

Symposium Egejskie

Vol. 2

Papers in Aegean
Archaeology



Edited by

Katarzyna Żebrowska
Agata Ulanowska
Kazimierz Lewartowski



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SYMPOZJUM EGEJSKIE
PAPERS IN AEGEAN ARCHAEOLOGY

VOL. 2
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EDITED BY
KATARZYNA ŻEBROWSKA, AGATA ULANOWSKA & KAZIMIERZ LEWARTOWSKI



INSTITUTE OF ARCHAEOLOGY
UNIVERSITY OF WARSAW

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INTRODUCTION

After c. 150 years of intensive research, Aegean archaeology is still a vigorous and dynamically developing discipline of broad research interests. These comprise the combination of traditional excavation with scientific methods, research based on large data sets, iconographic and textual studies, studies in religion, gender, technology, and production, socio-cultural and socio-economic analyses, methods of landscape and textile archaeologies, as well as theoretical deliberations. Geographically, investigation of the Bronze Age Aegean has spread off the shores and islands of the Aegean Sea, to the north and south, east and west, comprising now a large area of the eastern Mediterranean.

Being so vibrant and dynamic, the archaeology of the Aegean attracts each year new adepts: scholars and students who enter the discipline with new ideas and research enthusiasm. The *Symposium Egejskie* series is a platform created to present and introduce these new topics, approaches, and methodologies, as well as the achievements of new authors who are at the beginning of their research career as 'Aegeanists'.

It is our great honour to present the second volume of *Symposium Egejskie. Papers in Aegean Archaeology*. This peer-reviewed series was originally created as an answer to the great interest of adepts of the discipline in the *Conferences in Aegean Archaeology* organised by the editors successively since 2013. Although the core of the series derives from the papers presented at the *Conferences in Aegean Archaeology*, it also welcomes other contributions relevant to the Aegean Bronze Age.

The first volume in the series, published in 2017, comprised eight articles exploring a range of topics related to the Aegean region and cultures in the Bronze Age, as well as all connected themes, in this specific case: funerary architecture and ritual practices, Minoan art, the ties linking textile technology and Minoan glyptic, the use of databases in the study of small finds, the 'archaeology of childhood' in Crete and Cyprus, as well as Aegean and western Anatolian networks in the Late Bronze Age.¹

The present volume, published by the University of Warsaw Press, contains eleven contributions submitted by an international group of authors brought up in different 'archaeological schools' and academic

traditions. In their specialist studies, they use various methodological approaches, both theoretical and experimental. This publication is a collection of articles which are the outcome of the *4th* and *5th Conference in Aegean Archaeology* that took place in Poland in 2016 (the young researchers' session, April 8th, 2016, Archaeological Museum in Poznań) and 2017 (June 1st and 2nd, 2017, Institute of Archaeology, University of Warsaw). Unfortunately, not all of the papers originally presented could be published in this volume. The list of the conference participants who discussed the results of their current work in the field of Aegean Archaeology comprised also: Claudia V. Alonso-Moreno (Autonomous University of Madrid), Mariya Avramova (University of Warsaw; National Library of Poland), Kinga Bigoraj (University of Warsaw), Dr Peta Bulmer (University of Liverpool), Katarzyna Dudlik (Adam Mickiewicz University in Poznań), Anna Filipek (University of Warsaw), Oihane González Herrero (Autonomous University of Madrid), Joseph Gaynor (University of Liverpool), Michael Hirschler (University of Graz), Beata Kaczmarek (Adam Mickiewicz University in Poznań), Monika Koźlakowska (University of Warsaw), Anna Lekka (Hellenic Ministry of Culture), Stefan Müller (Heidelberg University), Jakub Niebieszczański (Adam Mickiewicz University in Poznań), Francesco Tropea (University of Nottingham), Dimitris Tsikritsis (University of Edinburgh), Agata Ulanowska (The Centre for Research on Ancient Technologies of the Institute of Archaeology and Ethnology, Polish Academy of Sciences), and Katarzyna Żebrowska (University of Warsaw).

The contributions are arranged in a chronological order, starting with the discussion on Cycladic vessels found in the Early and Middle Bronze Age contexts in Crete. In the article '*Cycladic Sauceboats in the Deposit of the Camerette in Ayia Triada*', Chiara De Gregorio presents the results of typological and contextual studies carried out on the Early Minoan III to Middle Minoan II pottery from the Deposit of the *Camerette* in Ayia Triada. She focuses her attention on one particular vessel type present within the ceramic repertoire, the so-called 'sauceboat', a form deriving from the Early Cycladic II Keros-Syros Culture.

¹ Żebrowska K., A. Ulanowska, K. Lewartowski (eds.) (2017) *Symposium Egejskie. Papers in Aegean Archaeology*, 1, Warsaw

(available in open access: <http://archeologia.uw.edu.pl/zalaczniki/upload2127.pdf>, accessed: 17.04.2019).

