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Cover Image: Iron Age terracotta figurine of a horse and rider from Cyprus.
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Editor's Welcome

Over the past several decades, and increasingly in recent years, there has been a movement toward interdisciplinary research in archaeology. *Chronika* strives to be at the forefront of this movement, by establishing a platform for graduate students of European and Mediterranean archaeology to share their research across disciplines. As a forum for interdisciplinary dialogues, *Chronika* provides an opportunity for students to expand the scope and depth of their research in new and provocative ways.

The disciplines of Anthropology, Classical Studies and Visual Studies share a common heritage in the humanities. Over time, however, this common heritage has been neglected, as archaeologists in each discipline develop theories and methods designed to answer specific research questions favored within their respective fields. The process of creating and defining acceptable parameters of research has contributed to a heightened sense of self-awareness inside disciplines; a phenomenon that has led to isolation.

At *Chronika,* we believe that it is worthwhile to reestablish interdisciplinary dialogues between archaeologists in Anthropology, Classics and Visual Studies; particularly among those who work in Europe and the Mediterranean. A greater emphasis on lateral thinking will emerge as a result, and a new generation of scholars, trained in interdisciplinary collaboration, will revitalize the field and encourage the production of original, engaging research.

Already within this inaugural volume of *Chronika*, one can observe disciplinary boundaries breaking down, in favor of multidisciplinary research. Leslie Feldballe utilizes both historical and archaeological evidence in her analysis of ethnicity and identity in the Iberian peninsula. Patrick Fazioli employs archaeological, geochemical, and historical research in the reconstruction of past landscapes in Austria. Darren Poltorak also uses phosphate analysis in his investigation of a Roman fortification and settlement in Romania. Joey Williams investigates his site in Portugal through excavation, ceramic analysis, GIS data, and historical research. Interviews with Dr. Michael Galaty and Dr. Carrie Murray provide thoughtful perspectives on how interdisciplinary research has influenced the careers of scholars in the field. Student participation in workshops and reviews of recent books further demonstrate the results of interdisciplinary research and collaboration.

The future of archaeological research in Europe and the Mediterranean lies in interdisciplinary collaboration. *Chronika* was established in order to provide graduate students with a venue to share their research, and to serve as a platform for interdisciplinary dialogues. The contents of this inaugural volume highlight the great range of projects currently being undertaken by students of Anthropology and Classics. We hope that readers will find the text informative, and a stimulating example of what the future holds for interdisciplinary collaboration among graduate students of European and Mediterranean archaeology.

James Artz
Laura Harrison
Michael Rienti, Jr.

Director's Welcome

It is with enormous pleasure that I welcome *Chronika* to the Publications of the Institute for European and Mediterranean Archaeology. I am especially delighted since this publication was initiated, edited and produced by IEMA graduate students.

The truly interdisciplinary character of IEMA shines through the pages of *Chronika* with articles ranging from European Prehistory to the Roman Empire and the Middle Ages. We look forward to future dialogue and debate among students of European and Mediterranean Archaeology from the University at Buffalo and beyond.

Let me use this note to also briefly introduce the Institute for European and Mediterranean Archaeology (IEMA) at the University at Buffalo (UB): IEMA is a Signature Center of Excellence within the College of Arts and Sciences and was created in 2006 by an interdisciplinary faculty, drawn from departments of anthropology, classics and visual studies. It consists of ca. 60 UB faculty and graduate student members and ca. 100 affiliated members from the US and abroad and is housed in the departments of anthropology and classics in the Ellicott Complex at UB North Campus.

IEMA's mission is (1) to coordinate, facilitate, and promote the research and teaching activities of faculty and students at the University at Buffalo concerned with the archaeological investigation of the European and Mediterranean areas; (2) to promote the study and teaching of the archaeology of the Mediterranean and European areas in the Western New York/Southern Ontario region, North America, and beyond; (3) to establish and maintain the University at Buffalo as a leading national and international center for research and teaching in the archaeology of the European and Mediterranean areas; and (4) to educate the general public about the archaeology of Europe and the Mediterranean and the significance of the experiences and contributions of the peoples who have inhabited these areas in the past.

In the fall of 2010, IEMA launched its Distinguished Monographs Series with SUNY Press by publishing two monographs. Two more are under peer review for 2011 and we plan to publish two per year. We also have two book manuscripts forthcoming and four book proposals. Over the past four years, IEMA organized four postdoctoral conferences and 36 public lectures. The lecturers, who stemmed from Austria, Canada, Germany, Hungary, Italy, Poland, Portugal, Russia Turkey, the UK and the Ukraine, represent both the wide interests of the IEMA faculty and graduate students and the international nature of the work. Since 2009, IEMA graduate students have organized regular hands-on IEMA workshops and Brown Bag Talks, which have proven an excellent source of academic inspiration. We have established international partnerships with the Universities of Cambridge/UK, Kiel/Germany, Sorbonne Paris/France and Catania/Italy and partnerships with universities in Canada and Europe are forthcoming. We have created a listserv for European Archaeology with ca. 150 scholars in Western New York, New York State and Southern Ontario.

Clearly it's an exciting and promising enterprise and I am thrilled to be part of it. I would like to express my deep gratitude to the College of Arts and Sciences, the departments of Anthropology, Classics and Visual Studies for their support and encouragement in putting IEMA together. My special thanks goes to the Associate Editors James Artz, Laura Harrison and Michael Rienti who edited this splendid first issue. Thanks too, go to *Chronika*'s first authors and IEMA members. Your work will help to establish IEMA as the top institution in the United States for the study and research of European and Mediterranean Archaeology.

Peter F. Biehl
Director

Questions of Greek Identity in the Western Mediterranean

Leslie Feldballe

The Greeks from the city of Phocaea journeyed far from their home to establish trading posts in the far western Mediterranean. The Phocaeans encountered a veritable melting pot of peoples on their journey: Celts, Ligurians, Iberians, Phoenicians, Etruscans and eventually Romans all played a significant role in the western Mediterranean. Was there a unique Phocaean identity on the Iberian Peninsula? How did that cultural identity evolved over the course of generations? Using both the literary and archaeological records, I will paint a picture of a thriving Greek culture surrounded by indigenous influences, examining how the two cultures interacted commercially and domestically. I will also examine the means by which the Phocaean Greeks at Emporion were able to preserve ties to the motherland, even if many had never set foot on Ionian soil.

The Phocaean Greeks journeyed far from their Ionian home to establish trading posts in the western Mediterranean, first among the Celts at Massalia, then among the Iberians at Emporion. The far west is known in myth as a land of mystery: of cannibals and temptresses, the stage for the tenth labor of Herakles. The far western Mediterranean was an area largely uncharted by Greeks but known for precious metals and other natural resources. By examining Phocaean interaction with the Iberians, it is possible to shed light on the concept of Phocaean identity as it existed in the Iberian Peninsula, and how that cultural identity evolved over the course of generations. Both the literary and archaeological records paint a picture of a thriving Greek culture surrounded by indigenous influences, showing how the two cultures interacted commercially and domestically. Examining the means by which the Phocaean Greeks at Emporion were able to preserve ties to the motherland, even if many had never set foot on Ionian soil, can also shed light on how they saw themselves, and presented themselves to outsiders.

When examining ancient colonial endeavors it is tempting to rely on the terms "colony" and "colonize" to describe the movements of people, but there are various and diverse ways to define the term "colony". In order to study the Greeks and their "colonial" presence outside of the area that we call "Greece" during the Archaic, Classical and Roman periods, one must consider these definitions of "colony." The Greeks used the term ἀποικία to signify a settlement, nearly always independent or self-governing, of Greeks in a foreign country.[1] They also employed the term ἐμπόριον to mean a trading post, market town or factory, such as were established in the western Mediterranean by the Phoenicians.[2] ἀποικία, meaning "from home", does not neatly translate into "colony" in our modern sense of the word. Nor were the first Ancient Greek "colonists" from the Archaic period colonists as we think of them today. The settler was the οἰκιστής,[3] the person setting out from the motherland to found a city.[4]

The first Greeks to lead the movement away from the homeland to establish permanent commercial settlements were Euboeans from Chalcis and Eretria, who established settlements on the Italian mainland in the 8th century B.C.E., and went on to found numerous settlements in Magna Graecia in the 8th and 7th centuries B.C.E. By the 7th and 6th centuries B.C.E., there were Greek settlements in Asia Minor, along the Black Sea coast, in North Africa and in the Western Mediterranean, which opened up valuable trade routes and forged economic relationships with indigenous peoples, as well as the Phoenicians and the Etruscans. In the 8th century B.C.E., inhabitants of the city of Phocaea, located on the Ionian coast of Asia Minor, began to look west in order to exploit lucrative trade routes already established by the Phoenicians and Etruscans.

The trading post called Massalia was founded in the 7th century B.C.E. by Phocaeans at the site of modern Marseilles in France, and was one of the first Greek ports in Western Europe. We know very little about the archaeology of Massalia because the modern city of Marseille has developed continuously atop the ancient settlement. From here, the Phocaeans looked even further westward in pursuit of trade and natural resources, and set their sights on the Iberian Peninsula. The far western Mediterranean was a mystery to many Greeks, and several myths swirled about its climate and inhabitants. The Pillars of Heracles, or the rocky outcroppings on the Iberian Peninsula and North Africa flanking the Strait of Gibraltar, were famous in the Ancient Greek mythic past.[5] What the Greeks knew to be true, however, was that the west was rich in metals, especially tin, and that these metallurgical resources were already being exploited through complex trade routes previously established by the Phoenicians.

The Greeks also knew of an indigenous Iberian people called the Tartessians with whom the Phoenicians had ample trade, and of the wealth of their kingdom, Tartessos. Comprised of a harbor city and its surrounding area, Tartessos was located on the southern coast of the Iberian Peninsula, in modern Andalusia at the mouth of the Guadalquivir River.[6] The Tartessians were famed in antiquity for their wealth in minerals and precious metals. The areas that are now known as Southern England, France, Spain, and Portugal were rich in tin deposits to which the Tartessians had relatively easy access. The Tartessians were extremely successful at exploiting the natural resources of the region, and they appear to have profited immensely from their ability to control the flow of precious metals down the Guadalquivir River and into the hands of waiting tradesmen.[7]

With precious metals so accessible in the Iberian Peninsula, there is little reason to wonder why the Phocaeans moved west from their settlement at Massalia to found a trading post on the eastern coast of modern Spain. This new site, Emporion, whose name supports its intended function, was founded circa 575 B.C.E., although the ancient sources disagree as to whether it was Phocaeans from Phocaea or Phocaeans from Massalia who first settled there.[8]

The original settlement at Emporion is known as the *Palaiapolis*, located on a small island at the mouth of the river Fluvia. Once the *Palaiapolis* was established, Greek pottery began to appear at indigenous sites further inland, at places like Ullastret, an indigenous settlement nearby, which showed signs of having prospered once Emporion was established. After about a generation, some of the settlers of the *Palaiapolis* moved to the mainland and created an additional settlement known as the *Neapolis*. Despite the fact that most of the remains date to the Roman period, it is possible to get an idea of what the *Neapolis* looked like in the Greek period. Prior to 200 B.C.E. it appears that the city lacked a theatre or other structure for entertainment. This is not surprising since the settlement in its earliest phases was a trading post. Both Strabo and Livy describe the *Neapolis* as a *dipolis*, or a "double city", with separate neighborhoods for Iberians and Greeks which were separated by a wall within the city itself.[9] Excavations at Emporion have yet to yield the location of the indigenous quarter of the city that was so widely reported in the ancient sources, nor are there any indications of a wall which separated the Iberians and the Greeks. Analyses of the *necropoleis* at Emporion indicate that Greeks and Iberians shared cemeteries and were often buried with a mixture of Greek and indigenous grave goods, and the Emporitans enjoyed a prosperous relationship with the Iberians at the nearby settlement of Ullastret. It appears that the inhabitants of Ullastret benefitted immensely from the nearby Greek presence and the huge influx of eastern Mediterranean goods which poured into Emporion. Extensive trade with Emporion is attested by a large number of Emporitan coins from the 3rd and 2nd centuries B.C.E.[10] Given the friendly relations between the Emporitans and their indigenous neighbors, it would not be radical to assume that they would have shared their urban space.

In addition to Emporion, there is a collection of other settlements known through the literary record to have been established by the Greeks on the Iberian Peninsula.[11] Only one of these settlements, Rhode, has been attested in the archaeological record. Rhode is located across the Bay of Roses from Emporion, and the two comprise the only two known Greek settlements, or "colonies" on the Iberian Peninsula. A popular theory tells us that Rhode was founded by settlers from Rhodes in the 8th century B.C.E., but it was likely founded in the 5th century B.C.E. by settlers from Emporion and Massalia.

In order to understand how the western Greeks viewed themselves and their cultural identity as part of the larger cultural milieu of the Mediterranean, one must first try to understand the idea of cultural identity in and of itself. In Greek, the term ἔθνος has been employed by many authors throughout history to mean a variety of things. Liddell and Scott define ἔθνος in its simplest form as a number of people living together, a company, or a body of men.[12] It has been used to describe tribes, groups and nations. The common denominator of all these uses, however, is that it essentially describes a group of people living and acting together, although not necessarily belonging to one race, tribe or kinship group (γένος).

In modern English, we have no term like ἔθνος. The closest approximation that we have has been identified by the sociologist Anthony Smith as the French word *ethnie*. According to Smith e*thnie* does not describe an objective ethnic reality, but more the meanings "conferred by a number of men and women over some generations on certain cultural, spatial and temporal properties of their interaction and shared experience."[13] There are several dimensions of *ethnie*, according to Smith, including a collective name, Thucydides focuses on this concept in the *Archaeology,* the first book of his *History of the Peloponnesian War,* when he discusses the development of the peoples of *Hellas*. Another dimension is that of a common myth of descent: foundation mythology is widespread in the ancient literature. A common foundation myth can help groups of people answer questions about why they are all part of the same community. Once this has been established, this can be carried away from a specific

geographical region with colonies or even colonies of colonies. Other dimensions of ethnicity include a shared history, a distinctive shared culture, an association with a specific territory, and a sense of solidarity.[14]

Before these dimensions can be explored through the lens of emigration, one must first examine how the Greeks viewed themselves even before they began to send settlers to faraway lands. There is an idea of a common "Greek" identity, but the inhabitants of the area that we know as Greece can fundamentally be seen as speakers of a set of related, mutually intelligible dialects of what we know as Greek. These ancient speakers, however would likely not have thought of it in such broad terms. Dialectical differences between Dorians, Ionians and Aeolians, would have been glaring to native speakers. We know that throughout the ancient texts, the Greeks are split into these dialectical and regional groups, the Dorians, the Ionians, the Aeolians, the Lesbians, the Arcadians, the Cypriots – the list can go on as one narrows down regional and dialectical differences.

But did these regional differences prevail once Greeks began to emigrate and the settlers now viewed themselves not on a stage with other Greeks, but on a stage with completely different cultural and linguistic groups? It seems unlikely that when the first Greek settlers came out to the west in the 8th century B.C.E., that they carried with them the "preconstituted consciousness of belonging to a wider Hellenic community."[15] These Greeks would have begun to view themselves in contrast with the indigenous populations they encountered. In their journey westward, the Phocaean Greeks would have crossed paths with a host of indigenous peoples: the Celts in the lower Rhône basin of France and the interior regions of France, Spain and Portugal, the Ligurians, along the north Italian coast east of Massalia and on the Iberian Peninsula, the Iberians along the coastal zones of Southern and Eastern Spain.[16] These settlers would have been living a great distance from and out of regular contact with the motherland, among populations with whom they shared no common language or customs. In this situation, they may have thought more proudly of themselves as "Greeks" than they did before they left home.

According to Strabo, prior to the founding of Massalia, the Phocaeans consulted Artemis of the Ephesians for guidance in this venture and were provided with an Ephesian woman named Aristarkhe as the leader for their expedition. The night before they set sail, the goddess appeared to Aristarkhe in a dream, ordering her to take along with her the sacred image of Artemis.[17] The Phocaeans solidified their distinctive Ionian identity, which the sociologist Smith names as a fundamental aspect of *ethnie,* when they brought with them the cult of Ephesian Artemis. Ephesian Artemis was venerated at Massalia and Emporion, although no archaeological remains of the cult have been located, and there is evidence of worship of the goddess at Ibiza and other sites around the Iberian Peninsula.

When a city like Phocaea was in the planning phases of emigration, it would appoint a person or a group of people who would function as the *oikist or oikists:* the founding member or members in charge of organization and control. This person would have overseen construction, religious ritual and "foreign policy" - interaction with the indigenous peoples. The *oikist* of Massalia is reported to have been a man named Protis, a merchant. Protis would have been the man to oversee the veneration of Ephesian Artemis, as well as other gods worshipped there, and establish temples in her honor. Aristotle tells us that there was a γένος at Massalia known as the Protiadai, who were descended from this *oikist.*[18] Although there would indeed have been an *oikist* at Massalia, it is likely that "Protis" was invented for the self-glorification of this *genos* and the reinforcement of the symbolic power that the *oikist* had in the settlement. Protis is derived from the Greek word for "first" and is likely a symbolic name of the *oikist*. The γένος of the Protiadai had claim in name to being the first inhabitants of Massalia, and the Massaliotes were unified under the foundation tale of Protis.

It appears that, at the time of their foundation, the inhabitants of Massalia and Emporion did not come into violent conflict with the indigenous populations. At Emporion especially, the Iberians seemed to welcome the permanent Greek presence, and the local population thrived as partners in the trade relationships forged in the Iberian Peninsula. The flow of precious metals from the west and goods from the east created a prosperous environment that appeared to last for several generations.

The Emporitans appear to have been open to sharing their space with their indigenous neighbors: recall that they are reported to have shared the same settlement at Emporion; numerous *necropoleis* there indicate that they shared the same burial space as well. But how did they set themselves apart? The Phocaean Greeks were only a part of a melting pot of peoples in the western Mediterranean. How does one go about looking at the ways in which they distinguished themselves in this cultural milieu? Changes in architectural style and urban planning can shed light upon possible answers to this question.

In the 2nd century B.C.E. the city of Emporion underwent a series of massive renovations and was expanded to include a religious complex and enlarged agora. With the city having been originally founded as an *emporion,* as its name so rightly proclaims, it is not unusual that the residents would have wanted a large commercial center, even if it does come at a later phase. By this time, the settlement at Emporion had been growing for generations, and most of the Greeks here would never have set foot on the soil of the Ionian motherland. The 2nd century B.C.E. brought with it the arrival of a Roman military presence on the Iberian Peninsula in response to the Carthaginian threat led by Hannibal. The Romans came in 218 B.C.E., under the leadership of Gnaius Cornelius Scipio Calvus, and added another layer to the complex relations which surrounded the Greeks there. Emporion became a strategic location for the Romans in the fight against Hannibal in the 2nd Punic War. The Roman presence cast a blow to Emporitan autonomy in the Iberian Peninsula. In response to this new and aggressive Roman presence, the Emporitans appear to have felt the need to reaffirm their ties to Phocaea and to reestablish themselves as the trade and commerce hub of the Iberian Peninsula. As Kaiser hypothesizes, the addition of permanent, monumental architecture to their city plan was perhaps not spurred by increased prosperity brought by the Romans, but was a response to political stress. The Romans likely upset the delicate balance that the Emporitans had cultivated with the Iberians since they first arrived.[19]

By the time the Romans appeared at Emporion, most Emporitans had likely never set foot in Phocaea. They may have been descended from Phocaeans, or Massaliotes, or they may have been of mixed Greek and Iberian heritage. But one must wonder if the fact that they had never visited the city that had sent forth their ancestors affected them at all. To the Emporitans, Emporion *was* Phocaean soil. These 2nd century B.C.E. renovations were likely emblematic of the desire to maintain economic control of the area, as well as establish the settlement more permanently with public architecture. It is clear that the Emporitans were working to distinguish themselves in some capacity, at the very least from the Iberians.[20]

It is important to remember that any Greek identity was diverse and in a constant state of evolution. This is especially true when examined outside of the areas in which the Greeks were the dominant indigenous culture.[21] In addition, similarities between the Phocaean settlements at Emporion and Massalia, as well as other Phocaean settlements like Lampsacus and Elea, might suggest other trends that show that there developed a distinct Phocaean identity. Recall that several ancient sources tell us that Emporion was populated by Phocaeans *and* Massaliotes, and the ancient authors have a tendency to regard these western settlements as either Phocaean *or* Massaliote, often without distinction. An inscription from the Phocaean settlement at Lampsacus in Ionia, relatating to peace agreements between Rome and Philip V, describes Massalia as the sister city of Lampsacus. The Massaliotes declare themselves to be the brothers of the Lampsacenes, and that good will always accompanies kinship.[22] This indicates that even in the 2nd century B.C.E. close ties remained between the daughter cities of Phocaea, long after the first Massaliotes sailed across the Mediterranean from Ionia. The inhabitants of these cities had an awareness of their Phocaean ancestry and their identity as Phocaeans.

One cannot ignore the archeological evidence for Greco-Iberian interaction at Emporion and the surrounding Iberian settlements. This can likely be ascribed to the fact that Emporion was established by the Phocaeans as a trading post, and thrived on interaction with the indigenous population to fuel trade and commerce. Their reason for settling was to reap the natural resources from these lands and partake in the lucrative trade routes controlled by Tartessians, Phoenicians and Etruscans. Understanding and interacting with the local peoples would have been entirely to their benefit. Similarly, the locals would have viewed the settlers as potential for increased wealth and thus worked to preserve friendly relations.

