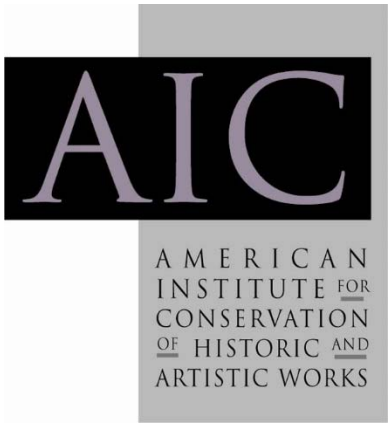

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MOSAIC CONSERVATION AT THE WORCESTER ART MUSEUM

Paula Artal-Isbrand

Introduction

The Worcester Art Museum, in Worcester, MA, has organized a traveling exhibition of ancient Roman art objects excavated from Antioch with the title *Antioch: The Lost Ancient City.* The show opened in Worcester in the fall of 2000, then it traveled to the Cleveland Art Museum in the spring of 2001, and its third venue was at the Baltimore Museum of Art in the fall of the same year. This exhibition marked the first time since the excavations in the 1930's that many important finds from Antioch, currently housed in 29 European, Middle Eastern and USA museums, were re-united. The highlight of this event consisted in the exquisite Antioch mosaics, made of stone and glass tesserae. They were the floors of private and public buildings.

History of Antioch and the Excavations

Founded in 300 BCE, Antioch-on-the-Orontes became one of the four major cities during the Roman Empire besides Rome, Constantinople and Alexandria. The ancient city of 800.000 inhabitants during its height was repeatedly rebuilt after major and minor earthquakes. The worst one destroyed it in 526 CE. Much of the damage to the excavated objects is attributed to this earthquake. The excavations which began in 1932 and ended in 1939 were a collaborative effort of five institutions including the Louvre Museum, Princeton University, Harvard University, the Baltimore Museum of Art, and the Worcester Art Museum. Antioch or modern Antakya, now in Turkey, was during that period under the jurisdiction of the French Protectorate of Syria. For their time the Antioch archaeologists were unusual because of their effort to properly document the excavations in the form of extensive and detailed field notes and hundreds of photographs. The finds were published by Princeton University Press.

The Conservation Campaign at the Worcester Art Museum

The conservation of objects for this exhibition started over three years before the exhibition opened. A total of four conservators worked on the conservation team at different times: Lawrence Becker, Sarah Nunberg, Diane Fullick and the author. The conservation team in collaboration with the curator, Christine Kondoleon, contributed to the development of ideas expressed in this paper. Also, Sari Uricheck and Sarah McGregor worked on this project during their graduate internships. The help of numerous volunteers was invaluable as well.

Even though ceramic, metal, stone and stucco objects were also treated, this paper will be limited to the conservation of the mosaics. Besides Worcester's own collection, a number of mosaics that came on loan were also treated.

Conservation Goals

Most Antioch mosaics had very similar structural problems due to the same lifting techniques and on-site stabilization procedures in the 1930's. Each institution had treated and stored their mosaics in different ways. Therefore, problems and conditions specific to each museum were also encountered.

One of the challenges was to prepare the concrete-backed mosaics for travel. In addition to being heavy it is their shape, which is large in two dimensions and relatively small in the third dimension that makes them extremely fragile, especially when moved from one place to another. During movement the center of gravity can easily shift and lead to cracking or even breaking. Some mosaics weigh over half a ton.

Another challenge was concerning their presentation. Questions about how to compensate for losses that were treated in numerous ways at different museums had to be addressed. All new fills had to be homogenous and consistent among themselves and made of a material softer than the original stone and glass tesserae, as well as strong and flexible enough to endure travel.

Even though there were also other problem solving situations during this conservation campaign, such as the cleaning of the mosaics, these aspects of the conservation treatment will not be addressed in this paper.

Stabilization and Transport of the Mosaics

When a mosaic first came to the conservation laboratory it was checked for loose tesserae by tapping its entire surface. Any loose ones were secured with Paraloid B-72 adhesive. The mosaics were also checked for cracks. All mosaics had been backed with concrete reinforced with iron bars and chicken wire mesh immediately after excavation (Fig.1). This system over time led in many cases to cracking due to the rusting of the iron in the concrete matrix (Fig.2). For mosaics that had been exhibited or stored outdoors over the years this was especially a problem. If the cracks did not extend to the tesselatum on the front, Flexi-Weld 520 epoxy was used to fill them. Otherwise, cracks were filled with Paraloid B72 adhesive bulked with 3-M glass micro-balloons.

