HERITAGE CONSERVATION & ARCHAEOLOGY

The Conservation of an Archaic Greek City on Crete

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> *In spite of all that we do, artifacts will deteriorate and age; that is their way of remaining with us, of existing in our present. Disintegration and disappearance play an integral role in the physical identity of sites and artifacts; they are their living memory in the present. Archaeological time does not stop when sites are abandoned. It continues to work at the component matter, which is assimilated into another environment where, imperceptibly, it holds the memory of other eras. (Olivier 2011, 57-58).*
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> *The present is fundamentally archaeological, in the same way that all the other periods of the past are archaeological, if only because the present is their historical extension. (Olivier 2011, 55).*

Laurent Olivier's perception of archaeological time resonates with philosophical concerns and practical problems of site conservation. Using a case study of an on-going excavation on Crete as a context for discussion, this paper presents some of these problems confronting researchers in the Aegean and elsewhere in the Mediterranean.

When we began excavating at the site of Azoria, a 6th century B.C. settlement on the island of Crete, we had to face basic logistical and technical problems involved in implementation of a large-scale and multi-stage program of site conservation (fig. 1). What is more, we also had to consider, in both academic discussion and practical application, this idea of archaeological time.

The broad aims of fieldwork at Azoria (www.azoria.org) have been to recover and document the remains of an early Greek city, studying the earliest phases of urbanization in the Greek Aegean, and reconstructing the sociopolitical organization of the urban center (Haggis et al. 2004; 2007a; 2007b; 2011a; 2011b). Continuing excavations investigate the transition from the Early Iron Age to the Archaic periods (1200-500 B.C.), the early development of the city, and emerging social institutions. Combining diverse research backgrounds and traditions, we hope to reshape a discourse on ancient and modern cultural landscapes, framing new questions in terms of debates current in archaeology, while engaging researchers, students, and local communities with widely differing experiences and perspectives to form multi-vocal dialogues on human-environment interaction through time.

Figure 1. View of Azoria from the south (Photo: Azoria Project)

Important parts of the project are site preservation and public programming. The long-term objectives of our work are to create sustainable programs of direct public and student participation in archaeological fieldwork and conservation, with a view to establishing an open-ended discussion on the broader meanings and impact of archaeological research in the world today. The immediate aim is to form international public-private partnerships that realize the importance of archaeology as the basis for heritage and cultural resource management, local site ownership, and sustainable tourism. Such programs we hope will encourage and enhance efforts by governments to increase environmental awareness, historical and cultural literacy, and on a local level, responsible and sustainable economic development.

Initial Problems

At Azoria, we accepted the fact that archaeological excavation is a destructive, destabilizing, and inherently transformative activity (fig. 2). By destroying archaeological contexts as we expose, document, and interpret them, we actively affect the physical structure and identity of the site, which in any case, is not a constant and static universe. That is, rather than frozen in time, unexcavated sites do not remain untouched, pristine, or in a perfect unalterable

stasis. Even in their buried state, a site and its contexts are, following Olivier's view above, continuously altered by conditions of slope, vegetation, erosion, salinization, sedimentation, climate, drainage, animals, seismic activity, and deep plowing, to mention only a few common variables. While change is inevitable and constant, and not actually stopped by leaving a site unexcavated—a commonplace rationale for intensive survey in the 1970s and 1980s—one dramatic irony of digging is that by exposing a site through excavation, archaeologists are in fact hastening and exacerbating the destruction of the very thing they seek to recover and study, while introducing new destructive agents.

Figure 2. East wall of the Communal Dining Building, temporarily stabilized during conservation (Photo: Azoria Project)

We saw this at Azoria after our first season of excavation in 2002. Our initial question was: how do we stabilize and conserve the ancient walls, floors, and features that we have uncovered, and at the same time, restore the equilibrium of the contemporary landscape (the combination of ancient remains and modern baulks, paths, agricultural terraces, and so on) that has been irrevocably disrupted through excavation, thus repairing the damage that we have done, or at least slowing down new destructive agents that we introduced by digging?

And the second question was, if conservation is in itself a transformative process, how do we do this in a way that will have the least effect on the physical structures that we have exposed, and the least impact on our ability to continue to study the site and reconstruct its history of occupation; and for others, the ability to comprehend and visualize details of ancient building practices, construction methods, phases of architectural modifications, as well as actual abandonment and post-abandonment formation processes?

A third and equally important question was: how long will the results of our conservation efforts last and how will they react or adapt to the environment? Even though we remained confident that our actions served to preserve the state of the site as we had exposed it, to the best of our abilities and resources, we also wondered how our interventions might affect the condition of the site through time and our ability to understand it. This third question remains perhaps the most important philosophical and practical concern confronting excavators today.

