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FUNCTIONAL ANALYSES OF ANCIENT HOUSE INVENTORIES

The extraordinarily rich architecture, décor, and household assemblages of the Terrace Houses in Ephesos remind us of just how elaborate urban living could be in Antiquity. The houses and material culture I discuss here are much more modest than those. My subject is the analyses of household assemblages: the collections of ordinary, often coarse and unglamorous pottery, metal, stone, and other artifacts which allowed the household to function, kept it safe, alive and productive.

What can we learn from these humble objects? In addition to the usual questions about the chronology of the building, in the right circumstances we can learn about household production, patterns of trade and exchange between the household and the rest of the city or the broader world beyond the polis, the socio-economic status of the household as a whole, the composition of the household, perhaps with free and non-free inhabitants, and other questions. But my focus here is on functional analysis that is, what artifacts were used for, and how artifact assemblages help us to determine how domestic spaces were used. The importance of artifact assemblages is that they offer information about the activities performed in a space, that is independent of the size, position, construction, décor, and other architectural aspects of that space. In conjunction with the study of architecture and literary *testimonia*, the analysis of household assemblages allows us to make more direct, nuanced and persuasive inferences about ancient activities, specific to individual houses and rooms rather than general statements about house and room types. They allow us to test some of our long-held hypotheses and analogies about how household spaces were actually used. The rich household assemblages preserved at some sites enliven our picture of ancient houses, and reveal an unsuspected variety in the way people organized their homes, the work they did, the compositions of households and their relations with the outside world.

I want to use examples from a couple of sites to ask a few questions:

1. How do we define a household assemblage? How do we distinguish a functional assemblage from other kinds of artifacts that may be found in houses, for instance rubbish dumps that may have been deposited in a house after it was abandoned?
2. How do we analyze incomplete archaeological records, such as partial assemblages, and incomplete excavation, recovery, mending, and publication?
3. How do we identify the functions of artifacts? Even when we have a secure ancient name, or a probable use, how do we know how specific artifacts were actually used? To what degree were artifacts used for multiple purposes?
4. How did objects change functions over time? Can we identify this in the archaeological record, and how does this affect our interpretation of artifact assemblages?
5. What is missing from the archaeological record, and how do we take account of it in assessing the functions of spaces?

I will use specific examples from sites familiar to me to address these questions, hoping that concrete examples may be of more use than purely theoretical discussion.

Defining a Household Assemblage

While archaeologists often refer to collections of shards and other stray finds from abandoned houses as household assemblages, I believe that we should define them more narrowly, as assemblages of artifacts that can reasonably be associated with the spaces in which they were found, that is, in a primary context. This definition would exclude artifacts from imported fills used to raise floor levels and cover earlier archi-

tectural remains, and secondary refuse which may be deposited in house rooms, often after the house was abandoned. These deposits may contain relatively well-preserved pots and other material, but they are obviously not found in a primary context. I suspect that the analysis of assemblages from primary contexts is complicated enough, and pose enough interesting and difficult problems of interpretation, that we should try to understand these first, and then move to the more problematic situation of secondary deposits. When we introduce another degree of separation between ancient household activities and the archaeological present, such as how to interpret discarded or redeposited artifacts in secondary contexts, the problems of interpreting ancient activities from their mute tools and byproducts become much more difficult. In this paper, I will try to focus on groups of more or less whole artifacts found in primary contexts, rather than the shards and detritus left after a house is abandoned¹.

Accustomed as we are to finding only the wreckage of abandoned houses, stubs of walls and shards of pottery left after everything worth taking was removed, archaeologists sometimes forget – or are forced to ignore – that ancient houses contained remarkably rich and varied collections of the equipment that allowed the household to function. It is only in houses that were violently destroyed by war, natural disasters, and the like, that household assemblages are preserved in anything like a primary context. This is a rare situation, however.

I have had the privilege of working on two ancient cities whose houses preserve relatively complete domestic assemblages: Olynthos, in the Chalcidic peninsula of Northern Greece, and Sardis, the capital of the Lydian Empire in Turkey. Although outside the purview of Hellenistic and Roman housing, these sites offer some of the better-preserved household assemblages in the Eastern Mediterranean, and they offer interesting lessons and comparative material for the study of ancient houses in general. What makes these sites special – and in a broad way comparable to the terrace-houses at Ephesos, largely demolished in a 3rd c. earthquake – is that they were violently destroyed, and their contents abandoned, broken but restorable, on the house floors. Olynthos was besieged by Philip II in 348 BC, was sacked and the inhabitants sold into slavery; the city was hardly reoccupied after the destruction². Sardis was captured by Cyrus of Persia in about 547 BC, the city ransacked and, perhaps, partly depopulated; in any case, the houses were abandoned and hardly disturbed³.

What Doesn't Survive?

Both of these cities were extensively looted by their captors before abandonment, removing most valuable materials, including gold, silver, and bronze. And as at most Eastern Mediterranean sites, only imperishable materials such as pottery, terracotta and stone were preserved, while organic and perishable items have, with a few exceptions, rotted away. Literary and epigraphic evidence, however, gives us a sense of what we are missing. The Attic Stelai, for instance, list salable belongings of well-to-do Athenian citizens who had been convicted of defaming the Mysteries of Eleusis⁴. The valuable items belonging to these households, however, are slaves, agricultural produce, real estate, building materials like tiles and bricks, metal tools and weapons, furniture, clothing, metal vessels, and large, coarse vases and implements like *pithoi* and grindstones. These are exactly the kinds of objects which either do not survive in the archaeological record, or which are typically under-studied in favor of smaller, finer, but less expensive objects such as figured pottery. Our familiar ceramic cooking pots, eating and drinking vessels, loomweights, and other typical household artifacts are almost beneath the notice of the auctioneers, too cheap to mention, or sold in relatively large lots. So we must already consider even our best archaeological assemblages, with whole pottery vessels, loomweights, and other common archaeological finds, as only a small part of the original equipment of the household, and not even the most valuable part. The houses from these relatively well-preserved sites are not, therefore, ›moments frozen in time‹ with complete household assemblages. The ›Pompeii Premise‹, the idea that some

¹ Of many studies see recently A. BERLIN, *The Pottery of the Second Temple Period. The Shmarya Gutmann Excavations, 1976–1989, Gamla 1, IAA Reports 29* (Jerusalem 2006).

² CAHILL 2002, 45–61.

³ Date discussed in CAHILL – KROLL 2005.

⁴ W. K. PRITCHETT, *The Attic Stelai*, *Hesperia* 22, 1953, 225–299; W. K. PRITCHETT, *The Attic Stelai, Part II*, *Hesperia* 25, 1956, 178–328; W. K. PRITCHETT – D. A. AMYX, *The Attic Stelai, Part III. Vases and Other Containers*, *Hesperia* 27, 1958, 163–310.

archaeological situations offer an unbiased view of the exact situation of a household at a particular point in time, has been debunked enough times that I hardly need mention it⁵.

And finally, excavation recovers only a sample of the material preserved in the ground. At Olynthos, excavated in four years between 1928 and 1938, Robinson apparently collected only pottery that was recognizably complete and considered worth mending. This means that cooking wares are almost completely absent from the publications, and larger black-glazed shapes are greatly underrepresented, probably because they broke into so many pieces that they were not recognized in the field or mended. The rapid pace of excavation allowed the expedition to uncover some hundred houses, more than at almost any other Greek city, but at the cost of fine resolution of their contents. At Sardis, we have tried to achieve complete recovery through careful sieving, flotation, and mending, but inevitably objects slip through; no excavation process recovers everything.