The major intervention to stabilize the mosaics consisted in framing them with custom-made steel or aluminum frames (Fig.3), which were fastened to the mosaics with screws that were anchored into the concrete backing. Crossbars on the back of the frames, padded with high density Ethafoam, provided additional support for cracks.

The crates fabricated for the transport of the mosaics were lined with Ethafoam and Volara. Also, a vibration absorbing neoprene padding (30005 Series) was constructed into the riding edge of a number of the largest crates for additional protection of the mosaics.

All the mosaics were moved and transported vertically only. This is the safest orientation for the concrete-backed mosaics, since concrete is strongest under compression. If transported flat the shear stress across cracks can seriously damage the thin mosaics.

Loss Compensation

Many mosaics exhibited losses of tesserae that had to be compensated for the exhibition. As the freshly excavated pavement fragments were backed with concrete while still in Syria, areas of missing tesserae got filled at the same time with the same concrete leaving an unattractive, irregular, gray fill that was flush with the tesselated surface, often obscuring original tesserae on the edge of the loss.

Each institution dealt with these fills differently upon receiving their share of Antioch mosaics. Some did not do anything to these fills (Fig.4). Others painted over them, replicating the pattern of the mosaic by often inventing the design (Fig.5). In other cases the concrete fills were replaced with plaster that was consequently painted, also imitating a mosaic design. At the Worcester Art Museum mosaic artists from Italy restored a number of mosaics in 1936. They removed part of the concrete, and filled the losses with stone tesserae (Figs.14, 16). Besides using new tesserae, unfortunately ancient tesserae were also used during these restoration efforts. These tesserae came from mosaic fragments thought not worthy of exhibit at the time. The numerous photographs taken during excavation proved to be invaluable to the Worcester conservators during the treatment of the mosaics because they allowed them to clearly distinguish original parts from restorations.

The question was what to do with all these losses treated in different manners over the last 60 years. The new fills had to meet the following requirements: the fill material had to be stable, reversible, and softer than the tesserae surrounding it. Also, it needed to have adhesive and cohesive strength to endure vibration during transport. The fills had to be aesthetically pleasing and recognizable as integrations. The color of the fills, which had to be stable over time, had to not only harmonize with the color of the surrounding original tesserae but preferably with fills on the other mosaics as well. This was especially important to achieve for the six mosaic segments that make up the Atrium House triclinium floor.

It was decided to chisel out the old concrete fills, and create new recessed fills with a lime-based, salt-free restoration mortar called Custom System 45 produced by Edison Coatings (Fig.13). This fill was to resemble the bedding mortar. The Custom System 45 mortar is made in a large variety of colors with the intention of imitating the appearance of different stones and mortars. They are produced by adding crushed stone and inorganic pigments of different colors to the lime mortar base. This restoration mortar is a two-part system that consists of the mortar powder solid and an acrylic emulsion which are mixed in a proportion of 5:1 to 7:1by weight. In order to improve the adhesion of the restoration mortar to the substrate, the acrylic emulsion is brushed on first.

Artal-Isbrand

The Edison mortar has all the characteristics that are required from the fill material. Due to the acrylic component in the formula, the cured mortar slightly softens when wetted with acetone. This makes it quite easily reversible. In cases where the water-sensitive glass tesserae bordered areas of losses, the fill material consisted of Paraloid B-72 adhesive bulked with 3M glass micro-balloons and glass beads and added inorganic pigments. These fills are very close in appearance to the mortar fills.

This filling approach became the general rule during this mosaic conservation campaign. But, as usual, where there is a rule there are inevitably exceptions.

In some cases where individual tesserae were missing in central parts of a mosaic it was thought necessary to use a different compensation approach. This was the case in the *Funerary Symposium* mosaic for example, specifically in the area of the head of one of the women. The absence of individual tesserae was visually disruptive making it impossible to appreciate the 2-dimensional illusion of a 3-dimensional work of art. Each little hole created by a missing tessera appeared as a dark shadow distorting the design immensely. If these multiple losses were filled with the restoration mortar, their appearance would not be very different to the image in Fig. 6. It was thought that it would be appropriate to fill these losses with newly fabricated restoration tesserae.

