Producing Pottery vs. Producing Models: Interpreting Workshop Organization at the Potters’ Quarter of Sagalassos

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Production studies hold significant and ever developing potential for the field of ceramology, in ways that intimately tie into discussions of use-life. The role of production on the subsequent “life” of pottery can be considered in myriad aspects fundamentally related to the object, including its physical design and properties of its function. When considering manufacturing, Peña rightly remarks on the possibilities for detailed studies of production defects on pottery noting the manner in which such material comprises part of the use-life of archaeological assemblages. In addition, numerous social and economic dimensions are contingent on the character of production and the organization behind it, including the social position of artisans, cultural influences on the development of design, utilization of various technologies, nature of its distribution, and role of industry in contemporary economy. These themes are gradually being developed in the field, thereby providing greater relevance for ceramology and material culture studies to the broader archaeological discipline.

In this paper we will argue that in order to continue to develop upon these social themes and in order to more fully consider the role of production on the use-life of ceramic objects it is first necessary to develop methodologies to begin to consider production settings and their associated material in multi-dimensional ways. No single line of study should be considered in isolation, but rather the workshop must be considered as a complex network of social, cultural, economic, and technological interactions that constantly influence and recursively are influenced by each other, and which can be elucidated from the material record. Integrated methodologies that attempt to provide a broader and multi-faceted dataset from pottery workshop settings are being developed and applied at the Potters’ Quarter of Sagalassos, and some of the preliminary results and potential applications for the study of broader social issues will be discussed.

PREVIOUS SCHOLARSHIP

In the process of developing methodological approaches to consider issues related to production at the site of Sagalassos, the works of two scholars have proven foundational to the formation of a broad conceptual framework. First, discussions of Roman period production organization and scales of production have very much centered on the important work by David Peacock in Pottery in the Roman World: an Ethnoarchaeological Approach. This text, fundamental in the promotion of ceramic production studies in Roman archaeology, defines modes of production by classifying industries according to organizational complexity. Peacock, himself, warns against the potentially reductionist nature of this classification, which oversimplifies and blurs fundamental variability expressed in the archaeological record. Likewise, although the present authors have drawn heavily on the conceptual framework and variables outlined by Peacock, we posit that such classifications schemes too narrowly define workshop settings and - as will be highlighted in the work being performed at Sagalassos, this classification system only begins to address the complexity of workshops present within even a single potters’ quarter. Additionally, the work of Dean Arnold, Ceramic Theory and Cultural Processes, has proven seminal to ancient ceramic production studies. This text impressively integrates a large corpus of ethnographic ceramic production data in an early attempt to theoretically blend systems thinking with cultural ecology. Once again, although providing a very useful conceptual framework, which has been utilized by the present authors, the generalizing theoretical nature of this text must be employed solicitously allowing for unique variability of each archaeological site.

In addition to the works by Peacock and Arnold, recent archaeological scholarship on crafts production in other regions has begun to proceed in different theoretical directions and to expand the application and interpretive potential of production studies. Aspects, such as ritualized production, social value, chaîne opératoire, control over and transmission of knowledge, gender, and social standing of artisans, are beginning to take centre stage in the investigation of crafts industries in antiquity. These avenues of study expand the implications of production studies and offer alternative means of integrating ceramology into broader archaeological inquiry. With these considerations, a diverse set of questions arises related
to the ceramic industries of the Roman period. Indeed, Roman period industries, by encompassing a broad range of production expressions, hold particular potential for the pursuit of such objectives. Yet, in many respects systematic and detailed analyses of these archaeological settings are still maturing. Lines of evidence must be identified and formulated for the study of social and economic dimensions of production. A multiplicity of methodological approaches for the material should be integrated in order to develop interpretations and models of workshop activity that appropriately express the complexity of the material record. These systematic methodologies should be expanded to permit comparative studies between production sites while addressing the uniqueness of each assemblage. Thus, having recognized these concerns and complications regarding the study of production settings, a first step in the integration of methodological approaches has begun to be implemented at the Potters’ Quarter of Sagalassos.