Despite the very incomplete preservation of the assemblages, though, the quantity of finds from these houses can be staggering. The excavation of about 100 houses at Olynthos (about 43000 sq. m.), for example, recorded some 20000 artifacts, mostly from the destruction level; and if the excavators in the 1920's and 1930's had saved and mended everything they found, such as the cooking and plain pottery that was discarded en masse, that number would probably have been hundreds of times greater⁶. Excavation of only a few household spaces at Sardis produced about 372 more or less whole pots and lamps – an average of two to three complete vases per square meter – and, if one counts loomweights and other grouped objects as separate, individual artifacts, another 454 objects of other materials, including bone, glass, clay, iron and bronze. If we at Sardis were to uncover as many rooms as they did at Olynthos and mend the pottery we find on average, one might calculate roughly that it would take about a thousand years to complete conservation.

Analysis

How does one analyze such quantities of material? The only way to deal with thousands of objects is with some sort of automated data processing system. This has become standard in archaeology all over the world, and raw archaeological data is increasingly being made available on the World-Wide Web. Following data entry, statistical analysis of such a body of information is very tempting. The 1980's and 1990's were the heyday for methodological studies of the use of statistical analysis in archaeology, adapting univariate and multivariate statistical methods to distinguish patterning among archaeological data and, ultimately, to derive cultural conclusions⁷. The use of Geographical Information Systems is also becoming increasingly widespread, and making its way into the archaeology of households. This links statistical and spatial analysis, so one can compare assemblages both in terms of their composition and their spatial distribution. Classical archaeology has tended to lag somewhat behind the more anthropologically-oriented disciplines in the development of statistical analyses, at least in the United States, in part because so many of their practitioners were focusing on individual objects of artistic significance, and not spending as much time on assemblages of undecorated pottery, grindstones, and the like. As I will argue below, however, I do not believe that most household assemblages are amenable to such statistical analyses. With this in mind, turn to some sites with well-preserved household assemblages.

Olynthos: Weaving, and Statistical Analysis for Room Function

Olynthos remains a major type site for ancient Greek housing. No Greek site has more excavated houses, and the house plans are particularly clear and well-defined, in part because the site was planned on a particu-

⁵ e.g. P. M. ALLISON, *Artefact Assemblages. Not the Pompeii Premise*, in: *New Developments in Italian Archaeology. Papers of the Fourth Conference of Italian Archaeology 3* (London 1992) 49–56.

⁶ The publications of Olynthos mention only 324 loomweights, for example, while the unpublished fieldbooks record more than 2761 of them. A large number of coarse and undecorated vases was probably discarded.

⁷ The literature is enormous. Useful recent reviews include M. J. BAXTER, *Statistics in Archaeology* (London 2003); D. L. CLARKE, *Analytical Archaeology* (London 1978); R. D. DRENNAN, *Statistics for Archaeologists: A Commonsense Approach. Interdisciplinary Contributions to Archaeology* (New York 1996); M. FLETCHER – G. R. LOCK, *Digging Numbers: Elementary Statistics for Archaeologists* (Oxford 2005).

lar occasion, occupied for a short time, and then violently destroyed. For these reasons, scholars have tended to approach the houses at Olynthos in a very normative fashion, choosing a single example as a type house, or even postulating that all the houses were originally identical, as was argued in Hoepfner and Schwandner's monumental work more than 20 years ago⁸. But after working on the houses and assemblages at Olynthos, I have become convinced that this approach is misleading, and that we must avoid the temptation to simplify our approach and treat the diverse houses as variant examples of essentially identical types. We must focus on specifics in addition to generalities, and on variety rather than sameness. Artifact assemblages offer specifics of how spaces were actually used, rather than broadly defined room types identified by architecture and literary descriptions.

For instance, consider the daily task of weaving. There is no architectural evidence for where people wove in ancient houses, and few descriptions in the literary record. The primary evidence is from the finds, mostly loomweights. Loomweights were found in most houses at Olynthos. Obviously, however, a single loomweight is not in itself evidence of weaving except in the most general sense; one needs many loomweights to make a loom. In a functional analysis, one must therefore consider not necessarily individual objects, but often groups of objects as ›artifacts‹. The significant artifact in a household was not the individual loomweight, but the loom, and this is represented archaeologically by clusters of loomweights.

At Olynthos, many houses contained clusters of loomweights large enough to postulate that they represent the remains of a loom with 10–40 weights (fig. 1). Rooms used for weaving can be identified in about a third of the excavated houses, and many others were either not well enough preserved, or the notes are not complete enough to determine household activities. The excavation notes generally do not record details such as whether they were found in a line, except in one case where a set of 43 loomweights was found in a 1.10 m long line – exactly what one would expect⁹.

Analysis of the find-spots of the more than 2700 loomweights from Olynthos reveals that there is no specific type of room in the house which can be identified exclusively as a weaving room (fig. 2). Clusters of loomweights are found occasionally in courtyards, more commonly in the *pastas*, and in a variety of other rooms to the north, south, and elsewhere around the house. The rooms average about 25 sq. m. in size, which is about the average size of all rooms at Olynthos, and they vary in size from about 6 sq. m. (a doubtful case, however) to almost 75 sq. m., encompassing practically the whole range of sizes of Olynthian rooms. They are generally not elaborately decorated, but this they share with most rooms in the city.

It is difficult, therefore, to make generalizations about the size and decoration of these rooms or to identify weaving rooms from their architectural characteristics. But these spaces tend to share some common attributes. Access to these rooms was usually well controlled: they are generally not courtyards or other open spaces; and they are all adjacent to a source of light – either the courtyard, or a light well. Weaving requires light, but one would not want to set the loom directly in the open, where it would be exposed to sun, rain, birds, children, and other potential disturbances. Rather, the women of the household found spaces that were well-enough lit to make weaving easy and pleasant, and yet were sheltered and well enough controlled to keep their work safe and secure.

P. Allison came to a similar conclusion in her analysis of the artifact assemblages from Pompeii. She identifies the most common type of room used for weaving as her ›Type 4: Small closed rooms off front halls‹, that is enclosed areas opening onto well-lit spaces¹⁰. Of the 46 rooms she identifies as possibly used for weaving, 14 were of this type; another six were small rooms adjoining gardens. Both Greeks and Romans tended to seek out controlled, well-lit rooms adjoining open areas for weaving, presumably for just the same reasons.

The excavation notes at Olynthos do not record exactly how the loomweights were found, whether in a tight group as if in storage, or in a line as if fallen from a loom, or scattered as if fallen. One might interpret a group of 10–40 loomweights found in the same room as a loom that was set up at the time of destruction. But this functional identification does not necessarily follow. In some cases it seems likely that the loomweights were not set up on a loom, but were being stored for use at another time and place. For instance, two groups totalling 71 loomweights were found in room g of House A iv 9, a room with a size of 4.6 ×

⁸ W. HOEPFNER – E.-L. SCHWANDNER, *Haus und Stadt im klassischen – Griechenland* ²(Munich 1994).

⁹ Villa CC: CAHILL 2002, 326.

¹⁰ P. M. ALLISON, *Pompeian Households: An Analysis of Material Culture* (Los Angeles 2004) 146–148.

