. The mummy will not be displayed due to its instability, but it will be represented by its CT scan (Fig. 17).

**TREATMENT** was undertaken to consolidate and stabilize the powdering adobe layer, which is detached from the wood support throughout. Various solvent mixtures and products were tested for their suitability as both consolidant and adhesive. Ultimately, 1% (w/v) Klucel G (hydroxypropylcellulose) : isopropanol was applied via syringe to powdering areas until cohesive, while 2% (w/v) Klucel G : ethanol was tamped over KT Toned Tengucho (2.5g/ m<sup>2</sup>) paper to secure detached adobe.

Paper bridge adhered across crack, with fibers positioned perpendicular to gap.

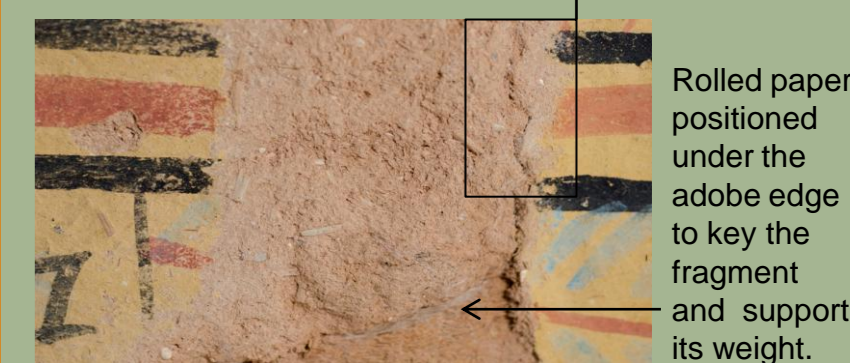


Fig. 16: Stabilized area of adobe on base.

Computer tomography (CT) scanning of the **MUMMY** was conducted at the Stanford University Medicine Imaging Center. The exterior contour of the mummy bundle is well preserved despite textile loss on the reverse; however, the scan illustrates extreme disarticulation of the individual's skeletal structure. The vertebral column, pelvis, and ribcage are collapsed.



Fig. 17: Mummy during live CT scan.

The mummy is tentatively identified as female based on the shape and size of the skull and mandible.

No evidence of excerebration is noted: the brain and nasal cells are intact. The hands and feet are individually wrapped in textile 'gloves.' The hands meet at the pelvis (Fig. 18).



Fig. 18: Detail of the articulated hands.

The CT scan will be accentuated via 3D reconstruction and exhibited on the Anatomage Table®, a life-size touch screen designed for interactive anatomy visualization in the medical field.