

# History of object conservation at the Gordion Archaeological Project, Turkey

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**ABSTRACT** Professional conservation has maintained a constant presence at the University of Pennsylvania Museum's Gordion Project since the resumption of excavation in 1988, and directly affected the preservation of collections long before then. This paper reviews that history by highlighting several specific areas of collaboration involving a variety of stakeholders working at and living around the site, as well as the changing role of conservation at the site since the start of excavation in the late 1950s. It considers successful outcomes as a reflection of the role of conservation on excavations in general. Topics discussed include failed early treatments and subsequent re-treatment of artifacts, building long-term relationships with Turkish authorities and conservators as well as site archaeologists and architectural conservators, long-term preservation efforts, an internship program and recent research.

## Introduction

Conservation, which has a very long history at the University of Pennsylvania's Gordion Archaeological Project in central Turkey, became more active and tied to the profession with the organization of the Gordion Objects Conservation Program in 1988. This paper reviews that history by highlighting several specific areas of collaboration involving a variety of stakeholders working at and living around the site, as well

as the changing role of conservation at the site since the start of excavation in the late 1950s (figure 1).<sup>1</sup>

The city of Gordion is best known as the royal capital of the Phrygian Empire during the Iron Age and thrived under the rule of the mythologized King Midas during the late 8th century BCE. The site, however, has a rich and complex history with over 4,000 years of occupation spanning the Bronze Age to the present day. The University of Pennsylvania Museum illustrated this history with the successful exhibit



**Figure 1** View of the Gordion excavation compound with Tumulus MM in the distance. (Photo: Cricket Harbeck.)

**Table 1** Gordion conservators and conservation interns 1988–2016.

Conservators	Conservation interns		Date
Stephen P. Koob	Jessica S. Johnson	University College London	1989, 1991
Jessica S. Johnson	Ellen Salzman	New York University	1992
Ellen Salzman	Hüsnü Kayışbudak	Ankara University	1992, 1993, 1994
Julie Unruh	Brenda Smith	Queen's University	1993
Hüsnü Kayışbudak	Julie Unruh	Queen's University	1994, 1995
Cricket Harbeck	Yunhui Mao	University of Delaware	1996, 1997
Angela Elliot	Cricket Harbeck	Buffalo State College	1997
Donna Strahan	Tom Braun	University of Delaware	1998
	Matt Crawford	Buffalo State College	1998
	Nathan Otterson	Buffalo State College	1999
	Angela Chang	University of Delaware	2000
	Dena Cirpili	Buffalo State College	2001, 2002
	Sarah Barak	New York University	2001
	Esther Chao	New York University	2002
	Chris White	Queen's University	2002
	Angela Elliott	Buffalo State College	2003, 2005, 2006
	Julia Day	Buffalo State College	2005, 2006
	Ozge Ustun	UCLA/Getty	2006
	Paula Hobart	Buffalo State College	2006
	Ariel O'Connor	Buffalo State College	2007
	Tara Hornung	New York University	2008
	Lauren Horelick	UCLA/Getty	2008
	Robyn Haynie	University College London	2009
	Elizabeth Drolet	UCLA/Getty	2010
	Emily Hamilton	Buffalo State College	2010
	Lily Doan	UCLA/Getty	2011
	Elizabeth La Duc	Buffalo State College	2012
	Colleen O'Shea	Buffalo State College	2013
	William Shelley	UCLA/Getty	2014, 2015
	Julia Commander	University of Delaware	2016

*The Golden Age of King Midas* (Rose and Darbyshire 2016). The excavations at Gordion were begun by the University of Pennsylvania in 1950 under Rodney Young, who focused on the Citadel Mound as well as many burial tumuli in the surrounding valley (Young 1981). Current excavations on the Citadel are carried out as part of the program overseen by Dr. C. Brian Rose (Rose and Darbyshire 2011).

Materials recovered from the Young excavations were overseen by Ellen Kohler (figure 2), who served as both the site registrar at Gordion and manager of the Gordion Archives at the University of Pennsylvania Museum (Darbyshire 2009). It is due to her diligence and dedication that the immense collections recovered from the excavations were so well taken care of even as the conservation field was just beginning to professionalize. Her well-thumbed copy of *The Conservation of Antiquities and Works of Art* (Plenderleith 1956) found at the dig house serves as a guide to understanding the older collections, and the preservation and deterioration we see in them now.