5.0 m which also contained a grindstone, a *louter*, two mirrors, hardware, probably from one or more pieces of furniture, a *louter* base, a grindstone, and a host of other artifacts. In the *pastas* of A viii 7 was a cache of 247 loomweights, together with five amphorae, four *thymiateria*, three female protomes, half a dozen vases and other artifacts. It seems unlikely that either of these rooms was used for weaving, as well as eating and drinking, ritual and the many other activities suggested by this collection of artifacts. Rather, these seem to be storerooms, and their contents would have been employed elsewhere in the house.

The simple presence of loomweights is not sufficient to conclude, therefore, that a room was used for weaving. A simple statistical analysis or distribution plot of the presence or absence of loomweights, or a more nuanced quantitative approach which considered not only the presence of loomweights but their quantity, would miss such exceptions: that there are too few loomweights in a room, or too many, or too many other artifacts in too small a room. Instead, I think one must approach the study on a room-by-room basis, taking into account the architecture and situation of the room, the number of loomweights, and the other equipment in the house, as well as circumstances such as how deeply the room was buried and whether there is evidence of later activity.

This analysis was presented in more detail elsewhere, and I will not belabor the point here¹¹. But I will point out a couple of methodological issues. First, it is tempting to deal with these masses of artifacts with statistics. I spent a number of years entering data from the Olynthos publications and original fieldbooks into a database, with the hopes that I could then use multivariate statistics to distinguish patterns in distribution of artifacts: that statistical analysis would reveal co-variation between types of artifacts, or that cluster, discriminant, factor analysis, or other methods would distinguish ›toolkits‹ of artifacts that tend to be found together, as has been done in anthropological archaeology. In the end, the database was essential, but the statistical analysis turned out to be relatively uninformative. It is not that there was no patterning in the data, but rather, that the cultural significance of the patterns was usually impossible to gauge. Moreover, the results probably depended more on how the data was defined and set up, than on the ancient situation.

Others have tried such methods in Classical houses. L. Nevett, for instance, independently analyzed some of the finds from Olynthos, and published her results in her excellent book ›House and Society in the Ancient Greek World‹. Among her analyses of household assemblages is a calculation of the indices of correlation between different types of artifacts at Olynthos, looking for patterns that might suggest functional relationships between varieties of artifacts¹². Among the strongest statistical correlations she discovers in her analysis is between loomweights and coins, with a phi-square of 0.449. The chi-square of 0 shows that the correlation is statistically significant; there is virtually no chance that this is the result of incomplete sampling. But what does this strong correlation between loomweights and coins mean in cultural terms, what does it tell us about ancient behavior? One might conclude that weaving was somehow associated with commerce, that it was often involved with the production of cloth for use and sale outside the household; or perhaps that cloth and coins were both valuable, and stored in similar ways. The explanation, I suspect, is much more mundane. Loomweights and coins are both very common, indestructible, and, for archaeologists working in the trenches, obvious artifacts to collect and record. They are found and recorded in small numbers in almost every room of every house; hence, there is a strong correlation between them. But, as discussed above, a single coin or a single loomweight is functionally insignificant; for a functional analysis one must look at groups of loomweights, and, probably, groups of coins. Single examples may be considered mere ›background noise‹, which can easily obscure more interesting and meaningful patterns in the archaeological record. The relatively simple statistical method of listing positive and negative indices of correlation, however, does not consider quantities, but simple presence or absence. It cannot distinguish such noise from meaningful patterns. One would have to look at correlations between unusually large numbers of coins and large numbers of loomweights – and here, we find no such positive link¹³.

A purely statistical approach can lead, therefore, to conclusions whose statistical significance is absolutely certain, but whose cultural and historical meaning is not at all clear. It is very difficult to decide which sta-

¹¹ CAHILL 2002, 169–180.

¹² L. C. NEVETT, *House and Society in the Ancient Greek World*. *New Studies in Archaeology* (Cambridge 1999) 61–64. 183 (Appendix 3: Results of the Analysis of the sample of excavated houses at Olynthos).

¹³ Cf. CAHILL 2002, 71 f.

tistical correlations are meaningful, and which are not. That remains a matter of judgement and definition of artifacts, not of statistics itself.

Rather than looking for patterns in data over the whole site, I have found it more useful to examine each room individually, and list the activities that might have gone on in that room, based on, for instance, the entire assemblage of artifacts, the size and architectural features of the room, proximity to other types of spaces and assemblages, and the overall picture of the house. This room-by-room approach brings one closer to the human beings that once lived in these houses and used these artifacts.

Methods of exploratory data analysis over the whole site are extremely useful, however. A flexible database program is essential, and it needs to be tailored to the specific needs of the site and its situation and particular questions. This can be used to aggregate quantities of different types of artifacts in rooms and houses throughout the site, to compare assemblages of artifacts in different types of rooms, and to create datasets tailored for specific statistical analyses, where those are judged to be appropriate. GIS applications are also extremely useful. These programs combine the artifact database with a digital site plan to create distribution maps, both for publication and more generally for exploratory analysis. In almost every case, though, my data had to be ›massaged‹ in its preparation for statistical or GIS analysis, for instance by removing outliers or special situations that would skew the results. And in the end, I always came back to looking at each space individually, house by house, room by room, and artifact by artifact.

Identifying Different Functions of Artifacts

I started with loomweights because they do not present some of the common problems of post-use and post-depositional histories. They are durable, their function is relatively clear and unambiguous, and they were not usually worth salvaging, so unlike some types of artifacts, they have not been systematically removed from the archaeological record. An important difficulty with functional analysis, however, is that objects can be used for different purposes, and may change their function and status over the course of their useful lives. A *krater* might be a showy centerpiece at a symposium when new; after a few years or decades of use, having lost a handle or chipped its rim, it may be demoted to more mundane uses in another part of the house; in a later stage of its life, perhaps it could be used to hold refuse, and at the end of its lifespan, it could become a planter in the courtyard. The discovery of a *krater* in a room, therefore, does not imply that the room was used for drinking. Rather than assuming that all vessels had a single purpose, one ought to try to determine, or at least confirm, the function of each individual object from its context. This introduces a new level of complexity and uncertainty into the interpretation of household assemblages, and at most sites the level of detail necessary to resolve these uncertainties is simply unattainable.

For example, louters were among the commoner stone artifacts at Olynthos, and seem to be used for a number of different purposes (fig. 3). Of the 64 louters found, some were associated with portable altars, and were probably used for some kind of ritual washing. The example in fig. 3, for instance, was found in a *pastas* together with two portable altars, apparently forming a sub-assemblage used for ritual and paralleled at other houses. Other louters served as basins for household washing, and still others were associated with grindstones, and were probably used as kneading bowls for making dough. The best example of the latter use was a well-preserved *louter*, found together with five grindstones and other equipment for baking in the House of the Tiled Prothyron (fig. 4). Unlike the *louter* in fig. 3, this *louter* was extensively mended, suggesting that it was late in its life-cycle¹⁴. I suspect, therefore, that it is misleading to speak of *the* function of a *louter*, but one should speak of a range of functions, changing according to its place in the life-cycle of the artifact or its location in the house.