DEVELOPMENT OF METHODOLOGIES:
THE POTTERS’ QUARTER OF SAGALASSOS
Situated in the interior of southwestern Turkey, the ancient city of Sagalassos has been excavated since 1990 by the Sagalassos Archaeological Research Project under the direction of Mark Waelkens of the Katholieke Universiteit Leuven. Among the numerous discoveries unearthed at the urban site, a large, six-hectare potters’ quarter has been identified in the eastern suburbium (Fig. 1). At least from the 1st century BC to the 7th century AD, this industrial quarter witnessed the production of tableware with a primarily regional distribution: Sagalassos Red Slip Ware. Study of ceramic production at the site has attempted to utilize and integrate numerous lines of evidence from the wealth of material thus far excavated from the Potters’ Quarter. Particular emphasis has been placed on specific workshops concerning their infrastructure, abandonment material, and refuse found in associated production dumps. The workshop-specific material has subsequently been considered in comparison with significantly more extensive, contemporary production dumps from nearby areas of the Potters’ Quarter. Studies of such production refuse have successfully assessed the manner in which the workshop material is consistent with or divergent from material deriving from the large-scale production dumps of multiple workshops, which represent more comprehensive expressions of pottery production from the entire industrial area.

In addition, recent excavations in the Potters’ Quarter are continuing to supply local workshop case studies for comparanda. By considering nuanced variability of production organization, comparative analyses between workshops are being performed regarding social and economic implications (i.e. potential production output, fiscal contribution to local industry and economy, social status of artisans, identity, roles, and ritual). These comparative considerations can then be used to assess variability across space (in terms of differentiation both

1 Peña 2007, 33-35.
2 Poblome et al. 2006; Poblome et al. 2007.
3 Poblome 2004, 30.
4 Peacock 1982; Dark 1990, 7-8; Fülle 1997; Whittaker 2002, 18.
5 Peacock 1982, 8.
6 Peacock 1982, 8; Costin 2008, 144-5.
7 See for instance Poblome et al. 1998.
13 Poblome 2006a.
14 Poblome et al. 2002.

Figure 1 Geophysical magnetometry across the area of the Potters’ Quarter, Sagalassos. Dark lineaments appear to indicate the presence of walls and passageways. White dots appear to indicate the presence of kilns/furnaces.
within a production “centre” and between production “centres”) in order to identify and track local and regional trends. In many respects, the types of observations being recorded may appear to be unexceptional and routine avenues of study; however, due to the monotonous and time-consuming nature of such analyses, these investigations have traditionally been avoided or only partially pursued. The potential for such detailed analyses of production contexts and associated waste to provide important data for archaeological inquiry has been repeatedly invoked by ceramologists. Nevertheless, this material still remains largely understudied, and projects, like that at the Potters’ Quarter of Sagalassos, are still in their early stages.

**LINES OF EVIDENCE**

In developing methodologies for the study of workshop contexts, this project has emphasized (but is not limited to) four approaches. These lines of evidence include; workshop infrastructure analysis, material studies of production contexts, ethnographic considerations, and conceptual modelling exercises. Together, these areas of study present complementary considerations of the workshops, and although the full breadth of analyses cannot be explained in detail in this paper as many such analyses are still ongoing, some examples of the types of investigations being performed within each of these approaches will be described.

**INFRASTRUCTURE**

Recent investigations into the workshops of the Potters’ Quarter at Sagalassos have resulted in a comparative study between two contemporaneous workshop contexts. The two late Roman (4th-6th centuries AD) Sagalassos Red Slip Ware workshops – a tableware production site (Fig. 2), and a coroplast workshop complex (Fig. 3) (producing oinophoroi, oil lamps, and figurines) – have been identified by remote sensing techniques as being situated on the
same street within the Potters’ Quarter and are located circa 50m distance from each other. Both workshops are constructed using similar architectural styles – mudbrick walls on a rubble-rock foundation. In this spatial and chronological respect, the two workshops can be considered as components of the same production “centre”.