De Gregorio considers the find a possible local interpretation of the Cycladic model and stresses that this kind of evidence could be especially helpful in reconstructing the place of Ayia Triada in the interregional contacts in the Late Prepalatial period.

Sarah Douglas and **Giulia Muti**, in their contribution ‘*A Case of Identity. Investigating the Symbolism of Spindle Whorls in Early and Middle Cypriot Tombs*’, investigate the symbolism of the textile tools, specifically spindle whorls, that were found at *Erimi Laonintou Porakou*, *Lapithos Vrysi tou Barba*, and *Galinoporni*. The authors discuss the key elements of the deposition of spindle whorls, e.g. characteristics of the tools, their use-wear, location, and relationship to the bodies, in order to identify and explain the recurring pattern of deposition, reasons for offering whorls as grave goods, and possible implications of the observed practices for the construction of the deceased’s identity.

Julia Binnberg’s efforts are directed towards understanding meanings of birds’ representations in Cretan art and roles played by birds in Minoan ontologies. In her contribution entitled ‘*Animism or Analogism? Bird Depictions and Their Significance for the Reconstruction of Cretan Bronze Age Ontologies*’, the author employs a typology of ontologies developed by French cultural anthropologist Philippe Descola in order to offer a new approach to the problem and comes to the conclusion that animism played an important role in Cretan ontologies.

In the article titled ‘*Minoan Pottery Kilns: A Re-Evaluation of Their Morphology, Technology, and Function*’, **Ioannis Pappas** investigates Minoan kilns used in Crete in the process of pottery production. The author re-evaluates the typology of these structures through a comparative study of their morphological, technological, and functional features. Special attention is paid to the so-called ‘channel kilns’ and the possible variants of their construction. Finally, Pappas describes all types of Cretan kiln sites in order to shed light on the relations between the firing places and ceramic workshops.

Georgios-Panagiotis Georgakopoulos examines various areas for food preparation in late Neopalatial Crete. His contribution ‘*The Kitchen of the Palace and the Cooking Areas of the Houses in a Minoan Neopalatial Town*’ focuses on the settlement of Kato Zakros as a case study. This contribution offers a definition of the basic criteria for recognising cooking areas and kitchens within the houses and discusses their possible variations. The food preparation areas identified at Zakros are compared to the evidence from other Neopalatial sites in order to investigate the social role and dynamics of the observed consumption practices.

Alessandra Saggio proposes an innovative approach to the study of Cypriot gaming stones in her article ‘*The Rules of the Game. Cypriot Bronze Age Gaming Stones: Their ‘Informative Perspective’ about Social Practices*’. She analyses the various contexts of the finds in order to enhance the informative potential of the objects. Saggio successfully uses this methodology to hypothesise about the social importance of gaming practices and the complexity of local communities living in Cyprus during the Bronze Age.

In the contribution titled ‘*Materialising Mythology. The Cup of Nestor from Shaft Grave IV at Mycenae*’, **Stephanie Aulsebrook** hypothesises on a possible common source for the maker of the Cup of Nestor from the Shaft Graves and Homer’s description of Nestor’s cup in the *Iliad*, as well as on the possibility of the survival of Bronze Age legends into the historical period.

In her article ‘*Aegean Headbands: A Functional Analysis. Macroscopic, Microscopic, and Experimental Studies*’, **Betty Rame** undertakes an attempt to reconstruct functional ‘biographies’ of metal headbands, from the moment of their production to their deposition in graves. Functional features, production techniques, and use-wear marks recognised on the Bronze Age headbands on the basis of macroscopic and microscopic observations made by the author are compared with the evidence resulting from experimental recreation of gold headbands by a professional goldsmith and expert on ancient gold working.

In the contribution ‘*Between Crete and Anatolia. Metal Finds of the So-Called Lower Interface in the LBA*’, **Miloš Roháček** offers a thorough typological analysis of the Late Bronze Age metal objects found in the lower part of the East Aegean-West Anatolian Interface, backed up by a comparison with contemporary Cretan items. As a result, the author observes that some categories of bronzes from the Interface are characterised by very strong Minoan-Mycenaean traits. Such phenomenon has not been noted in artefacts from other areas of the Aegean.

The analysis of changes in the Cult Centre of Mycenae after the supposed earthquake in Late Helladic IIIB carried out by **Stephanie Aulsebrook** in her second article (‘*Crisis at the Cult Centre. Evidence from the Megaron Basements*’) reveals how the community responded to the crisis caused by the catastrophe. The author explores Ian Driessen’s concept of ‘crisis architecture’ and focuses her research on the Megaron.

In his contribution entitled ‘*Pottery as an Indicator of Interregional Contacts. Placing the Vardar and Struma River Valleys in the Cultural Network of Central Macedonia in the Late Bronze Age — State of Research*

and Future Perspectives, **Cezary Bahyrycz** leads the reader to Northern Greece, to the valleys of the Struma and Vardar rivers, in order to trace the relations of local communities to the Balkans and Greece in the Late Bronze Age. The evidence explored by the author is the pottery found during excavations of numerous sites and presently stored in several museums. The analysis

is based on a methodological assumption that pottery styles can function as a medium of cultural information and thus can reflect interregional contacts and influences. As a result of the examination, a picture emerges of the valleys as routes of intensive contacts between the north and south, and we get an insight into the present state of research.

