Journal of Archaeological Science: Reports xxx (2016) xxx–xxx

Contents lists available at ScienceDirect

Journal of Archaeological Science: Reports

journal homepage: www.elsevier.com/locate/jasrep

Pottery production at two neighbouring centres in the Late Bronze Age Saronic Gulf: Historical contingency and craft organisation

William D. Gilstrap [a,b,*], Peter M. Day [a], Vassilis Kilikoglou [c]

[a] Department of Archaeology, University of Sheffield, Sheffield, UK
[b] Archaeometry Laboratory, University of Missouri Research Reactor Center, Columbia, MO 65211, United States
[c] Laboratory of Archaeological Materials, NCSR Demokritos, Aghia Paraskevi, 15310 Athens, Greece

ARTICLE INFO

Article history:
Received 11 November 2014
Received in revised form 10 December 2015
Accepted 4 March 2016
Available online xxxx

Keywords:
Pottery
Mycenaean
Late Bronze Age
Petrography
SEM
Production technology

ABSTRACT

In exploring ceramic production technology and exchange during the Late Helladic IIIB-Late Helladic IIIC Phase 1 periods in the area of the Saronic Gulf, pottery from several archaeological sites has been analysed, characterising compositional groups and tracing their movement around the region. This investigation has highlighted and characterised a number of production centres, of which the two highlighted here produce similar vessel types, including painted finewares, cooking vessels and large tubs. Although the range of pottery in these centres is similar and certain technical features are near identical, each centre features distinctive 'ways of doing' and apparent contrasts in their organisation.

This paper examines the choices made in pottery production for coarse and fine vessels, especially in terms of raw material choice and manipulation, as well as in firing procedures. It contrasts pottery production at this time on the island of Aegina with that at Kontopigado Alimou in Attica, only c. 22 km distant on the mainland to the North-east. While the workshop at Kontopigado used the same raw materials in varying proportions to produce different vessel types, Aegina hosted production which varied more markedly according to the type of vessel produced. In Aegina, fineware vessels are produced in an entirely different fashion from their coarseware counterparts. These contrasting, contemporary technological practices are considered within the broader Mycenaean social landscape and the historical circumstances of their development.

Published by Elsevier Ltd.

1. Introduction

Analytical research on ceramics over the past fifty years has demonstrated the chronological depth and complexity of production traditions at a number of locations throughout the Aegean. Pottery production around the Saronic Gulf is no exception. There, a detailed study of ceramics recovered from several contemporary archaeological sites dating from the Late Helladic IIIB (French, 1967; Kilian, 1988: 118; Mountjoy, 1999a: 32, Mountjoy, 1999b: 514; Vitale, 2006: 178; Stockhammer, 2008) to Late Helladic IIIC Phase 1 period (Rutter, 1977, 2003; Gauss, 2003) has revealed multiple pottery production centres and the wide distribution of their products (Gilstrap, 2015). In the present study, pottery from two of these contemporary production centres is characterised through integrated analyses by thin section petrography and scanning electron microscopy (SEM) to reconstruct some of the technological choices made during production and to link those choices to vessel types. In doing so, the diversity of technological practice and possible differences in the organisation of these two centres of the ceramic craft are explored.

The pottery production centres considered here are located on the island of Aegina (Fig. 1), long studied as a centre of ceramics (Zerner, 1986, 1993; Lindblom, 2001; Mommsen et al., 2001; Gauss and Kiriatzi, 2011; Klebinder-Gauss and Gauss, 2015), and the recently-excavated site of Kontopigado in the Athenian suburb of Alimos, Attica (Fig. 1; Kaza-Papageorgiou et al., 2011; Kaza-Papageorgiou and Kardamaki, 2012, 2014). Analysis of pottery from these two centres indicates that there are discrete practices in operation in the production of similar ceramic vessel types by neighbouring contemporary manufacturers in the Saronic Gulf. Evidence suggests that producers at both locations manufactured similar vessel types. While it is clear that choices of raw materials are ultimately dependent upon the geological setting in which each centre is located, the choices of those materials from available resources, their *manipulation* and the *technological processes* used for the production of specific vessels demonstrates stark contrasts between centres. On the other hand, further details suggest the sharing of rather specific technological practices. In other words the deeply different approaches to production show insight into the organisation of pottery production and belie key points on contact and transmission of practice.

Three distinct groups of pottery have been chosen here to shed light on these phenomena, considered in light of the varied histories which might epitomise the experience of different settlements and regions,

* Corresponding author at: University of Missouri Research Reactor Center, 1513 Research Park Drive, Columbia, MO 65211.
E-mail address: gilstrapw@missouri.edu (W.D. Gilstrap).

http://dx.doi.org/10.1016/j.jasrep.2016.03.004
2352-409X/Published by Elsevier Ltd.