Superficially the two workshop settings also present very similar pictures of production. Both workshops utilized the same clays and slips and most likely were integrated into the same distribution networks of raw materials, particularly those providing Canakli clay from a valley source eight kilometres down-slope from Sagalassos. Likewise, both workshops utilize similar technologies, including potters’ wheels, and simple updraft kilns with combustion chamber diameters measuring less than 1.5 m. Moreover, many of the same tools (potters’ ribs, fettling knives, stamps, hairpins and styli) appear among the remains of both workshops. However, on closer evaluation of the architectural and infrastructure remains, the workshops begin to demonstrate very different internal organizations that may not only be a function of the different wares being produced. In terms of their relative architectural infrastructure, the two workshops are very different in their contextual settings. While the tableware workshop is an architecturally independent building, the coroplast workshop is situated within a broader architectural “complex” comprising possibly four or five adjacent, yet discrete, workshops – each with exterior courtyards containing kiln(s). All of the workshops of this “complex” appear to be producing coroplast wares of similar types (namely oinophoroi, figurines, and oil lamps). In addition, stamp/mould matches have been identified in abandonment contexts between these workshops suggesting some degree of exchange and interaction of tools and resources between the coroplast production units. In contrast to the independently situated tableware workshop, the coroplast workshop is organized according to a much more integrated production complex with separate, yet closely related neighbouring workshops. Thus, it is argued that even within a single potters’ quarter, significant contemporaneous variation is expressed by the architectural plans and organization of the workshops.

MATERIAL STUDIES
In addition to the infrastructure analyses described above, material from abandonment contexts from individual workshops within the Potters’ Quarter has been analyzed. These abandonment contexts represent a variety of material types including Sagalassos Red Slip Ware, coarse wares, tools, kiln furniture, and wasters. Development of methodologies for the study of ceramic material from production contexts is in many respects divergent from traditional typo-chronological considerations of pottery assemblages. By identifying, documenting, and quantifying secondary traces of production techniques evidenced on ceramic sherds from various contexts, this study has developed numerous classifications of the material record from the Potters’ Quarter. Drawing upon the typological framework of Sagalassos Red Slip Ware by one of the present authors,17 quantifiable changes in the frequency and occurrence of these secondary production indicators are being tracked through time and between workshops in the material record from the production site.

For instance, material derived from the late Roman table ware workshop and contemporary refuse deposits at Sagalassos has yielded much information, particularly regarding kiln stacking and firing techniques commonly being utilized between the 4th and 6th centuries at the site. By integrating several lines of evidence (fused stacks

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16 Poblome 2006b.
17 Poblome 1999.
of over-fired vessels, oxidation/reduction patterns of surface coloration on vessels, and fragments of secondarily applied clay to support stacks of vessels in the kiln) detailed reconstructions of kiln loading procedures have been developed. For example, fused stacks of over-fired wasters demonstrate that vessels of the same type are typically nested together in the same stack (Fig. 6). Flow direction of partially melted vessels indicates that vessels are overwhelmingly stacked “right side up”. Likewise, delineated reduction/oxidation zones (e.g. reduced rims with oxidized bodies), demarcate vessel parts that had been differentially exposed to firing environments within the kiln (Fig. 4). Such surface color transitions can occur due to a variety of firing circumstances (tightness of stacking, points of contact between vessels in stacks, placement of stacks within larger vessels, etc.). Patterns in such surface oxidation/reduction zones are tracked according to specific vessel forms; these observations are then compared to patterns observed in fused wasters of the same vessel types, and consequently, some of the circumstances dictating these surface coloration patterns can be interpreted. Finally, excavation of production refuse contexts has recovered numerous fired clay fragments, which appear to have been used to support stacks of vessels in the kiln during firing. The morphology of these fragments – often with distinctive rim impressions still extant – suggest strategic placement of the clay pieces against stacked vessels just prior to firing. In some instances, examples of wasters have been observed on which the secondarily applied clay pieces are still attached. These sherd preserves evidence regarding the method by which such clay was applied in the stacking process and support kiln loading reconstructions based on fused stacks and reduction/oxidation patterns of wasters. The material from the Potters’ Quarter offers a large corpus from which to extract typical measurements of distances (e.g. distance between vessel rims in a stack), which are recorded according to vessels and dimensions of vessel types (Fig. 5). These measurements are then used to spatially model kiln loads for use in production volume studies. The results from these analyses are indicating that many form-specific techniques for loading the kilns were implemented in the Potters’ Quarter during the 4th to 6th centuries AD, and the selection/adaptation of these techniques would have been related to the product repertoire of each workshop.