Two approaches were used to make new tesserae during the Worcester conservation campaign. One was to cast them in plasticine using Whatman's paper pulp mixed with Sigma methyl-cellulose; the other one was done by casting them in President-Coltene silicone-based impression material using plaster. The plaster was consolidated with Paraloid B-72 after curing. Windsor & Newton watercolors or Golden acrylics were used to paint them. Figs. 7 and 9 show the detail of the head in Fig. 6 after filling with paper pulp restoration tesserae, and after in-painting with water colors. This filling approach was taken only where the shape and color of the tesserae were predictable since no invention of the design was acceptable.

Another exception to the filling rule was the compensation of a large loss in the center of the dining room floor. In a computer model of it in Fig. 9 all the mosaic segments now belonging to six different museums can be seen side by side as they were found and as they were exhibited in the Antioch exhibition. In Fig.10 is a field photograph before the floor was lifted. The damage in the center of the floor occurred before the mosaic was discovered, when a trench was dug to built a wall. In this particular case the conservators and the curator decided to continue parts of the repetitive geometric border with plaster restoration tesserae cast in entire sections in order to better integrate these two fragments into the floor (Figs.11, 12). The remainder of the loss was to be filled with Edison mortar.

In Fig.13 the panels can be seen *after treatment* incorporated into the dining room floor at the exhibition venue in Worcester. The plaster restorations were painted using an airbrush in a slightly lighter color than the original border to make the restorations obvious. To compensate for the missing mosaic pavement between these two fragments an entire separate fill panel was

fabricated, using a wooden board for the substrate.

In the case of the Funerary Symposium mosaic it was decided to cover areas of the 1930's tesserae restorations with tinted tissue paper instead of removing the restoration tesserae (Figs.14-16). It was felt that these skillful restorations are now part of the history of the mosaic. Besides being incorrect, the modern faces, for example, which were in perfect condition, made the ancient, eroded faces look secondary.

But not all the restorations were covered. It was decided that the restorations of the geometric border sections and the background curtains would be left uncovered because they don't seem to be invented shapes but rather a continuation of existing patterns. Also, the curtains help to establish the physical space in which the banquet is taking place.

Conservation and Techniques Gallery

In addition to the galleries featuring the art, the exhibition also incorporated a gallery dedicated to the conservation and the excavation of the mosaics. It included a case with materials, tools and description of techniques used by Worcester Art Museum conservators during this recent conservation campaign, as well as two text panels explaining what conservators do and how mosaics were made in antiquity.

In the same gallery the visitor could also view archival photographs showing mosaic lifting and cleaning methods during the excavations in Syria, the installation of the mosaics at the Worcester Art Museum in 1936, and the Italian mosaic artists at work.

Conclusion

This project did present the conservation team with tough but interesting challenges. The stabilization and moving of the mosaics required a lot of heavy equipment and close collaboration with contractors such as riggers, welders, crate makers and art transport professionals most of whom had never dealt with mosaics before. Problem solving often involved long discussions and, the decisions made were rarely clear-cut answers to fundamental questions. For example, the conservators had to compromise in their filling decisions by restoring parts of a number of the mosaics "invisibly" with tesserae. This decision was based on the fact that it was believed that it is also the role of the conservator to present the art object in such a way that it helps the viewer in the process of looking and interpreting it.

It was a very rewarding project, which has afforded the Worcester conservation team a unique opportunity to work very closely with a large number of mosaics and learn immensely from this favorite art medium of the Romans.

Acknowledgments

I want to thank the Andrew W. Mellon Foundation for financing my attendance to the conference. My deep appreciation also goes to Lawrence Becker for having given me the opportunity to part-take in this outstanding project, and to Christine Kondoleon for having envisioned and organized this exhibition. Finally, special thanks to my friend and colleague Tony Sigel for his constant support.