This diversity of functions of a single type of artifact greatly complicates the analysis of artifact assemblages and room use, and brings into question conventional identifications and classifications of artifacts. The presence of a *louter* in an assemblage could indicate washing, or ritual, or bread-making, or perhaps all of these, at different times. How does one decide which is the correct interpretation? One may look at the associated artifacts, but these are not always sufficiently well preserved to indicate the full range of activi-

¹⁴ See CAHILL 2002, 71. 89. 99 f. 109. 112. 115. 119. 132. 143 f. 146 f. 158. 164. 166. 168.

ties. The condition of the artifacts is also important in determining their function. New and well-preserved objects may be assumed to be used for more ›original‹ purposes which may be higher in perceived status, such as ritual, while broken, incomplete and reused artifacts may suggest activities lower in status. But all these evaluations are subjective at best, and demand specific, careful analysis of complete assemblages in primary contexts, rather than automated statistical analyses of incomplete or secondary assemblages.

To investigate this phenomenon of multiple functions and reuse, let me turn to another site with well-preserved domestic assemblages, Sardis.

The Life-Cycle of Artifacts at Lydian Sardis

At Sardis, we have had the great fortune to excavate a destruction level of the Lydian period. Weapons, armor, and skeletons of soldiers bearing signs of multiple traumas show that the destruction level is the result of military action rather than natural catastrophe¹⁵. The destruction is well dated by Attic and other imported pottery, by carbon-14, and by dendrochronology to the mid-6th c. BC¹⁶. A military destruction in the middle of the 6th c. BC at Sardis must be the famous capture and sack of the city, in about 547 BC. Herodotus describes the sack of the city, and Cyrus' moment of revelation when Croesus points out to him that it is not the city of the Lydians that the soldiers were looting, but Cyrus' own property; so Cyrus puts a stop to it. Nonetheless, the houses were burned and abandoned, and their remaining contents left for the most part undisturbed. One group of excavated houses is located at the western edge of the city, at the foot of the Lydian fortification wall¹⁷. More recently we have found the same destruction level in the centre of the city, on the site of the later theatre.

Although later remains cover the Lydian houses, the Lydian level is remarkably well preserved. Piles of vases were found smashed *in situ* on the floors; grindstones still rested on benches, cooking pots were still full of food, and hundreds of other objects of iron, bronze, bone, glass and other materials littered the floors. The skeleton of one of the inhabitants lay on the floor where he was slain, and other skeletons were found elsewhere in the destruction level outside the houses.

In general, Lydian levels are deeply buried beneath late Roman and other buildings, introducing still another complication in the understanding of ancient houses: to understand one level, we must destroy another. For this reason, we have not yet completely uncovered even one house; all we have are a few fragmentary plans and partly-exposed rooms (fig. 5). But the extraordinary preservation of these domestic assemblages gives us an unusual look at the life cycle of Lydian pots and other artifacts, and how objects in different stages of their life cycles move through the house in different ways. We see vases at every stage of their use lives, from brand-new, hardly worn cooking pots still on their cooking stands with food still inside them, to stacks of stemmed dishes piled on the floor, some newer and some more worn, with owner's marks and other graffiti, through partial or repaired vessels still apparently being used for their original purposes, to broken objects being used for some purpose other than their original function, to discarded shards and fragments.

I want to focus on method and the problems of analysis, rather than on the results of these particular excavations; questions that affect everyone working with household assemblages. The level of detail we have here is much greater than that at Olynthos or most other sites with ancient houses, so that we can test some of our assumptions about household assemblages and the actual functions of household objects. Unlike at

¹⁵ C. H. GREENEWALT, Jr., When a Mighty Empire Was Destroyed. The Common Man at the Fall of Sardis, ca. 546 B.C., *Proceedings of the American Philosophical Society* 146/2, 1992, 247–271; C. H. GREENEWALT, Jr. – A. M. HEYWOOD, A Helmet of the Sixth Century B. C. from Sardis, *BASOR* 285, 1992, 1–31; C. H. GREENEWALT, Jr., Arms and Weapons at Sardis in the Mid-Sixth Century B.C. / M.Ö. VI. Yüzyıl Ortasında Sardis'de Askeri Techizat ve Silahlar, *Arkeoloji ve Sanat* 79, 1997, 2–20.

¹⁶ On the date CAHILL – KROLL 2005.

¹⁷ The very location of the Lydian city has been reexamined in the last decade, and is now thought to be along the north slopes of the acropolis, under the Roman city, rather than along the Pactolus river; see C. H. GREENEWALT, Jr., Sardis, in: W. RADT (ed.), *Stadtgrabung und Stadtforschung im westlichen Kleinasien. Geplantes und Erreichtes*, *Byzas* 3 (Istanbul 2006) 359–372; N. D. CAHILL, Mapping Sardis, in: N. D. CAHILL (ed.), *Love for Lydia. A Sardis Anniversary Volume Presented to Crawford H. GREENEWALT, Jr.*, *Sardis Reports* 4 (Cambridge, MA 2008) 112–124. On these houses N. D. CAHILL, Lydian Houses, Domestic Assemblages and Household Size, in: *Across the Anatolian Plateau. Readings in the Archaeology of Ancient Turkey*, *AASOR* 57, 2000, 173–185.

Olynthos, also, we have very complete recovery and mending of even partially preserved artifacts, which gives us an unusual view of the sorts of finds that might have been discarded at other sites.

One partly excavated house in the western part of the city consists of an irregularly shaped open yard, a small, almost square room that served as a kitchen, a workshop which was involved in making glass beads and other artifacts, and an unexcavated narrow corridor-like space (fig. 6). The north and east limits of the house are inaccessible, under a road to the north and under well-preserved Roman houses to the east; but we have the south and western portions of this one house. The architecture is a fairly normal vernacular construction, with mud-brick walls on stone socles, earth floors, and thatched roofs. We do not know how large the house originally was. If it was roughly the size of Olynthian houses, 15–20 m on a side, we might have excavated about one third to one half of the house. It is not a very old building; a sondage reached its earliest floors, dating to the early 6th c. BC, so when it was destroyed, the house was at most 50 years old. It went through a number of phases, however, and the main walls were rebuilt two or perhaps three times during the course of those 50 years.

Only one space has been completely excavated so far: a kitchen, a relatively small, almost square room, about 3 m on a side. In one corner was a low bench with two grindstones on it; in the adjacent corner was a hearth. A set of shelves ran along the north wall, attested by piles of nails and by the pottery and other artifacts that fell from the shelves when the house burned. The wall was also pierced by two slit windows opening out onto the adjoining court. The room was packed with artifacts and furnishings, among them 67 complete pots, and 21 other objects of iron, bronze, bone and other materials. The small room contained seven cooking pots, three cooking stands, a large cookingware amphora probably full of grain, a stack of 23 stemmed dishes in one corner, as well as a few *oinochoai*, a table amphora, a few *skyphoi* and the like. There were relatively few drinking vessels – no kraters, only four *oinochoai*, and only half a dozen *skyphoi*, four of which were missing handles, compared to the 23 stemmed dishes for eating.

In the open yard was a shallow pit, covered by a wooden floor supported around the edges by irregularly placed upright posts. The purpose of this pit is unclear. The monumental pits at Boğazkale used to store grain are an obvious parallel, but those are orders of a magnitude larger, holding 7000–9000 cu. m. of grain, protected from the damp earth by a stone-lined floor, covered by a layer of straw and then by a meter or two of solid earth, to create an anoxic storage environment¹⁸. Nonetheless, it was expected that the outer edges of the grain stored in these *bothroi* would be lost to mould and damp. But it would be very difficult to seal a pit as small as the one in the yard of the Sardis house effectively from air and water, and I would expect that if it was used to store grain, the percentage of loss would have been very significant, if not catastrophic.