Furthermore, close analysis of “waster” vessels from these production dumps yields significant data concerning aspects of production “defects”. In fact, such bodies of material present a broad range of material that appears to have been purposely discarded in the production setting. Numerous examples of spalling, cracking, warping, over-firing, etc., have been observed and documented by the ceramic production study. These observations can then be used to compare Sagalassos Red Slip Ware types in order to identify forms that may have been more “prone” to specific defects. Utilizing the detailed chronology of Sagalassos Red Slip Ware typology, it is possible to temporally correlate Sagalassos Red Slip Ware from various contexts across the site of Sagalassos. Ceramics deriving from urban contexts can also be compared with the Potters’ Quarter refuse dumps to consider thresholds of production defects – as related to local distribution and consumption patterns.

Detailed observation from such large deposits of Sagalassos Red Slip Ware has already identified changing patterns
in surface oxidation/reduction through the centuries of production in the Potters’ Quarter. From the 4th century AD, Sagalassos Red Slip Ware from the Potters’ Quarter begins to display a notably darker (more reduced) surface coloration than material from the preceding centuries. Such surface coloration changes, intentional or not, can be the result of numerous alterations in the firing process (differences in kiln type, stacking procedures, fuel type, duration and intensity of firing, etc.). Through detailed analyses of production settings (specifically related to kiln design and furniture, use of container forms to hold stacks of tableware, and archaeobotanical observations of changing fuel types from the city), several of these variables are being evaluated for applicability or rejection. Although the exact motivation for this change is still being investigated, this example demonstrates that significant changes in production techniques (and possibly technologies) occurred over time within the Potters’ Quarter.

In addition to wasters and kiln furniture, production contexts have provided numerous tools. These instruments include potters’ ribs, trimmers, *styli*, moulds, roulette wheels, stone palettes and hand mortars, axe heads, and turntable fragments. This corpus probably only represents a small fraction of the tools originally used in the production process. Nevertheless, the recovered tools demonstrate a range of morphologies utilized in the Sagalassos Potters’ Quarter and suggest specific technological constraints on production. By comparing the tool morphologies represented in workshop contexts with the secondary production traces visible on ceramic products, moulds and stamps, it is possible to discern specific uses of tools for ceramic production. For example, it is clear that fettling knives found in high frequency in the coroplast workshop are typically used to cut excess clay protruding from the edges of moulds and to cut neck holes for oinophoroi. Multiple incising tools (i.e., combs, hairpins, and styli) are often used in combination for the production of a single decorated mould. In addition, personally inscribed objects, particularly potters’ ribs and moulds, appear to demarcate possessions (and perhaps even roles) of craftspeople within the production environment. This may have significant implications for the way in which tasks were internally organized, as spaces for at least three potters’ wheels were observed in a late Roman tableware workshop suggesting that throwers were working side-by-side in the production setting. In addition, use of what would often be classified as “non-pottery” related objects (i.e. hairpins and *styli*) have been found in high frequency in the workshop settings and may have implications on the way in which ancient potters related the broader contemporary material world to their craft. It is important to note – for the purpose of highlighting workshop variability – that inscribed objects are not consistently represented across all tool types. Rather, certain types (e.g. lamp molds) appear to be more frequently inscribed with potters’ marks than others (e.g. *oinophoroi* molds). Such variation possibly hints at organizational variability in producing different object classes even within the same workshop settings.