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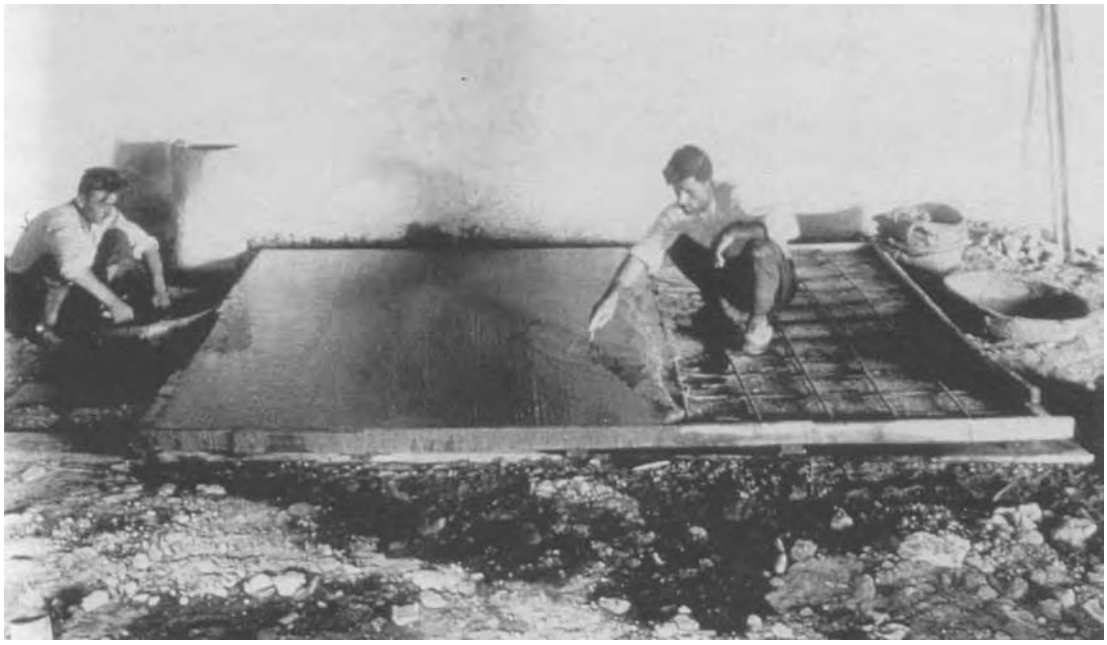

Figure 1. Syrian workmen backing a mosaic with concrete that is reinforced with iron bars and chicken wire, shortly after excavation in the 1930's. Photograph courtesy of the Department of art and Archaeology, Research Photograph Collection, Princeton University.

Figure 2. Mosaic with a cracked concrete backing at the Worcester Art Museum in 2000.

Figure 3. The same mosaic as in Fig. 2., after being framed with a metal frame.

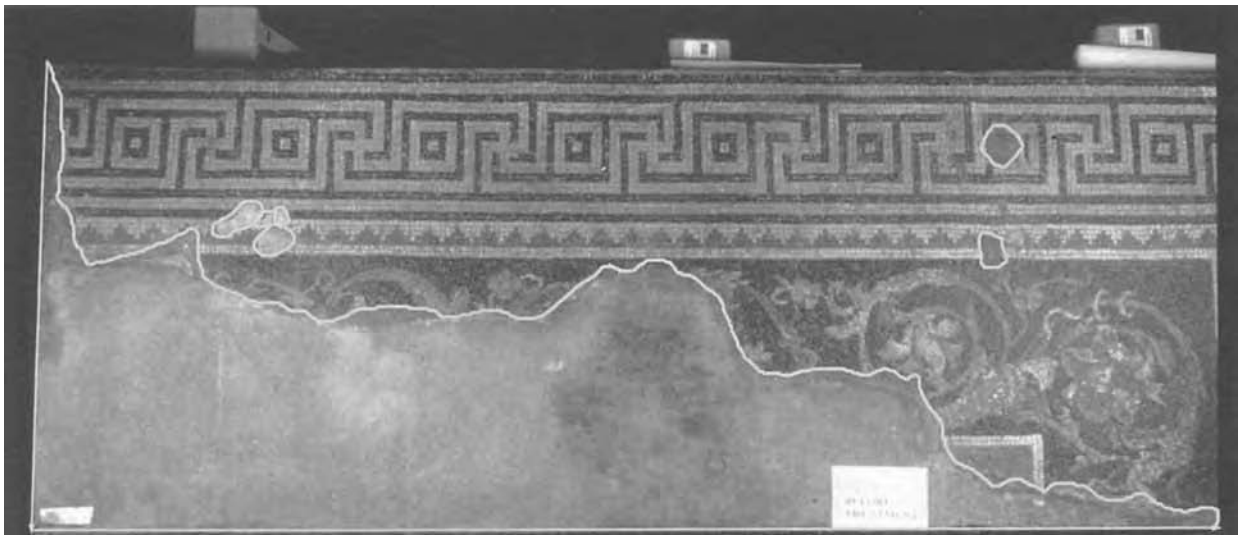

Figure 4. Mosaic fragment from the Atrium House dining room before treatment (collections of the Wellesley College Museum; early 2nd century CE). Outlined are the losses that were filled with concrete during the backing process shortly after excavation.