The trend of good relations between the settlers and the indigenous, the consistency of religious traditions with sister cities and the motherland and the evidence of political solidarity all coalesce to form a sense of Phocaean heritage that recalls the sociologist Anthony Smith's dimensions of *ethnie,* or ἔθνος. Even if the Massaliotes and Emportans of the 2nd century B.C.E. could not feel the same connection to the motherland that their founding fathers did, they were still able to project a Phocaean identity to the outside world. In the later years of their development, their Phocaean identity was not a last vestige of a culture disappearing under the influence of the Romans, but was consciously maintained by the communities in order to project that identity to the rest of the Mediterranean.

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[1] Websters New International Dictionary. "Colony" 528.
[2] Liddell and Scott 1889, " μπόριον" 256.
[3] Liddell and Scott 1889, "ο κιστής" 546.
[4] I will use the terms "settlers" and "settlements" rather than "colonists" or "colonies" to ensure that no unwanted connotations come with the terminology. This will allow the author to discuss ancient Greek settlements in a general sense, and to differentiate where needed to discuss more specific terminology.
[5] As the tenth of his twelve labors, Heracles journeyed west to obtain the cattle of Geryon on the island of Erytheia in the far western Mediterranean. (Strabo. *Geog.* 3.5.5).
[6] Pausanias. *Description of Greece.* 6.14.3.
[7] Herodotus. *Hist.* 1.163
[8] Livy tells us that it was colonists from Phocaea itself that founded Emporion (*History of Rome.* 34.9.1) who also resided there with Massaliotes and Iberians. Strabo says that the founders were from Massalia (*Geography.* 3.4.8).
[9] Strabo. *Geog.* 3.4.8, Livy. *Hist. of Rome.* 34.9.1-2
[10] Martin i Ortega 2001.
[11] Carpenter 1925.
[12] Liddell and Scott 1889, " θνός" 226.
[13] Smith 1986, 22.
[14] Smith 1986.
[15] Hall 2004, 38.
[16] Dietler 2009.
[17] Strabo. *Geog.* 4.179
[18] Preserved by Atheneus 13.576a.
[19] Kaiser 2001.
[20] Kaiser 2001.
[21] Lomas 2004, 475-490.
[22] Dominguez 2004.

The Dynamics of Culture Contact in the Eastern Mediterranean Bronze Age: Evidence from Aghia Photia

Laura Harrison

The intensification of interregional contacts between the Cyclades and Crete in the Early Bronze Age is often linked to the development of the first palace states on Crete ca. 1900 B.C.E. Emerging elites in the Cyclades and Crete established long-distance trade routes in order to secure access to prestigious items, including metals, needed to legitimize their authority. This phenomenon created an international spirit,[1] which involved both the movement of goods and the establishment of new sites at strategic locations. The cemetery at Aghia Photia on Crete is in a unique position to shed light on these processes, since the tomb architecture and contents have pronounced Cycladic parallels, and appear to indicate that those entombed there migrated from the Cyclades.

Archaeological Evidence for Culture Contact

Understanding the dynamics of culture contact is possible through a careful study of several kinds of archaeological material. Pottery is the most abundant material from Bronze Age sites, and it is well suited for this purpose. Mineralogical studies of pottery allow archaeologists to identify specific inclusions in the clay fabric. Since potters tend to use locally available materials, which are distinctive due to local geology, it is possible to determine whether a particular sherd is locally made or imported from elsewhere.[2]

Gold, copper and tin were used increasingly in the Bronze Age to make tools, weapons, and personal ornaments. The presence of metal artifacts is often associated with elite status, and linked to the intensification of interregional contacts in the eastern Mediterranean. Tin is an essential ingredient required to make certain kinds of bronze, yet is scarce in the Mediterranean. The closest known sources are located in Afghanistan and on the Iberian Peninsula. As demand for tin increased in the Early Bronze Age, so did the incentive for distant populations to engage with each other through long-distance trade. The abundance of metal artifacts in the Early Bronze Age Mediterranean, what Colin Renfrew refers to as *metallshock,*[3] indicates that long distance trade for both raw materials and finished products must have been intensive in this period.[4]

Burial customs provide additional evidence for culture contact in the Early Bronze Age. As Davaras and Betancourt point out, "tombs can confirm the cultural identity of a community and the ethnic affiliations of its members."[5] Despite the high degree of variation in burial styles in Early Bronze Age Crete, two main categories emerge: the house tombs of the north, and the circular tholos tombs of the southern Mesara region.[6] Populations from the Cycladic islands to the north, however, buried their dead in small cist tombs, maintaining their own distinctive burial practices despite increased contact with Crete.[7] The appearance of a new burial style in an area dominated by a different burial tradition can support hypotheses of culture contact, as discussed below.

Case Study: Aghia Photia

Aghia Photia is a site on the northeastern coast of Crete, 5 km east of modern-day Siteia. It consists of a settlement atop a small hill overlooking the Aegean Sea to the north, and a cemetery 200 m to the east. Radiocarbon dates and ceramic sequences indicate that Aghia Photia was occupied in the Prepalatial period of the Early Bronze Age. The cemetery at Aghia Photia, with 262 tombs, is the largest Bronze Age cemetery on Crete, and one of the largest in the Aegean. There are three types of tomb architecture present at the cemetery: cist tombs, pit graves and a rock shelter.[8] By far the most common type is the cist tomb, which consists of an antechamber and a burial chamber separated by a stone slab.

Although the burial chambers of cist tombs vary widely in shape (they can be rectangular, elliptical, circular, or irregular), they are similar in their orientation (most tombs face northeast, toward the sea), their construction (subterranean chambers dug into the limestone bedrock), and their small size (the largest being 2.35m in length).[9] A substantial amount of offerings (approximately 2000 vases) were found in the burials, usually near the head or body of the deceased individual.[10]

The cist tombs at Aghia Photia are very different from other Early Bronze Age burials on Crete. Typical Cretan tombs of this period are communal, so

cemeteries have a small number of tombs in relation to the number of people buried there. The Cretan house tombs, such as those at Mochlos in northeastern Crete, were often constructed above ground against a cliff, and were built so that adjoining rooms shared common walls. They are also substantially larger (occasionally over 3.5m in length) than those at Aghia Photia and other Cycladic style cemeteries. Tholos tombs containing multiple inhumations in large circular chambers are also markedly different, in terms of size and architectural layout, than the cist burials at Aghia Photia.[11] As Davaras and Betancourt point out,

> "The crucial characteristic of the built tombs used at Aghia Photia is that each construction consisted of two interconnected spaces, each with its own function. The usual Cretan burial practices could use either caves, single architectural spaces, or several interconnected or adjacent spaces…but they never had the two-part architectural design of the Aghia Photia built tombs." [12]

The significance of the Early Bronze Age cemetery at Aghia Photia lies in its connection with Cycladic burial traditions to the north. The strongest architectural parallels to the tombs at Aghia Photia are in the Cyclades, at sites such as Phylakopi on Melos, Chaliandrini on Syros, Agrilla on Ano Kouphonisi, and on the island of Thermi. Notably, Chaliandrini (with over 600 excavated tombs) is the only cemetery in the Aegean with more cist tombs than Aghia Photia.[13]

Ceramics provide additional evidence for a connection between Aghia Photia and Cycladic cultures to the north. More than 95% of the ceramics from the cemetery have close ties with the Kampos group of ceramics from the Cyclades, based on style, technology, shape and clay recipe.[14] Kampos pottery found at Aghia Photia has the same petrographical and technological composition as Cycladic pottery from Naxos, Paros and Amorgos, and is found in association with other materials like obsidian blades and "Pyrgos" bottles that are "definitely of Cycladic provenance."[15]

Metallurgical evidence at Aghia Photia points to Cycladic connections as well. Metal objects from the cemetery include a bronze axe/chisel, as well as long daggers with central midribs, chisels, saws, awls, fishhooks, and small animal-shaped figurines that all have Cycladic parallels.[16] Regular, long-distance trade for metals is attested by provenance studies that show the copper in these objects is of Cycladic origin.[17]

The Cycladic connection is strengthened because both crucibles from the cemetery, found in Tombs 10 and 45, show formal ties with Cycladic types.[18] They both have substantial residue from vitrification, a high degree of copper, and a low degree of iron, which indicates they were used to melt and cast copper that had already been smelted. This reveals that the residents of Aghia Photia were engaged in trade for copper that was smelted in the Cyclades, and that they manufactured the finished metal objects locally.[19]

Conclusion

Taken individually, the ceramic and metallurgical discoveries at Aghia Photia may appear to indicate that the relationship between Crete and the Cyclades was simply one of intensive trade. Taken collectively, this does not adequately explain the number and types of objects found that are consistent with Cycladic material culture. In addition, if trade were sufficient to explain the finds at Aghia Photia, we would expect to discover strong evidence of other trading partners at Aghia Photia, which we do not. The lack of *diversity* in the objects found at Aghia Photia, and their parallels with remains found in the Cyclades requires a different explanation: Aghia Photia was built and occupied by a Cycladic population that migrated to Crete. In other words, the Aghia Photia discoveries call for a migratory explanation, not a trade one.

Propelled by an international spirit, driven by the desire to obtain prestigious imported metals, the residents of Aghia Photia may have established a settlement on Crete in order to exploit their access to valuable raw materials in the Cyclades and beyond, and bring them to a growing market on Crete. The introduction of metals to Crete may have fueled the development of social hierarchies, based on differential access to these prestigious items. Ultimately, metal objects played an important role in the palatial economies of Minoan society. Perhaps Aghia Photia was one of the earliest permanent settlements linking Crete with the valuable metal resources of the Eastern Mediterranean and beyond, which contributed to the rise of palace states around 1900 B.C.E.

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[1] Renfrew 1972.
[2] Hodges 2000,198, Renfrew 1969, 154.
[3] Renfrew 1972, see also Tsipoulou 2007, 140.
[4] Muhly 1985.
[5] Davaras and Betancourt 2004, 4.
[6] Davaras and Betancourt 2004, 235, Watrous 2001,172.
[7] Day et. al. 1998,145-47, Davaras and Betancourt 2004, 235.
[8] Davaras and Betancourt 2004, 232.
[9] Davaras and Betancourt 2004, 232; Betancourt and Muhly 2007, 146; Day et al. 1998, 135.
[10] Watrous 2001,164.
[11] Davaras and Betancourt 2004:235-37, Watrous 2001:172.
[12] Davaras and Betancourt 2004:236-237.
[13]Broodbank 2000, 302; Davaras and Betancourt 2004, 5, 238; Day et al. 1998,136; Watrous 2001:164.
[14] Betancourt and Muhly 2007:146, Day et al. 1998:133-136, Davaras and Betancourt 2004:231, Watrous 2001:164.
[15] Day et al. 1998:139.
[16] Betancourt and Muhly 2007:151.
[17] Day et al. 1998:135-136.
[18] Betancourt and Muhly 2007, Tsipopoulou 2007.
[19] Betancourt and Muhly 2007:150.

Landscape Archaeology in the Eastern Alpine Region: Archaeological, Geochemical, and Historical Approaches to the Past

K. Patrick Fazioli

*This report summarizes the results of archaeological, geochemical, and historical research in the reconstruction of past landscapes in a small region of southeastern Austria. During field seasons in 2009 and 2010, the author coordinated pedestrian surface collection, soil phosphate survey, and targeted test excavations over c. 4 km^2 area along the Middle Mura river valley in order to identify changes in past settlement and land use from prehistory through historic periods. Diagnostic ceramic materials provide the chronological context for examining the evolution of the human landscape over the past three thousand years and phosphate analysis provides further evidence of long-term land use and field systems. Results indicate a possible correlation between prehistoric and post-medieval use of space, with significant settlement and land use expansion beginning in the 15th century C.E. Overall, the survey was able to effectively trace changes in past human activities beyond what was known through previous excavations of individual sites.**

Introduction

This report summarizes the results of archaeological and geochemical survey in several non-contiguous areas along the Mura River valley, in the southeastern part of Austria. This work was carried out as part of the doctoral dissertation research of the author, and was funded by a Dissertation Improvement Grant from the National Science Foundation. The goals of this project were to (1) identify and investigate areas of past human activity within a small section (~4 km^2) of this river valley through the integration of multiple complementary datasets; (2) to determine the potential and limitations of soil phosphate analysis as a method of archaeological prospection and landscape reconstruction in the Eastern Alpine Region; and (3) to track long-term changes in human settlement and land use through soil chemistry and material culture.

The Mura River (Ger: *Mur*) is a tributary of the Danube that flows from the High Tauern region of the Alps into the Drava River in Croatia. The Middle Mura region runs north to south through the center of the Austrian province of Styria (Ger: *Steiermark*) roughly from the capital city of Graz to the city of Leibniz. This research project is situated along the Middle Mur directly between these two cities, near the town of Wildon (see Figure 1). Although this region has not received as much archaeological attention as other areas of the eastern Alps, recent excavations have convincingly demonstrated its significance in both the distant and recent past. Of primary importance was the extensive archaeological work conducted from 1986 – 1994 on the small hill directly west of the modern city (the *Wildoner Berg*), which revealed traces of occupation from virtually every period from the Late Neolithic through the 18th century C.E., making this site one of the longest continuously occupied places in all of Austria.[1] Today on this site overlooking the confluence of the Mura and Kainach Rivers stand the ruins of a medieval castle (*Wildoner Schlossberg*), generally considered to be the location of a meeting described in the *Annales Fuldenses* between Arnulf of Carinthia, Carolingian King of East Francia, and the Slavic Duke Brazlaw of Sissek in 892 C.E.[2] More recent rescue excavations have recovered further evidence of intensive human activity in this area, particularly during the Late Bronze Age (*Urnenfelderzeit*), Early Iron Age (*Hallstattzeit*), and Early Medieval (*Frühmittelalter*) periods.[3] While these excavations, along with numerous other previously recorded archaeological sites and stray finds, have proven the archaeological significance of this area, no systematic survey of the broader landscape had ever been conducted.

The author sought to address this research lacuna by systematically examining traces of past human activity in the wider landscape along the middle Mura. Based on promising topographic locations and previous archaeological fieldwork, several areas were selected for further investigation. Of primary interest was the small valley (*Rasental*) that lies directly south of the *Wildoner Schlossberg*, where the aforementioned excavations had uncovered evidence of both prehistoric and early medieval activity. On the eastern side of the Mura, fields around the small villages of Afram and Sukdull were also chosen for investigation. While no official archaeological research has even been conducted in these areas, some early medieval stray finds have been documented.[4] Their proximity to the *Schlossberg* and the Mura also merited their inclusion within the project boundaries. Additionally, fields around two villages about 10 km north (Fernitz and Enzelsdorf) of Wildon

and one village 7 km south (Göttling) along the Mura River Valley were selected as a representative sample of the broader middle Mura region.[5]

Methodologies for Reconstructing Past Landscapes

Pedestrian Surface Survey

Once areas of interest for the project were selected, the author led teams of American and Austrian students in conducting several complementary survey methodologies over the course of two field seasons (2009-2010). The first technique employed was pedestrian surface collection, an effective and widely utilized method of archaeological survey in which individuals walk in parallel transects over plowed fields and collect artifacts that have been exposed by agricultural activity.[6] Since this project sought to provide high-resolution survey data within a densely settled, highly anthropomorphic landscape, relatively tight 10 m transect spacing was adopted. Surveyors were instructed to keep any materials not obviously modern (rubber, plastic, etc.) and surface materials from each transect were individually bagged to ensure the highest possible quality of spatial data. Survey was conducted in fields where surface visibility was greater than 20%; in total the survey covered about 2.0 – 2.5 km^2. Locations of elevated artifact density identified during survey were recorded and separately bagged. In the laboratory, artifacts were washed, counted, weighed, and labeled. Potentially diagnostic artifacts were grouped into basic typologies and entered into a GIS database for further spatial analyses, the results of which are presented below.

Soil Phosphate Analysis

In addition to pedestrian surface collection, the qualitative analysis of soil phosphorus was also conducted in the project. Soil phosphate analysis works by identifying elevated levels of phosphate ions in soils, which can be a useful indicator of past human activities.[7]Archaeologically significant activities such as agriculture, settlement, ritual, and daily refuse deposition can all cause markedly elevated levels of phosphates in soils. Although phosphate is not the only archaeologically significant chemical compound found in soils, it is particularly useful because the ions become quickly fixed and remain generally immobile at most soil pH levels. While modern agricultural practices such as fertilization can increase phosphate levels in the soil, they generally do so uniformly across broad areas, thereby keeping archaeologically significant areas higher than the background noise. A major advantage of soil survey is that it can be conducted in both plowed fields and other areas (meadows, forests) where poor visibility makes surface collection ineffective. Since much of the project area was not seasonally plowed, this technique proved extremely useful for examining past human activity beyond agricultural fields.

Swedish agronomist Olaf Arrhenius was the first to recognize the significance of soil phosphate as an indicator of past human activity while doing regional agricultural soil survey in the 1930s.[8] This method was quickly adapted to archaeological research in Germany,[9] but was slow to be taken up in the Anglophone world, until the advent of a more scientifically-oriented, processual archaeology in the 1960s, as well as the subsequent development of a rapid field test.[10] Today soil phosphate analysis is generally regarded as a highly valuable archaeological tool and has been used with success in a number of different geographical and environmental contexts.[11] Although soil phosphate testing is most frequently used to identify site boundaries and activity areas during or just prior to excavation, it has also been implemented as a method of prospection and landscape reconstruction;[12] the latter strategy was adopted in this project.

In order to explore phosphate data on a landscape scale, soil cores were taken on a 50 m grid using small (1/4" tip) augers and a mobile GPS device. Soil samples were separately bagged and labeled at 10 cm intervals, most soil cores in this project going 60 – 90 cm deep. In order to identify areas of elevated phosphate against natural background levels, this project employed a type of qualitative analysis known as the "spot" test.[13] In a field laboratory, 1 – 2 g of soil from each 10 cm sample was placed on filter paper and subjected to a fast and relatively weak acid digestion reaction, causing a blue spot with lines radiating outwards through the reaction of soil phosphate with molybdenum blue. After several minutes, the tests were then placed in a salt stop-bath, which halts the reaction and removes the soil from the filter paper. The resulting blue spots were then assessed on a qualitative scale from one to five, based on their size and intensity (one = lowest phosphate, five = highest phosphate). Up to twenty samples can be tested simultaneously, permitting a high volume of tests to be conducted in a short period. Since this relatively simple and inexpensive method of phosphate analysis allows the archaeologist to conduct thousands of tests in the field without the need for highly specialized equipment or expensive laboratory costs, it is certainly the most efficient way to employ phosphate analysis on an inter-site, landscape scale. In this project, approximately 900 soil samples were taken; the thousands of resulting tests were then entered into a GIS database for further analysis.

Test Excavations

While phosphate as a prospection method has been successfully employed around the world, it has several limitations. Perhaps the most significant is a lack of temporal definition for phosphate depositing episodes; in other words, it is not always clear which period produced elevated phosphate levels in soils. Also natural or anthropogenic post-depositional processes that significantly move soils can also limit its effectiveness. Both of these issues must be considered when testing in areas that have a long history of continuous intensive settlement, such as in the middle Mura valley, which today is a combination of urban, suburban, and rural settlement densities. Such problems can often be addressed through the identification of diagnostic artifacts from surface collection or further subsurface investigation. Towards this end, about a dozen 1 x 1 m test excavations were also conducted in areas of elevated phosphate or surface artifact levels, in order to determine the correlation between surface artifacts, soil phosphate levels, and subsurface materials. These small excavations were also useful for establishing the basic soil stratigraphy of the project area.

Historical Documentary Research

Historical records, cartographic sources, and toponymic (place name) studies are also important elements of past landscape reconstruction, particularly for proto-historic and historical periods. While a full discussion of the historical framework of this region is beyond the scope of this article, a brief synopsis will illustrate how more recent textual sources can potentially shed light on earlier, pre- and proto-historic activity.

The first historical accounts of the greater Eastern Alpine Region place it within the "Celtic" polity of Noricum, a Late Iron Age state-level society that controlled much of the Eastern Alpine Region. Noricum was eventually conquered and absorbed into an expanding Roman Empire by 16 B.C.E., subsequently becoming a Roman province of the same name. During the Roman Provincial period (c. 16 B.C.E. – 400 C.E.), the political and economic center of the middle Mura region was the Roman town of Flavia Solva (today outside the city of Leibnitz, 10 km south of the project area). The remains of a small Roman *castrum* were also identified on the *Wildoner Schlossberg*, which may have been abandoned in the early 5th century AD, as Roman military and political control over the region rapidly eroded.[14] The next four centuries are shrouded in mystery, as there are almost no historical or archaeologically recognizable traces of human activity in this part of Austria.[15] Traditional historical narratives place Slavic-speaking peoples in the region beginning around the 7th century C.E., and Germanic-speaking groups are thought to have migrated in from the north and west several centuries later. The first early medieval historical accounts only appear in the late 9th century (the mention of *hengistfeldon* in the *Annales Fuldenses* noted above), and from the 10th – 12th century C.E. the region served as a *march* (borderland) between the Carolingian Empire and rival polities to the east, such the Avars and Magyars.[16]

Both historical written sources and toponymic evidence suggest that a mixture of Slavic and Germanic-speaking populations inhabited the area during the early and high medieval periods. The project area includes villages that are of Germanic (Göttling, Stocking, Afram) and Slavic (Sukdull, Fernitz, Lang) etymology.[17] The derivation of the name *Wildon* is less certain, with some experts suggesting either Slavic or perhaps pre-Slavic origins.[18] Although place name studies are another useful dataset for reconstructing past landscapes, they should not be regarded as unequivocal evidence of ethno-linguistic settlement patterns or interaction. The naming of topographic features or villages reflects single historical events and cannot always be directly correlated with later demographic changes.