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The editors
Katarzyna Żebrowska, Agata Ulanowska
& Kazimierz Lewartowski

CYCLADIC SAUCEBOATS IN THE DEPOSIT OF THE CAMERETTE IN AYIA TRIADA¹



ABSTRACT: The increased Cretan participation in overseas markets during Early Minoan II led to the introduction of new pottery shapes. One of the most distinctive vessels was the so-called ‘sauceboat’ of the Early Cycladic II Keros-Syros Culture. In Crete, this shape developed in the local Minoan styles. Even if it spread less widely than in the Mainland, it was assimilated by the local material culture, and some examples are even documented in periods succeeding Early Minoan II. The Deposit of the *Camerette* in Ayia Triada, south of *tholos* A, illustrates this phenomenon. The Middle Minoan IA deposit was dug in 1998–1999 and has revealed 434 vessels and thousands of pottery fragments, dating from Early Minoan III to Middle Minoan II. It comprises the most common shapes of Prepalatial Minoan pottery in the Mesara plain: bowls, baking plates, buckets, miniature winepresses, plates, jugs, tankards, sauceboats, cups, conical cups, teapots, cooking pots, *pitharakia*. This contribution will offer preliminary results of the typological and contextual studies on the Deposit of the *Camerette* and will focus on possible imitations of Cycladic models. This evidence may be particularly useful to understand the significance of Ayia Triada towards the end of the Prepalatial period.

KEYWORDS: Deposit of the *Camerette*; Ayia Triada; Minoan; Cycladic; Bronze Age; Pottery; Sauceboat.

Between 1997 and 1999, by means of the Universities of Venice and Catania, the Italian Archaeological School at Athens conducted new soundings in the necropolis of Ayia Triada (Fig. 1).² In south-central Crete, the archaeological site lies on the western slope of the hill where the Palace of Phaistos is located, 3 km away. The excavations of the 1990s concerned different structures dated from Early Minoan (EM) to Late Minoan (LM): the Tomb of the Painted Sarcophagus, the *tholos* B and the ossuary behind it, the *tholos* A and its annexes. Also excavated was the area of the so-called *Camerette*.³ Placed 7.50 m south of *tholos* A, these were two blocks of rooms separated from the tomb: named respectively 1–10 and a–c. The two groups of rooms were located on the eastern side of a wall enclosing two *baetyls* and overlooking an open paved area (Fig. 2).⁴

The area of the *Camerette* had been partly discovered for the first time in 1904 by the Italian Mission in Crete, directed by Pernier and Halbherr.⁵ In 1933, Stefani and Banti published the data regarding the structures and the finds.⁶ The *Camerette* were probably used to collect the equipment for ceremonies performed in the nearby open area. These were focused on *tholos* A,⁷ conceived as an ancestors’ tomb and a point of reference for the ritual activities of the community. Indeed, in Late Prepalatial Ayia Triada, the population was dispersed in several dwelling areas, and the only recognisable architectural structures of this period are in the necropolis.⁸

In 1998, a pottery dump was uncovered southwest of *Cameretta* a: the so-called Deposit of the *Camerette*. This was located in an ellipsoidal pit, bordered by a semi-circular structure perpendicular to the wall

1 I would like to thank Prof. Filippo Maria Carinci for the opportunity to study the pottery from the Deposit of the *Camerette* for my final dissertation at the Scuola di Specializzazione at the Italian Archaeological School at Athens. I also thank the Directors of the Italian Archaeological School at Athens, Prof. Emanuele Papi and Prof. Emanuele Greco, for the possibility to examine the materials in storerooms and the archive of the Italian Archaeological School.

2 DI VITA 2001.

3 DI VITA 2001; LA ROSA 2013.

4 LA ROSA 2001, 222–225, pls. LXXIIc, LXXIIIa; 2013, 171–251, pls. I, X, XII, XXIX, XXX.

5 PARIBENI 1904.

6 BANTI, STEFANI 1933.

7 CULTRARO 1994; 2003.

8 CARINCI 1999; 2003; 2004; CULTRARO 2000; TODARO 2011.



Fig. 1 The Ayia Triada site (TODARO 2003, 9).



Fig. 2 The area of the Camerette and the Deposit of the Camerette (LA ROSA 2013, 307).



Fig. 3 The Ayia Triada sauceboat (LA ROSA 2013, 217).