Figure 5. Detail of the *Menander, Glykera and Comedy* mosaic (collection of The Art Museum, Princeton University; c. 250-275 CE). Outlined are painted concrete fills imitating a tesserae pattern with an invented design in the largest fill.

Figure 6. Detail of a head of the mosaic representing a *Funerary Symposium*, after removing concrete fills (collection of the Worcester Art Museum; late 4th century CE).

Figure 7. Same detail as Fig. 6, after filling losses with restoration tesserae.

Figure 8. Same detail as in Fig. 6, after inpainting the restoration tesserae.

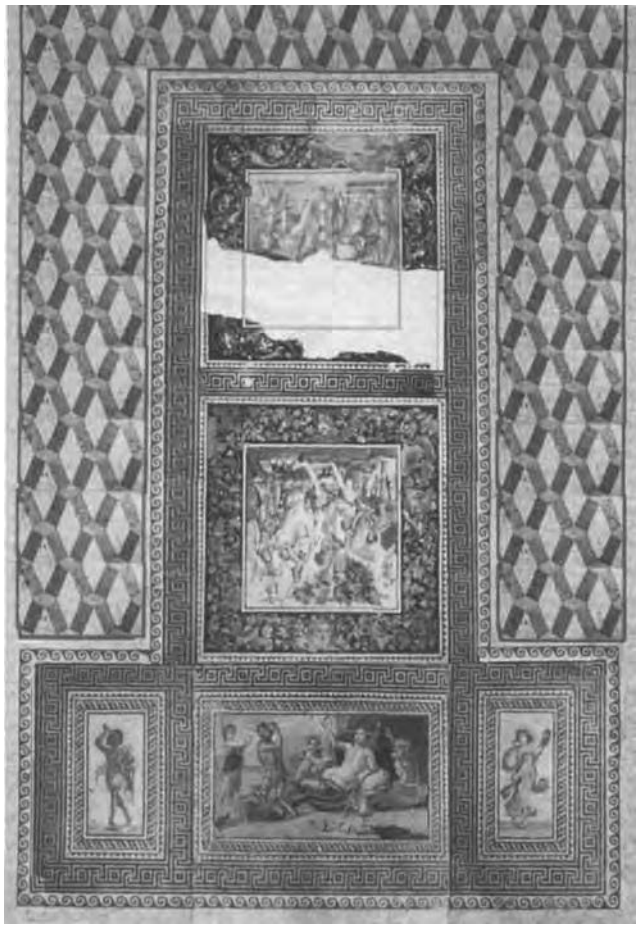

Figure 9. Atrium House dining room floor. Computer-generated photo composite showing all the panels that were separated after excavation and distributed to several institutions. They were reunited during the Worcester exhibition. The loss in the center of the floor was caused by the low wall-like structure visible in Fig. 10.