Cartographic sources are also useful for examining past settlement and land-use patterns. Other than their obvious utility in identifying the names and locations of early villages and roads, cadastral maps also show changes in property and field boundaries that often can be proxy evidence for settlement histories. For example, long and thin field boundaries (such as those in Afram) probably indicate initial land use in the high medieval period, while the irregularly shaped field systems in Rasental seem to suggest much earlier agricultural activities. The first and most useful cadastral maps in this region were produced during the 1820s under the direction of Habsburg Emperor Franz I (see Figure 2).

Results

Surface collection over 2.0 – 2.5 km^2 produced a large quantity of archaeological material, predominantly consisting of small, heavily weathered ceramic sherds. Most of these ceramics were non-diagnostic body sherds and could therefore only be assessed by their macroscopic fabric composition. Although the ceramic material demonstrated a wide variety of fabric colors and textures, they were initially grouped into two major categories: (1) low-fired, moderately to highly porous fabrics, frequently with large (primarily carbonate) inclusions and (2) higher-fired, less porous fabrics with smaller or entirely without macroscopically visible inclusions. Based on current knowledge of ceramic fabric types in this area, these types can be cautiously classified into two broad categories: the former as prehistoric (predominately from the Late Bronze Age [1000-800 B.C.E.], Iron Age [800-100 B.C.E.], or Early

Medieval [700-1100 C.E.] periods) and the latter as historic (primarily from the Medieval [1100-1500 C.E.] and Early Modern [1500-1800 C.E.], and also Roman Provincial period [16 B.C.E - 400 C.E.]). For the vast majority of sherds without decorations or diagnostic features, more precise identification was often not possible. However there were also many sherds that could be diagnostically identified and chronologically placed by their decoration, rim style, or unique fabric type.

Interpretation

Using these broad categories, it is estimated that approximately 80% (n=5056) of the ceramic material recovered from the surface collection was historic and 20% (n=1316) was prehistoric. It should also be noted that these artifacts exhibited significantly different distributions over the landscape. In most surveyed fields, there was a nearly constant level of background noise of historic ceramic material, probably a result of the common agricultural practice of mixing broken ceramic materials in with fertilizer. Yet the boundaries between areas with low and high densities of historic ceramic material were still relatively sharp, indicating that such farming practices cannot account for the entire distribution of historic ceramics. When considering the prehistoric material, the boundaries between high and low surface concentrations were much more dramatic. For example, one small (roughly 5 x 5 m) area in Afram produced several kilograms of prehistoric ceramic material, with only a few other sherds being recovered from the adjacent transects. This small "site" also indicates that many generations of seasonal plowing did *not* significantly disperse the prehistoric ceramic material, as might be otherwise assumed.

The spatial results from the archaeological and geochemical surveys were entered into a GIS software program for further analysis (see Figure 3). The elevated areas of historic activity, prehistoric activity, and soil phosphate levels revealed some interesting patterns. The first obvious spatial attribute of prehistoric material is its proximity to freshwater sources, a common pattern seen worldwide among societies that do not dig wells. There also appears in many cases to be a strong correlation between elevated prehistoric and historic ceramic surface densities. In other words, the areas with the highest amount of historic materials were frequently, but not always, directly on top of prehistoric activity. Results from several test excavations revealed a similar relationship, with historic and prehistoric materials present together in the plough zone, or prehistoric materials in a layer below the historic materials. Although conclusions with such a small dataset can only be tentative, such direct correlation might indicate a relatively high degree of continuity between prehistoric and historic settlement and land use, which would make sense if these areas were the most desirable locations in the landscape. Overall, human settlement and land use in the middle Mura valley appears to first expand in the Late Bronze and Early Iron Ages (c. 1200 – 800 B.C.E.) before contracting (but not disappearing) in the Late Iron Age through Early Middle Ages. Human activity again increases during the high medieval period (1100 – 1300 C.E.) and then more significantly again in the early modern period (1500 – 1700 C.E.).

When adding the results from the soil phosphate analysis to the surface collection, some additional interesting results emerge. Perhaps contrary to expectations, the areas demonstrating the highest levels of soil phosphate in most cases did *not* directly overlay the areas of highest ceramic surface density. Instead elevated levels of phosphate seem to appear directly adjacent to the high artifact concentrations. Considering that surface artifact data and soil phosphate levels can indicate different types of past human activities, this is an intriguing pattern. Unfortunately, most of the targeted test excavations did not produce unambiguous results that might have revealed the precise nature of the high phosphate areas. Without further excavation, only a few tentative suggestions can be forwarded. First is the possibility that the elevated phosphate areas indicate prehistoric field systems, while the artifact densities are correlated to domestic activities. It is important to note that elevated phosphate areas do not directly correlate with contemporary agricultural fields, so these anomalous phosphate levels cannot be simply the result of modern agricultural activity (i.e. fertilizer). This particular pattern could also be caused by different methods of deposition. In other words, the areas of artifact density would be where the domestic refuse was discarded, while the elevated phosphate could possibly indicate animal bones and other organic waste.

Overall, results of the archaeological and geochemical surveys produced important and interesting data, and provide a much clearer picture of the development of settlement and land use activity from prehistory through historic periods than previous excavation data alone. Future research, perhaps with additional excavation and survey, will hopefully shed even greater light on these important questions in the evolution of past landscapes in the Eastern Alpine Region.

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[1] See contributions in Pickl 1989.
[2] Kramer 1992, 50; see also Schaffler 1978.
[3] Gutjahr and Roscher 2002; Gutjahr 2004, 2007, 2008, Roscher 2005.
[4] Modrijan 1963, 45.
[5] See Gutjahr 2002, 2003.
[6] For an overview of the methodology and literature on pedestrian surface collection, see Banning 2002, Fish and Kowalewski 1990.
[7] For an overview of phosphate analysis in archaeology, see Holliday and Gartner 2007, Bethell and Máté 1989.
[8] e.g. Arrhenius 1934.
[9] Lorch 1940, Grundlach 1961.
[10] Some early uses of archaeological phosphorus in the U.S. include Dauncey 1952, Dietz 1957, Cruxent 1962.
[11] For example, see Sinclair and Petrén 2002, Taylor 2000, Thurston 2001.
[12] For some examples of soil phosphate as a method of archaeological prospection, see Provan 1971, Keeley 1981, Crowther 1997, Rypkema et al 2007.
[13] This project used a modified version of the method outlined in Eidt 1973; see also Thurston 2001.
[14] Lotter 2003.
[15] Roth 1989.
[16] Bowlus 1995, Baltl 2004.
[17] Hüttenbach 2004, Zahn 1896.
[18] Hausner 1989.

Site Prospection through Phosphate: Evidence from Cumidava, Romania

Darren Poltorak

Locating sites is one of the most vital tasks of archaeology, and in some cases the most difficult. While the old work horse of site prospection, surface collection, is still widely used and preferred, it is not effective in unplowed areas, limiting the areas where sites can be found. There are a wide variety of different remote sensing methods that have been used to fill in these gaps, each with their own benefits and limitations. I will be focusing on one, phosphate spot testing, which amongst the ones with the widest range of usability. By looking at the details of the method, as well a case of its application, the usefulness of this tool will be made clear.

Phosphate Spot Test

The link between phosphate and archaeological sites has been know since the early twentieth century, first observed by Arrhenius, when he discovered a correlation between high phosphate levels and prehistoric sites.[1] He later applied the method to other regions, such as sites in the Americas.[2] Through much development, a weak acid extraction has become the preferred method of processing phosphate samples,[3] to avoid burying the anthropogenic phosphate in naturally occurring phosphate.[4] The largest contributor of anthropogenic phosphate is usually produced through trash deposits, particularly discarded bone. As such, any survey conducted with phosphate is locating primarily trash deposits.

The ring chromatography test, or the spot test, utilizes a fast weak acid digestion, and the addition of molybdenum blue is used to mark the phosphate, which will produce spots, rings, and radiating lines dependent of the amount of phosphate in the soil.[5] The test provides relative data, and due to variability in soils ability to fix phosphate,[6] results should be focused regionally. This method of spot testing has been used both for very large surveys[7], as well as at a smaller scale.[8] It is at this small scale that the case study was focused.

The test involves taking a small, pea-sized sample from the soil collected, and adding a solution of ammonium molybdate and 6 molar hydrochloric acid. After the sample digests for 30 seconds, a solution of ascorbic acid is added. Then after 2 to 2½ minutes, the sample is placed in a stop bath of sodium citrate and sodium bicarbonate. The degree of reaction is then evaluated based on the amount and intensity of blue remaining. The durations of digestion allow for 20 samples to be tested comfortably, and with multiple people, many series can be run without increase of supplies.[9]

This method offers several benefits for survey, regardless of size. First, it can be conducted in the field without the use of a formal lab, making it convenient to use anywhere, regardless of conditions. In the case study, these tests were conducted outside at the campsite of the project. Second, the method does not cost very much. The chemicals used in the test, with the exception of 6 molar hydrochloric acid, are readily available, and easy to transport. The hydrochloric acid needs to be acquired in the project country, but is easily obtained from any chemistry department. Beyond the chemicals, the only supplies needed are soil probes, a scale, a graduated cylinder, droppers, and filter paper, which are again are inexpensive, and easy to obtain. Third, the sampling is only limited by the depth the probe can reach. While some issues can arise because of variable phosphate levels, by and large variation from background levels are still noticeable. This wide range of usability, coupled with a smaller learning curve compared to other remote sensing techniques, such as electric resistivity and ground penetrating radar, make phosphate spot testing are very effective tool in site prospection.

Case Study: Cumidava Archaeological Research Project

Located in Rasnov, Romania, the Cumidava Archaeological Research Project (CARP) is seeking the civilian settlement that would have supported the Roman frontier fort in the area, as well as other activities around the Castrum Cumidava. During the 2010 field season, a phosphate survey was conducted over the area. In the 1000m by 500m area, we used a 25m by 25m grid for collecting points. These samples were tested using the molybdenum blue phosphate spot test, and ranked 1 through 5, as seen in Figure 4. Only depths sample from 30 cm and below were considered, to reduce the influence of surface contamination. The highest reading within each sample, 30 cm or below, was designated in Figure 4.

From this data, a rather high level of background phosphate can be seen across the area. As such, only those reading points having 4s and 5s will be examined in greater detail. While the image does not show the depths that these occur, with two exceptions, all the

in greater detail. While the image does not show the depths that these occur, with two exceptions, all the high values are at the depth that corresponds to the Roman occupation, and point EC21, which is located in the castrum. Of the two exception areas, the two points at WH37 and WH38 are just high at the 30cm mark, and are the location of modern trash deposits. The other point, WD24, is at a depth of 1.4 m, twice that of the layer of interest. As such, these two areas will be disregarded from further discussion.

Of the remaining areas of interest, we see some patterns of phosphate readings. Two areas have points of high phosphate bundled closely together. These indicate heavy use of the area, possibly organized trash areas. One of these areas, the one just northwest of the castrum, appears to be located along the path that the *Via Principalis* would have run. The region the the southwest of the castrum appears of a different nature. Five points enclose an area of roughly 37500m^2, without high phosphate value neighboring points. It is possible that these points deliminate the boundaries of settlement.

These interpretations are preliminary, as phosphate survey requires ground truthing to firmly establish the period that produced the phosphate. This is the focus of the upcoming 2011 field season of CARP. In forthcoming seasons, the survey are will be expanded 500 m to the east of the castrum, to have a 1 km^2 survey area around the castrum.

Conclusion

Phosphate surveys offer greater possibilities in archaeological site prospection. The low cost and ease of use make the method ideal for students starting their research. While involving a few more steps than a traditional field walking to establish what materials are being dealt with, flexibility of land that it can be used on allows for exploration of areas that have been previously untouched due to the difficulty of locating sites in none plowed areas. The method also scales well, making it versatile for a great many research questions. While certainly not the best method of prospection in all cases, it is a very useful tool to have at your disposal.

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[1] Arrhenius 1929a and Arrhenius 1929b

[2] Arrhenius 1963

[3] See Eidt 1973, Eidt 1977, and Proudfoot 1976 for further details about the development and changes of the method

[4] Wells et al. 2007

[5] Salisbury 2010

[6] White 1978

[7] See Edit 1973 and Thurston 2001

[8] See Woods 1984

[9] Modified from Eidt 1977, Thurston 2001.

Caladinho 2010: A Preliminary Report on the Excavation of a First-Century B.C.E. Tower in Alto Alentejo, Portugal

Joey Williams and Rui Mataloto

The 2010 season marked the first excavation of the site of Caladinho, a small fortified structure on a hilltop near Redondo, Portugal. Field survey undertaken by Rui Mataloto has identified 24 similar structures throughout the Alentejo region. Surface finds on each site suggest a mid-1st century B.C.E occupation and subsequent abandonment in the beginning of the 1st century C.E., thus linking these structures to the reorganization and colonization under the nascent Roman empire. Our project is the first systematic archaeological investigation of one of these small forts. Open area excavation of the structure permitted us to remove the collapsed structure, revealing the well preserved walls of a tower, three stamped pieces of Italian terra sigillata, and other dateable ceramics. Preliminary analysis of the structure, its assemblage, and its regional context indicates that the tower was part of network of fortified structures meant to control and surveil the newly colonized territory. This paper reports on the excavation of the structure at Caladinho, draws comparisons with other similar structures in the region, and considers potential motives behind its construction. The very brief occupation suggested by the finds and the establishment of at least one large villa nearby suggests that this watchtower was an effective means of control. Future work at this and other towers will further investigate this mechanism of colonization and control over the landscape in the Alto Alentejo region.[*]

The site of Caladinho is one of twenty-four small, fortified structures located in the Alto Alentejo region of Portugal. The majority of these structures were identified as a result of the intensive regional survey undertaken to mitigate the archaeological and environmental impacts of the recent Alqueva Dam Project, although Caladinho was first reported by João de Almeida in 1945.[1] In 2000 and 2001, Rui Mataloto conducted a field survey of these structures, recorded the presence of some exposed features, and analyzed surface finds. He categorized them into two types, small forts and tower enclosures, and dated them to the middle of the 1st c. B.C.E. to the beginning of the 1st c. C.E. Based on their ceramic assemblages (Figure. 9) he posited that these were among the first structures to be constructed during the earliest stages of Roman colonization in this rural context.[2] While none of these structures are identical, they share a number of characteristics, including their topographic placement, small occupied areas, thick outer walls, and artifact assemblages. These same features have often been used to argue for their defensive or even military nature, though some recent work has identified them as fortified farm houses.[3]

Caladinho is located on a hilltop on the border between the municipalities of Alandroal and Redondo, roughly 40 km from the city of Évora. When surveyed in 2000, one main structure was recorded on the site. This structure is situated on a naturally defensible ridge overlooking the plain to the north and west. It is hypothesized that the structure at Caladinho was a watchtower embedded in the landscape in order to surveil the surrounding plain. Together with the other, similarly situated forts throughout the Alentejo, it formed an observational network that allowed monitoring of movement within the countryside. In most cases, however, there is no intervisibility between the watchtowers. They must, then, have been intended for observing only their local landscapes.

An abundance of pottery was recovered in the initial survey. Most of it was locally produced, although several imports were also collected. These include Baetican amphorae of the Haltern 70, Dressel 7-11, and Dressel 1C types as well as numerous sherds of Italian terra sigillata and amphorae fragments of Italian fabric (Figure. 6). The remainder of this assemblage includes a diverse variety of pots, bowls, and storage containers. Some wares, decorated with undulating lines or a reel, were also recovered. Interestingly, thirty-four loom weights were also discovered during surface survey. In addition to this evidence of textile production, slags from the working of lead and iron were also collected, along with a lead clamp used to repair a fractured vessel. The presence of metalworking at Caladinho is mirrored at the majority of the other forts. Indeed, many of them are located near ancient mining installations.

Caladinho and the other forts are situated in the epicenter of resistance to Roman imperial control over

western Iberia. From 80 – 72 B.C.E. in this region, the renegade Roman senator Quintus Sertorius created a break-away Roman republic, with disaffected Romans as well as indigenous elites forming the new senate. Évora, named *Liberalitas Iulia Ebora* in antiquity, is mythologized as Sertorius's headquarters, although little evidence exists for the city in this period. After suppressing Sertorius's rebellion, Évora was raised to *municipium* status, and quickly became an important city on the route from Lisbon to Mérida. Also, the much larger and almost certainly Roman fortification of Castelo da Lousa occupies another hilltop to the south of Caladinho. Castelo da Lousa was founded at or around the same time as Caladinho in the 60s B.C.E., contains a similar artifact assemblage, and incorporates elements of Roman architecture built in the same manner as Caladinho.[4] Castelo da Lousa may have served as the headquarters for all these forts, though this point requires significantly more investigation. Given the tumult of the first decades of the 1st c. B.C.E. in Iberia, it is no surprise that forts like Caladinho, Castelo da Lousa, and the others in this region were constructed. The surveillance they provided would have greatly aided in securing this landscape.

In 2010, Mataloto and Williams undertook an expanded project at Caladinho, which was judged to be an excellent representative example of the other forts in the region. The project set out to complete the excavation of the tower to sterile strata. Its primary goal was to test the hypothesis that these structures were related to the Roman colonization and reorganization of the Alentejo in the mid-1st c. B.C.E. It also hoped to better identify the inhabitants of this structure – were they indigenous people concerned over the safety of the countryside, or invaders monitoring the movements of indigenous people through the landscape? And, regardless of the identity of the inhabitants, the project also sought to better understand the nature of the control granted by watchtowers like Caladinho. Given their regular proximity to mines and fertile agricultural land, it may be postulated that the forts were intended to grant their owners control over natural resources and perhaps even monitor enslaved labor.[5]

With the permission of IGESPAR and the local municipality of Redondo, excavation at Caladinho began last summer assisted by a team of field school students and volunteers. Open area excavation of the structure permitted the removal of several stratigraphic layers of debris, revealing the thick walls of a tower, a fortification wall to the northwest, and an abundance of artifacts. The tower, however, proved to be double the size suggested by features exposed on the surface, making it impossible to complete its excavation in a single season. Regardless, the removal of the debris from the tower's collapse revealed a great deal of information regarding its foundation, abandonment, and inhabitants.

Cleaning of the walls exposed the full extent of the structure, and three basic spaces were identified inside: a narrow northeast room, a large southwest room, and an L-shaped corridor between the two (Figure. 7). In total, the structure is nearly 9 × 5 m in size, with external walls that are almost a meter wide and internal walls which are roughly half that size. The southern corner of the structure has disappeared (likely eroding down the hill over the past two millennia) while the northern corner has suffered some damage from trees. The eastern corner of the site incorporates an outcrop of bedrock, while the western corner abuts a much larger outcrop. The nearly 4 m height of this outcrop suggests that the tower must have been at least as tall if the occupants were to see over the outcrop and to the plain below. This minimum estimated height is supported by the great deal of debris located within and on top of the standing remains.

The walls of the structure were constructed from unbonded rubble, comprised entirely of the local schist stone. The stones incorporated into the structure appear to have been chosen and laid with some care, and there is some evidence that clay was used to line the interior walls of the structure. It appears that the majority of the packed clay lining was washed away when the collapse of the upper floor or floors exposed the interior of the structure to the elements. The internal walls appear, at least on the plan, to have been constructed after the larger external walls, but the precise phasing of the walls will only be certain when the structure is excavated to its foundations.

The narrow northeast room is slightly over 1 m wide at its largest point and a little over 2 m long. It lies immediately opposite a 1 m wide gap in the wall leading out to a promontory, perhaps used for observing the countryside to the north and west. Whether access to this promontory was available only to the occupants of the tower is as yet unclear. This gap is flanked by another 1 m gap which we think is the main entrance to the structure. The corridor makes a 90 degree turn to the southeast near the center of the structure. On the plan, the corridor looks deceptively narrow here as interior walls are leaning inwards, one of them precariously. The confined space makes it difficult for more than one or two people to work in this area at any given time, but nevertheless a great deal of rubble from the building's collapse was removed as this area was excavated to more than a meter in depth. The larger room contained less rubble particularly on its southern and western sides, probably owing to the

same erosive forces that claimed the southern corner of this room.

While the presence of two entrances on the northern corner calls into question the defensive nature of this structure, the potential defensive application of the L-shaped corridor is significant. The presence of walls on the western side of the hill, which incorporate the stone outcrops and reinforce the natural protection provided by the ridge, indicates some additional attempt at defensive architecture. Further exploration of the hilltop is needed in order to determine whether these walls continue around the fort or if they only block the approach from the northwest.

Little can yet be said about the functions of the narrow northeastern room or the larger southwestern room until the remainder of the debris is removed. We speculate that these spaces were used for storage, perhaps even the storage of the products of nearby agriculture or mining overseen by the tower. We hope that the presumably undisturbed contexts beneath the debris of the tower's collapse will provide the answer. Nevertheless, the careful stratigraphic excavation of the debris revealed evidence of the upper floor as well as the nature of the collapse itself. We were able to recognize multiple stratigraphic units within the debris, suggesting that the collapse took place over a period of time. As the upper floor gave way and fell inside the structure, it was followed by the walls slowly leaning, and finally falling, inward. Notably, there appears to have been some activity at the site after it had begun collapsing. The remains of what may have been a metallurgical furnace were recorded along the northwestern side of the large room, along with some slag, charcoal, and burned clay, all located above and cut into a unit of rubble.