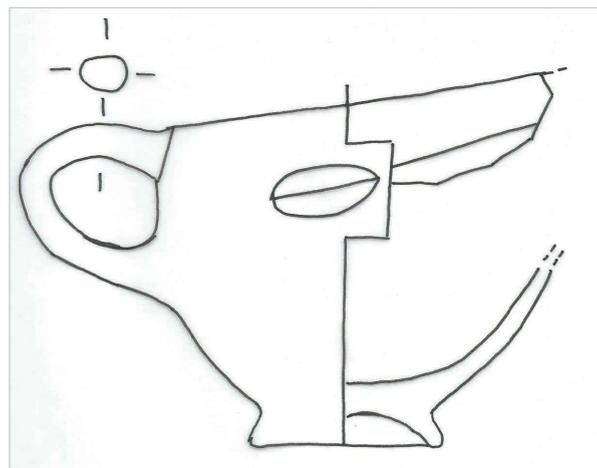


Fig. 4 The Ayia Triada sauceboat (drawing by G. Fatuzzo).

with *baetyls*.⁹ The two-year excavations in 1998 and 1999 revealed mostly pottery but also two obsidian blades, a sandstone grindstone, some stone weights, and a small burnt bone. The finds were mainly dated to the Late Prepalatial period, between EM III and Middle Minoan (MM) IA. The materials of the Deposit of the *Camerette* likely represented the first set of contents of the *Camerette* 1–10, removed to make room for the new ones, discovered during the 1904 excavations. Several vessels were intact or were easy to mend. In the Deposit of the *Camerette*, a total of 434 vessels were recovered, along with thousands of other pottery fragments. The deposit comprised the most common shapes of the Late Prepalatial period: conical cups, jugs, shallow bowls, teapots in Patrikies style, jars, several sherds of baking plates, bowls, buckets, miniature wine-presses, tankards, cups, cooking pots, *pitharakia*, a vessel with horns, a clay engraved sheet, and the so-called ‘sauceboat’.¹⁰ Conical cups and jugs were the most documented.¹¹

The sauceboat was mended from 11 fragments but is still missing the spout, except for a sherd impossible to reunite (Figs. 3–4).¹² The Ayia Triada sauceboat is globular-ovoid, with an opening on the side opposite to the handle to insert the spout, semi-ellipsoidal in cross-section, probably ending with an open beak. The rim is simple and thin, raised in the last part near the break. Underneath it, there is a rod-like vertical handle. Two amygdaloid lugs are placed underneath

the rim too, perpendicular to the handle and to the spout. The ring base has a conical shape on the exterior and is concave on the underside. The sauceboat is 9.1 cm tall, with a base diameter of 5.1 cm and a rim diameter of 8 × 10 cm. The surface is more polished on the exterior and in the upper part of the interior. The vessel is painted on the exterior and on a horizontal band under the interior rim with a red/dark red paint (HUE 2.5 YR 6/8 red – 4/2 dusky red). The fabric is pale yellow (HUE 10 YR 8/6 yellow): granular and with a lot of grits in the lower part of the body, finest in the ring base, the upper part, and probably in the handle. La Rosa identified as parts of sauceboats other fragmentary ring bases found during the 1997–1999 excavations in the area of the *Camerette* 1–10 and a–c, and in the Deposit of the *Camerette*.¹³ From their discovery, the Ayia Triada sauceboats were considered as a local variation of the original Proto-Helladic type, one of the most distinctive vessels of the Early Cycladic (EC) and Early Helladic (EH) II cultures.

The closest comparison to the Ayia Triada sauceboat was uncovered at Moni Odigitria, at the beginning of the Ayiopharango Valley in southern Crete.¹⁴ The vessel resembles a shallow sauceboat in form and surface treatment, even if the form is not entirely clear from the surviving fragment. It has the shape of a shallow bowl, probably with a low pedestal. The Moni Odigitria sauceboat was uncovered in the environs of *tholos* A and could be dated to EM IIB.¹⁵

9 The Deposit of the *Camerette* was 3.70 m wide in NW-SE direction and 3 m long, with a depth of 2.45/2.65 m; LA ROSA 2013, 209–226.

10 Inventory no. HTR 98 3079; CARINCI 2003; LA ROSA 2013, 209–226.

11 The recognisable conical cups are 268 and the catalogued jugs are 92.

12 The fragments of the sauceboat were found between the 21st and 23rd of July and the 3rd and 5th of August 1998; LA ROSA 2013, 217–218.

13 LA ROSA 2013, 198, 226.

14 BRANIGAN, VASILAKIS 2010.

15 BRANIGAN, CAMPBELL-GREEN 2010, 95, P127.

A fragmentary EH sauceboat was also found in the Platyvola Cave, on the west side of a gorge above the plain of Kerameia, 25 km east of Chania. The site was first mentioned by Faure in 1962¹⁶ for the finding of sherds dated from the EM till the Hellenistic period, and in 1965, under the direction of Tzedakis, the local Archaeological Service started stratigraphic excavations. The archaeological research identified four chambers in the cave. In one of these, a significant number of human bones was found, suggesting the funerary purpose of this part of the cave. The bones could not be dated accurately, but the use of the cave as a burial place seemed related to the EM times. In the other chambers, a large amount of pottery was discovered and dated from the Middle Neolithic to the Post-Palatial period. The EM pottery originated from different regions of Crete and was uncovered with imitations of Cycladic models, such as a frying pan vessel¹⁷ and cylindrical pyxides with decoration of horizontal grooves on the body,¹⁸ a marble Koumasa style figurine, and two fragmentary sauceboats.