Fig. 1. Map of the Saronic Gulf and surrounding areas, illustrating the location of sites from which pottery was sampled. Nb: Comparative pottery from Corinth is not of Mycenaean date.

in what we call the 'Mycenaean World'. The analysis investigates the production technology of cooking pottery,[1] bathtubs[2] and tablewares[3] from Kontopigado in Attica and from the island of Aegina, in order to identify the types of raw materials used, methods of raw material processing and the conditions under which they were fired. This detailed approach to technological reconstruction is motivated by an understanding of technology as a social phenomenon, where practice has far wider implications than the technical action itself (Lemonnier, 1993). Working to reveal the way in which ceramic vessels have been brought into being, by attempting to reconstruct their operational sequences, or *chaînes opératoires*, makes it possible to investigate each operative action independently, while simultaneously placing it within a technical system. This method creates a dialogue of interaction between materials, object and technician delineating socially acquired knowledge and gesture.

2. Methods

Thin section petrography and scanning electron microscopy coupled with an attached energy dispersive X-ray spectrometer (SEM-EDS) are used here to reconstruct the different stages of pottery production, exploiting data on mineralogy, petrology, texture, microstructure and chemical composition. This combination of techniques has proved useful in investigations of Aegean pottery (Day et al., 1999, 2006; Day and Kilikoglou, 2001). Petrographic data were collected according to the methods developed by Whitbread (1989, 1995). Inclusions are identified according to mineral type, size, shape and abundance whiletechnological aspects, including textural features, optical activity and grain size distribution are used to interpret the kinds of choices made during manufacture.

SEM-EDS is used to characterise the degree and type of vitrification microstructure within the ceramic matrix, in the light of semi-quantitative chemical analysis, which is indicative of firing conditions such as temperature and atmosphere (Maniatis and Tite, 1978, 1981; Kilikoglou, 1994; Day and Kilikoglou, 2001:120–124). Examination of a fresh fractured ceramic cross section by SEM reveals a topographic image of the microstructure developed in the ceramic body during the process of firing. The key point in the SEM study is the assessment of the degree of the vitrification that the clay paste has undergone, which, combined with the coupled EDS semi-quantitative elemental analysis, provides valuable information on the technology of manufacture (Maniatis and Tite, 1978, 1981). The morphology and extent of vitrification in combination with the chemistry of the body, are related to the temperature range, gradient and atmosphere of the kiln, as well as the type and the processing of the raw materials.

3. Results

The analytical results are presented according to production origins. Group descriptions for both sources refer to both published and unpublished pottery from a variety of sites around the Saronic Gulf including: Ayios Konstantinos, Methana (Konsolaki, 2002), Kanakia (Marabea, 2010, 2012), North Slope of the Athenian Acropolis (Broneer, 1939; Hansen, 1937; Gauss, 2003; Rutter, 2003), Kontopigado (Kaza-Papageorgiou et al., 2011; Kaza-Papageorgiou and Kardamaki, 2012, 2014) and Lazarides, Aegina (Sgouritsa, 2010, 2012). The regional geology of each area is presented first in order to demonstrate the kinds of available raw materials useful in pottery production. This is followed

[1] For Aeginetan cooking pottery types found in this study prefer to Marabea (2012, 209 Fig. 20) and Kaza-Papageorgiou et al. (2011, 259 Fig 23, 148–140). For Kontopigado cooking pottery types see Kaza-Papageorgiou et al. (2011, 258 Fig. 22, 144–146, 260 Fig 24, 155–16).

[2] For bathtubs see Kaza-Papageorgiou et al., 2011, 262 Fig. 26, 164–167. Aeginetan produced bathtubs from Ayios Konstantinos, Methana and Myti Kommeni, Dokos are currently unpublished.

[3] Aeginetan "tableware" or fineware for this period mainly derive from the site of Lazarides in the form of deep bowls (FS 284). For Kontopigado produced "tableswares" or fineware see Kaza-Papageorgiou et al. (Kaza-Papageorgiou et al., 2011, 233–257, Figs. 6–21).

Please cite this article as: Gilstrap, W.D., et al., Pottery production at two neighbouring centres in the Late Bronze Age Saronic Gulf: Historical contingency and craft organisation, Journal of Archaeological Science: Reports (2016), http://dx.doi.org/10.1016/j.jasrep.2016.03.004