

Dakhleh Oasis Project
Columbia University
Excavations at Amheida 2005
Conservation of mural paintings

INTRODUCTION

This report describes research that was undertaken in 2004, as part of the comprehensive program for the conservation of the mural paintings of the ancient site of Amheida, Egypt.

2004 LABORATORY RESEARCH

During the 2003 field season, samples were collected from the reception hall of the villa, a locus of on-going excavation and research. Other samples were collected from various areas of the site. The samples were sent to the Winterthur Museum and the University of Delaware for laboratory analysis. There are three principal research questions:

1. Samples of salts removed from the reception hall. What is the composition of the salts that are present throughout the masonry and mural paintings in the reception hall of the villa?

2. Samples of salts removed from other points in Amheida. What is the composition of salts found in other areas of the site? Do they differ from the salts found in the masonry of the villa?

3. Samples of paint and preparation from the murals of the reception hall. Can analyses identify the media that was used to paint the murals?

SUMMARY OF FINDINGS

Salts from the Reception Hall

Eleven samples of salts were analyzed by x-ray fluorescence. This method of analysis provided basic data on the composition of the salts. All the salts appear to be very common, carbonates, silicates and sulfates. There is no indication of the presence of unusual salts. Specifically, it was posited that magnesium chloride might be present because this salt is found in many other areas of Egypt and is notorious for its deleterious effects on cultural property. Magnesium chloride will deliquesce at about 32

percent relative humidity, provoking damage both from water and salt efflorescence. However, there is no indication of the presence of magnesium chloride thus far at Amheida.

It must be stressed that exact identification of the salts will require another type of analysis, by x-ray diffraction. X-ray diffraction is a very specialized method of analysis that requires complex equipment and a highly trained operator. X-ray diffraction can be carried out at the University of Delaware. Selected samples of salts will be analyzed by this method in 2005.

Salts from Other Areas of the Site

Five samples of salts were removed from various points in the site, at a distance from the villa. The goal was to ascertain if there is any difference in composition of the salts in the masonry of the villa, compared to salts found in other areas of the site. Differences in composition could indicate, for example, that the masonry was created from sources of materials that have a highly localized origin.

The same types of very common salts were identified. These results allow two initial conclusions. First, it would appear that the masonry is being made from earthen materials collected in the oasis. Second, it seems that no unusual salts are present. However, it must be stressed that these are very preliminary observations. Further studies will be required.

Samples of Mural Paintings and Plaster

Six very small samples of mural paintings and preparatory plaster were collected from various points on four walls of the reception room. Some areas of the murals have been “over-plastered and over-painted” and the hands of at least two, and perhaps three, different artists can be discerned. Samples were taken from earlier and later strata and from areas that seem to indicate the work of different artists. Prof. Wolbers studied the samples as cross sections mounted in bioplast resin. The samples were stained with agents that will fluoresce if lipids, proteins, carbohydrates are present.

Four out of the six samples stained positively for the presence of oils or of oils and proteins together. These results indicate that much of the paint media has survived and can be identified. No carbohydrates were identified, indicating that gum-based paints were not used in the villa. It is interesting to note that this consistent use of media, oils and proteins but no carbohydrates, was identified in all strata and areas of the murals.

Two samples appeared to lack any paint media. This is an interesting result because it strongly suggests why so many areas of the murals are in such fragile condition: the pigments remain unbound. During execution of the murals, binder would have been present in all the paints. However, in some areas the amount of binder must have varied so much that very little was used. Over time, that small amount of binder was degraded to the point where, at present, it cannot be identified.

SITE WORK IN 2005

Villa, Reception Hall

During the 2005 field season, backfill was removed from a section of mural paintings that were conserved in 2004. The condition of the mural in 2005 was compared to photographs of it taken at the end of the excavation in 2004, prior to backfilling. No change in condition could be discerned.

Villa, Three Small Painted Rooms

Three small rooms with exquisite mural paintings were uncovered to the north of the Reception Hall. Because each room will require individual and simultaneous conservation services, excavation of the rooms was suspended until 2006, when other conservators can be engaged.

2005 ADDITIONAL ANALYSES

During the 2005 field excavation, carved masonry fragments of the temple were excavated and taken to the excavation facility for processing. A very subtle dark layer was perceived over much of the surface, under but also incorporated with, the grime. It was posited that this dark layer might be lead-white paint that had altered over time.

Samples were sent to Prof. Richard Wolbers, Winterthur Museum, for analysis. The analysis indicated the presence of a lead-based pigment bound in an oil medium. This is a significant discovery because often it is difficult to discern the difference between discolored lead paint and soiling, especially in the field.

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