In 1988, excavations resumed under the new project director G. Kenneth Sams, with Dr. Mary Voigt in charge of excavations. At the same time, Stephen Koob was invited to start the Gordion Objects Conservation Program. In

1989, Jessica Johnson joined Koob as the first conservation intern (Johnson et al. 1996). The lab facilities were basic and included a shared table, a metal can with a tap and a stone sink draining to the outside. Since then, with the support of Sams and now the current project director Brian Rose, object conservators have been part of the team each summer. There have been four heads of the Gordion Objects Conservation Program: Stephen Koob, Jessica S. Johnson, Cricket Harbeck, and Angela Elliott. The authors currently share management of the program. To date, 31 student interns and a number of conservators have worked with us throughout the years (see Table 1).

## Conservation's role on the Gordion team

Since the start of a formal program in 1988, a conscious effort has been made to integrate conservation into the daily activities and planning of the site. Common to many field conservators, one of the early hurdles was changing our image, and being seen less as restorers and more as stewards of the collection who also undertook the more subtle work of



**Figure 2** Ellen Kohler examining reconstructed ceramics at Gordion. (Photo: Penn Museum Gordion Archive, Image #46000.)

preservation and research. Over the years, we have worked steadily to broaden awareness by creating opportunities to integrate with the team and by engaging more in day-to-day work life.

Building and maintaining rapport with the Gordion team is now a priority and we place a high value on being available to our colleagues and participating in simple ways as part of the crew. This is facilitated by having two basic conservation labs to service the needs of the many people working at the site. One lab is centrally located in the collections storage area at the dig house, where newly excavated materials are treated alongside the registrar, researchers and pottery specialists. About a mile away is another workspace at the Gordion Museum to address long-term preservation needs for the exhibit and storage areas, and to treat objects being studied in the collection (figure 3). The conservators generally work together in the same lab at the same time each day, helping to ensure at least general knowledge of all projects taking place. We typically split our time on-site during the excavation season to maintain a constant conservation presence. All attempts are made to overlap mid-season so that information on projects is shared and communication is maintained throughout the season through regular email updates.

The success of the Gordion Objects Conservation Program is in many ways due to our outreach and educational efforts to the larger team. Various approaches are used to dispel the myth that conservation is a specialized practice that only conservators are qualified to do: instead, the

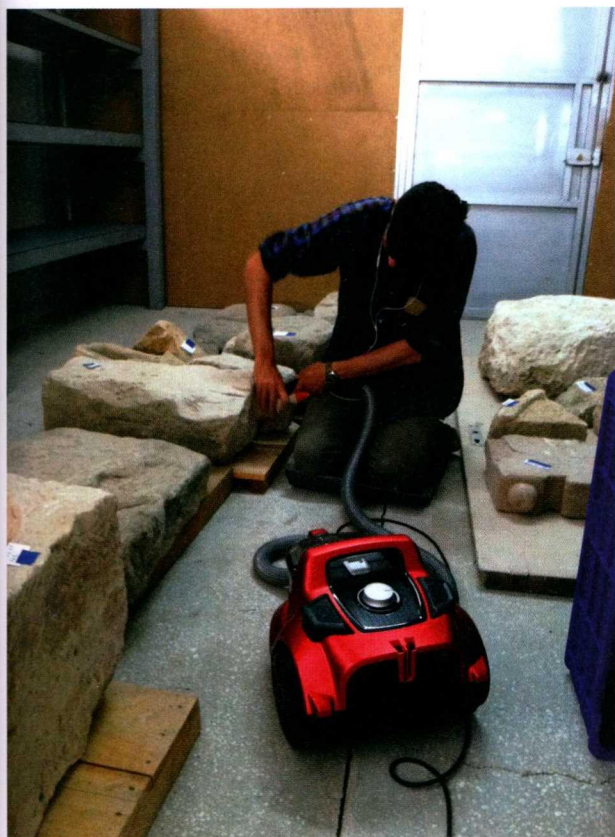


**Figure 3** Conservators at work in the Gordion Museum conservation laboratory. (Photo: Cricket Harbeck.)

program shares the responsibility with the whole excavation team, believing it will make them more vested in the future of the archaeological materials. We provide Paraloid B-72 adhesive to researchers who carry out their own repairs on research material including ceramics, bone and iron alloys. In this way, we are assisting researchers with practical methodologies they feel are important, but at the same time we ensure a removable repair if it is necessary in the future. Recently, archaeology students have been asked to participate on basic treatments such as cleaning stone, alabaster, and ceramic mosaic pegs, thereby giving them an intimate connection with the objects (figure 4).