The artifact assemblage recovered from the interior of the structure gives us some idea of the inhabitants, the function of the upper floor, and the chronology of the site (Figure. 8). Thirteen fragments of Italian *terra sigillata* were collected, the majority of which were undiagnostic body sherds. The few diagnostic pieces, however, included two bases of the *Conspectus* B1 type, one of which bears a radial stamp with the name: *Dar*[*e*]*vs* (Figure. 8). Dareus is thought to have been active at Lyon between 30-20 B.C.E.[6] Two other stamped pieces were also recovered (Figure. 9). Although fragmentary, the name of A. Vibius Scrofula may be read on the smaller of the two. This name is relatively common on *terra sigillata* produced at Arezzo between 40-15 B.C.E.[7] The third stamped piece is illegible, but may present the name of Camurius, another Arretine potter active between 30-70 C.E.[8] Together these ceramics give us a useful *terminus post quem* for the abandonment of the structure as they were all found amid the debris, meaning that they were probably among the objects on the upper floor when it collapsed. We can then assume that the tower at Caladinho remained occupied into the last decades of the 1st c. B.C.E., and perhaps into the 1st c. C.E.

Unlike the assemblage recovered during survey, only two amphora fragments were collected during excavation, and what few were collected were found during the last days of the project. We presume this is because the amphorae used on site were stored in the bottom floor, whereas the upper floor was used for domestic activities. Thus, it is encouraging that amphorae began to appear on the final days of the project as that would suggest that we have found the bottom of the debris and will be able to excavate the sealed contexts of the bottom floor this coming summer. Nevertheless, it is worth noting that the two amphora fragments we recorded were both of Baetican fabric, but were otherwise undiagnostic. Another amphora sherd of the same fabric was discovered embedded in the central interior wall. If we are able to recover and analyze this fragment, we hope that it will provide us with a date for the construction of that wall and perhaps of the entire structure.

The common wares collected during the excavation are of a diverse morphology and most are made in the local clay. Interestingly, and supportive of the evidence for a domestic function of the upper floor, 18 loom weights of a variety of sizes were collected, primarily from the narrow room and the corridor, although two were excavated near the northeastern wall of the large room. Added to the 34 loom weights recovered during surface survey, the 52 total weights suggest the presence more than one loom. The sustained domestic activity suggested by the loom weights runs counter to our interpretation of the site as a watchtower, and we intend to pursue this line of questioning further.

Given the defensive nature of much of Caladinho's architecture – as well as the surveillance potential provided by its position within the landscape – it is difficult not to interpret Caladinho as part of a program of colonization and control connected to the Roman occupation of the region.[9] The nearness of Évora and Castelo da Lousa, both of which were settled by the Romans at roughly the same time as Caladinho, also argues in favor of this interpretation. The control over nearby natural resources offered by Caladinho and the other defensive structures in the Alentejo perhaps was the impetus behind their construction. And, once the region was secured and the landscape reorganized and divided amongst numerous new villas, Caladinho and the other watchtowers were swiftly abandoned. Indeed, field survey of the area around Caladinho supports this interpretation. A large unexcavated villa is located to

the northwest. While limited, data collected from this site during field survey suggests that it was founded at the end of the 1st c. B.C.E., just as sites like Caladinho were falling out of use.

Mataloto and Williams intend to complete the excavation of the main structure at Caladinho in 2011. It is hoped that the contexts excavated after the last of the rubble is removed will reveal not only the function of the ground floor rooms, but also further clues as to the identity of the site's inhabitants. We also hope to expand the excavated area to include more of the hilltop and, with small, targeted test pits to ascertain the presence of any additional structures. Given time and resources, we would also like to expand the project to encompass other small forts in the Alentejo. We hope in the near future to be able to place these structures more fully in their regional context and to better understand the changing Alentejan landscape and its inhabitants under the nascent Roman Empire.

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[1] Almeida 1946.

[2] Mataloto 2002, 179-80; for further information on the site of Caladinho, see also Calado 1993, 55; Calado and Mataloto 2001; Mataloto 2004, 39. The use of fortifications such as these in the reorganization of western Iberia during the first decades of Roman colonization is widely discussed. See especially Ortiz Romero (1995), Moret (1995) and Fabião (1998, 265-90).

[3] Vasconcelos (1895) and Maia (1974a; 1974b) categorize these structures as evidence for military occupation, while Wahl (1985) and Moret (1995, 557) suggest that they are instead fortified homes. Fabião (1998, 287) suggests a multiplicity of functions for this type of structure.

[4] Alarcão et al. 2010.

[5] Maia (1986; 1996) identifies similar structures in the south of Portugal as supporting the mining industry. A similar interpretation of watchtowers associated with mines in the Faynan region of Jordan has been advanced by Friedman (2009).

[6] Ettlinger et al. 1990, 154-5; Oxè et al. 2000, 210 (see Figure. 724 [584] for an image of the same stamp).

[7] Oxè et al. 2000, 479 (see Figure. 2400 [2327,2328] for images of stamps similar to this one).

[8] Oxè et al. 2000, 173 (see Figure. 514 [397] for images of stamps similar to this one).

[9] Fabião 1998, 520; see also Ortiz Romero and Rodríguez Díaz 1998; Gonçalves et al. 1999.

Visualizing Agricultural Production during the Eneolithic: A Case Study from the Tripol'ye Giant-settlement of Tal'yanki

Thomas K. Harper

*Archaeologists seeking to understand the economic landscape of prehistoric farming societies often make use of theoretical models such as site catchment analysis to make inferences regarding agricultural production. Such exercises are necessarily deterministic in nature and the quality of their results fluctuates wildly depending on the quality and amount of inputs involved. The Eneolithic Tripol'ye giant-settlements of central Ukraine present a special problem for landscape studies due to the paucity of material evidence available beyond the architecture and layout of the settlements themselves. This paper seeks to re-analyze published material on the Tomashevskaya local group of the Western-Tripolian Culture, particularly relating to the largest of the giant-settlements, Tal'yanki. It is proposed that through a multi-disciplinary approach combining archaeology with agricultural science, a more coherent picture of subsistence behaviors and social organization can be formed.**

Introduction

The past four decades of research have established the Tripol'ye giant-settlements (*c.* 4100-3400 B.C.E.)[1] of the South Bug-Dnieper interfluve as a "real laboratory for the studies of many aspects of the Tripolian culture,"[2] including mathematical models of settlement rotation, paleodemography and paleoeconomy. While these settlements do not showcase any marked deviation from, or any special developments beyond, the rather homogeneous material assemblage of the general Tripol'ye culture, their unique size and character pose many questions for researchers. Of particular interest are speculative models for land-use and agricultural production, such as the cereal production estimates of S.N. Bibikov (1965) and the site catchment analysis for the settlement at Maidanetskoe conducted by B. Gaydarska (2003). The research presented focuses on creating a synthesis of these previously-applied methodologies, while striving to incorporate a wide variety of additional variables. The focus of this exercise is the settlement at Tal'yanki, located some 25 km from the town of Uman' in the Cherkassy region of Ukraine.

Tal'yanki

Only small samples of the giant-settlements have been excavated, but they can be characterized as "planned," unfortified settlements, situated around a central open area in several concentric rings.[3] With no internal differentiation of architecture, the political organization of the settlements is thought to be rather egalitarian, with authority vested in a number of big men or chiefs, each of whom would have represented a kin group or clan-like unit. Further evidence for this organizational scheme comes from the layout of the settlement plan, where subdivisions of up to twenty houses can be perceived.[4]

Tal'yanki is most often cited, based on the calculations of expedition leader Vladimir Kruts, as having approximately 2700 structures covering 450 hectares.[5] On the basis of a demographic reconstruction allowing five to seven inhabitants per dwelling,[6] these calculations have generated a population figure of roughly 14,000. Philip Kohl, advocating the higher end of Kruts' figures, characterizes Tal'yanki as having "possibly more than 15,000 people," with as many as 30,000 if one includes hypothetical satellite settlements.[7] While these are impressive numbers, their underlying calculations can be shown to be problematic.

According to Oleksandr Diachenko, the key problem is the issue of geometry.[8] Kruts' area of 450 hectares is derived as the product of the average width and length of the settlement. While this would be appropriate for a rectangular settlement, Tal'yanki, like most other Tripol'ye settlements, is oval in shape. Therefore, it is necessary to use the formula $a = \pi\ (0.5l)\ (0.5w)$, in this case yielding a result of approximately 350 hectares. In light of this recalculation, the rest of Kruts' extrapolated figures become untenable.

Placing the number of structures at 2700 is the result of extrapolation based on a geomagnetic survey conducted over 232 hectares of the site that yielded a count of approximately 1400 structures.[9] This average of about six houses per hectare, factored in with Diachenko's new measurements, gave him an adjusted total of approximately 2050 structures.[10] Another factor that must be considered is whether all the structures constitute dwellings, and whether all were simultaneously in use. A proportion of 78.4% was deemed appropriate for the nearby settlement at Maidanetskoe;[11] applied to Tal'yanki, this returns a figure of approximately 1600 chronologically-inhabited

structures.

Analysis of the sex-age structure of human remains from the late Tripol'ye inhumation burials at Vykhvatintsy leads Diachenko to believe that, on the basis of high mortality rates, Kruts' five to seven individuals per household is possibly too high.[12] For the purposes of exploring as many scenarios as possible, calculations for the total population of Tal'yanki were made using averages of four to seven inhabitants per dwelling, returning a range of results from 6400 to 11,200. These calculations are tentative, and will be repeated with greater accuracy once more precise measurements can be integrated.

Agricultural Activities

The Tripol'ye agriculturalists cultivated cereals such as barley, buckwheat, einkorn, emmer, millet, and wheat, as well as a variety of legumes and fruits (both wild and domesticated) such as plums and grapes.[13] While sheep, goats, cattle and pigs were tended in fairly large numbers, osteological finds of auroch, deer, elk and horse remains show that hunting still played an important role in diet supplementation. Copper and bone fish hooks and flint arrowheads attest to this as well.[14]

Animal husbandry formed an important part of the Tripolian economy, with cattle being the most numerous. In addition to being kept for meat and milk production, they were likely used as draft animals as well; the morphology of steer bones found at Tal'yanki attest to this, showing large muscle attachments.[15] Combined with the primitive ards found at the Cucuteni-Tripol'ye settlement of Novyie Ruseshty in Moldova and a clay model of bulls drawing a sledge discovered at Maidanetskoe, this provides evidence that Tripol'ye agriculturalists could have utilized animal labor extensively.[16] Indeed, it is hard to imagine a large, cereal-dependent population existing in the absence of this technology.

Cereal Production

The first calculations regarding Tripolian agricultural production were published by S.N. Bibikov during the mid-1960s. Bibikov's calculations have formed the basis of much work that has come after him.[17] Working from a dataset compiled from sixteenth- and seventeenth-century historical accounts of crop yields, Bibikov[18] concluded that early farmers would have sown 131-164 kilograms of cereal per hectare for a gross yield of 655 kilograms per hectare (kg ha^{-1}). Half of this amount would be removed due to harvesting and threshing losses, spoilage, and seed requirements for the next spring, providing a net consumable yield of 328 kg ha^{-1}. Given a base dietary requirement of approximately 197 kilograms of grain per person per year, Bibikov calculated a per-person land use figure of 0.6 hectares.

B. Gaydarska is considerably more conservative in her estimation of cereal yields.[19] Citing R. Dennel and D. Webley,[20] she states that a gross yield of 400 kg ha^{-1} would have been more appropriate for early agricultural societies. In her scenario the base dietary requirements are also slightly higher, at 210 kilograms of cereals per person per year. After a fifty percent reduction to account for losses, this produces a net yield of 200 kg ha^{-1}, translating to a land requirement of about 1.05 hectares per person per year, not inclusive of the other resource needs that she later addresses.

This amount, 200 kg ha^{-1}, is quite low; as a ratio of output to input inclusive of seed requirements for the next season, the net production (after waste) can be expressed as 2.2:1. This is analogous to marginal yield quantities from the medieval period. The historian Georges Duby states that yield ratios of 1.6:1 to 2.2:1, while poor, were not out of the ordinary for agriculturalists in medieval France and Italy.[21] Due to the possibility of crop failure, medieval magnates generally planned for a ratio no higher than about 1.7:1.

However, on the other side of the spectrum, based on J.Z. Titow's 1972 study of agriculture in medieval Winchester, England, Gordon Conway states that yields of 3:1 to 6:1 were more normal.[22] While poor yields (2:1 or lower) did occur, they were the exception rather than the rule. In light of this, it could be more reasonable to assume that Duby's "feeble productive capacity" and "abiding presence of famine"[23] during the medieval period were episodic calamities rather than a general trend. It is possible that the sources mentioned by Duby represent a greater desire to writing of calamities as opposed to a normal state of affairs.

It is important to note that none of these scenarios can be applied to the question of site-specific agricultural production with any large degree of confidence. A number of biological and climatological variables that dictate the growth of crops fluctuate greatly depending on the locale in question. They must be addressed with the use of a more comprehensive model than simply multiplying land area by average yield ratios. However, as a tool for informing hypotheses, this methodology of analogy should not be completely discounted. In examining the potential resource availability in the territory surrounding Tal'yanki, a range of figures will be utilized to illustrate a variety of different scenarios.

Site Catchment Analysis

The limit for land exploitation in sedentary societies is generally defined as five to six kilometers, or roughly one hour's walk, from a habitational site.[24] The use of artificial units such as circles with radii based on these

figures should not be regarded as the be-all and end-all of spatial analysis.[25] However, they are a useful tool for estimation of possible resource procurement in the absence of clear material evidence regarding land utilization.

In her site catchment analysis of Maidanetskoe, Gaydarska utilizes circles of increasing radius from the center of the settlement, with the settlement area itself subtracted from the calculated catchment.[26] In preparation for replicating this methodology for analyzing Tal'yanki, two criticisms came to mind: firstly that, since the site is not circular, a circular catchment area is inappropriate; secondly, that utilizing the sparsely-populated middle of the site as a starting-point was inappropriate for most of the settlement's population, which would have lived in the dense outer rings. Thus, the resulting catchment analysis of Tal'yanki has an oval catchment area and is exclusive of the site itself (see Figure 10 and Table 1).

Gaydarska takes a very comprehensive approach, computing spatial requirements for not only arable land, but also fallow territory, pasture lands, and "natural resource" zones, which would have provided territory for limited hunting and fuel wood harvesting.[27] However, her differentiation between fallow territories and dedicated pasture land may needlessly inflate the land requirements. The presence of livestock is taken into account in the analysis for Tal'yanki, as well as the figures for natural resource zones, but fallow land is deducted and assumed to have doubled as grazing territory for herds.

This analysis for Tal'yanki (see Table 2), depending on one's view of possible population sizes and net cereal yields, can be interpreted as either contradicting or supporting the necessity for hierarchical social organization and satellite settlements. However, given the author's position on reasonable yield levels (preferring Bibikov's figures, if not higher), it is stressed that a population level of 6400-8000 is a preferable interpretation, utilizing land resources that are available within a five to six kilometer radius of the settlement boundary.

Depletion of Soils

The environmental impact of the giant-settlements is conventionally estimated to have been severe, with soil nutrients completely exhausted from intensive agricultural cultivation and woodland area reduced by eighty percent over a fifty year period.[28] Shifting settlement patterns are attributed to ecological destruction wrought by intensive agricultural activities, with an anthropogenic environmental crisis ultimately contributing to the downfall of the Tripol'ye culture in the South Bug-Dnieper interfluve.[29] However, what is the scientific basis for this line of reasoning? Throughout history, the black earth soils (chernozem) of Ukraine have been an agricultural boon, earning it the epithet "bread basket of Europe." It is a testament to the productivity of these soils that they continue to be highly prized for cereal production in the present day.[30]

Agricultural scientists have conducted numerous crop trials over the past two centuries, some lasting several decades.[31] The usual focus of these studies is to determine the long-term effects of various modern agronomic inputs that are irrelevant to the study of Eneolithic farming, such as inorganic fertilizers. However, the performance of control treatments from modern trials is very useful not only for examining production figures, but also the effects of soil nutrient depletion over a long timescale. One such example is control treatment 21 of the Ivanovice Crop Rotation Experiment, begun in the eastern Czech Republic in 1956. This study was conducted on black earth soils that are roughly analogous to the chernozemic soil of the South Bug-Dneiper interfluve. Over the course of five decades (1956-2006), winter wheat yields from this treatment increased from 3.6 to 4.2 t ha^{-1}, despite an inexorable drop in soil nutrient availability.[32] This was attributed to improved plant genetics over the course of the study. It is also worth noting that while nutrient concentrations tested significantly lower in 2006 than they had at the project's start, the levels of soil nitrogen (N), phosphorous (P), potassium (K) and magnesium (Mg) were still within a very productive range.[33]

The Magruder Plots, a winter wheat fertility study that has been in continuous operation since 1891 at the Oklahoma State University, are another example.[34] Unlike the ICRE study, the Magruder Plots are not rotated, and thus provide data on monoculture cropping. Even under these conditions, which are generally seen as anathema to responsible field management, it took seventy years for a nutrient-limited growth response to be perceived.[35]

E. Kunzová and M. Hejcman state in their analysis of the ICRE study that archaeological theories regarding population shifts due to the soil nutrient depletion of chernozemic soils are very unlikely.[36] In this regard, perhaps archaeologists have overextended themselves through over-reliance on behavioral assumptions and qualitative comparisons. Site context is everything with regards to predicting environmental impacts, and efforts should be made to simulate early agricultural practice quantitatively.

Mathematical Modeling

Several models exist to simulate crop growth and study

the environmental and economic impacts of agricultural production. They can be configured to take into account nutrient availability and precipitation limitations, and are generally tailored to a region-specific context. Although output is easy to obtain, the success of studies such as these is contingent on the input of accurate data reflecting regional patterns of environment and biology,[37] as well as the element of human behavior.

Studies of inorganic fertilizer application suggest that the growth response of crops is directly correlated with nutrient availability, conforming to a predictable regression.[38] Long-term studies that have addressed nutrient depletion scenarios, such as ICRE and the Magruder Plots, also show similar trends in the inverse.[39] It seems feasible to adapt these regression models to problems of Eneolithic agricultural production, but there are many variables that must be adequately addressed before proceeding:

1. Base nutrient availability; utilizing soil testing, site-specific baseline levels for important macronutrients (N, P, and K) must be established for relevant stratigraphic horizons.
2. Presence and predominance of cultivars; the prevalence of relevant crops must be established to determine nutrient requirements, yield quantities, and dietary information.
3. Climactic data; together with geomorphology and paleoclimate specialists, figures for mean seasonal temperatures and precipitation must be established, as these variables greatly affect the maturation of crops.
4. Human behavior; the study must take into account several scenarios regarding agricultural practices and management behaviors. Among these are the types of fallow cycles and crop rotations undertaken (if any), harvesting behaviors, coefficients for harvesting, threshing and storage efficiency, and analysis of site catchment and resource availability.

The end result of this line of inquiry could either involve the use of a preexisting model, or it could necessitate the construction of a dedicated model for archaeological applications. Nothing short of experimental research into the on-site production of ancient cultivars over the course of many years would yield thoroughly testable results. However, in the absence of such it is at least important to improve upon current speculative methods.

Conclusion

When so much of the scholarship regarding the agricultural landscape of Tripol'ye farming communities is built upon layers of theoretical inference, it is necessary to deconstruct the methodologies involved in constructing these layers. From recalculations of settlement size to well-informed spatial analysis and mathematical modeling, a more coherent picture of life at Tal'yanki and other settlements can be formed. Instead of questioning how the residents of the giant-settlements could have lived in such a crowded manner in settlements as populous as 14,000 individuals, perhaps it is more pertinent to question the assumptions that have guided research until now. In other words, lacking clear data as to *why* the people of Tal'yanki lived in the manner that they are assumed to have lived, perhaps it is also worth questioning *whether* they lived in this way.

The 2011 field season will offer opportunities to further explore the topics introduced here. It is hoped that through the acquisition of quantitative data such as soil nutrient concentrations and the performance of spatial analysis, a clearer picture of life at the giant-settlements can be crafted. Few fields have such far-reaching social and political ramifications as agriculture, especially when the feasibility of entire settlement systems is predicated upon its sustainability and consistency.

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[1] Personal communication with Diachenko, January 11, 2011. Kohl (2002, 153), drawing on Videjko (1996, 53), gives a range of *c.* 4200-3600 B.C.E. There is some disagreement on the area required for a site to be branded a "giant-settlement;" Videjko interprets early sites larger than 30 ha as being formative giant-settlements.
[2] Kruts 2008a, 47.
[3] Kohl 2007, 44.
[4] Kohl 2007, 44.
[5] Kruts 2008b, 58.
[6] Kruts 2008a, 46.
[7] Kohl 2007, 44.
[8] Diachenko (forthcoming).
[9] Kruts 2008b, 58.
[10] Personal communication with Diachenko, December 19, 2010.
[11] Diachenko (forthcoming, 7).
[12] Personal communication with Diachenko, December 19, 2010.
[13] Kohl 2007, 44.
[14] Kohl 2007, 45.
[15] Videjko 1996, 70.
[16] Kohl 2007, 45.
[17] See Kruts 1989; Videjko 1993; Gaydarska 2003.
[18] Bibikov 1965, 53.
[19] Gaydarska 2003, 212.
[20] Dennel and Webley 1975, 106.
[21] Duby 1978, 28.
[22] Conway 1987, 107-108.
[23] Duby 1978, 29.
[24] Chisholm 1968, 131.
[25] Roper 1979, 124.
[26] Gaydarska 2003, 214.
[27] Gaydarska 2003, 214.
[28] Kruts 2008a, 47.
[29] Kohl 2007, 45.
[30] The Tripol'ye stratigraphic horizon underlies much of the chernozemic layer and Tal'yanki, as it does at other settlements. At this level, the soil is less humic in composition and soil nutrient availability in the Eneolithic soil was likely less than its modern counterpart. Testing is needed to establish the scope of these differences.
[31] Kunzová and Hejcman 2009, 227.
[32] Kunzová and Hejcman 2009, 227.
[33] Kunzová and Hejcman 2009, 229.
[34] Mullen et al. 2001, 6.
[35] Mullen et al. 2001, 8.
[36] Kunzová and Hejcman 2009, 232.
[37] Mantel 1997, 13-14.
[38] Lana 2008, 20-23.
[39] Kunzová and Hejcman 2009, 229; Mullen et al. 2001, 7.