ETHNOGRAPHIC CONSIDERATIONS

Use of ethnographic approaches for archaeological purposes has justifiably raised much criticism, concerning both ethical concerns and use of analogy with archaeological remains. When used with care, however, ethnographic studies can demonstrate the potential variability and complexity of ceramic industry organizations, give insight into specific technologies for which few other sources exist, and offer a humanistic reflection on ancient industries that is often only represented by fragmentary archaeological remains. For the purposes of this study, ethnographic analogies are referenced as a means of conceptualizing complexity of ceramic production without dictating archaeological interpretations. For instance, efforts to estimate ancient workshop output at Sagalassos amply demonstrate the value of considering ethnographic evidence. Much previous archaeological literature regarding this topic for the Roman period has centred both on analyses of kiln loading accounts from sites, such as la Graufesenque, Arezzo, Pergamon, and Pisa and comparisons of kiln size from workshops. The evidence for kiln size is of particular interest for this project, as the updraft kilns thus far excavated in the Potters’ Quarter can be considered to be of relatively “modest” dimensions.
(typically with firing chambers between 1 m. and 2.5 m. in diameter). However, workshops are often associated with small courtyard/outdoor areas containing two or more of these kilns, thus raising questions concerning the relation of firing frequency to production output. Ethnographic case studies offer some important insight. A workshop at Gujrat, Pakistan, described by Owen S. Rye and Clifford Evans, alternately fired two wood-fired updraft kilns (each with c. 2 m. firing chamber dimensions) – while one heated, the other cooled, and firings were performed every four to five days.25 Such rapid firing rates described ethnographically have, consequently, influenced our perceptions of the relationship between kiln size, number of kilns, and production output potential. This example illustrates that simple associations between isolated aspects of infrastructure must be re-evaluated with reference to the organization of the entire workshop complex. We argue that such investigations can begin to be pursued by developing integrated multi-dimensional archaeological methodologies that conceptually consider ethnographic accounts.

CONCEPTUAL MODELS OF PRODUCTION

Initial observations and reconstructions deriving from the methodologies cursorily outlined above for the ceramic production study of the Potters’ Quarter at Sagalassos suggest that many earlier models of ceramic production, which have been utilized in Roman ceramology, should begin to be revisited. The detailed nature of such investigations that support more complex reconstructions of workshops can be used to assess the applicability (or inapplicability) of such models and to formulate new conceptual frameworks based on greater diversity of production expression and operation in the Roman world and even within the same production “centre”. Such diversity is beginning to demonstrate patterns reflecting local/regional variability and/or temporal changes in production activities, which may have social, cultural, economic, and/or technological implications. Initial observations deriving from the ceramic production study at Sagalassos suggest variability in infrastructure within the production “centre” among contemporaneous workshops, variable production markings present on different types of moulds within a single workshop, and changes in firing techniques occurring throughout the Potters’ Quarter beginning in the fourth century AD. Thus, the archaeological patterns being observed by employing the methodologies described in this paper are suggesting that many of the early models developed for ceramic production “centres”26 do not adequately manage the variability being interpreted for the archaeological remains of the Sagalassos Potters’ Quarter workshops. That is, the generalizing nature of the models is not able to adequately classify the broad range of behaviours and production organizations that are emerging in the archaeological record. Instead, new models of complexity utilizing the breadth of evidence derived from these approaches should be formulated for assessment of Roman-period production.

Development of these methodologies represents a first-step in the pursuit of more complex questions that are beginning to be revealed in the archaeologies of other regions. Yet, this project, by generating detailed reconstructions of production organization and models of complexity, provides necessary groundwork from which more social questions related to ancient industry can be conceived in dynamic ways both in comparison between production settings and within individual production “centres”. The Roman period ceramic industries, already recognized as possessing a wide-range of variability, in particular, offer tremendous potential for the application of such studies.