These were discovered in several fragments, first during the 1966 excavations.¹⁹ The two restored sauceboats have a globular body with a straight and rounded rim, raised to the spout. The round cross-section handle is beneath the rim. The handle is vertical on one sauceboat and horizontal on the other one. Both sauceboats have a conical and flaring pedestal base, hollow on the underside. The sauceboats have a black-greyish slip, mostly faded to dark red. The surface is polished, as it is visible on the exterior and on the interior of the vessel, and the fabric has a lot of grits of medium and small size. One mended sauceboat is 17 cm tall, including the spout, and 24 cm wide.

The Platyvola sauceboats are different from the Ayia Triada one, not just in their dimensions. The body is neatly globular and the handle is smaller. The bases are not comparable: the Ayia Triada one has a base ring and the other is a pedestal. The restored spouts could have been different because that of the Deposit of the *Camerette* vessel could have been wider. Tzedakis²⁰ hypothesised a local origin for the sauceboat found in the Platyvola Cave, and he conceived it as a Cretan reproduction of off-island models. Moreover, other EM II vessel shapes from the Platyvola Cave had foreign connections, such as the pyxides, very common in the Cyclades. Betancourt²¹ agreed and asserted

that it could be considered as the prototype of Minoan sauceboats, different from the EC and EH ones because of its evident globular shape and the small pedestal base. Two golden vases were proposed as models, but they are both suspected of being fakes. The archaeologist also recognised another model for the Platyvola sauceboat in the vessels realised from gourds.

The Cretan origin of the vessels is not accepted. Their shape and bright decoration recall the EH Urfirnis sauceboats of the Mainland, as Protopapadaki has pointed out.²² In his analysis, Wilson²³ referred to Caskey's type IV and paralleled the pedestal base of the Platyvola ones with those of the vessels present in Attica, Boeotia, and Cyclades. If the Urfirnis sauceboats found in Crete were from Mainland Greece, they would be the only imports from the Mainland in EM II. Wilson underlined that it could have been possible that several Mainland artefacts arrived in Crete via the Cyclades and Kythira, where the first signs of Minoan presence are dated to EM II.²⁴ The origin of these materials could also be identified in Attica and not in the Argolid. The finding in various Cretan sites of cups with *barbotine* decoration similar to those uncovered at Kastelli Chania and at Kastri on Kythira could confirm this hypothesis. Many elements with possible connections with off-island contexts were found in western Crete. In this region were indeed uncovered EM I–II cemeteries with Cycladic resemblances, such as NAMFI beach and Nea Roumata, and the Nopigeia one, with an intramural *pithos* burial similar to the ones on the Mainland. However, our knowledge of this region is so far less complete than of those in Crete.²⁵

Several fragments of sauceboats were also found in the Lera Cave. First described by Faure in 1960,²⁶ this cave is located close to the top of the hill which overlooks the natural port of Stavros, at the north-western end of the peninsula of Akrotiri Kydonias. The Lera Cave has three rooms, in which have been found artefacts dated from the Neolithic to the Hellenistic period but no human bones. The stratigraphy, however, is unclear. Amongst the most common EM II fine wares, some fragments of Urfirnis sauceboats were uncovered. These sherds have a burnished surface, almost black, comparable to the Urfirnis examples. In particular, one of the restored sauceboats recalls the Caskey type IV, and the other can be paralleled with the Platyvola Cave vessels. The Lera Cave fragments

16 FAURE 1962, 44.

17 PROTOPAPADAKI 2017, 445, fig. 32.

18 TZEDAKIS 1968, pl. 376β; PROTOPAPADAKI 2017, 443, fig. 28.

19 TZEDAKIS 1966, 428; 1967, 505; 1968, 415, pl. 376γ; 1984, 6, pl. I, 3; PROTOPAPADAKI 2017, 443, fig. 31.

20 TZEDAKIS 1968, 415–416.

21 BETANCOURT 1985, 38–39.

22 PROTOPAPADAKI 2017, 443.

23 WILSON 1984, 303–304.

24 BROODBANK 2004, 73–81.

25 LEGARRA HERRERO 2014, 137–140, 303.

26 FAURE 1962, 46–47.

are insufficient to determine their origin. They have been found together with some sherds of Urfirnis pyxides and fine vessels of unknown origin. Because of the lack of human bones in it, the cave is supposed to have been used as a refuge or as a temporary dwelling, but not for burial purposes.²⁷