Cybele and her cult at Rome: National Embarrassment or Benevolent Savior?

Krishni Burns

Literary sources regarding the worship of the Goddess Cybele in Rome suggest that her worship was disconcerting, even disgusting to the Romans. It is believed that when the Romans imported her cult in the second century B.C.E. they were unaware of the ecstatic practices of her priests, the Galloi, particularly their custom of auto-castration. Once the Romans discovered their mistake they did everything possible to minimize their contact with the traditional aspects of Cybele's cult by confining her priests to their temple complex, forbidding Roman citizens to join the priesthood, and establishing new Romanized rites to worship her. However, archaeological evidence in the form of temple architecture and votive offerings found at the temple to Cybele on the Palatine and at Ostia suggest that the Romans embraced the worship of Cybele. Roman citizens did not participate in the ecstatic rites of Cybele, but they were comfortable incorporating both her cult and her priests into the urban fabric of their cities.

Introduction

Cybele, Rome's Magna Mater Deum Idaeum, was worshiped with secret mysteries, yet she is an intrinsic figure in Rome's public religion. Her role as a figure of both public and private religion is reflected in her places of worship. The primary temple of the Magna Mater in Rome rests on the Palatine next to the ancient cave that was believed to Lupercalia and in close proximity to the hut of Romulus, the most precious site in Rome's history.[1] However, the actual traditional worship of the goddess was so distasteful to the Romans that they felt it necessary to separate themselves from her priests and rites, both legally and physically. With all these ambiguities it is difficult to locate the Magna Mater conceptually within Roman religion. However, in spite of textual evidence that suggests that Cybele was treated as a subversive, dangerous presence with the fabric of Roman society, archaeological evidence suggests that the Romans more easily accepted her than current scholarship believes. In this article I will use two temples to Cybele, the temple on the Palatine hill and the temple at Ostia, as case studies to examine how Cybele and her cult fit into Roman society, both physically and ideologically.

Palatine

There is very little evidence available regarding the sanctuary and the associated building of the cult of Cybele on the Palatine. The site has been excavated several times, first by Pietro Rosa in 1862, then later by A. Vaglieri and G. Boni in 1907 and Pietro Romanelli in 1950.[2] None of the information from these excavations is readily available in English and the vast majority of it has never been published at all, so it is hard to discuss the cult's physical manifestation within the fabric of the Palatine. However, there is some information available by way of pictorial evidence and the current exposed remains of the sanctuary.

The original temple to the Magna Mater on the Palatine was built shortly after her worship was introduced into Rome. Marcus Junius Brutus, the Praetor at the time, dedicated the temple in the year 191 B.C.E.[3] This temple lasted less than a hundred years before it burned down in 111 B.C.E. The next year a second temple was built on the site by Metellus during his consulship.[4] This temple also fell prey to one of Rome's many fires and Augustus erected the final incarnation of the temple in the 3 C.E.

The Metellan temple was built with a north/south orientation. The entrance faced directly south. Vermasseren describes it as follows. "To this building belonged the podium divided into a cella and a pronaos with antae as well as columns with Corinthian capitals. A flight of stairs leads to the entrance. In front of the temple is at some distance a flight of stairs (the so called Scalae Caci) which, during the feast of the Megalensia, may have served as a theater."[5] The pronaos was decorated with an unknown number of columns. Extant representations of the temple suggest that there were 4-6 columns across the front of the temple, but such representations are notoriously unreliable.[6] The columns that stretched around the front and sides of the porch were made out of peperino tufa with Corinthian capitals. Inside the cella, there were smaller columns with ionic capitals.[7]

Both of the flights of stairs that Vermasseren mentions are also part of the socio-religious fabric of the city. The ten or so stairs leading up the podium to the entrance of the temple most likely served as seating for

the Megalensian[8] games that took place in front of the temple.[9] The festival included theatrical contests[10] for which both Plautus and Terence wrote, so it is possible that the steps in front of the temple were curved like those of a Roman theater, or at the very least temporary wooden bleachers were added to the sides of the staircase in order to facilitate the theatrical performance.

The Scalae Caci, on the other hand, was tied to Rome's mythological founder Romulus. Romulus' hut was reportedly located at the top of this staircase. Scalae Caci connected the Palatine with the Forum Boarium, and as such was a major thoroughfare during the Republican period. The name Cacus comes from the mythical giant that Hercules defeated on the site while returning to Greece after completing his tenth labor.[11] The "Ladder of Cacus" is connected to this mythical pre-foundation of Rome. The temple to Cybele was built at the heart of Rome's mythical foundations. Her temple is in an area that defines the nature of Roman society, placing her at the center of Roman religious life and social character.[12]

Augustus's reconstruction in 3 C.E. did little to alter the basic plan of the temple. He raised the temple platform, and refurbished both the interior and the exterior. On the exterior Augustus stuccoed and decorated the columns and rebuilt the outer walls in quasi-reticulate tufa and concrete. He replaced the interior colonnade with marble Corinthian columns and paved the floor with colored marbles and slate.[13] The courtyard was extended and embellished.

The general message of this incarnation of the temple to the Magna Mater is that she continued to hold an important place in Roman religious life. Augustus was known both for the propaganda of his building program[14] and his concern for morality among his citizens, so his lavish rebuild of the temple suggests that he did not feel particularly concerned about the exotic ways of her priesthood. Also, his work on the area in front of the temple implies that the Megalensia enjoyed an increase in popularity during the late Republic/early Empire.

A number of statues were recovered in the Palatine excavations. The most well known of them is a larger-than-life image of the Magna Mater seated on a throne. The statue has lost its head and both arms. It was recovered from the area of the front steps of the Palatine temple by Pietro Rosa's 1872 excavation, so it is unlikely to be related to the cult image in any way.[15] There were images of Attis, Cybele's mythic priest/lover and also a number of other images of divinities recovered at the site, including an image of Venus Genetrix.[16]

Venus is not a goddess typically associated with Cybele outside of the Roman world; she seems to be present at the temple for purely Roman reasons. Cybele was originally a Phrygian goddess, so the Romans naturally chose to connect her with their legendary Trojan roots. Augustus was particularly interested in the Romans as Trojans, which is why he promoted his supposed descent from the Goddess Venus via the Trojan hero Aeneas. The presence of Venus Genetrix at the temple of the Magna Mater was a deliberate attempt to recast the Phrygian Goddess as a Trojan goddess, and thus an integral part of Rome's mythic foundation.

A large collection of terracotta votive figurines were found buried within the Metellan Temple's podium. The figures include images of the goddess herself, figures of Attis in various possess, heads of Bacchus, and several other unidentifiable human figures, most notable several dancing women wearing theater masks. There are also a number of body parts, such as breasts, torsos, fragments of hands and feet, and several representations of the glans penis. Other types of figurines are animals, such as lions, roosters, dogs, rams, goats, pigs, and horses, as well as plant material such as pinecones[17] and baskets of fruit.[18]

Figures of Attis are the most common by a large margin. The mythology surrounding Attis and rituals he inspired, the auto-castration of initiates into the goddess's priesthood in order to insure the priest's total devotion to the Magna Mater, were the most problematic aspects of the cult for Roman citizens to accept.[19] However, Romanelli's excavation yielded some 94 Attis figurines altogether.

Most of the figures are exotically dressed in Phrygian caps and a long cloak-like garment that is clasped around the chest under the armpits, then hangs loose down to the thigh, at which point it is split into two strips. Each strip is wrapped vertically around the leg and clasped several times in front of the leg to create a series of openings down the leg. The outfit often leaves the abdomen and genitals of the figure exposed. None of the Attis figurines found are preserved enough to tell if he is being depicted before or after his auto-castration, but other later representations of the same type from Rome suggest that he is intact in this iconographic type.[20]

Attis' numerous representations and his "Phrygian" costume both of which emphasize his act of self-mutilation, suggest that the people of the city of Rome did not find Cybele's castrated priests, known as the Galloi, and the self-mutilation aspect of her cult as abhorrent as the literary sources suggest. The figurines must be dated to before the building of the second temple. This suggests that long before Claudius

integrated the priesthoods of Cybele into the larger Roman social structure Attis was a major part of cult worship, receiving votive offerings at the temple. These terracottas are arguably the oldest Roman representations of Attis, so he and his associated rituals were most likely embraced with cult when Cybele was first brought to Rome.

Less revealing, but equally helpful, the representations of Cybele do not follow the Greek type of Cybele depictions, but rather the Pergamum type. The murial crown that she wears here and elsewhere in Roman images does not appear in Greek images. It comes from central Anatolia, confirming the Roman claim that they imported the cult directly from the area around Mount Ida.

All together, the material evidence for the cult of the Magna Mater on the Palatine confirms the majority of the literary evidence, but disagrees with some of its accepted prejudices. The Romans might have found Cybele and her traditional rituals distasteful, but they were nonetheless readily accepted when they brought the cult into Rome. Attis was always a part of her worship, as were the Galloi that mirrored his actions. Romans did not necessarily participate in the castrations of Cybele's worship but they acknowledged the importance of the ritual and were willing to participate on the periphery by watching the parade and including images of Attis in their place of worship, if not dedicating them themselves. The custom of celebrating the Megalensia in front of the temple also suggests that the Romans were comfortable with their Anatolian goddess. If the Romans truly wished to separate themselves from the Galloi and their rituals, they would not hold the Megalensian games outside the very site of the Hilaria, the festival at which the Galloi dedicated themselves, a scant week after the Hilaria ended.[21]

Ostia

To understand the temple to the Magna Mater on the Palatine's place in the Roman urban fabric and Roman religious life, it might be helpful to briefly compare it to a temple in a Roman city where the Magna Mater also had Roman religious roots. Cybele arrived at Ostia at the same time, or more accurately a few hours before, she came to Rome. Ostia is the site of her great founding miracle, the place where one chaste matron, Claudia Quinta, was able to pull the ship out of the mud alone using only her girdle, while the combined might of Roman manhood could not budge it. Cybele could easily have been granted the same public prominence in Ostia as she had in Rome. According to legend she arrived in Ostia at the same time and in the same way as she did in Rome and she also performed divine wonders in Ostia, but her temple at Ostia is very different from her temple in Rome.

The temple at Ostia is much older than the surviving remains of the temple at Rome, perhaps accounting for some of its variations.[22] It is located prominently on the south side of the city right next to the porta Laurentina. The temple is actually part of a large complex devoted to the Magna Mater and her associates. The south side of the complex is built into the Sullan city walls and the northeast side runs along the Cardo Maximus, one of the town's major thoroughfares. The complex is shaped like a triangle with the door to the complex located in the center on the northeast side. In the southwest corner, directly across from the entrance, is the temple to the Magna Mater.

The temple itself was built along the lines of the temple at Rome, though on a much smaller scale. It was built on top of a podium and has a small cella that can be reached by way a flight of steps and a pronaos. There were most likely four columns across the front of the pronaos and the steps were covered with marble, so the temple must have been richly decorated.

Across from the temple in the southeast corner is a large building, larger than the temple, dedicated to Attis. Two larger-than-life satyrs flanked the entrance of the building and life-sized statues of Attis were found inside, along with a Venus Genetrix.[23] In the same area as the shrine to Attis a small complex devoted to the divine personification of war, Bellona, including a temple and housing for her college of priests. It is possible that Bellona is included in the larger Cybele complex because she had become associated with an Anatolian goddess often worshiped in conjunction with Cybele.[24] There are several small rooms along the interior of the complex which have not been designated with any particular function and an enclosed ditch in the far southeast corner that probably was used for the rite of the taurobolium. The large central courtyard was left open and covered with yellow sand. Although the temple to Cybele is much older, most of the complex, excluding various additions and alterations, can be dated to the reign of Hadrian.[25]

The point at which this temple complex differs most from that of the Magna Mater on the Palatine is that it is clear that this is a private mystery cult. The complex is located prominently on a major thoroughfare, but it is not part of the central public space of the town and the actual temples are cut off visually from the rest of the city. There is no indication that public festivals like the Megalensia were celebrated within the complex. Instead, epigraphic evidence[26] and the room for the taurobolium suggest that the cult at Ostia focused on solely private rituals. Altogether, it seems that the cult

located on the Palatine was unique in its role in Roman public life. Most incarnations of the cult of the Magna Mater were mystery cults centered on secret rites and individual worship.

Conclusion

The cult of Cybele on the Palatine was a mystery cult with secret rites and initiations that promised resurrection by living the life of its resurrected founder Attis, but at the same time played an important role in Roman public religion as the protector of Rome's independence. The cult and its goddess did not originate in Rome, but on the Palatine they were immediately embraced into the heart of Rome as part of Rome's heritage. Unlike other incarnations of the cult, on the Palatine hill Cybele managed to straddle the worlds of public and private, Roman and foreign, Republic and Empire.

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[1] Plutarch, the *Life of Romulus* 20.4.
[2] Vermasseren 1977, 3.
[3] Ibid. 4.
[4] Ov. Fast. IV, 347-348.
[5] Vermasseren 1977, 4.
[6] The most helpful of these is a fragment from the Ara Pietatis Augustae which was preserved in the Villa Medici. Claudius built the Ara Pietatis Augustae in 43CE, so the representation shows the Augustan temple rather than the Metellan temple. However, the Augustan rebuild did the not change the basic structure of the temple, so the image is relevant to both incarnations of the temple (Vermasseren 1977, 5).
[7] Claridge 1998, 127-128.
[8] Instead of worshiping the goddess her traditional Pergamum rites, the Romans instituted a four-day festival of games and theater for her at the beginning of April, the *Megalesia* (Roller 1999, 288-289).
[9] Claridge 1998, 126-127; Cicero, *On the Responses of the Haruspices*, 11-12
[10] Livy 36.36.
[11] Ver. *Aeneid* 8.195ff.
[12] Roller 1999, 273.
[13] Claridge 1998, 127 also see Coarelli 2007, 136.
[14] Zanker 1988.
[15] Vermasseren 1977, 4.
[16] Ibid. 7-8.
[17] These pinecones once again invoke Attis's death under the pine tree and later resurrection.
[18] Roller (1999, 275-276) gives a helpful summery of the collection, but the full published catalogue can be found in Vermasseren (1977, 11-36; pl. 12-199).
[19] Alvar 2008, 257-261 also see Ov. Fast. IV.191-214 and 350-352; Dion. Hal. Ant. Rom. 2.19.3-5.
[20] Vermasseren 1977, 82; pl. 305.
[21] Fishwick 1966, 193-202.
[22] Meiggs 1973, 355-359; also see Vermasseren (1977, 107-110).
[23] Vermasseren 1977, 112-115; figures 365, 367, 373, and 374.
[24] Meiggs 1973, 360.
[25] Ibid. 364.
[26] Supra n. 16.

Graduate Student Workshop on Ceramic Technology and Petrography

K. Patrick Fazioli

This event was held on Tuesday, April 20, 2010 from 5 to 7 PM at the North Campus of SUNY Buffalo. The invited discussants were Dr. Russell Adams, Research Associate in the Department of Anthropology at McMaster University in Hamilton, Canada, and Dr. Hajnalka Herold, Research Associate at the Vienna Institute for Archaeological Science (Austria).

The purpose of the workshop was to introduce graduate students to the theory and methodology behind ceramic petrography, the study and characterization of mineral inclusions in ceramic thin sections. In this method, ceramic samples are ground to 0.03 mm thick and mounted on a glass slide. They can then be examined with a polarizing light (petrographic) microscope, which allows for the identification of minerals in the sample, based on their behavior in both plane and cross-polarized light. This method borrowed from geology has proven quite useful for addressing a number of archaeologically relevant topics, such as identifying the source of clay used in pottery, as well as examining the additional technological choices made during the ceramic manufacturing process (method of forming, use of temper, firing temperatures, glazing and finishing). Ceramic petrography continues to be frequently utilized by archaeologists working in a variety of periods and regions, since it allows the researcher to analyze a large volume of material at relatively low costs.

After briefly outlining the basic theoretical and methodological framework of the method, Drs. Adams and Herold each discussed the ways in which they incorporated ceramic petrography in their own research.

Dr. Adams works in southwest Asia, most recently in the Faynan district of southern Jordan. His research focuses on Bronze Age production (both ceramic and metallurgy), technology, and environmental contamination. More information on his research can be found at:

http://russellbadams.brinkster.net/RussellAdams.htm.

Dr. Herold works in Central Europe, specifically in eastern Austria and western Hungary. Her research focuses on the Early Middle Ages (c. 600 – 900 C.E.), particularly on the relationship among Avars, Slavs, and Bavarians in the Danube region. Ceramic compositional analyses allowed her to explore the connections between material culture, technological traditions, and social identity. More information on her research can be found at:

http://homepage.univie.ac.at/hajnalka.herold/research.html.

The graduate students were able to examine some of Dr. Adams' thin sections under polarized light microscopes, illustrating some of the techniques and methods outlined in the presentations. They were invited to consider how thin-section petrography might be salient in their own research projects.

Conference Report: North East Graduate Archaeology Workshop, Joukowsky Institute for Archaeology and the Ancient World, Brown University

Aaron Chapnick, Jessica Richardi and Theodore Tibbits

Attending the North East Graduate Archaeology Workshop at Brown University on 13 November 2010 was an absolute pleasure, and we are sure that we speak for all those who participated. Members of the Joukowsky Institute graciously hosted the event in their beautiful new facility on Brown's Providence campus. The workshop's goals were clear from the start: to foster professional networking between graduate students in archaeology and related disciplines, and to encourage the sharing of knowledge and resources between graduate communities in the northeast. Representatives from many institutions, including Boston University, Brown University, Bryn Mawr College, Harvard University, Rutgers University, SUNY at Albany, SUNY at Buffalo, UMass Amherst, and UMass Boston, gathered together to exchange ideas openly and without prejudice. In a large group each institution presented on the various aspects and strengths of their programs. In smaller discussion groups, graduate students and faculty engaged in very informal dialogues about a range of topics. All students were encouraged to share their ideas or to describe current research projects. The workshop was a unique opportunity to meet students of both similar and dissimilar interests, and from these beginnings, to form long-lasting professional friendships and networks.

Participants were encouraged to take part in two small afternoon discussion sessions, the choice based on their particular interests. Session topics included materials science, ancient economy, data visualization, complex societies and state formation, household archaeology, colonialism, landscape and survey archaeology, lithic technology and production, the archaeology of food, urbanism, and historical archaeology. The sessions on data visualization and household archaeology were particularly interesting and worth describing in further detail.

The students who met to discuss data visualization hailed from many different backgrounds and specialized in very different fields of archaeology. The session offered the participants an opportunity to talk about the techniques and methods involved with GIS, remote sensing, photogrammetry, statistical spatial analysis, and other types of data visualization. The diversity of the group encouraged participants to take a step back from the context of their own work and to look at cross-discipline issues involved with the expanding utilization of data visualization. Students shared their personal experiences with data visualization, the open-table discussion effectively enlightening the group to a broader range of options in software, data sources, and equipment. All participants were able to take something away from the discussion, whether it was a suggestion regarding the use of different software, a useful book on surveying, or a recommended course to expand their knowledge of data visualization methods. Finding reliable sources of GIS and geophysical survey training was a hot topic; among several helpful suggestions were Harvard University's two week intensive GIS program course and the numerous online modules offered by Environmental Systems Research Institute (ESRI). Participants also discussed common problems, such as the difficulty and costliness of acquiring remote sensing data for use in archaeology. The technology of data visualization acted as a common language through which historical archaeologists were able to communicate effectively with Classicists and prehistoric archaeologists.

The group felt strongly that there should be some sort of standard for data collection across all fields of archaeology. Archaeologists use information collected from satellite images, total stations, or even measuring tape to preserve the past; we ought to strive for accuracy and precision across all disciplines, whatever the technique. The use of data visualization in archaeology is a rapidly expanding field and we shall soon reach a point at which every archaeologist (GIS specialist or not) will be required to have an active knowledge of these techniques. At the end of the session, Joukowsky student Clive Vella suggested the foundation of a Google Group to keep the conversation going between the participants, and to encourage continued cross-disciplinary cooperation. The discussion session and the formation of the Google Group are steps in the right direction.