Near this pit was a set of three cooking stands, still with cooking pots on them. A hearth was set near the centre of the yard, in which one or two more cooking pots were placed. The northern and eastern parts of the yard remain unexcavated. Shelves were set against the north wall, and fragments of *pithoi* were found in the northeast edge of the excavated area.

North of the yard was a room which, unlike the other spaces in this and other houses, had been deliberately ransacked, probably very shortly after the destruction. The reason for this attention is not hard to discover: in the backfill of the room 3.5 kg of opaque red glass cullet were found, a rare and expensive glass known mostly, at this period, from eastern sites such as Nimrud and Persepolis. Benches in the two southern corners of the room probably were used for working glass.

The excellent preservation gives us an unusually detailed look at not only shapes and decorations, but also at wear patterns and use evidence, and at the differences between rooms in the conditions of vases. In the kitchen, most of the artifacts were apparently in a primary use, showing only normal wear. The stemmed dishes, for instance, are worn on the inside, bearing knife scratches and other evidence of long use. Many also bear graffiti, which are perhaps best interpreted as owners' marks. The cooking pots were mostly complete and associated with hearths and cooking stands; the plates, *oinochoai*, table amphorae and other vessels were all complete, and most looked fairly new. The two grindstones were both in relatively good condition.

The contrast between the assemblage of this kitchen and that in the yard outside is quite striking. As in the kitchen, objects in the yard were concentrated along the walls, where they had been either set on the floor

¹⁸ J. SEEHER, Getreidelagerung in unterirdischen Großspeichern. Zur Methode und ihrer Anwendung im 2. Jahrtausend v. Chr. am Beispiel der Befunde in Hattuscha, *SMEA* 42/2, 2000, 261–301.

or on shelves, again attested by groups of nails and other hardware. But many of these vessels were clearly not used for their original purposes, but had been partly broken and then reused for something else.

For instance, waveline hydrias and *amphorae* are among the common Lydian storage vessels, and a number of them were found in the houses (fig. 7a). In the yard, however, a partial hydria was found, preserving the body without the neck. The broken edges had been smoothed off, and the vessel was being reused to hold the iron-rich remnants of some kind of industrial processing (fig. 7b). These fragments were found scattered among the shards, and the interior of the hydria was heavily stained by iron. Even aside from missing its neck and part of its body, the hydria was very worn, its surface eroded and scratched from years of use.

Nearby was a hydria neck, found in fragments on the floor with the shattered remains of an *oinochoe* inside it (fig. 7c). The neck had been broken from its body, and was being reused as a stand. This turns out to be surprisingly common in Lydian pottery: in the very first year of excavation at Sardis, a group of nine such hydria necks reused as stands was found in an area of sector HoB that became known as the ›Lydian Shop‹¹⁹. Another five necks were found in a cluster of domestic artifacts in the same sector, about 30 m away, and more in the theatre²⁰.

Other reused vessels abound in the assemblage from the yard. These include three stemmed dishes with their stems and feet broken off, a grayware stemmed dish stem, missing the plate, six *oinochoai* without their necks (fig. 8), and hydrias, a *pithos*, *skyphoi*, and other vessels which were missing large portions and so were probably being used in a secondary function. In most archaeological situations, we could not be confident that these portions were actually missing in antiquity, and had not been simply lost in excavation or in post-depositional disturbance. Here, however, the floors were covered with a thick layer of destruction debris, which preserved almost every shard, and when we don't find the neck or the body or the stem of an object, and particularly when the broken edges are worn, as they often are, we can be fairly confident that it was broken in Antiquity.

If one did not look carefully at the worn and incomplete state of these vessels, or if one was not confident that the missing parts were already missing in Antiquity, one might easily argue that the hydrias, *oinochoai*, *skyphoi*, stemmed dishes, and other vessels show that the yard was used for eating and drinking, or for the storage of eating and drinking utensils. One might, for instance, distinguish ›wine sets‹ among the pottery in this courtyard, such as a *krater*, twelve *oinochoai* and a table *amphora*, no fewer than 22 *skyphoi*, and a number of peculiar vases possibly related to drinking, such as a phallic vase, a large flask, and a boat-shaped vase with a sipping spout. In statistical analyses, and particularly in analyses based on shards rather than whole vessels, these partial, reused objects could have been categorized simply as amphoras and hydrias, *skyphoi* and *kraters*, and one would conclude without hesitation that the area was used for eating and drinking, formal dining with elaborate Orientalizing vessels, and similar functions. But that conclusion would be greatly mistaken. Only the bottom of the *krater* was preserved, reused as a dish or plate; six of the *oinochoai* are missing necks and handles (fig. 8), and many of the *skyphoi* are missing handles or other portions, and only half the boat vase was found, discarded in a pile of rocks dumped against the wall of the yard. Few of these drinking vessels could actually be used for drinking at the moment of destruction.

Interestingly, the yard also contained a number of pieces of decorated Orientalizing pottery, including a *dinos* decorated with sea monsters (fig. 9), a once-fine table amphora, a lid, two Myrina amphorae, the boat vase²¹. All of these were very worn, however, and some were full of repair holes, showing that they had been extensively mended in Antiquity and so were very probably not in use as drinking utensils when the house was destroyed. These Orientalizing vessels show that the household could afford fancy vessels for drinking and dining, but that the ones we have found were not the tableware in use at the time of destruction; they are cast-offs from previous generations.

¹⁹ G. M. A. HANFMANN, Excavations at Sardis, 1958, BASOR 154, 1959, 5–35; A. RAMAGE, Make Do and Mend in Archaic Sardis. Caring for Broken Pots, in: N. D. CAHILL, Love for Lydia. A Sardis Anniversary Volume Presented to Crawford H. Greenewalt, Jr., Sardis Reports 4 (Cambridge, Mass. 2008) 79–85.

²⁰ Cf. below.

²¹ GREENEWALT et al. 1995, 15–19 figs. 16, 17; C. H. GREENEWALT, Jr., Sea Serpents at Sardis, Harvard University Art Museums Review 4, 1994/1995, 1–6.

In all, about 30–32 of the 133 pottery vessels from the yard – about 22–24% – were clearly reused in some way. This is between two and five times the level of reuse than we saw in the kitchen — where just 4–10% of the vessels showed some sign of reuse, and about half of those were *skyphoi* missing a handle.

	Total pots	Reused	Percent
North House: Kitchen	67	3–7	4–10%
North House: Yard	133	30–32	22–24%
South House	77	1–3	1–4%

It makes intuitive sense that broken, cast-off pottery should end up in less formal parts of the house such as the courtyard, to be used for other purposes, as planters or stands or containers. Cups and jugs wielded by inebriated Lydians probably had a short life, and most households probably had a regular supply of partly-broken *skyphoi*, kraters, *oinochoai* and other vessels from parties that went on a little bit too long.