If any act of conservation is logically reversible and its outcomes potentially impossible to predict for the long term, then what is the future of all archaeological sites (and all excavations)? Even though imperatives exist today to conserve archaeological sites, there are also clear difficulties in securing substantial and sustainable financial support for archaeological conservation, which is enormously expensive and time consuming—endowments supporting archaeological fieldwork want data recovery, research, and publication, not conservation or cultural resource management. Given these opposing tendencies, how can we realistically hope to preserve archaeological landscapes for the long term? The question is merely how long and it what forms the change and eventual disappearance will take.

Figure 3. Chief conservator S. Chlouveraki excavating a fragment of a fallen roof beam from the floor of the Hearth Shrine (Photo: Azoria Project)

In an age that has self-righteously rejected the old-fashioned passive neglect of over a century of field archaeology—that is, just walking away from a site after excavation letting nature take its course—the question remains as to whether governments or archaeologists are actually capable of, or even interested in, keeping up with the real financial and labor investment required in this ideal global vision,

one that should probably expect to conserve a site in perpetuity in response to constant encroaching environmental and sociopolitical changes in the contemporary landscape.

Figure 4. Conservation of the east wall of the Monumental Civic Building (Photo: Azoria Project)

The archaeological present is no more forgiving than the archaeological past, and we have yet to come to terms with the idea that our static and synchronic creation of the "preserved site," is not only undergoing a physical transformation as we speak, but that everything we do to a site, and every subsequent effort we expend in conserving it, ultimately changes it all the more, pulling that site further into the phenomenological landscape of the present, and into our own interpretation of what we think the site should be.

A common solution to this conundrum is reburying the site, known as "back-filling." After the archaeologists have recovered their data, and documented the contexts, then, because of lack of money, time, or interest, or in passive avoidance of all of the problems mentioned above, they lay down a layer of geotextile over walls and floors and features, and fill the spaces with dirt, normally derived from their original excavation. Such a method is, however, not inexpensive and, more importantly, removes the site from our realm of immediate experience and limits the possibility of future research or visitation.

The Site of Azoria

These are the problems that we considered and discussed at length, while making decisions in the field at Azoria. Back-filling, for example, was not an option for us. The horizontal extent of excavation, steep slopes and unstable terrain, patterns of erosion, and depth of deposition at Azoria made it unfeasible, if not practically impossible, to rebury the site in attempts to restore the landscape to the state before excavation. Moreover, the conditions of our excavation permit from the Greek Ministry of Culture, and the interests of the local village of Kavousi, were to create an archaeological site that could function as a cultural resource in the region. Also, for us archaeologists, the importance of the site outweighed any such considerations.

Azoria is an Archaic city, with standing architecture spanning the late 7th through early 5th centuries, and well-preserved domestic and civic contexts that are providing critical information about the structure of settlement in a period hitherto poorly understood on Crete—indeed a veritable lacuna in the archaeological record of the island. Given the rarity of properly documented 6th–century remains in the Aegean, the considerable gaps in our knowledge of Archaic domestic space and early Greek civic buildings (Haggis 2011a; 2011b; Haggis and Mook 2011a), our aim was, from the outset to conserve and prepare the site for public visitation.

Figure 5. Using hand tools to remove the earth mortar (Photo: Azoria Project)

The site was established in Late Minoan IIIC (ca. 1200 B.C.), continuously occupied through the Early Iron Age, and then radically transformed in the Archaic period (700-500 B.C.) with material remains consistent with urbanization (Haggis and Mook 2011b). Our initial campaign of excavation in 2002-2006 demonstrated that by the end of the 7th century B.C., the settlement was substantially rebuilt. This dramatic renovation significantly altered the plan of the site, its architectural form and spatial organization. New buildings suggest an increase in site size and population, and an equally new conceptualization of public and domestic space. The elements of city planning are the formal repetition of house types

(Haggis and Mook 2011a); the construction of concentric circuit walls, organizing and restructuring space; and two civic building complexes, unparalleled in the Aegean, consisting of the Communal Dining Building and the Monumental Civic Building, both evidently constructed for communal feasting and public rituals (Haggis et al. 2011a). A burnt destruction and rapid abandonment at the start of the 5th century B.C. preserved systemic deposits giving us unusually detailed information about the form and function of an Archaic city.