The discussion group which focused on household archaeology was fascinating, thanks to its compelling illustration that both theory and methodology can be shared across quite different archaeological fields. The group consisted of a Roman archaeologist, a Bronze Age Greek archaeologist, two Neolithic archaeologists, and a historical archaeologist. On the surface, their academic interests could hardly have been more disparate, yet the discussion flowed easily. All present quickly realized how the theory of household archaeology could help in analyzing and understanding individual research problems. Neolithic and historical

archaeologists may form opposite ends of the archaeological spectrum; during the session, however, these scholars engaged in a most lively and enlightening discussion about each other's methods. Neolithic and historical archaeologists discovered that they shared interests, such as economic production, self-sufficiency, and integration into larger networks, despite the fact that they worked in different geological contexts and disparate time periods. In contrast, our Roman and Bronze Age Greek archaeologists had relatively little in common with regard to theory and methodology, despite initial expectations to the contrary. Both learned a great deal from each other, and from their Neolithic and historical colleagues. The energetic dialogue on the particulars of respective research projects was particularly interesting.

The North East Graduate Archaeology Workshop was a successful event. It provided an open forum for archaeologists of various backgrounds to voice their opinions, form professional networks, and discuss issues that are shared across archaeological and historical disciplines. We are very grateful to everyone at the Joukowsky Institute for their hospitality and their proficient management of the event, especially students Alexander Smith and Elizabeth Murphy and the director of the Institute, Dr. Susan Alcock. The students at Brown University believe that the event will be held again next year. We certainly hope so. The frequent organization of gatherings like this one would do much to enhance the quality of archaeological research and education in the northeastern United States.

Please consult the following websites for more information:

North East Graduate Archaeology Workshop: http://proteus.brown.edu/negradworkshop/6461 (22 February 2011)

The Joukowsy Institute for Archaeology and the Ancient World at Brown University:
http://www.brown.edu/Departments/Joukowsky_Institute (22 February 2011)

For more information on joining the Archaeological Data Visualization group, please contact Clive Vella at clive_vella@brown.edu

Conference Report: Early Medieval Settlements in North-West Europe, AD 400-1100

Michael Rienti, Jr., Jennifer Shaffer Foster and Kathryn Whalen

The conference *Early Medieval Settlements in North-West Europe, AD 400-1100* took place from 26 to 28 November 2010 in the Clinton Auditorium on the Belfield Campus of University College Dublin (UCD). Organized by the INSTAR Early Medieval Archaeology Project (EMAP), this international event brought together academics from across Northern Europe and the United States to explore and discuss the current state of settlement archaeology with a focus on the Early Medieval Period in the British Isles.

The majority of the twenty lectures focused on Ireland; however, there were also several talks discussing research in Scotland and Anglo-Saxon England, as well as one presentation discussing early medieval settlement archaeology in Wales. Three of the lectures emphasized research on the Viking Period (8th-12th centuries) in each of these areas, including the first ever publication regarding the recently discovered and excavated Viking *longphort* of Linn Duachaill at Annagasson, County Louth given by Eamonn P. Kelly, Keeper of Irish Antiquities at the National Museum of Ireland.

Within the eight sessions of the conference, three broader topics permeated the lectures. On the first full day of the conference there was an emphasis on the construction, development and change of Early Medieval Settlements. One of the more intriguing talks of the first day was that of Dr. Simon Gilmour, which suggested a possible link between the peoples of what are now Western Scotland and Eastern Ireland based on settlement patterns and construction. Although close relations between these two geographic areas have long been suggested for the entirety of prehistory, Gilmour presented new evidence that lent additional credence to this theory. The second day's presentations were dominated by religion, with the vast majority of the lectures describing archaeological and historical research on early medieval ecclesiastical settlements and burials. A secondary theme of the day was Viking *longphorts* in Ireland, both the aforementioned *longphort* at Annagasson and the Viking settlements in Dublin, famously uncovered in the 1960s at the Wood Quay site, and periodically investigated along the River Liffey in years since.

Irish archaeology is relatively new to the table of Anglo-American theoretical perspectives, and the desire to break from past cultural-historical models of research and analysis was evident at this conference. Many of the presenters emphasized that over the last decade, archaeologists have made considerable progress in moving beyond many older, general and universally applied beliefs regarding Early Medieval settlements. This trend was further encouraged by Martin Carver, researcher at Sutton Hoo, who ended his lecture with a call for increased emphasis on understanding Early Medieval settlements within their broader spatial and temporal contexts.

On the whole, the conference was both enjoyable and very informative, with both a large amount of overview of Early Medieval settlements that could be helpful for beginning graduate students planning on working in this region; as well as some specific and detailed case studies that might aid a more advanced student in the process of focusing their research. Two excellent resources now available to students are the lecture of Lorcan Harney and Thom Kerr, which provides a detailed historiography of ecclesiastical investigations in Ireland since 1920, and the publications of EMAP, which over the last several years has assembled an immense bibliography of articles and site reports of many Early Medieval investigations.

Presenters and Topics

Chris Loveluck, University of Nottingham
Keynote Lecture
Early medieval north-west Europe: settlements, behavioural settings and social identity, AD 600-1100.

Finbar McCormick, Queens University Belfast
Aidan O'Sullivan, University College Dublin
INSTAR Early Medieval Archaeology project (EMAP): Exploring early medieval dwellings and settlements in Ireland.

Simon Gilmour, Society of Antiquaries of Scotland
Early Medieval Settlement across the Atlantic Seaways: contacts, development and change in Scotland, AD 400-900.

Mark Redknap, National Museum of Wales
House and home in early Medieval Wales.

Michelle Comber, National University of Ireland Galway
The Landscape of Early Medieval Settlement as preserved in the Burren region of western Ireland.

Micheál Ó Droma, Freelance Archaeologist
Jonathon Kinsella, EMAP, Univesity College Dublin
Early medieval ringforts and enclosures in Ireland: a case study of the evolution of two enclosure sites in Co. Tipperary.

Sally Foster, University of Glasgow
Editor, *Medieval Archaeology*
Revisiting the residence of Pictish power in early medieval Scotland.

Gareth Davies, University of Nottingham
Early medieval settlement morphologies and material culture: The changing rural elites of Anglo-Saxon Norfolk.

John Barber, AOC Archaeology, Scotland
Anne Crone, AOC Archaeology, Scotland
Early medieval architecture and engineering: the construction of secular and sacred wooden structures.

Helena Hamerow, University of Oxford
The Anglo-Saxon house: form, function and life-cycle.

David Griffiths, University of Oxford
Viking Age buildings, landscape and status – from Orkney to the Irish Sea.

Lorcan Harney, EMAP, University College Dublin
Thomas Kerr, EMAP, Queens University Belfast
Living and working with God: crafts and economy on early medieval church settlements and archaeological excavations in Ireland.

Matthew Seaver, EMAP, University College Dublin
Living with the dead in early medieval Ireland – settlement enclosures with human burials AD 400-1100.

Tomás Ó Carragáin, University College Cork
Early medieval settlement on ecclesiastical estates: The INSTAR Making Christian Landscapes Project.

Martin Carver, University of York, editor *Antiquity*
Early Insular Monastaries and Prehistory – some tentative relationships.

Chris Lowe, Headland Archaeology
Early historic monastic settlements and their use of space: case studies from Hoddom and Inchmark.

Gabor Thomas, University of Reading
Settlement Dynamics and Monastic Foundation in pre-Viking England: New Perspectives from Excavations at Lyminge, Kent.

Paul Stevens, Valerie J Keely, Ltd.
Excavation and experimental archaeology at an early medieval monastic site at Clonfad, Co. Westmeath.

Rob O'Hara, Archer Heritage, Ltd.
Digging through the Celtic Tiger boom archaeological excavations of early medieval settlements in Co. Meath Ireland.

Eamonn P. Kelly, National Museum of Ireland
Viking longphorts in Ireland and the recent discovery and archaeological excavation of the longphort of Linn Duachaill, in Co. Louth.

Linzi Simpson, Margaret Gowen & Co., Ltd.
The Viking longphort at Dublin: insights from recent discoveries.

Frauds, Myths, and Mysteries: Science and Pseudoscience in Archaeology

By Kenneth Feder. 2nd edition. Pp. xiv + 231, figs. 81, b&w. Mayfield Publishing, Mountain View, California 2006. $45. ISBN 1-55934-523-3.

Kyle Somerville

The propagation of "alternative" archaeologies is a simultaneously fascinating and disturbing phenomenon, disseminated and reinforced by innumerable television shows, books, and movies. It is a subject that is almost always ignored within academia, and consequently students of archaeology are often ill-prepared to deal with the wild claims of these people. In that regard Kenneth Feder, a prehistorian at Connecticut State University, has come to the rescue with his book *Frauds, Myths, and Mysteries: Science and Pseudoscience in Archaeology*, an overview of popular archaeological myths and contentious cases, and a deconstruction of the evidence and logic behind them.

At 201 pages, Feder's book is a quick and breezy read, the text clear and concise. The book is divided into four general parts. In the opening chapter, he outlines the origins of his interest in alternative archaeologies, noting that their lure lies in the fact that they purport to use scientific principles while simultaneously existing outside of science, and outlines six major reasons behind pseudoarchaeology: money, fame, nationalistic furor, religion, romanticism, and mental instability.

The second part discusses epistemology, or the examination of how we know what we know, focusing on the scientific method and Occam's Razor, which he later uses to deconstruct several of his case studies. Feder is an unabashed processualist, and for him archaeology is a science, subject to scientific principles of rules and laws. His arguments hinge on the contention that through logic and scientific deduction there is a knowable, reconstructable past, which may turn off some more post-modernist readers.

The third part, and the bulk, of the book is devoted to various and famous archaeological mysteries and hoaxes from all over the world and from all temporal scales including Piltdown Man, pre-Columbian visits to the New World, ancient astronauts, psychic archaeology and, of course, Atlantis. Feder lays out the origin of each topic and carefully deconstructs the so-called evidence behind it. He caps each topic with a small section that includes archaeological perspectives on the particular area of the world in which each topic occurs. However, these short discussions are little more than footnote summaries of academic archaeological debates and they assume the reader is already somewhat familiar with the archaeological evidence.

Feder concludes the book with a short discussion of current archaeological mysteries, discussing how archaeologists have yet to discover the meaning behind European cave paintings, exactly how Stonehenge was built and what it was used for, and the reasons behind the fall of the Mayan civilization. This section is somewhat outdated, although a seventh edition of the book was released in November that will hopefully rectify this issue.

In a baffling oversight, however, although it is mentioned briefly at the beginning of the book Feder fails to discuss pseudoarchaeology from within the discipline, most notably resulting from political pressure and nationalism. This is a conspicuous omission, and while pseudoarchaeology is mostly associated with aliens and Atlantis, pseudoarchaeology driven by nationalism and performed under the guise of academic archaeology is a very real practice and, indeed, is inarguably more dangerous to the discipline than charlatanism. By focusing on the pseudoarchaeologies from outside the discipline and ignoring the role of academic archaeology as a potential source of fraud, Feder overlooks this very real issue, and the tragic examples offered by Nazi Germany and elsewhere clearly necessitate a discussion of pseudoarchaeology beyond that proffered by psychics and fame hunters.

Importantly, Feder discusses how and why these frauds are perpetrated and what makes their conclusions wrong. For example, Erich von Daniken's special brand of baloney may seem seductive to even trained archaeologists, but Feder makes sure to point out that von Daniken often fabricates his evidence or completely ignores evidence which does not work in his favor. Archaeologists are quick to dismiss frauds and hoaxes under the guise of no evidence, but they often don't know how or why there is no evidence behind these claims. The ignoring or twisting of evidence by alternative archaeologies is a recurring theme throughout the book, and one which academic archaeologists would do well to pay attention to. Feder also briefly touches in why the propagation of these claims often fall onto Egypt and Mesoamerican, pointing out that racism is often a motivating factor, in that non-white people couldn't possibly have the means or intelligence to construct such monumental

structures. However, this point is regrettably underexplored in the book.

Perhaps most importantly of all, however, Feder's book shows that pseudo and alternative archaeologies are not limited in scope to the deep past of the Egyptian pyramids, Stonehenge, and the Maya. The historical period, as well, has been subject to this nonsense with fake Minnesota rune stones point to Viking explorations of America, Mystery Hill in New Hampshire, considered by some to be "America's Stonehenge" and a Celtic temple, in reality a root cellar and a unique example of 18th-19th century vernacular New England architecture. Clearly, no period of history is exempt from alternative explanations. One might be tempted to call this edition is outdated, it is a sad fact that some of the mysteries Feder discusses continue to be a bugaboo for archaeology. For example, the Newport Tower in Rhode Island, which some "investigators" argue are the remains of a Viking or Templar church but considered by most archaeologists to be the remains of a 17th century windmill, received renewed attention in a recent issue of *Archaeology* magazine and its own television special.

While Feder's book is not perfect, it nonetheless highlights a portion of archaeology that is too often overlooked and too quickly dismissed out of hand. By not challenging these frauds and hoaxes, archaeologists do a great disservice to the people they study and to today's public. Indeed, as Feder notes in his conclusion (1990, 201): "I believe, and have tried to show in this book, that we deserve better-and can do better. We deserve a veritable past, a real past constructed from the sturdy fabric of geology, paleontology, archaeology, and history, woven on the loom of science. We deserve better and can do better than weave a past from the whole cloth of fantasy and fiction…the veritable past is every bit as interesting as those pasts constructed by the fantasy weavers of frauds, myths, and mysteries". I agree, and I think all archaeologists, regardless of their temporal or geographic interest, will find the book of relevance to their work and to our discipline.

Vikings of the Irish Sea: Conflict and Assimilation AD 790-1050

By David Griffiths. Stroud, Gloucestershire, UK: The History Press, 2010. 192 pp., 100 figures. £17.99. ISBN: 978-0-7524-3646-3.

Michael Rienti, Jr.

Griffiths' work provides the reader with a perspective that is somewhat unique in Viking studies in the British Isles. Rather than emphasizing the Vikings as a "national race" or emphasizing their role in the rise of a modern nation states by focusing on research within a single bounded territory, a problem that Griffiths believes exists in too many texts dealing with this subject, the purpose of this book is to bring together the archaeological and historical evidence of Viking activity from all of the areas around and within the Irish Sea (Ireland, Wales, southwest Scotland, northwest England and the Isle of Man) in order to place them "within the context of each other." As illustrated by the title, two of the principle themes in this work are conflict and assimilation. The main argument Griffith makes is that it is more important for scholars studying the archaeology and history of Scandinavian presence in Britain and Ireland to focus on understanding the processes of contact, assimilation and change that took place between societies during and after the Viking Age, rather than continue to place emphasis on why the Viking Age took place and how it unfolded as a discreet period of time. This argument is both presented and supported well throughout the course of the book.

This book can be divided into five sections – chapter 1 is an introductory chapter, chapters 2 and 3 focus on conflict around the edges of the Irish Sea, chapters 4, 5, 6, and 7 discuss different areas of cross-cultural impact and assimilation, chapter 8 deals with resulting cultural change and chapter 9 presents the authors concluding remarks.

In addition to outlining the overall purpose and principle arguments of the book, chapter 1 also explains Griffiths' choice of the Irish Sea as the region of focus for his book. As mentioned above, Griffiths believes there is too much emphasis on studying Vikings in the context of single bounded territories or countries. This is especially true given the importance of ships, sailing and seaways to Viking societies. The Irish Sea would have been important in terms of subsistence, communications, economics and the movement of peoples and ideas. Furthermore, the areas surrounding the Irish Sea are only a days apart by water, a much shorter time of travel than to many other locations within the countries they are now part of. The first chapter also provides very brief discussions of the problems associated with modern conceptions of 'Vikings' and the various sources available for studying the Viking period including historical, linguistic, genetic and archaeological evidence.

In chapters 2 and 3 Griffiths discusses the conflict that accompanied the Vikings into the Irish Sea region. chapter 2 focuses primarily on Ireland, and contains a good overview of the historical accounts available in the form of the Irish Annals detailing the advent of Viking raids in Ireland and their course over late 8th and early 9th centuries. The author also discusses briefly the curious lack of any contemporary textual evidence for similar raids taking place on the eastern shores of the Irish Sea. The final topic of this chapter is the establishment of the first Viking bases in Ireland, the *longphort* or *dún* sites, the historical discussion of which is accompanied by a description of archaeological finds at some of the more important *longphorts* such as those at Dunrally, Annagassan and Dublin. chapter 3 continues to look at conflict, but examines Viking incursions into areas on the eastern side of Irish Sea – Galloway, Strathclyde, Cumbria, Northumbria, Mercia and Wales – after the establishment of Scandinavian presence in Ireland between the middle of the 9th-century, when these attacks are first documented, and AD 1050.

Chapters 4 through 7 highlight those areas where the impacts of the Viking presence, and where the resulting cross-cultural assimilation, are perhaps the most evident – settlement and patterns of land-holding (chapter 4), burial practices (chapter 5), trade (chapter 6) and urbanization (chapter 7). Griffiths believes that for the most part, Vikings coming into the Irish Sea region fit themselves into existing schemes of land-holding and land-use, rather than transplanting or creating new patterns; a claim that is assessed and supported primarily by ecclesiastical records of land grants and holdings and by place-name analysis. The burial practices of the area are comparatively analyzed by sub-regions – Ireland, the Isle of Man and the east coast of the Irish Sea from Scotland to Wales. The chapter dealing with trade focuses on numismatics and archaeological evidence of contact and exchange present in hoards and markets. Griffiths explores the nature of Viking related urbanization mainly through the case studies of Dublin, Chester and communities along the Bristol Channel.

Chapter 8 is entitled "Assimilation and Cultural Change," and it is in this final chapter of the book that Griffiths truly broaches the effects of cross-cultural assimilation between the Vikings and the various cultures living around the Irish Sea and the changes that the contact between them may have had on their respective societies. Here attention is given to commonalities in burials and grave goods, the conversion of the Vikings to Christianity and the incorporation of Scandinavian motifs into Christian religious iconography, architecture, and the blending of languages. One interesting possibility Griffiths suggests is the existence of a hybrid Irish Sea metalwork tradition that begins to appear during the 10th- century. This chapter also contains a brief three paragraph discussion of the concepts of hybridity and acculturation and their role in the process of cultural change.

Griffiths' work possesses numerous strengths. First and foremost is the clear, concise and knowledgeable prose. Despite frequently changing the focus of a topic from one geographic area to another around the rim of the Irish Sea, the reader is never lost and does not feel as though they are reading 'fluff.' The various bodies of evidence are well integrated without over relying on any one type of source. Whenever possible the author uses primary texts, and examples of archaeological sites with brief discussions of the finds are provided whenever it is appropriate. Unfamiliar terms are clearly identified and defined, and the illustrations are both relevant and helpful.

One confusing element of this book is the seemingly 'too little, too late' amount of attention paid to the topic of change. Based on the work's title and the author's introductory comments, one expects cultural change to be a much more prominent element. Instead, the vast majority of the focus is on contact and topical areas of assimilation. At points throughout the book there is the feeling that the discussion could benefit from further development. One of the books great strengths is undoubtedly the vast amount of information that the author provides; however, the book is not a long one, being just shy of one hundred and fifty pages when excluding pages not given over to discussion, and there are sections that seem to end abruptly. This is particularly true of seemingly important sections at the beginning and end of the work, such as those detailing issues with modern conceptions of 'Vikings', available source material for the Viking period, and the processes of cultural change.

Overall Griffiths' work possesses more strengths than weaknesses, and this is an interesting and insightful book that is recommended as a must read for all scholars studying aspects of the Viking Age in, as well as the interaction between between, any of the areas located in the Irish Sea region. Given the author's very accurate statements about how the 'Viking phenomena' should be viewed in more holistic contexts, Viking researchers in other areas of Europe might enjoy and benefit from this book as well. With regard to the main weakness of the work, Griffiths himself admits in his concluding remarks that there is a significant amount of additional research to be done on many of these topics. Given the author's expert knowledge of the subject any lack of information is more likely to reflect a hole in the historical and archaeological evidence available to scholars rather than an omission, and this is likely the cause of the truncated discussion of cultural change in the Irish Sea region. It is hoped that in the coming years more will be published on this fascinating subject.

Interview with Dr. Carrie Murray, 2010-2011 IEMA Postdoctoral Fellow

James Artz

Dr. Carrie A. Murray is currently the Postdoctoral Fellow at the Institute for European and Mediterranean Archaeology at the University of Buffalo, SUNY. She received a Bachelor's of Arts with honors in Anthropology and Archaeology from University of California, San Diego. For her graduate studies, she earned her Master's of Philosophy in Archaeological Science from the University of Cambridge, and then went on to University College London for her Doctor of Philosophy in Archaeology. She has since held posts at the University of Cambridge in the Faculty of Classics and Downing College, and also at the University of Wales, Lampeter in the Department of Archaeology and Anthropology. Her background enables her to combine interests in Cultural Anthropology and Classical Archaeology. Dr. Murray's research covers pre-Roman and early Roman Italy, and Greek colonization, and she focuses on understanding social action through developments in ritual spheres.

What are your current research interests? What publication projects are you working on?

The main publication that I am currently writing is one of the outcomes of the Leverhulme Greek Colonization and European Development Project at the University of Cambridge, directed by Professor Martin Millett. This is a co-authored book with my partners on the project, Sara Owen and Jason Lucas. We are each researching a number of case studies across the Mediterranean, involving both particular colonial settlements and the local settlements in the surrounding areas. In particular, we are interested in exploring the complex dynamics of the social interaction between Greek newcomers and locals, which can no longer be understood as a one-way, dominant influence of the 'superior' Greeks over 'naïve' locals. The Greek colonization research fits into my interests of exploring cultural interaction, recognizing choice and action at individual and group levels, and investigating material culture as meaningful social expressions.

Are you working on any field projects at the moment?