To the south of this house is another, partially excavated domestic space (fig. 6). This house was a later addition, built after the first house had already undergone a number of building phases, and perhaps only very shortly before the destruction by Cyrus. Unlike the northern house, there were no earlier floors. This house seems to be a single, multipurpose space rather than a group of more specialized spaces. In the small area exposed we find artifacts belonging to a full range of household activities: cooking and baking, eating and drinking, weaving, and the like. Unlike the northern house, however, there are very few incomplete and reused vessels here. Among about 77 vessels, we have only one fragmentary bread-tray, one neckless *oinochoe*, and two *skyphoi* missing handles. Imported drinking vessels included two fine Attic black-figured cups dating to the mid-6th c. BC and in brand-new condition, but the assemblage included many fewer Orientalizing vessels, only the foot of a stand (the remainder perhaps removed by a deep Roman foundation), a small *oinochoe* or mug with rosettes, and a lid²². Again, it is dangerous to argue far-reaching conclusions from such incomplete excavations, but the pattern seems to make some intuitive sense: a house built more recently will tend to have a larger proportion of newer artifacts, and fewer cast-offs from earlier phases, and we see the satisfying confirmation here. It also may have interesting implications about the popularity of Orientalizing vessels around the middle of the 6th c. BC.

It is not hard to understand the situation here, and not unexpected. Households will naturally make use of broken but still usable objects; look anywhere in the Third World today and one will see all kinds of objects reused in the most imaginative and frugal ways. For the most part, ancient households did not necessarily manufacture or obtain specialized implements for different purposes, but used ordinary household objects for different purposes — as, for instance, the Greeks could use louters for different purposes, or the Lydians used ordinary cooking pots in refining gold from electrum²³. But this is a phenomenon not often taken into account in the archaeological record, largely because artifacts are so incompletely preserved due to post-depositional processes and incomplete excavation. This phenomenon, however, clearly has important implications for any functional analysis.

In 2006, we began excavating in the Roman theatre of Sardis. The theatre itself is very badly damaged by stonerobbing, but in the *cavea* of the theatre, where the seats had been robbed out, a welcome and entirely accidental discovery was a well-preserved Lydian house, with apparently the same destruction level found near the fortification and elsewhere. This is the first indication that Cyrus' destruction of Sardis encompassed not only the fortification (whose destruction is documented elsewhere along its circuit) but also the centre of the city. A number of weapons were found in the destruction debris, including three arrowheads, a spearhead, two knives, and five round stones, perhaps sling-stones; these may attest fighting in this part of the city as well. Although the house was not deeply buried by destruction debris from the fortification, the preservation is again quite extraordinary – especially considering that part of the deposit was found just under modern ground level (figs. 10. 11).

²² N. H. RAMAGE, Two New Attic Cups and the Siege of Sardis, *AJA* 90, 1986, 419–424.

²³ A. RAMAGE – P. T. CRADDOCK, King Croesus' Gold: Excavations at Sardis and the History of Gold Refining, *Sardis Monograph* 11 (Cambridge, Mass. 2000) 84.

Only part of one room or space has been excavated so far. It is unclear whether this is an interior or an exterior space. A partial schist pavement and a limestone column base suggest that a partly roofed area with an earth floor opened onto a paved, unroofed space. A door leads into an adjacent space, yet unexcavated. Despite the very small exposure, the construction seems more elaborate than any other Lydian domestic architecture known so far. Houses here in what must have been the centre of Lydian Sardis, on a hill with cool breezes and a fine view, may have been more luxuriously built than those at the outskirts of the city next to the city wall.

So far we have mended or identified some 78 vases, and more remain to be sorted, including all the cooking wares (fig. 12). I can only make a few preliminary comments here about the domestic assemblages. Pottery was scattered over the southern, earth part of the floor; the paved area contained many fewer artifacts. There were no hearths, but cooking pots and other cooking implements were quite common: the shard material suggests at least 14 cooking pots, two cooking stands, a bread-tray, as well as at least six plain storage amphoras, about two hydrias and other coarse vessels, and two sets of grinding stones.

Again, reused vessels are not uncommon. There were five hydria necks, probably reused as stands, and at least one neckless *hydria*. In addition to the stands made from reused *hydria* necks, there were three purpose-made stands. Vessels for eating and drinking include two column kraters, three *oinochoai* and a table amphora, and a few *skyphoi*, perhaps seven or so. This is not a very large number, and there were no fine, decorated drinking vessels.

The only Orientalizing vessels are fragments of perhaps two Myrina amphoras, apparently with Anatolian-style metopes on the neck and Wild Goat-style animals on the shoulder. One at least is extremely worn, and both are probably only partially preserved. The situation is not unlike that of the ›yard‹ of the first house, therefore: this may be an older establishment, and perhaps an outdoor, less formal portion of the house, with a relatively high proportion of reused objects, some of them once very beautiful. Until we complete more excavation and mending, it would be premature to speculate about the use of space or comparisons of this house to other Lydian houses. But this is an exciting development. We have the potential – as yet unfulfilled – of comparing household assemblages and plans in different regions of the city. Certainly we are not ready to make broad generalizations or comparisons about household plans or household organization, as one could at a more extensively excavated site like Ephesos or Olynthos. But the remarkable preservation does allow us to test some of our assumptions about functional analyses of artifact assemblages, and naturally the situation turns out to be much more complicated than we might hope. One cannot simply argue that if an area contains kraters, *skyphoi*, and *oinochoai*, it was probably used for drinking. You must look at the whole assemblage of the room, and at the preservation and situation of the objects, to decide, on a case-by-case basis, what the objects were actually used for. Can any statistical system, however complex, catch these subtleties and complexities?

Missing Artifacts

Let me return to Olynthos, and consider drinking assemblages at that site. There are, of course, many drinking cups, kraters, and the like in Olynthos, and many houses had *andrones*. But at Sardis, not all assemblages with kraters and *oinochoai* were drinking assemblages. Can we test this hypothesis at Olynthos?

When I began working on the domestic assemblages at Olynthos, I fully expected to find kraters and drinking cups associated with *andrones*. However, it turns out that there are very few objects of any kind from *andrones* at Olynthos: only 141 in all from 34 *andrones*; and most of those objects are bits of iron, an occasional loomweight or coin, essentially archaeological background noise. Nor are there many kraters from the site: 21 all told, many of which are from the South Hill. And only one *krater* is from an *andron* – and that is a very fragmentary example²⁴.

More importantly, although one would expect to find kraters in *andrones*, or at least in houses with *androns*, in fact one does not. When one compares the distributions of *andrones* and kraters, you find that they are almost mutually exclusive (fig. 13). One might hypothesize that the kraters were not stored in the *andron*

²⁴ D. M. ROBINSON, Olynthos 5 (Baltimore 1933) no. 162, a red-figured bell *krater* from house A vi 3, room b.

itself, but in another room of the house. But a distribution plot of the kraters against houses with *andrones* shows that there is no such linkage at all: houses that have kraters, tend not to have *andrones*, and houses that have *andrones* have relatively fewer kraters. The pattern is clear enough that there must be a specific reason for this. I suspect that the reason is that any household that was wealthy enough to devote a whole room in their house to formal dining, could also afford metal vessels by preference to ceramic; and virtually all these metal vessels were removed by the fleeing inhabitants or looted by Philip's soldiers. Recent years have seen much discussion about the relative importance of metal vis-à-vis ceramics; but this pattern suggests that by the mid-4th c. BC metal was widespread enough, and pottery considered cheap enough, that even fairly ordinary citizens commonly used – or invested in – metal vases in preference to pottery²⁵. This is not the place to pursue arguments about the value of pottery versus metal. But the unfortunate conclusion is that we can say almost nothing about functional assemblages of drinking at Olynthos, or about the original contents of *andrones*, and that any functional analysis of ceramic drinking vessels at Olynthos – and perhaps at other Classical Greek sites – is very likely to be misleading. Again, we must always be mindful of what is missing from the archaeological record.