For excavators, a first aid kit filled with supplies is provided as well as a written set of *Gordion Conservation First Aid Guidelines* for recovering newly excavated materials. The *Guidelines* are two pages of basic information outlining the range of materials commonly found at Gordion – ceramics, unbaked clay, bone, glass, iron, and bronze etc. – with information on how to buffer the environment in the field for each material. The kit includes small plastic lidded boxes and bags, padding/buffering materials including acid-free tissue, and cotton gauze. The *Guidelines* as well as the kit are shared with an offer to advise or help with actual lifting on-site whenever the excavators consider it necessary. Excavator requests for assistance have priority and all work quickly stops when we are called to the field.

We have also found that over time and with the professionalization of individuals with whom we first worked as students, conservation is now accepted and expected, and



**Figure 4** Gordion Project archaeology student assisting with rehousing and maintenance of stone in storage. (Photo credit: Cricket Harbeck.)

we no longer have to prove the worth of having a conservator on-site. This same acceptance, which can be seen within much of archaeology in the Middle East and elsewhere, likely relates to the expansion of program-educated conservators working on-site and greater familiarity of what the field can add to archaeological research and other interests in general.

We are also committed to offering field opportunities to conservators and conservation interns to ensure a better understanding of archaeology in the conservation field, whether or not these students continue working on-site. Each season we work with at least one graduate conservation student covering a broad array of responsibilities. Over the last few years we have also included Iraqi conservators who teach at the US program at the Iraqi Institute for the Conservation of Antiquities and Heritage in Erbil, Iraq (Johnson et al. 2014). The Iraqi professionals have few opportunities to gain conservation experience at an active excavation therefore working at Gordion expands their skills and knowledge to share with their students and colleagues.

The Gordion Objects Conservation Program has a long, close relationship with the conservators at the Anatolian Civilization Museum with visits between the groups each summer. Occasionally, conservators from this lab have participated with on-site work. More often, the Ankara laboratory has generously offered its facilities and equipment to assist with analytical analysis such as x-radiography and portable XRF. Turkish students in conservation and archaeology also participate on-site and are included in activities depending on their interests.

## Conservation and research

For many years, researchers have been asked to participate in decisions related to the storage and handling issues surrounding their objects. This has improved our preservation efforts as active use of the collection for current research questions often reveals collection care needs. Recent storage improvements resulting from research of the collections include the organization and housing of iron materials, and new storage and labeling of a collection of human remains. Our goals in both these projects were not only to provide safe housing, but also to consolidate and organize the collection using the researchers' expertise.

As site conservators, we want to contribute to the broader conservation community through study and research. Our saline soil conditions are an ongoing concern, and we regularly encounter fully corroded iron, active bronze disease on copper alloy materials and salt efflorescence on ceramics. In particular, desalination of ceramics is a standard site treatment, and during an active field season there are often up to 12 ceramics soaking at a time. Conservator Julie Unruh conducted lengthy research on the desalination process and studied the damage to different ceramic bodies caused by soaking. Her findings resulted in a streamlined procedure using a mathematical formula to identify a desalination endpoint (Unruh 2001). Independently, conservators at the Arizona State Museum made improvements to the technique by including a time component: the outcome of this research is a more efficient use of deionized water and a general reduction in a ceramic's soaking time (White et al. 2010). In the field, an Excel spreadsheet is used for the calculations and to simplify the process, particularly when multiple treatments are under way. All desalination information collected at Gordion is retained for future review.

## Tumulus MM

Another long-term study has centered on Tumulus MM, a monumental burial mound associated with the legendary King Midas. Tumulus MM, a key feature in the Gordion landscape, is the largest of over 100 burial mounds at the site, and dates to approximately 740 BCE (figure 5). Over the last two decades, conservators have worked closely with Dr. Richard Leibhart on a variety of projects ranging from long-term environmental studies to various cleaning campaigns (Liebhart and Johnson 2005). One effort that spanned several summers involved carefully cleaning the exterior of many ancient juniper timbers by removing concrete splatters and drips that were deposited when a structural cap was added above the tomb in the 1960s (figure 6).

There has also been a decades-long monitoring program to capture environmental data inside the tomb throughout each year, as well as tracking movement of the wood timbers and changes in biological growth within the tomb structure. Interestingly, we have found that the tomb chamber maintains a cyclical humidity variation throughout the year, and



**Figure 5** View of Tumulus MM and the Gordion Museum compound. (Photo: Richard Liebhart.)



**Figure 6** Conservators removing concrete spillage on juniper timbers of the ancient tomb chamber inside Tumulus MM. (Photo: Richard Liebhart.)