Fragments of EC and EH sauceboats have been attested in Knossos too. The EC ones have a painted decoration and were found along with some horizontal handles of *pithoi* in the West Court House. Both pottery shapes were uncommon in Knossos, but fine ware sauceboats with a yellowish slip and dark-on-light decoration were typical of the EC II production. One of the fragments uncovered in Knossos is considered by Wilson as a local copy of a Cycladic prototype. Moreover, Broodbank connected the painted sherds directly to those found in the looted area of Kavos, in Keros, later designated as the Special Deposit North,²⁸ and to those of Ayia Irini II.²⁹

Some Urfirnis sauceboats have also been documented in Knossos. Several fragments from at least eight sauceboats were found by Warren³⁰ in the area of the Royal Road, south of the EM IIA building. None of them was restorable to a complete profile, but the spouts could correspond to Caskey's types II or IV, attested in the middle and late phases of Lerna.³¹ Considering the fabric and the Urfirnis type surface decoration, Warren proposed the Argolid as the place of origin of these Knossos vessels. Wilson³² hypothesised a comparison between the sauceboats and those found in Ayia Irini, with a grey core and red surface, and dated to EM/EH II. The fabric and finish of the Cretan artefacts are indeed comparable with the West Cycladic examples, including those from Ayia Irini II–III. In that period, Kea had contacts with the Mainland, mainly with Attica, not with the Argolid.

Only one yellow mottled ware fragment of a sauceboat has been documented in Knossos. The yellowish slip and the fine painted decoration, both on the interior and on the exterior, were typical of the EC II production, especially on Kea and on Keros.³³ On the contemporary Mainland sauceboats, the painted decoration occurred usually on the interior.³⁴

Cadogan also refers to two rims with the Cycladic-type decoration from Knossos, and he considers one

as an example of the frying pan style and the other as a fragment of a basket-shaped vessel or *kalathos*.³⁵ These sherds confirm the presence of several off-island imports in EM IIA Knossos. The sauceboats represent one-fifth of these materials, with many parallels in the EC II Keros-Syros assemblages, including Ayia Irini II and III, and Phylakopi A2.³⁶

Sauceboats were also present in Poros,³⁷ the neighbouring site of Knossos. They occur mostly in Urfirnis ware, in the same fabric as those uncovered in Knossos, Ayia Irini, and Phylakopi. The others were in dark-on-light and mottled wares. Altogether, the sauceboats represented about 10% of the off-island imports in the EM IIA Poros pottery assemblages.

On the northern coast of Crete, another sauceboat has been uncovered in the house tomb cemetery of Petras.³⁸ The vessel was part of an EM IIA deposit excavated underneath Room 4 of House Tomb 3. It mostly comprised drinking and serving shapes but also small storage vessels and cooking pots. Among several imports identified, there is the sauceboat whose origin is supposed to be in the East Aegean.

The sauceboats attested in Crete are from EM IIA contexts. It was a period of dynamic interactions between Crete and the Aegean, as documented by several discoveries: Cycladic figurines in the necropoleis of the island, EH and EC amulets and seals, Cycladic pottery in EM contexts, and occasionally Minoan pottery in the Cyclades.³⁹ They actually have been found in regions that maintained contacts with the off-island territories. The sauceboat from Moni Odigitria represents an exception: it was dated to EM II B, even if information about the vessel is uncertain, and it was uncovered in an area poorly connected with other regions during EM II.⁴⁰

The Ayia Triada sauceboat was found in a pottery dump, with sherds closely comparable with those discovered in the Phaistos phases VIII, IX, and X, corresponding to EM II and MM IA.⁴¹ In the same excavations in the Deposit of the *Camerette*, several fragments of EM vessels were found, namely Pyrgos and Ayios Onouphrios pottery.⁴²

The Ayia Triada sauceboat is very similar to the EH II examples: the shape and decoration recall the Urfirnis artefacts.⁴³ The vessel could be connected to the finds

27 GUEST-PAPAMANOLI, LAMBRAKI 1976.

28 SOTIRAKOPOULOU 2007, 33–35, 93–94, 209; 2016.

29 BETANCOURT 1985, 20; WILSON 1985, 358–359, P466, pl. 58; 1999, 231–235; BROODBANK 2000, 223.

30 WARREN 1972A, figs. 7, 8.

31 CASKEY 1960, 290–292, fig. 1, I–IV.

32 WILSON 1999, 72, 231; 2007, 69.

33 ZAPHEIROPOULOU 1975; BROODBANK 2007, 148–150, 187–188, fig. 6.5; SOTIRAKOPOULOU 2007.

34 WARREN 1972A; WILSON 1984, 310–304; 1999, 76–77; 2007, 69.

35 CADOGAN, HOOD 2011, 258–260.

36 WILSON 2007, 69–70.

37 DAY *et al.* 2004, 72, fig. 4.2 m.

38 TSIPOPOULOU 2017, 74–75, fig. 25 h.

39 LEGARRA HERRERO 2014, 144–149.

40 DÉDERIX 2017, 24–31.

41 TODARO 2013, 188–195.

42 LA ROSA 2013, 210–211, 220–222.

43 FAHY 1962, 36–37.

from Lerna III,⁴⁴ in particular those of Caskey's type I/ type II, with a hemispherical body and a rising spout. The sauceboat of the Deposit of the *Camerette*, however, differs from these because of the vertical and bigger handle, and the presence of amygdaloid lugs on its sides.⁴⁵ Moreover, the surface is less burnished and has a lighter paint than the Urfirnis examples. In other Mainland regions, such as Attica or Boeotia, it is not possible to find direct parallels either.