Understanding how domestic assemblages and spaces were used can be complicated by many different factors – missing classes of artifacts and materials, the systematic reuse of artifacts, implements with multiple purposes – which can be very difficult to control. But I find it heartening that an understanding of assemblages and room use is best reached by a humane approach to ancient houses and households, and by an informed understanding of antiquity and the complexities of each archaeological situation, rather than a mathematical or statistical approach, no matter how sophisticated.

List of Bibliographical Abbreviations

The citation follows guidelines of the German Archaeological Institute <www.dainst.org> (16.01.2009) and those of the Austrian Archaeological Institute <www.oeai.at/publik/autoren.html> (16.01.2009).

CAHILL 2002	N. D. CAHILL, Household and City Organization at Olynthus (New Haven 2002).
CAHILL – KROLL 2005	N. D. CAHILL – J. H. KROLL, New Archaic Coin Finds at Sardis, <i>AJA</i> 109, 2005, 589–617.
ROBINSON 1941	D. M. ROBINSON, Metal and Minor Miscellaneous Finds, <i>Olynthus</i> 10 (Baltimore 1941).

Sources of Illustrations

Fig. 1: N. Cahill after ROBINSON 1941, pl. 136.
 Figs. 2. 5. 6. 10. 13: N. Cahill.
 Fig. 3: after ROBINSON 1941, pl. 218.
 Fig. 4: after ROBINSON 1941, pl. 186, 2.
 Figs. 7–12: © Archaeological Exploration of Sardis.

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²⁵ Argued in CAHILL 2002, 180–190. Of many recent studies of ancient metal vessels cf. M. VICKERS – D. GILL, *Artful Crafts. Ancient Greek Silverware and Pottery* (Oxford 1994); also B. BARR-SHARRAR, The Decline of Ceramic Reliefware After Alexander the Great, in: *Papers Read at the Fifth International Symposium Held in Thessaloniki, October 10–15, 1989 = Ancient Macedonia 5* (Thessaloniki 1993) 161–166; B. BARR-SHARRAR, Observations on the Relationship of Ceramic Reliefware to Metal Prototypes, in: *Επιστημονική συνάντηση για την ελληνιστική κεραμική. Χρονολογικά προβλήματα, κλειστά σύνολα, εργαστήρια. Πρακτικά* (Athens 2000) 515–519; S. I. ROTROFF, How did Pots Function within the Landscape of Daily Living, in: M.-C. VILLANUEVA PUIG – F. LISSARRAGUE – P. ROUILLARD – A. ROUVERET (eds.), *Céramique et peinture grecques. Modes d'emploi* (Paris 1999) 63–73.

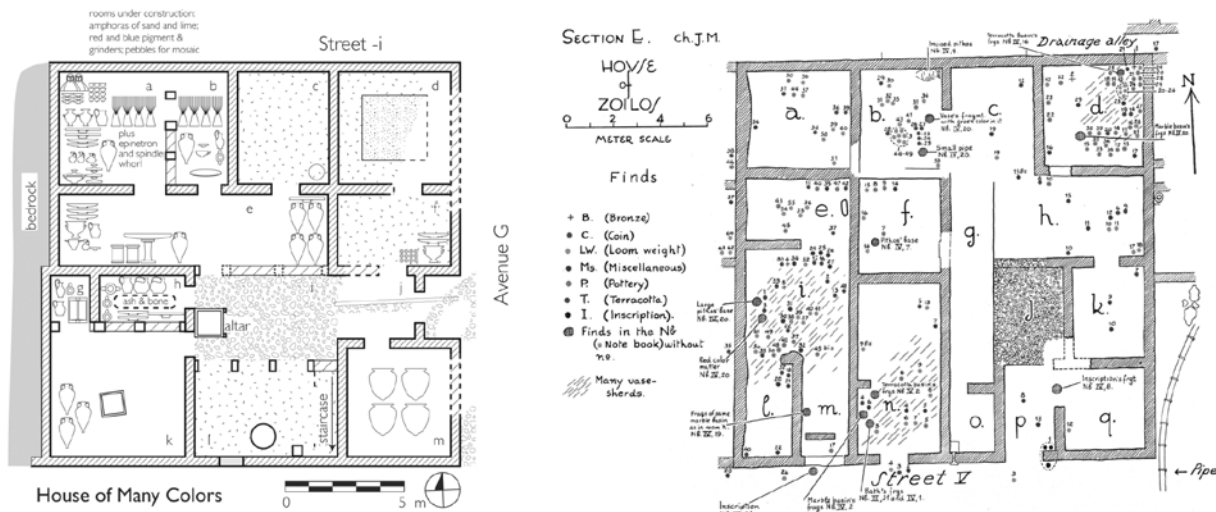


Fig. 1: Olynthos, Plans of the House of Many Colors (L) and the House of Zoilos (R)



Fig. 2: Olynthos, Plans of select rooms used for weaving



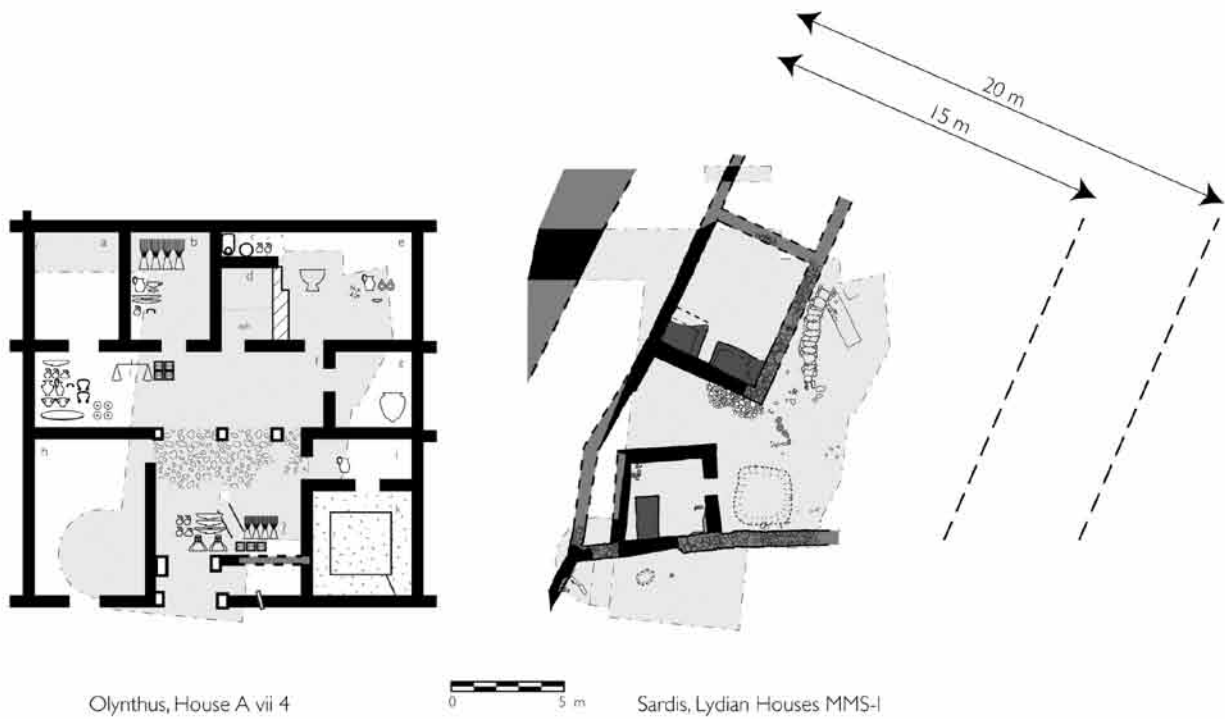
Fig. 3: Louter from the Villa of the Bronzes, Olynthos