Figure 6. S. Papadaki using an air-compressor pistol to remove the ancient mortar. (Photo: Azoria Project)

Field Conservation at Azoria

The ancient walls and built features in the buildings at Azoria were made of fieldstones and earth mortar, while the superstructures of the flat roofs used wooden beams and slats to support layers of gray-green phyllite silty-clays. The wood of the roofs does not survive except if burned—it is normally found carbonized as pieces of charcoal lying on the floors or imbedded in collapsed ceiling debris (fig. 3). The local wall stones are dolomite, gray crystalline limestone (*sideropetra*), and phyllite (schist). The Archaic building practices involved bedding rather large dolomite boulders with hammered or roughly dressed facets and faces, and then setting regular courses of smaller blocks and boulders of *sideropetra*, dolomite, and schist (fig. 4). Because of the catastrophic nature of the Archaic destruction of the site, subsequent seismic activity, and extreme erosion on the slopes, the walls needed stabilization and conservation soon after exposure.

Large scale conservation was conducted from 2003 until 2008, by permission of the Greek Ministry of Culture and under the supervision of the Archaeological Service. Efforts to understand the impact and effectiveness of our conservation practices, have, however, involved a long-term study of materials, techniques, and environmental variables, while repairs from seasonal damage, site upkeep, and maintenance continue to this day.

The overall conservation plan was designed and directed by Stephania Chlouveraki, the Head of the W.D.E. Coulson Conservation Laboratory of the Institute for Aegean Prehistory Study Center for East Crete. Decisions on methods, techniques, and materials were made by Chlouveraki in consultation with the Department of Conservation of the Greek Ministry of Culture; the chief conservator of the Archaeological Museum of Ayios Nikolaos (24th Ephorate of Prehistoric Antiquities); and the Azoria Project excavation foreman, Manolis Kasotakis.

The basic materials and equipment used over the past decade consisted of 34,000 kg of sand; 11,000 kg of white cement; 1000 kg of lime; 250 kg of marble dust; 350 meters of water hose; two plastic tanks (reservoirs); three air compressors; a generator; two electric hand mixers; five air-pressure hammers; two water pumps; and an unaccountable amount of burlap, geotextile, and various hand tools. The field team normally consisted of one or two conservators, five field staff members and several students working about 7500 person hours (fig. 5).

Figure 7. Excavation foreman M. Kasotakis washing a wall before application of the mortar (Photo: Azoria Project)

Field Methods

Our methods and field techniques have evolved over the last decade, but the principal aspects of wall conservation have remained the same. The first stage of architectural stabilization was to remove as much as possible of the ancient earth mortar from between the wall stones on all exposed facets of the walls. The

purpose was to clean the interstices of the wall blocks to a depth of about 10 cm, or as deeply as possible into the wall face, without moving or destabilizing the original position or coursing of the stones (figs. 4-5). While we initially used small-diameter iron rods, ice picks, and small hand picks, to dig out the ancient mortar by hand, we later employed air-pressure pistol-shaped hammers, powered by air compressors, and fitted with a narrow wedge or chisel-shaped head (fig. 6).

Once the ancient mortar was removed, the wall was washed carefully with a hose or sprayer, using the water pressure to clean the surfaces and interstices of the stones (fig. 7). Washing the walls before application of the mortar was critical. The process cleans and reduces the temperature of the surfaces of the wall stones facilitating the adherence, setting, and long-term stability of the compound. The mortar material we used experimentally in 2003 consisted of a mixture of lime, white cement, tephra, and a combination of fine and coarse-grain sand. After observing the condition of the mortar after a year, we noticed that the material adhered well to the masonry, but wider interstices were less stable and some cracks were evident. In 2004 we removed the lime and tephra from the mixture, using principally sand and white cement.

Figure 8. Chlouveraki and Kasotakis applying mortar to Neolithic walls underlying the Archaic Service Building (Photo: Azoria Project)

The final stages of wall conservation are equally arduous: this is the application of the mortar, and then the scraping of the interstices (fig. 8). When applied, the mortar compound must be compacted deeply into the spaces between wall stones, normally using one's fingers at first, and then wooden pegs, hammers and mallets. At this stage the air-compressor pistols were effective; fitted with custom-fashioned hammer-shaped spikes, they could be used to pound the mortar deeply in between the wall stones, with considerable precision (fig. 9). These final stages of the process were perhaps the most important, as the bond between the mortar and stone must create a clean and even seam, sealing the spaces between wall stones completely so that no rain or wind-born soil and vegetation can penetrate the exposed surfaces to take root in the wall. This stage was also time sensitive—the mortars had to be pressed and scraped before setting (fig. 10)—and involved hundreds of hours of scraping down the interstices, further pressing the mortar into place against the stone surfaces.

Figure 9. Use of the air-compressor pistol to pack the mortar (Photo: Azoria Project)

More detailed work, requiring a team of architectural conservators, was necessary to repair fractures in the stepped bench of the Monumental Civic Building (fig. 11). Ancient fissures in the fine *sideropetra* blocks of the bench had begun to expand, after exposure to the elements in 2005 and 2006. Extreme temperature fluctuations at this elevation—especially alternating freezing and warming trends during the winter months—combined with normal seismic activity, caused or widened multiple fractures within the building, and elsewhere on the site.