**Figure 7** Entrance to the Gordion Museum. (Photo: Jessica S. Johnson.)

that the timbers move seasonally, but with no permanent changes (Liebhart and Johnson 2005). This research is currently being prepared for final publication.

## The Gordion Museum

One of the first large collaborative projects in which conservation played a major role was during the expansion of the Gordion Museum in 1998 (figure 7). Working together, Gordion director G. Kenneth Sams and Ilhan Temizsoy, the director of the Anatolian Civilizations Museum, orchestrated an addition that doubled the size of the original 1965 museum (Sams and Temizsoy 2000) that included a large gallery wing, additional object storage and new workspaces. This was a significant undertaking that spanned two full field seasons and involved a specialized team.

Conservation was deeply involved in the exhibit project from its early stages and was instrumental in bringing onboard Chicago-based exhibit designer John Russick and a skilled mountmaker, Martin Geise. There was a large conservation team of both conservators and interns, and after two

seasons 214 conservation treatments were completed on unstable and poorly restored objects from the Young excavations prior to installation. In addition, over 600 objects were surveyed, documented and installed with the help of numerous local colleagues and Gordion team members.

Conservation was also heavily involved in the design process and specified case construction based on American conservation guidelines. Unfortunately, the cases were built locally from available materials, and since their completion have emitted a strong chemical odor. Prompted by ongoing concerns on the stability of the displayed collections, we continue to perform intermittent testing using metal coupons, pH test strips and formaldehyde badges. Since installation, visual monitoring of the exhibits is also carried out each year. The annual survey examines the condition of artifacts as well as the immediate exhibit case environment, and the museum structure such as leaking windows and wall cracks. It is used to identify and prioritize treatments and make improvements to the exhibit area. An added benefit is that it has provided an opportunity to collaborate with the museum's manager, Ibrahim Bolat, who now identifies problems throughout the year that we then address during the field season.

Since not all the objects were treated prior to installation in 1998, there is an ongoing effort to work through the remaining materials, most of which are ceramics with unstable adhesive repairs and ugly plaster fills. These treatments offer a good exercise for our conservation interns to practice comprehensive restoration work that is beyond that carried out on newly excavated ceramics (figure 8).

## Pebble mosaic

A final example of an ongoing collaborative effort is the treatment and reinterpretation of a large tri-color pebble mosaic. The mosaic is from the floor of an important Early Phrygian building in the Citadel Mound (Young 1965) and dates to the second half of the 9th century BCE. Like Tumulus MM, it is one of Gordion's gems: it is the oldest known of its kind, and is a rare example of an unusual irregular geometric pattern (Rose 2017: 157). It was discovered in 1956 and then reburied for many years until it could be safely recovered. Because it was not intact and due to its large size, the best preserved areas were removed in 33 roughly rectangular sections (Young 1965; Thompson 2011; Wolgemuth 2014). Once lifted, the sections were backed with rebar and concrete, and stored for decades, first outdoors at the excavation house and then at the Gordion Museum. Sometime in the early 1980s the panels were embedded in a recessed concrete floor in a covered area outside the museum, where they have remained on display.

Noticeably deteriorating and poorly displayed, the mosaic became a focus of study by the Gordion architectural students and conservators led by Frank Matero (Matero et al. 2013). Matero conceived an ambitious plan to address structural issues, improve legibility of the pebble design and modernize the display. For several years, his team studied and documented the deteriorated pebble face and damage incurred from early stabilization efforts. The outcome was a thorough documentation report on each panel *in situ* (Thompson 2011). Matero's team also successfully removed a single panel from the concrete floor to aid in developing a plan for future work on the remaining panels (figure 9). It was the subsequent treatment of this one panel that prompted collaboration between object and architectural conservation as the issues faced required both areas of expertise.

Our first collaborative effort was to identify a suitable facing to stabilize the pebble surface so that the panel could be flipped and the back side treated. Collaborative work continued through the assessment of the back and an attempt to remove the rebar and excessively thick concrete backing. Work on the back was led by the architectural conservators and, because of our close proximity, we were often asked to help problem solve. Typical discussions centered around treatment strategies and conservation materials, and we quickly began sharing our lab spaces, equipment and supplies for this project. This was one of the first opportunities at Gordion for these different conservation teams to work together and fortunately it proved an easy working relationship.