The Ayia Triada sauceboat could be instead considered as a local evolution of the Cretan reproductions of the off-island prototypes. The vessel is different from the Minoan sauceboat model, corresponding to the vessel found in the Platyvola Cave. The sauceboat from the Deposit of the *Camerette* could be interpreted as a combination of external influences and Cretan tradition.

The local models of this artefact could be identified in two vessels from southern Crete. One is a bowl from Myrtos,⁴⁶ uncovered in room 91 and attributed to the period II of the settlement. The vessel has an open rim spout, opposite to the vertical rod-like handle, and a pedestal foot. It has a grey-brown buff fabric with tiny white, dark, and gold mica grits. It is burnished and covered with a buff slip and a red-brown paint, inside and outside. It is 10.1 cm tall with a spout, with a diameter of 15.6 cm and 20.9 cm wide. This spouted bowl of Vasiliki ware type recalls the Ayia Triada sauceboat but with some differences: a more flattened body, an everted rim, a smaller handle, and a spout which is not elliptical in cross-section.

Another parallel could be identified in a miniature vessel uncovered in the EM II levels of the Archanes necropolis. Only the body, with a typical pedestal base, concave on the underside, and the rod-like vertical handle, recalls the Ayia Triada artefact. The spout with a beak, similar to the sauceboats, has some waves on the rim.⁴⁷

The vessel of the Deposit of the *Camerette* could be compared to a find with no direct parallels from the area of Room 35 of the Palace of Phaistos, uncovered during the first excavations at the beginning of the 20th century.⁴⁸ This polychrome spouted cup, with a cylindrical body and a spout opened in the upper part, is 6.5 cm tall. On each side of the rim there is a lug. The rod-like vertical handle is opposite to the spout, and the base ring is concave on the underside. The exterior is decorated with black paint and thin white stripes around the spout, and, on the sides of the body, some stripes of red paint form a crescent band filled with white dots. The vessel was made of fine and yellowish clay, probably using a wheel. The cup has no direct comparisons and was dated to MM IB. Todaro, however, associated the vessel with some sherds from the nearby areas in the Palace and dated it to the Phaistos phase X, corresponding to MM IA.⁴⁹ The handle and the ring base are evidently similar to the Ayia Triada sauceboat, and even the cylindrical lower part of the body recalls it. The Phaistos vessel could be considered as an evolution of the Ayia Triada sauceboat or as another local development of the EC and EH prototypes.

The forthcoming scientific analysis of the pottery of the Deposit of the *Camerette* will help to clarify the origin of the sauceboat. At present, the macroscopic analysis of the vessel only allows it to be compared to the majority of the pottery from the dump. The more accurate definition of the provenience of the sauceboat will be useful to complete the knowledge of Ayia Triada during the Late Prepalatial period. This could help to define the possible presence or not in the site of artisans capable of making this uncommon vessel with an external derivation. The study will be useful in order to obtain a broader comprehension of the role played by Ayia Triada and the nearby area in the inter-regional contacts during the Late Prepalatial period.⁵⁰

BIBLIOGRAPHY

- Banti L. (1933) La grande tomba a Tholos di Haghia Triada, *ASAtene* 13–14, pp. 155–251.
- Betancourt P. (1985) *The History of Minoan Pottery*, Princeton.
- Branigan K. (2010) The Late Prepalatial resurrected, in: O. Krzyszkowska (ed.), *Cretan Offerings: Studies in Honour of Peter Warren*, London.

- Branigan K., T. Campbell-Green (2010) The pottery assemblage: data and analysis, in: K. Branigan, A. Vasilakis (eds.), *Moni Odigitria: A Prepalatial Cemetery and its Environs in the Asterousia, Southern Crete*, Prehistory Monographs 30, Philadelphia, pp. 69–126.