I am currently organizing a new field project on the island of Pantelleria. I will be co-directing with Sebastiano Tusa, the Soprintendente del Mare, Regione Sicilia. The site includes the standing remains of what seems to be a Hellenistic Period fort structure. It is very exciting to be working with the Italian authorities on a site that has not been previously investigated. I am particularly interested in discovering the long-term use and transformations of this structure. The project will also help demonstrate how Pantelleria, situated between Sicily and Tunisia, played a key role at the crossroads of the Mediterranean Sea.

What was your dissertation topic? Has your dissertation work played a significant role in developing your current research interests, or have you moved in new directions?

My dissertation topic investigated the development of authoritative statuses in Etruscan culture through changes in monumental architecture, burial practices, and the iconography involved in both. The research was so interesting for me, combining different types of archaeological evidence that had not been considered together, and with anthropological questions in mind. Elements of the approach and methodologies have remained key things in my mind. Going straight from an early Etruscan topic for my dissertation into a Greek colonization topic for the Leverhulme Project certainly meant delving into whole new areas of data, but I am still fascinated with how material culture (from small artifacts to monumental architecture) can reveal much about complex social expressions, particularly in ritual spheres— religious and funerary.

Where do you see your research and fieldwork going in the future?

I am looking forward to writing a book that has been on my mind for quite some time. I plan to expand an area of my doctoral research that I had to omit from my dissertation due to space. In terms of fieldwork, I am looking forward to expanding the Pantelleria Excavation Project.

What are your thoughts about working in the US after doing your Ph.D in Britain?

Studying and working in the United Kingdom was an amazing experience. It was exciting to be a part of interdisciplinary departments, and have access to excellent library resources. The weekly guest lectures at the Accordia Research Seminars, University College London and Classical Archaeology Seminars, Faculty of Classics, Cambridge were invaluable opportunities to meet scholars and learn about their research. Going to the pub after the seminars was a great chance for faculty and students to interact and discuss ideas. It was also extremely helpful getting so much teaching experience on such a wide range of topics at Cambridge and Wales; it was tough during the busiest times, but very beneficial in the end.

After having experience in the UK juggling different types of teaching, administrative duties, and research, I feel very able to handle just about anything now. It has been exciting to return to the US after being away for such a long time. Working at IEMA is a nice way of transitioning into the US system, by being a part of a research institute, as well as the Anthropology and Classics Departments.

What have you found most helpful and rewarding about the IEMA Postdoctoral Fellow position? What has been most challenging?

It is very helpful being involved in the interdisciplinary context of IEMA, interacting with colleagues and students in Anthropology, Classics, and Visual Studies. With my own work, I am enjoying developing my own research topic, and organizing the associated conference. It is exciting to see the event and the edited volume coming together with interesting contributions from so many scholars. Teaching the graduate course is also fun, because we are covering a wide range of contexts and materials. The class discussions are lively with students from Anthropology and Classics bringing different perspectives to the table. It is challenging juggling the different responsibilities, and learning about the particular ways things are done at UB, but it is all just part of the normal game.

Do you have advice for graduate students?

If I could offer any advice to help graduate students, I think I would mention these three things: First, work on what interests you. Do not worry about what topics seem to be on trend, you have to be truly interested in something you will spend years doing. Second, do not be afraid to meet senior scholars. Go to conferences and guest lectures. You can learn a lot about areas outside of your normal range, and even enjoy being part of the community. And third, of course, publish. It is difficult to fit more work into our schedules, but if you can strategically carve an article out of your dissertation research, it is worth it.

Blurring the 'Line' between Anthropological and Classical Archaeology: An Interview with Dr. Mike Galaty

Michael Rienti, Jr.

Dr. Michael L. Galaty is currently Professor of Anthropology and Chair of the Department of Sociology and Anthropology at Millsaps College in Jackson, Mississippi. He earned a Bachelor's of Arts with honors from Grinnell College in 1991, and received his Master's of Arts and Doctor of Philosophy degrees in anthropology from the University of Wisconsin, Madison in 1994 and 1998. His research interests include prehistoric Greece and Albania, the origins of complex societies and early states, regional analysis and archaeometry with ceramics. Throughout his career, Dr. Galaty has conducted research that frequently crosses the interdisciplinary lines between anthropological and classical archaeology.

Hi Dr. Galaty. To begin, can you please give us an overview of your research interests and goals, and describe how both anthropological and classical archaeology have influenced your work?

As an undergraduate I took Greek and courses in classical archaeology and studied abroad in Greece, but I was drawn particularly to anthropological archaeology. I decided to attend graduate school in anthropology with a research focus on the rise of states in Greece. Little did I know that this was not commonly done! That said, and with the help of excellent mentors in both camps – Doug Price, Gary Feinman, John Bennet, Jack Davis – I have managed to straddle both worlds. I was lucky to get a job that allows me to teach anthropology but work in the Classical world. And I somehow manage to get to AIAs and SAAs (and sometimes AAAs) each year (heck, I even went to CAMWS once!). Most importantly, having access to the views and positions of both anthropologists and classical archaeologists has produced for me, I think, interesting insights as regards Mycenaean states and their position in a cross-cultural, global archaeology of archaic states, generally. This would not have been possible had I not worked in cross-disciplinary fashion.

Since starting my academic career I have had conversations with professors, other graduate students and even some undergraduates that give the sense that there is a line separating anthropological and classical archaeologists, despite the fact that both are trying to better understand the past. As someone whose research crosses disciplinary lines, do you believe that such a line exists?

This is less and less true, particularly within certain circles (i.e. amongst the younger generation). IEMA is proof of that. Over the years I have developed great respect for my classically-trained friends and colleagues, and I have witnessed the divide between disciplines begin to close. We are not so different anymore. Sometimes we share the same goals, but have different primary means of getting there; e.g. some classical archaeologists emphasize historical data and see archaeology as being primarily an historical endeavor. I see myself as a scientist. But both approaches can be integrated when people are smart about research design. Things are no different in other parts of the world – Mesoamerica or China, for instance – where documentary and epigraphic data are also available. These lines are largely illusory and when drawn are often drawn for political reasons that have little to do with good archaeological research.

Why do you think this is? Is there a theoretical or methodological conflict, a problem in communication, or is this a generational issue based on differences from the past being passed down within the disciplines? What can today's students do to counter this?

First and foremost, students need to be committed passionately to what they are doing. If you want to be an anthropologist and study ancient Greece, don't let anyone tell you it can't be done. A handful of us have been very successful living in both worlds. Good archaeology is good archaeology no matter where it is done. That said, working in Greece can be difficult, in terms of permitting and one's association with the American School. But the "classical" world is much wider than Greece. That is why I have spent the bulk of my career working in Albania. Students should not be afraid to address "classical" research questions in parts of the world other than Greece and Italy.

Based on your experience, are there any special theoretical or methodological considerations that need to be addressed when conducting cross-disciplinary research?

Doing cross-disciplinary research requires proficiency in both fields, to the extent that is possible. Students who are serious about working in the classical world need to know their history and at least something about the classical languages. Likewise, they must understand anthropological-archaeological method and theory. You can't do both part way. You have to do both fully and to the best of your ability. You also need to know your audience. Writing a grant proposal for the NSF is different than writing for the NEH. I have gotten money from both, but I had to be "bilingual" to do so. It does not matter where your project is located or what time period you are interested in. What matters is how you describe the nature and goals of your research. Writing a paper for *American Anthropologist* is different than writing for the *American Journal of Archaeology*. One also needs to be capable of a certain degree of theoretical and methodological "empathy" since we sometimes speak different languages and use different techniques, despite having similar goals.

Do you have any advice for students who are doing, or plan to do, cross-disciplinary research now or in the future?

The best thing one can do is network across disciplines. There are excellent people in both camps who can provide guidance and opportunities. Get into the field and do fieldwork. This is absolutely essential. The Great Divide between disciplines is not bridged between the pages of text books, it is bridged person by person, one by one by one, over beers and around campfires. Finally, cultivate a methodological specialization that is needed always and everywhere, in Greece and throughout the world. Having such a specialization (in addition to being a good, well-rounded scholar) makes one indispensible, but also helps open doors and provides cross-disciplinary points of contact. For me it was archaeological chemistry and ceramic petrography, but there are all kinds of specializations that are desperately needed in Greece, and elsewhere in the classical world.

Where do see cross-disciplinary research in ten years time? Where would you like to see it? How long do you think it would take, and how difficult would it be, to establish greater collaboration between anthropological and classical archaeologists?

In 1999, in the introduction to *Rethinking Mycenaean Palaces*, Bill Parkinson and I wrote: "The great divide is …a loss to both anthropologists and Aegean prehistorians. If this gap between the fields is to be closed, we must each take an active role in closing it" (p. 22). In the second edition to that book, published in 2007, we wrote: "[In 1999] we bemoaned the disciplinary rift between classically and anthropologically trained archaeologists… Today, that rift seems much narrower and less permanent than it once did. … In terms of shared method and theory, the divide has been nearly closed." (p. 2). Cross-disciplinary research occurs and is valued when individual scholars decide to work together across fields and traditions. For this to happen, though, archaeologists from both camps must integrate, get to know each other (ideally working together in the field), share ideas and perspectives, and conference and publish together. These kinds of relationship can happen now, to the advantage of anthropology and classical studies, if we, and students in particular, decide to form them. *Chronika* is a prime example.

IEMA Student Research Scholarship 2012

IEMA will award up to four IEMA Research Scholarships, pending budgetary approval, to IEMA Graduate Student Members in the amount up to $2,200 for pre-dissertation or dissertation research for the period from June 1, 2012-June 1, 2013.

Eligibility: All currently enrolled doctoral students who are IEMA members.

Application Materials Required: A brief proposal of no more than 2 pages (typed, single-spaced) in which you describe your research and its significance; and 1 page with the budget.

In addition, submit the following supporting materials:
1) A curriculum vitae
2) Any funding you have received or applied for dissertation research

Submit proposals by email to the director of IEMA Peter F. Biehl with Attn to: IEMA Research Scholarship in the subject line.

Deadline: 4:30 p.m. Monday, February 13, 2012.

The IEMA Board will review the applications and notify the recipient by March 1, 2012.
The recipient of this award will file a 3-5-page report with the IEMA Director of Graduate Studies; this report will be printed in *Chronika*. In addition, the recipient will give an IEMA Brown Bag Series Lecture.

Recipients of 2011 IEMA Student Research Scholarships

James Artz (Department of Classics)
Water Supply Systems in Roman Greece: A Comparative Study

Greek cities typically used terracotta pipes for water supply, and the use of lead is most strongly associated with Roman hydrological building practices. Little comparative work has been done, however, to measure the extent of technological assimilation during the period of Roman control of Greece. A comparative study of classical Greek cities and colonies founded during the Roman period will help to determine whether Greek engineers adapted their techniques to account for new technologies, or preferred to maintain their traditional building practices.

Caitlin Curtis (Department of Anthropology)
Preserving Cultural Heritage with Sustainable Tourism in Anatolia: A GIS Approach

In Central Lydia, western Turkey, the burial mounds of Bin Tepe are under constant threat from looting, development, andagricultural expansion. By instituting sustainable tourism, the Central Lydia Archaeological Survey (CLAS) hopes to instill long-term economic value and thus promote preservation. Visibility analysis in Geographic Information Systems (GIS) will be used to pinpoint ideal locations for tourist viewing platforms, as well as to delineate buffer zones round mounds where orchard expansion should be banned. By presenting the results to local leaders, we hope convince them that the destruction of heritage is an urgent problem and that preservation promises significant benefits.

Laura Harrison (Department of Anthropology)
The North Trench at Gournia: New Light on Processes of State Formation in Bronze Age Crete

This issue of social complexity and state formation has been energetically debated on Crete since the publication of Colin Renfrew's book The Emergence of Civilization in 1972. Much of the debate centers on whether state formation was a gradual, evolutionary process, or a rapid, revolutionary process. Only one ceramic deposit is known that falls into the critical final period of state formation, and can shed light on this question: the North Trench deposit at Gournia. This project aims to recover the remaining portion of the North Trench deposit through excavation, and to conduct a detailed study of the ceramics, in preparation for publication.

Eugen Ruzi (Department of Anthropology)
Analyzing the Compositional Variability of the Early Neolithic Red-Monochrome Ceramics from Southeast Albania

Archaeometric techniques will be used to analyze the internal compositional variability of the Red Monochrome pottery from Early Neolithic sites in Southeast Albania. The goal of this project is to extract data from the physical properties of the pottery in order to answer questions about the social world of the early farmers, their technology-related behavior, and the culture-historical context for the formation of Early Neolithic communities in the Balkans. Laser Ablation ICP-MS, X-ray Diffraction, and Scanning Electron Microscopy will provide information on the elemental and mineralogical composition of the ceramics, the non-plastic materials added to the clay, the location of raw material sources, and the firing temperature of pottery production.

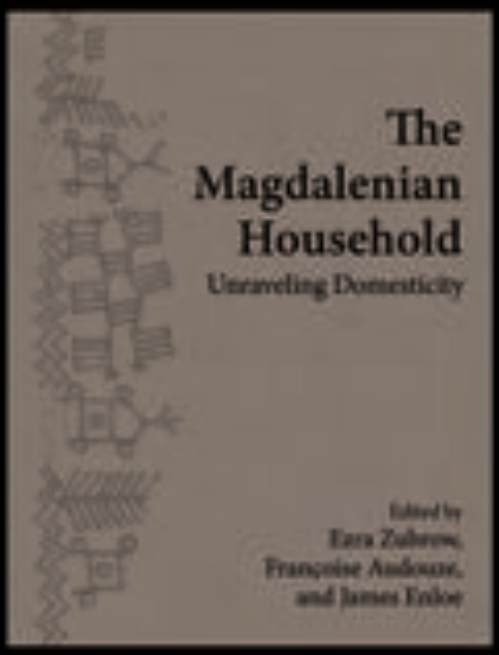
IEMA Publications

Series
IEMA Monograph Series

Volume 1
The Magdalenian Household
Unraveling Domesticity
Edited by Ezra Zubrow, Françoise Audouze, and James Enloe

Series:
Proceedings of the IEMA Postdoctoral Visiting Scholar Conference on Theories and Methods in Archaeology

Volume 1
Eventful Archaeology: New Approaches to Social Transformation in the Archaeological Record
Edited by Douglas Bolender



Volume 2 (*forthcoming*)
Archaeology of Violence: An Integrated Approach to the Study of Violence and Conflict
Edited by Sarah Ralph

IEMA Student Membership

The Institute for European and Mediterranean Archaeology (IEMA) welcomes student members from the University at Buffalo. IEMA student members can submit articles for publication in *Chronika,* present current research to peers and faculty from a range of disciplines in monthly Student Brown Bag lectures, apply for IEMA Student Research Scholarships, link a professional profile to the IEMA website, and receive a discount off the purchase price of IEMA publications.

Students from outside universities may subscribe to IEMA, for a fee. They will receive a copy of *Chronika*, a 20% discount on IEMA publications, and be informed of upcoming IEMA lectures and events on our listserv.

Eligibility

IEMA student membership is open to University at Buffalo students of Anthropology, Classics, and Visual Studies. Students from other departments at the University at Buffalo can apply for affiliated membership, by sending a request to the IEMA Governing Board (iema@buffalo.edu).

IEMA student membership is restricted to graduate students, but undergraduate students are encouraged to attend lectures, the annual IEMA Visiting Scholar Conference, and other IEMA events.

Graduate students from outside universities may join IEMA for $15, and are encouraged to submit articles to be considered for publication in *Chronika.* A copy of the student ID must be submitted to IEMA, at the address listed on the following page. Faculty and waged employees may join IEMA for a fee of $30.

Benefits

Student members of IEMA have access to a number of benefits. These benefits are designed in order to help students further their own research, and also to gain experience presenting and publishing their work. Student members of IEMA can:

- Submit an article to *Chronika*, the IEMA graduate student journal
- Present current fieldwork and research in monthly Student Brown Bag talks
- Apply for an IEMA Student Research Scholarship, to support archaeological fieldwork and research
- Link a professional profile to the IEMA website (UB students only)
- Access an online version of Chronika (UB students only)
- Receive a discount off the purchase price of IEMA Publications (40% for UB students, 20% for non-UB students and faculty)

IEMA Student Membership Application

Name_____ _____ _____
first middle last

Email Address_____
(Please use your school email address)

Are you a University at Buffalo Student? ☐ Yes ☐ No

If not, where do you go to school?_____

What department are you in?_____

Street Address_____

City_____ State_____ Zip_____

Country_____

What are your research interests? _____

_____

_____

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_____

Please return this completed form by mail to the following address:

Attn: IEMA Student Membership
380 MFAC Ellicott Complex
SUNY Buffalo
Buffalo, NY 14261
USA

If you are from an outside university, please enclose a check for $15(student rate) or $30 (faculty and waged rate), made out to "IEMA."

This membership application is also available online, at www.chronika.yolasite.com.

Figure 1: Austrian province of Styria with the Mura River Valley study area outlined.

Figure 2: Example of an Austrian historic cadastral map from 1820.

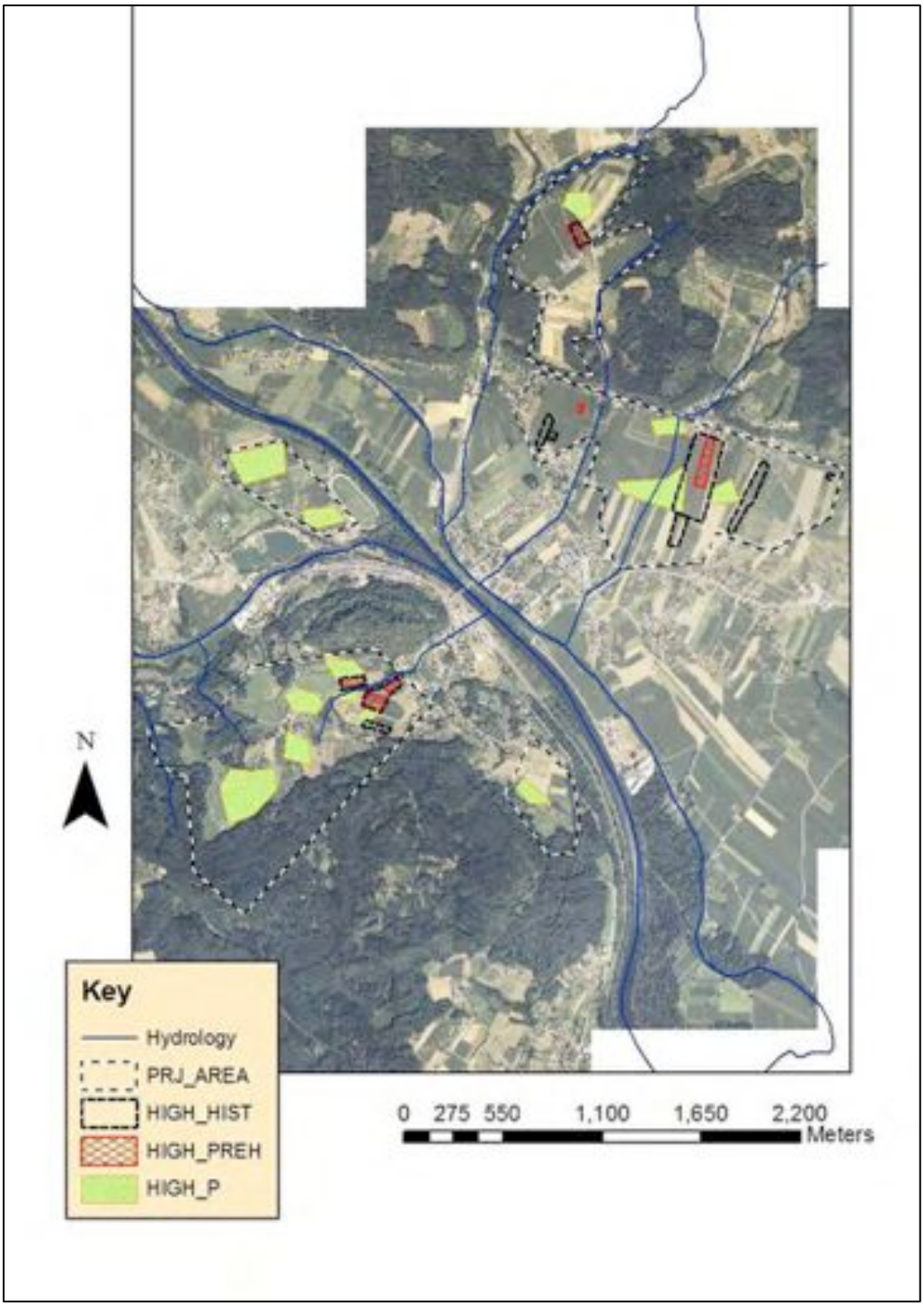

Figure 3: Aerial image of author's project area in the Mura River Valley showing local hydrology, areas of high prehistoric and historic artifact concentrations and areas of high phosphate.