**Figure 8** Conservation intern practicing ceramic restoration techniques. (Photo: Cricket Harbeck.)



**Figure 9** Overview of the pebble mosaic on exhibit at the Gordion Museum.

In 2015, Elisa Del Bono took charge of the Architectural Conservation Program and prioritized stabilization efforts of the unstable city gate, which was vulnerable to seismic activity (Rose 2017: 148). The same year, our director Brian Rose asked the Objects Conservation Program to lead treatment of the pebble face since the mosaic was scheduled to travel at the end of the season for display in *The Golden Age of King Midas* exhibit. Getting the panel ready for display involved many basic but time-consuming treatment steps. The general outline of treatment involved surface cleaning, mechanically removing concrete that obscured the pebble surface, adhering loose pebbles, and adding new pebbles and grout to clarify the design (Figure 10) (Harbeck and Johnson 2015). Because we needed to maintain our regular conservation activities on-site, we soon began soliciting help from the Gordion team. Partly due to the end of the season deadline and partly to the growing collaborative nature of the Gordion team, our colleagues made themselves readily available to help. With the aid of Richard Liebhart, an archaeologist familiar with the local geography, we found replacement pebbles at a nearby quarry which likely was the source of the original pebbles.



**Figure 10** Conservators removing excess grout from a pebble mosaic surface. (Photo: Penn Museum Gordion Archive, Image #2015\_01309.)

Our Gordion archivist, Gareth Darbyshire, located an early watercolor drawing and photographs of the mosaic *in situ* that was used to guide pebble placement. Archaeology students helped clean the pebble surface and with selecting and placing replacement pebbles.

Although working several miles from each other, we strove to maintain regular discussions with the architectural conservators and relied on their input. Meetings often took place during meals, breaks, or days off, and were constructive and positive exchanges that have bonded our teams together. Del Bono's team also volunteered to help with treatment during their personal time, and was instrumental in flipping the panel so that the pebble face could be treated, procuring supplies like the sand used in the grout mixture, and building a solid work table to support the mosaic during treatment.

One of the main discussion points was the large areas of loss in the design. It was here that the broader Gordion team, which included our Turkish governmental representative, different archaeologists, and our director met for regular discussions to set the goals. Meetings continued during treatment to review progress on filling the lacunae and identify how much compensation was needed to clarify the design.

Conservation of the mosaic is one of the more complicated treatment projects undertaken by the Gordion Objects Conservation Program. Because of its historical uniqueness and the enthusiasm we received from the Turkish Ministry of Culture and Tourism on the outcome of this one panel, the mosaic continues to be a priority. With one panel complete, we have a better understanding of the treatment needs and logistics for addressing the remaining 32 segments. We continue to work together on a variety of issues including a new display structure and interpretive display at the Gordion Museum, and a review of similar mosaic treatments to refine our treatment methodology. Discussions with our Turkish colleagues are centered on ways to remove the remaining panels from the current display using equipment available on-site and creating a workspace that allows visitor interaction.

## Conclusions

The Gordion Project is one of several Turkish excavations with a long and uninterrupted history, and for many reasons, making Gordion an exciting place to work. The early and tireless efforts by registrar Ellen Kohler to catalog and stabilize new finds from the Young excavations created a solid foundation on which the Gordion Objects Conservation Program could build. In the spirit of her work, a focus on collaborative efforts, research and education is grounded in protecting the collections. Going forward, the Gordion Objects Conservation Program continues to seek ways to dissolve the traditional boundaries between the many specialists at Gordion and promote a sense of shared stewardship. Gordion is presented not as an ideal but instead as a program that, despite many ups and downs, has achieved success.

## Acknowledgements

We are sincerely grateful for the support and encouragement we received from our previous director, Professor G. Kenneth Sams, and the vision and enthusiasm of our current director, Professor C. Brian Rose.

## Note

1. Several major areas of conservation work at Gordion are not part of this review: the Gordion Furniture Project, which was carried out over many years at the Anatolian Civilizations Museum under the direction of Elizabeth Simpson (Simpson and Spiridowicz 1999; Simpson 2011) and the Gordion Architectural Conservation Program (Goodman 2005; Matero 2014), which has focused on the excavated architectural remains of the City Mound and is a long-standing project directed by the faculty and alumni of the University of Pennsylvania Historic Preservation Program with Elisa del Bono in charge of current projects. A major stabilization project was also carried out for the world's oldest standing wood building found inside Tumulus MM that was supervised by Dr. Richard Liebhart (Liebhart and Johnson 2005).

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