

Introduction

Objects requiring conservation in 2010 were the following:

- (1) Bronze finds, including fragments of statuettes, coins, rings, other objects, and one gold ring.
- (2) Nails of iron, in different scales and heights (3-7 cm).
- (3) A ceramic vessel, requiring rejoining, reconstruction, and recreation of the lost parts.
- (4) A glass vessel, broken into a lot of pieces, to many of which soil particles adhered.

The bronze objects, particularly the coins, generally had a crusty layer of green corrosion, as described in the 2008 and 2009 reports. These were treated

- chemically, with citric acid 10% and formic acid 10%, using either immersion or with gel or by covering with cotton. The solution was sometimes heated for better penetration, when the corrosion crust was especially thick.

- electrochemically, using a galvanic cell of aluminum paper as anode (+ pole) and the object (coin) as cathode (- pole), and the solution (in gel or on cotton) as electrolyte. This produces a migration of positive ions from the anode to connect with the negative ions of the cathode through the electrolyte, leading to breaking the atomic joins between the corrosion atoms, which then become easy to remove.

- mechanically, by dremel, metal tools, and scalpels.



Heads and chest of Osiris, after cleaning. Note the artificial white eyes.



Bronze ring, before and after restoration.



Above, a coin after cleaning. Below, galvanic cell (a simple method of electro-chemical cleaning). Note: the arrow refers to the coin's location.



Gold ring, before and after restoration.

Note:

- (1) the brown crust adhering to the ring, reflecting the greater strength of the iron used to support the gold coating.
- (2) the iron corrosion, reflecting the fact that iron is a less noble metal than gold.
- (3) the treatment applied,
 - a: mechanically by a dentist's drill to remove the brown corrosion of ferrous and ferric oxides, which covered the gold, till one reaches the part of iron on the groove.
 - b: by hand work and metal tools, taking care to preserve the ring's circumference.
 - c: by consolidation of the iron on the groove by araldite, and removal of the excess of araldite by drill.

Ceramic vessel

Description:

The vessel was collected together and joined before, but with a bad kind of resin and in a bad state; many fragments separated from the others. Additional fragments were also found. In addition, a part of the edge was lost, along with the base. The fragments were decorated on the inside with vegetal and geometric designs drawn in red ground oxide; this decoration was largely in good condition.

Collecting and Joining:

I had to remove the old resin using acetone and a scalpel with great care, to avoid new breaks on the edges or defacement of the drawing. After removing the old resin and drying the

pottery completely (because the acetone makes the pottery moist), I rejoined the fragments using UHU heart.

Replacing missing pieces involved the following steps:

- (1) determining the rim diameter and supporting in the correct position the remaining parts of the edge (fig. a & b).
- (2) isolating the two surfaces by covering with latex or sticky paper to keep those parts away from the gypsum.
- (3) putting sheets of clay over and under the lost part, with a similar part of the object to have the same decoration, on each side.
- (4) dampening the edge of the pottery which will be touched by the gypsum.
- (5) dropping the gypsum in milky viscosity into the space between the two sheets of the clay.
- (6) removing the clay from the two sides after the gypsum is fully dry, and then removing the sticky paper.
- (7-8) finishing the two surfaces of the gypsum and drawing the decoration; the surface is treated with metal tools and with sandpaper of different grades to achieve a standard smoothness (fig. c & d).
- (9) coloring the decoration with ground oxide color (fig. e, f, & g).
- (10) postponing reconstruction of the base until information about it is confirmed.



(fig. a & b) Joining a part of the rim with gypsum according to the drawing.



(fig. c & d) The inner reforming with gypsum . Note the inside decoration with geometric and vegetal drawing.



(fig. e & f) shows the inner side with similar color.



(fig. g) Shows the outer side after reconstruction. Note the fabric decoration, by scalpel and metal tool.

Roman Glass bottle

Description

The fragments were opaque and gray in color, with soil adhering. Some parts showed corrosion of the glass.

The treatment began with removal of the sand and the soil, using wooden tools and sometimes with a solution of ethanol and water at 1:1. Pieces were then joined using small metal wires in an easily moved angular shape, attached using a plastic stick and sometimes, in the case of smaller pieces, with resin. All of these joins are temporary. Once the general shape of the vessel is reached, the resin is replaced with araldite. This occurs step by step, as the temporary resin is removed using acetone. Araldite has good fluidity under a heat lamp.

As shown in the images, the lost parts are replaced by surrounding the cavity with wax on the two surfaces, leaving a hole through which to introduce the araldite liquid by drops. Once it is dry, the wax is removed.

The work on this vessel was not yet complete at the end of the 2010 season.



The vessel after cleaning and joining most of the pieces with resin and metal wires.



A lot of metal wires and missing parts still.



The last step (to date) in the reconstruction of some missing parts (shown by arrows).