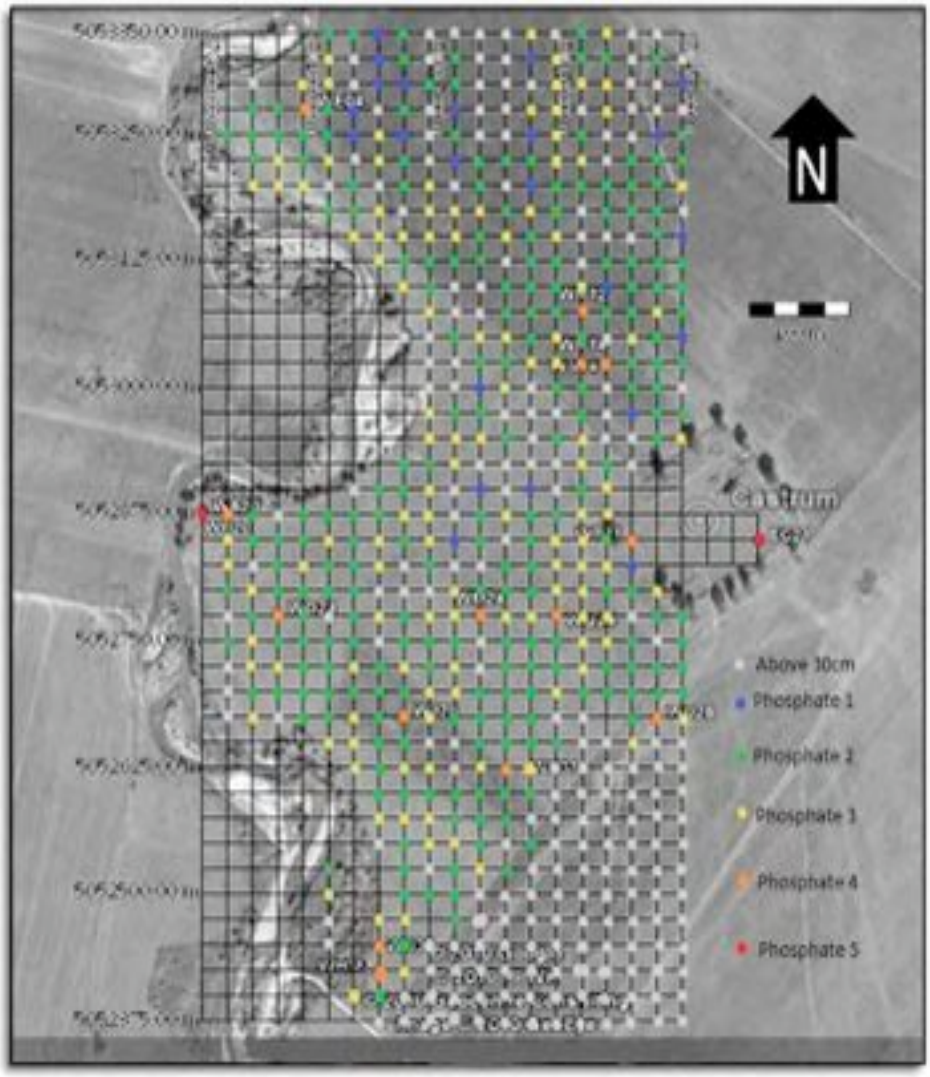

Figure 4: Phosphate results from research conducted at Cumidava, Romania. (Background image acquired from Google Earth).

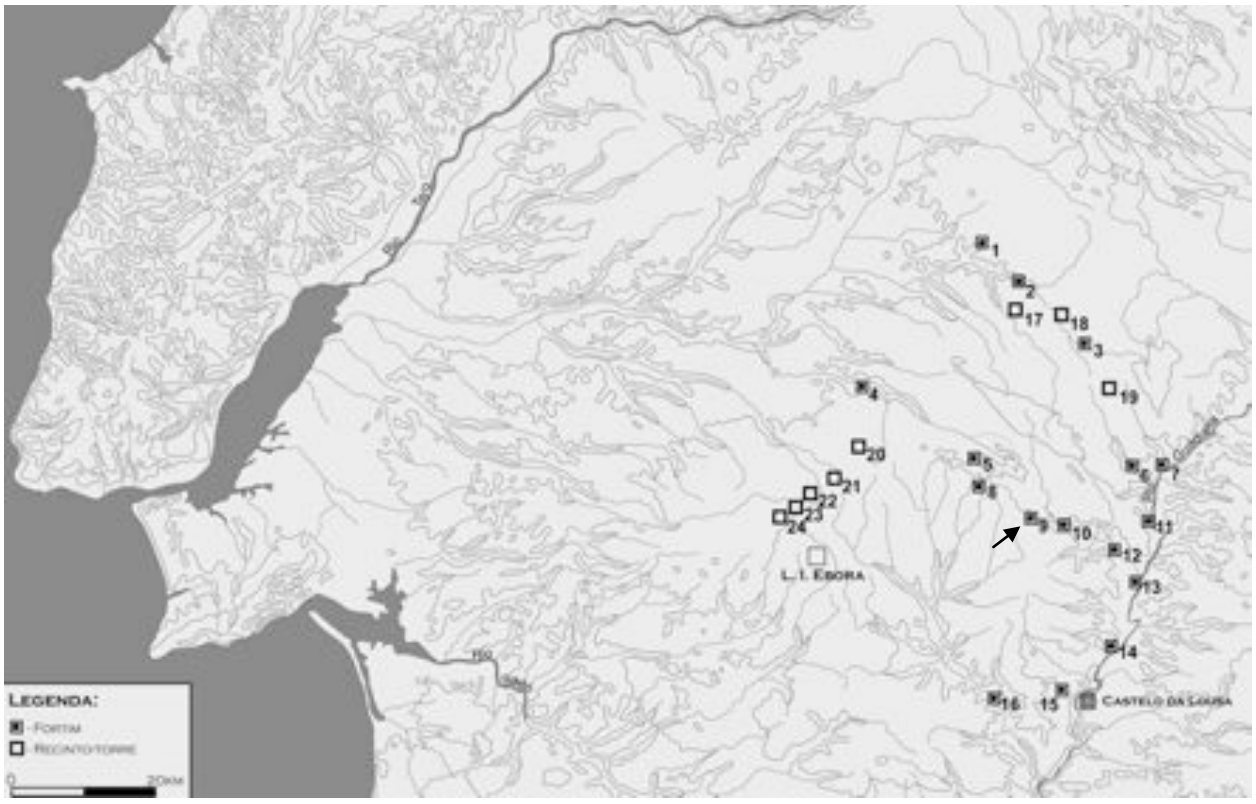

Figure 5: Distribution map of the twenty-four forts and tower enclosures in the Alto Alentejo region (Mataloto 2002, fig. 71), numbered: 1 – *Malhada das Penas 1*; 2 – *Beiçudos*; 3 – *Penedo do Ferro*; 4 – *Soeiros*; 5 –*Cortes*; 6 - *Outeiro Pintado*; 7 – *Três Moinhos*; 8 – *Monte do Almo*; 9 – ***Caladinho***; 10 – *Castelinho*; 11 – *Rocha de Províncios*; 12 – *Outeiro dos Castelinhos do Rosário*; 13 – *Castelo da Pena de Alfange*; 14 - *Monte do Gato 2*; 15 – *Defensinha*; 16 – *Moinho do Tojal*; 17 – *Mariano*; 18 – *Outeiro da Mina*; 19 – *Terrugem*; 20 – *Castelo do Mau Vizinho*; 21 – *Santa Justa*; 22 – *Sempre-Noiva*; 23 – *Castelo dos Mouros*; 24 – *Vale d'El-Rei de Cima.*

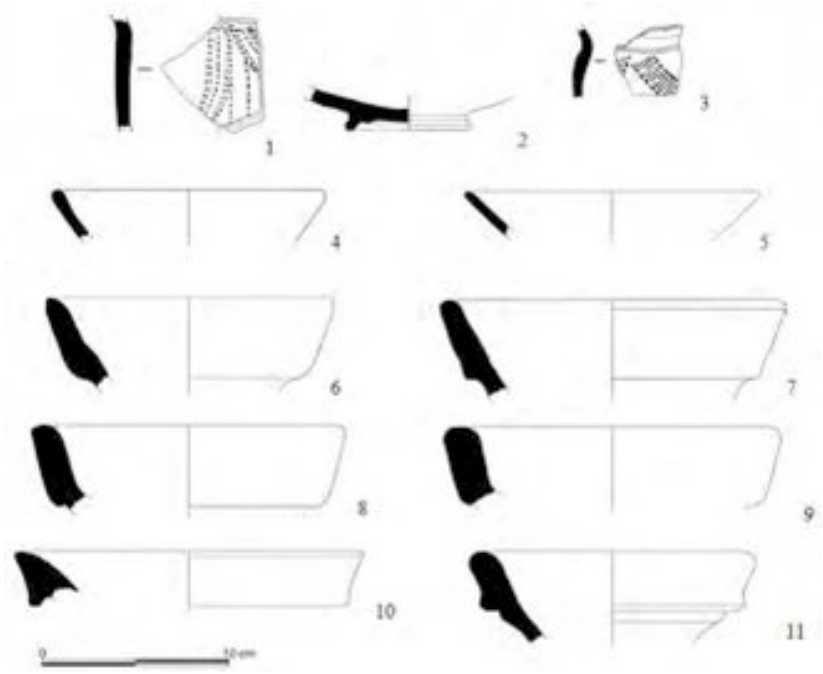

Figure 6: Ceramics collected during initial survey at Caladinho (Mataloto 2002, fig. 28): 1 and 3 – ceramic decorated with a reel; 2 – ceramic base of grey fabric; 4-5- cups; 6-9 – amphorae of Haltern 70 amphorae; 10-11 – Dressel 7-11 amphorae.

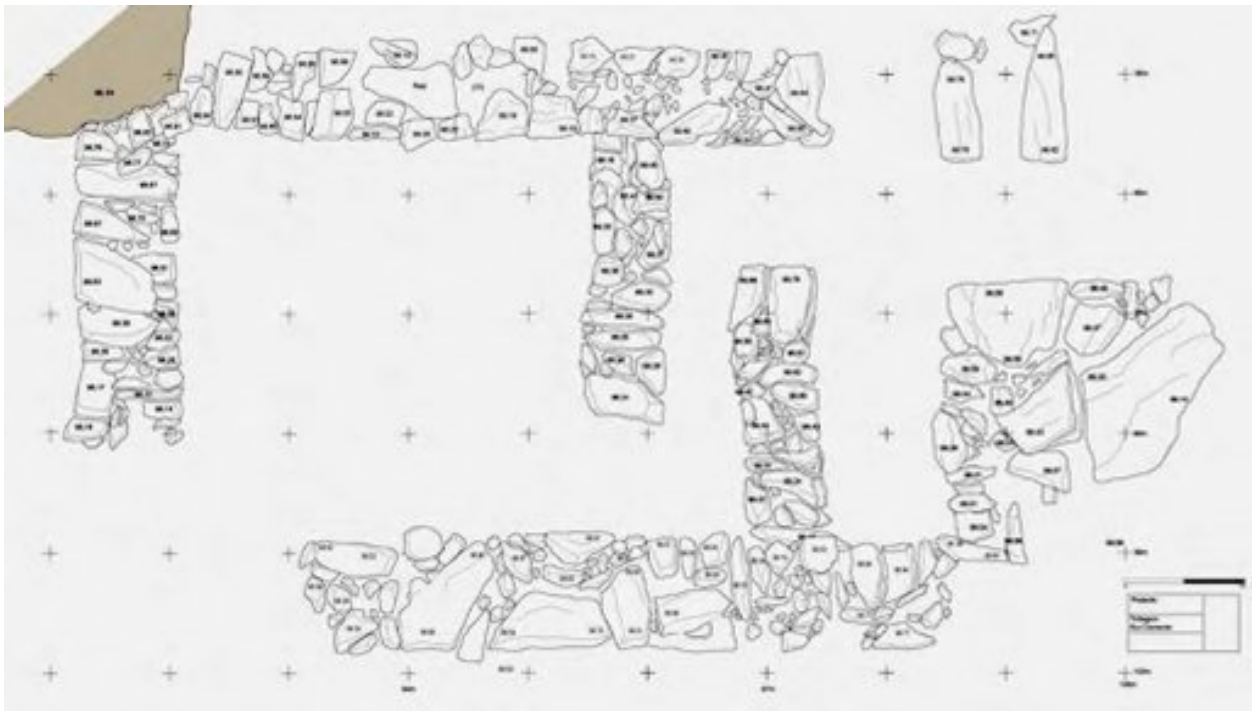

Figure 7: Plan of the excavation at Caladinho (illustration by R. Clemente).

Figure 8: Bases of Italian *terra sigillata* platters, one bearing the name of the potter "Dareus."

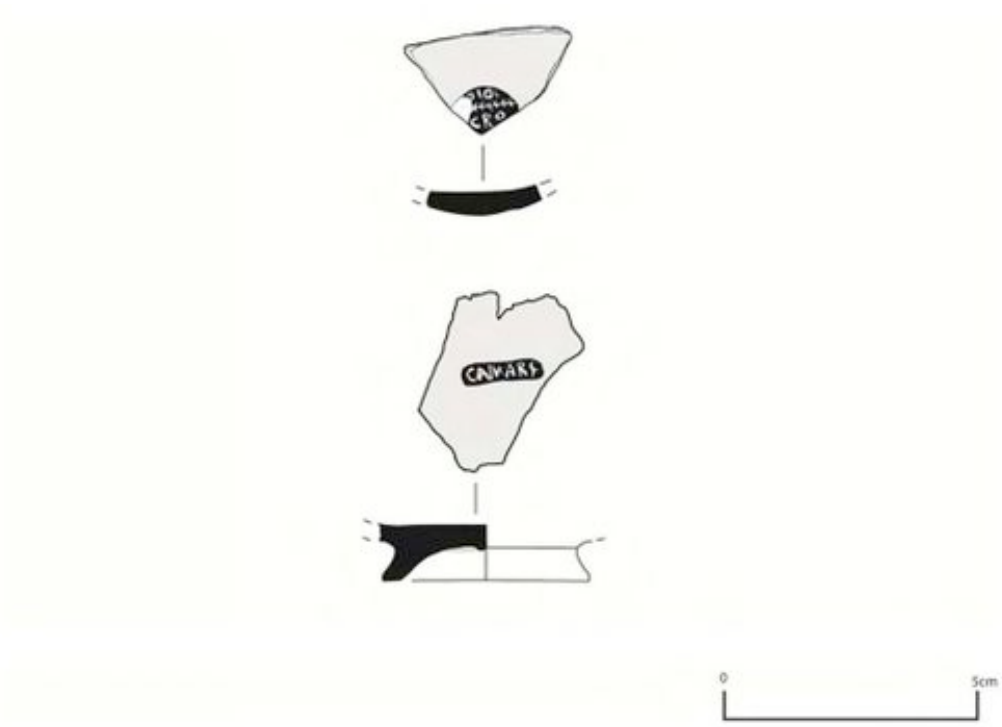

Figure 9: Italian *terra sigillata* fragments with stamps tentatively identified as the names of "A. Vibius Scrofula" and "Camurius."

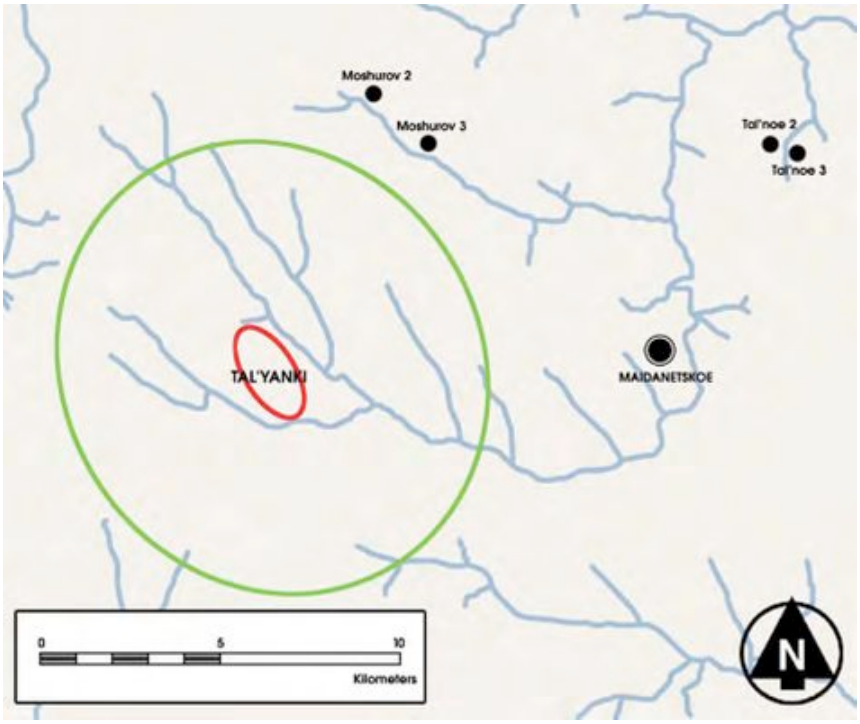

Figure 10: Representation of the Tal'yanki giant-settlement (red) with a five-kilometer site catchment radius (green) in relation to nearby settlements.

Table 1: Available land area defined by 1 km intervals from the site boundary.

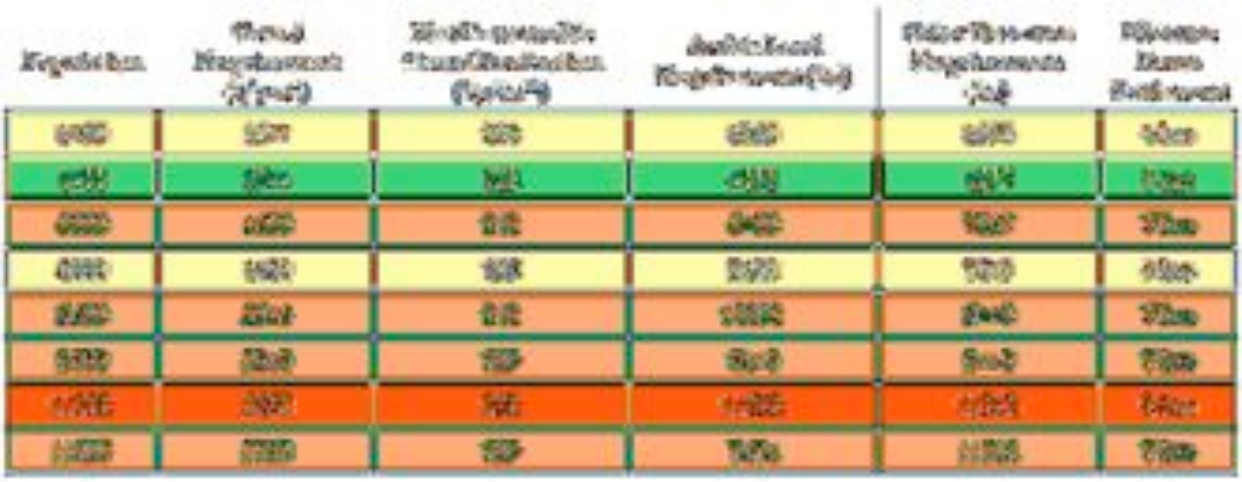

Table 2: Land requirements given differential figures for population (based on 4,5,6, or 7 individuals on average per household and a total of 1600 households) and average cereal production (based on figures from Dennell and Webley 1975 and Bibikov 1965).

About the Editors

James Artz is a third year Ph.D. student in the Department of Classics, with a concentration in Mediterranean Archaeology. James completed his B.A. at the University of Michigan with concentrations in History and Latin and his M.A. from Tufts University with a concentration in Classical Archaeology. His Master's Thesis focused on fifth-century Athenian foreign policy, particularly exploring economic causes for the transformation of the Delian League into the Athenian empire.

James has excavated in the Athenian Agora for the past six years and is currently an Assistant Supervisor. He is refining his dissertation topic, which will focus on a comparative study of the water supply systems of Athens and Corinth. Through a study of water supply, James plans to explore the extent of cultural change in Athens and Corinth during the period of incorporation within the Roman empire.

Laura Harrison is a second year Ph.D. student in Anthropology at the University at Buffalo. She earned her B.A. in Anthropology and Art History from Ithaca College in 2007, and subsequently worked at the New York State Museum and the Smithsonian Institution. Laura's fieldwork experience spans multiple geographical regions and time periods; from Neolithic and Chalcolithic Çatalhöyük, Turkey to Late Woodland Levanna, New York. Since enrolling in the Ph.D. program at the University at Buffalo, her primary research has focused on the development of social and political complexity in the Bronze Age Aegean. She continues to cultivate her interest in museum studies via projects on cultural heritage and law, collections management, public outreach, and digital media in museums.

Laura is currently a trench supervisor in excavations at the site of Gournia in eastern Crete, and is preparing her M.A. thesis on the development of social complexity in Bronze Age Crete. In addition, she is a Teaching Assistant at the Cravens collection at the University at Buffalo.

Michael Rienti, Jr. is a Ph.D. student in the Department of Anthropology specializing in Archaeology. He earned his B.A. in Anthropology from the State University of New York College at Plattsburgh in 2007 with minor concentrations in Archaeology and History. Michael is currently working on his M.A., which is exploring the potential use of multi-element soil chemistry analyses in regional landscape studies using data from Thy, Denmark. For his dissertation, he hopes to focus on questions of continuity and change in social identity and memory as it relates to political changes during the Late Iron Age and Early Medieval Periods in Southern Sweden.

Michael began doing archaeology in 2006 focusing on historical archaeology in the Northeastern United States, and has worked at the University at Buffalo Archaeology Survey doing Cultural Resource Management Archaeology in Western New York State since 2008. Recently, he developed a strong interest in proto-historic Scandinavia and is currently a member of the project *Forests, Farmers of the Smålands: Pastoralists and the State in Iron Age, Medieval and Early Modern Sweden*, directed by Dr. Tina Thurston of the University at Buffalo.