Fig. 4: Louter in situ with Grindstones, House of the Tiled Prothyron, Olynthos



Fig. 5: View of houses in sector MMS-I at Sardis



Olynthus, House A vii 4

0 5 m

Sardis, Lydian Houses MMS-I

Fig. 6: Plan of houses excavated at sector MMS-I at Sardis, compared to house A vii 4, Olynthos



Fig. 7a: Intact waveline amphora,
from southern house in MMS-I



Fig. 7b: Reused waveline hydria



Fig. 7c: Hydria neck reused as a stand, from yard of northern house,
sector MMS-I at Sardis



Fig. 8: Oinochoe, found intact but with neck broken off in antiquity,
from yard of northern house, sector MMS-I at Sardis



Fig. 9: Orientalizing dinos with ancient repair, from yard of northern house, sector MMS-I at Sardis



Fig. 10: View of house in theater, Sardis, 2006

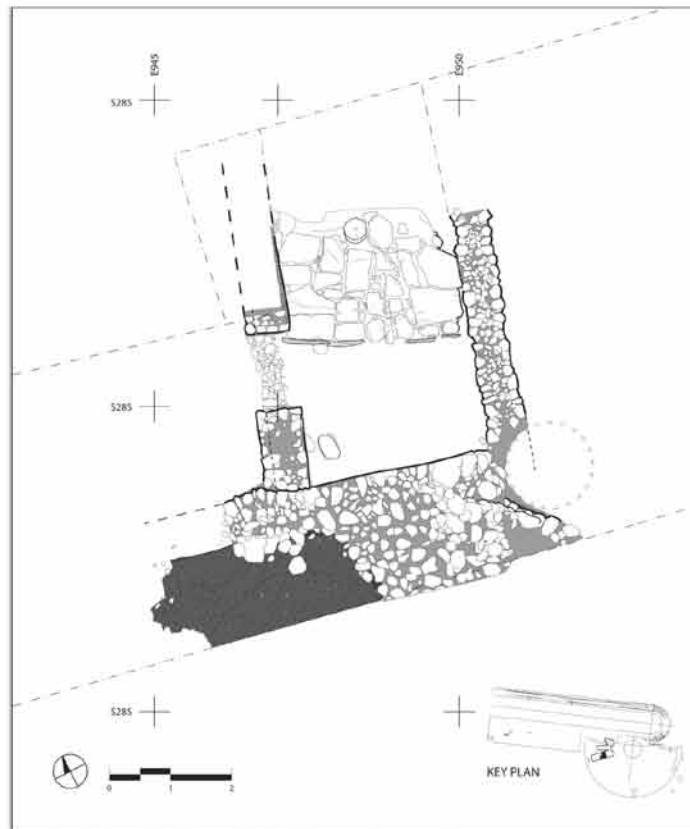


Fig. 11: Plan of house in theater, Sardis, 2008



Fig. 12: Partial assemblage from theater, Sardis, 2007

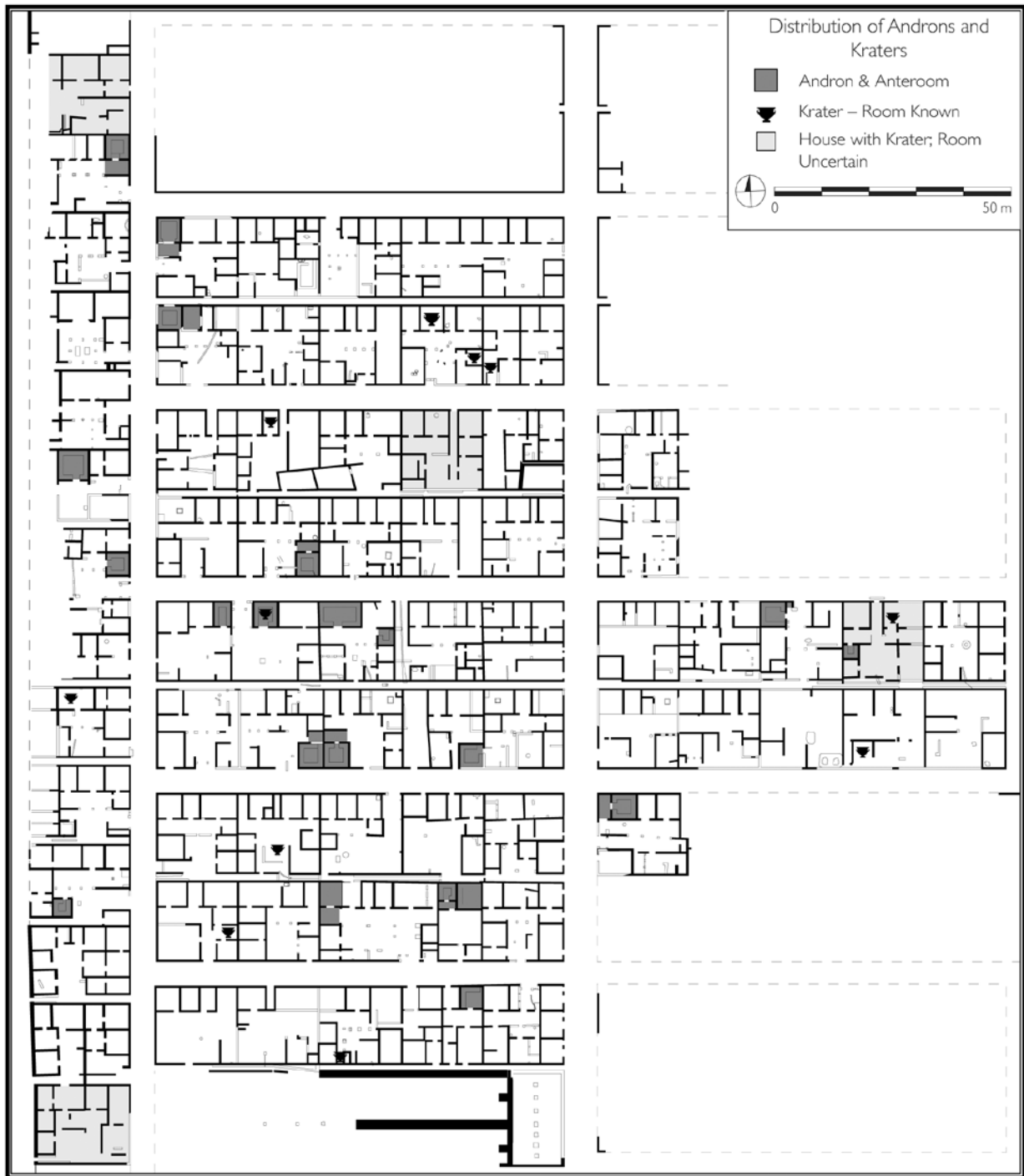


Fig. 13: Distribution map of kraters and andrones at Olynthos