Future Plans

Our chief conservator at Azoria, Stephania Chlouveraki, has monitored the application of conservation methods, and over the past several years, the aesthetic and structural results of the work, at the same time developing new strategies and materials for the future. Starting in 2013, Chlouveraki has proposed to integrate earth-based mortars using a mixture of white Portland cement, quarry sand, and sieved soil derived from our excavation dumps. The added soil will thus consist of a mixture of natural sediments

from local parent bedrock materials at the site (dolomites and phyllites), which comprised the original archaeological matrices. The effectiveness of the use of cement-stabilized earth mortars has already been widely tested in Cretan contexts by Chlouveraki, along with Eleni-Eva Toumbakari of the Greek Ministry of Culture, Directorate for Restoration of Ancient Monuments; and Vasileia Kasselouri-Rigopoulou of the National Technical University of Athens, School of Chemical Engineering. While assessing the physicomechanical and aesthetic compatibility of the compound, the tests have also demonstrated the benefits of the mortar color and workability, as well as the ergonomics of the application.

From the start, conservation at Azoria has been a dynamic engagement with the site and with the physical and cultural landscapes that shape the place and the archaeological remains. It has also been a dialog between researchers, students, and the local inhabitants of the region of Kavousi.

Starting in 2013, the Azoria Project will implement an international and inter-institutional archaeological fieldwork program, designed to include students and the general public in various aspects of archaeological field research and conservation through hands-on experience doing field work. The program, the Field School in Classical Archaeology, organized through the Duke-UNC Consortium for Classical and Mediterranean Archaeology (CCMA), will provide students and others the opportunity to join the project, learning excavation, recording, and conservation techniques first-hand, as well as various methods and fields of inquiry, such as environmental archaeology, archaeobotany, zooarchaeology, ancient history, and classical archaeology.

Figure 10. Scraping and cleaning applied mortar (Photo: Azoria Project)

The second goal of the project is to implement a program of systematic site preservation and public programming, as a service-learning component of the project. This program consists of architectural conservation and the design of permanent signage and access paths on site. Site preservation will continue to be conducted along with excavation and study phases of the project (2013-2022), and participants will work with the local community, members of regional cultural groups, and researchers, with the goal of preserving and presenting the results of excavation to the general public. The purpose of work in 2013 and 2014 is to create a long-term plan of site management, integrating participation from throughout the United States and Greece, including the villages near the Azoria site. The goal is to encourage community ownership of the site as a cultural and educational resource in the region, while establishing sustainable local, national, and international government and private sources of financial support for site upkeep and maintenance, and educational programs.

Figure 11. Conservation of the stepped bench within the Monumental Civic Building (Photo: Azoria Project)

The third component of engagement is the development a tourism program, centering on the site of Azoria and the broader modern, traditional, and ancient agricultural and cultural landscapes. We have laid groundwork by forming a partnership between the Azoria Project, the local community of Kavousi, and the award-winning eco-tourism group, Crete's Culinary Sanctuaries: Interactive Educational Programs in Crete, Greece (CCS), which runs international seminars on biodiversity and its relationship to modern and ancient agricultural practices in Greece. The ultimate goal is to establish an annual series of seminars on ancient and modern agricultural practices in the region of Azoria, relating the results of archaeological work to traditional agricultural practices and society.

The broader purpose of our work at Azoria is to demonstrate that archaeology plays a vital role in environmental, historical and cultural education. Archaeology explains the physical remains of past human activities that we use to understand cultures, and sociopolitical configurations and identities. It addresses very directly the nature of culture change and the study of cultural context on multiple spatial and temporal scales. In its discourses and applications, archaeology is at once academic, political, and social: it has a direct impact on the day-to-day economies of local communities (where excavations take place), while affecting modern ethnic, national and political identities and understanding. It actively engages and transforms cultural landscapes, and necessarily involves local communities, while developing wide-ranging interactions and dialogues in multiple venues (among students, scholars, governments, and lay people). On an international level, archaeology catalyzes discussion on cultural history, allowing us to better visualize—and to make informed decisions about and negotiate— the diachronically changing dimensions of the human experience.

Archaeological time continues to exist in the present, and the site of Azoria, as a product of both excavation and conservation is very much part of a new systemic context of the contemporary landscape. Conservation is but one of the formation processes that continue to affect the site, and how we see it and understand it. In practice, it has encouraged an active interaction with the ancient remains, in a sense creating an on-going dialog between conservators, archaeologists, local inhabitants, and the site itself.

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