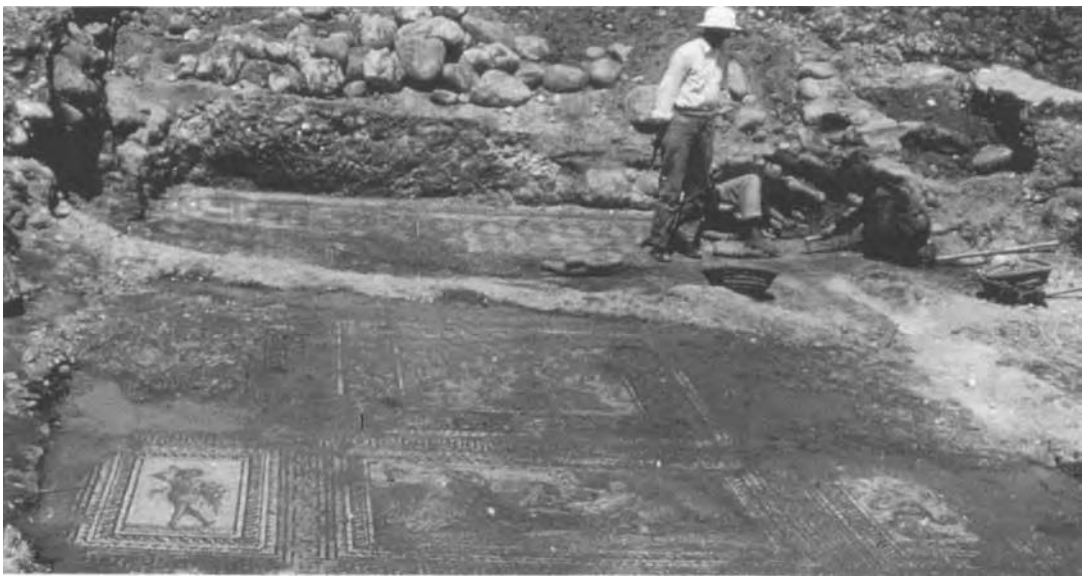

Figure 10. The Atrium House dining room floor during excavation.

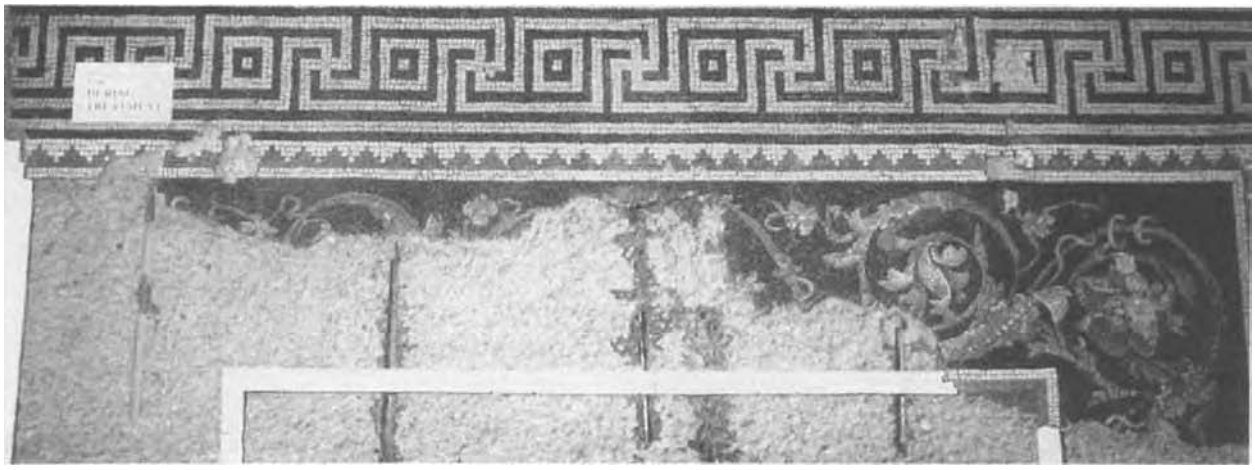

Figure 11. Mosaic fragment from Fig. 4, after recessing the concrete fill and with plaster tesserae restorations in place.

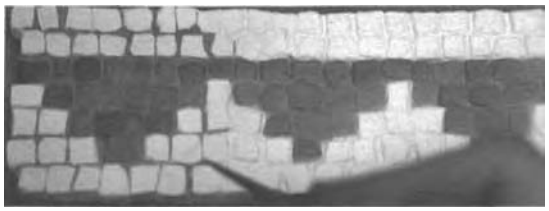

Figure 12. Cast plaster tesserae restoration strip in the process of being painted.

Figure 13. Panel representing Aphrodite and Adonis (collection of The Art Museum, Princeton University), from the Atrium House dining room. After conservation, in the Worcester exhibit. The upper border is the Wellesley fragment in Fig. 11. The border areas, except for the sections along the top and lower left, are a black and white photographic image of fragments which are in the collection of the Antakya Museum.

Figure 14. Detail of *Funerary Symposium* mosaic after the 1930's restoration with stone tesserae (the outlined areas is to be covered with tissue paper).

Figure 15. Detail of Fig. 14 after covering the 1930's restoration of the faces with tinted tissue paper.

Figure 16. *Funerary Symposium* mosaic, after treatment. Outlined are all loss areas, most of which were filled with stone tesserae in the 1930's.