44 WIENCKE 2000, 584–592, fig. II. 92.

45 CASKEY 1960, 290–293, fig. 1, I–IV.

46 WARREN 1972B, P313, 122, fig. 59, pl. 44D.

47 SAKELLARAKIS, SAKELLARAKIS 1972, pl. B, 2.

48 PERNIER 1935, 134, fig. 59, 8.

49 TODARO 2013, 82–83, 210–211, fig. 27b.

50 BRANIGAN 2010, 25–30; DÉDERIX 2017, 9–10, 24–31.

- Branigan K., A. Vasilakis (eds.) (2010) *Moni Odigitria: A Prepalatial Cemetery and its Environs in the Asterousia, Southern Crete*, Prehistory Monographs 30, Philadelphia.
- Broodbank C. (2000) *An Island Archaeology of the Early Cyclades*, Cambridge.
- Broodbank C. (2004) Minoanisation, *PCPS* 50:1, pp. 46–91.
- Broodbank C. (2007) The pottery, in: C. Renfrew, C. Doumas, L. Marangou, G. Gavalas (eds.), *Keros, Dhaskalio Kavos: The Investigations of 1987–88*, Cambridge, pp. 115–237.
- Cadogan G., S. Hood (2011) *Knossos Excavations, 1957–1961: Early Minoan*, London.
- Carinci F. M. (1999) Haghia Triada nel periodo protopalaziale, in: V. La Rosa, D. Palermo, L. Vagnetti (eds.), *Επί πόντον πλαζόμενοι. Simposio italiano di Studi Egei dedicato a Luigi Bernabò Brea e Giovanni Pugliese Carratelli, Roma, 18–20 febbraio 1998*, Roma, pp. 115–132.
- Carinci F. M. (2003) Haghia Triada nel periodo MM, *CretAnt* 4, pp. 97–143.
- Carinci F. M. (2004) Priests in action, *CretAnt* 5, pp. 25–41.
- Caskey J. L. (1960) The Early Helladic period in the Argolid, *Hesperia* 29, pp. 285–303.
- Cultraro M. (1994) *La grande tomba a tholos di Haghia Triada: una revisione*, unpublished postgraduate thesis, Italian Archaeological School at Athens.
- Cultraro M. (2000) La brocchetta dei vivi per la sete dei morti, in: *Pepragména tou I' Diethnoús Kriologikou Synedriou: Irakleio, 9–14 Septemvriou 1996, t. 1, Proistorikí kai archaía ellinikí periódos (Πεπραγμένα του Η' Διεθνούς Κρητολογικού Συνεδρίου: Ηράκλειο, 9–14 Σεπτεμβρίου 1996, τ. 1, Προϊστορική και αρχαία ελληνική περίοδος)*, 1, Herakleion, pp. 309–326.
- Cultraro M. (2003) La grande tholos di Haghia Triada, *CretAnt* 4, pp. 301–328.
- Day P. M., N. Dimopoulou-Rethemiotaki, D. E. Wilson (2004) The pottery from Early Minoan I–IIB Knossos and its relations with the harbour site of Poros-Katsambas, in: G. Cadogan, E. Hatzaki, A. Vasilakis (eds.), *Knossos: Palace, City, State. Proceedings of the Conference in Herakleion Organised by the British School at Athens and the 23rd Ephoreia of Prehistoric and Classical Antiquities of Herakleion, in November 2000, for the Centenary of Sir Arthur Evan's Excavations at Knossos*, BSA Studies 12, London, pp. 67–74.
- Déderix S. (2017) Communication networks, interactions, and social negotiation in Prepalatial South-Central Crete, *AJA* 121:1, pp. 5–37.
- Di Vita A. (2001) Atti della Scuola. 1998–2000, *ASAtene* LXXVI–LXXVIII, pp. 375–466.
- Fahy L. (1962) *The Early Helladic Sauceboat*, Cincinnati.
- Faure P. (1962) Cavernes et sites aux deux extrémités de la Crète, *BCH* 86, pp. 36–56.
- Guest-Papamanoli A., A. Lambraki (1976) Les grottes de Léra et de l'Arkoudia en Crète occidentale aux époques préhistoriques et historiques, *ArchDelt* 31 A', pp. 178–243.
- La Rosa V. (2001) Minoan Baetyls: between funerary rituals and epiphanies, in: R. Hägg, R. Laffineur (eds.), *POTNIA. Deities and Religion in the Aegean Bronze Age. Proceedings of the 8th International Aegean Conference Göteborg, Göteborg University, 12–15 April 2000*, *Aegaeum* 22, Liège, Austin, pp. 221–226.
- La Rosa V. (2013) Haghia Triada, *CretAnt* 14, pp. 133–308.
- Legarra Herrero B. (2014) *Mortuary Behavior and Social Trajectories in Pre- and Protopalatial Crete*, Philadelphia.
- Paribeni R. (1904) Ricerche nel sepolcreto di Haghia Triada presso Phaestos, *MonAnt* XIV, pp. 677–756.
- Pernier L. (1935) *Il Palazzo Minoico di Festos*, Roma.
- Protopapadaki E. (2017) Kykladízon eidólio Proanaktorikís periódou apó tin Platyvóla Chaníon (Κυκλαδίζον ειδώλιο Προανακτορικής περιόδου από την Πλατυβόλα Χανίων), in: P. Sotirakopoulou, N. C. Stampolidis (eds.), *Cycladica in Crete: Cycladic and Cycladicizing Figurines within Their Archaeological Context, Proceedings of the International Symposium (Museum of Cycladic Art, Athens, 1–2 October 2015)*, pp. 437–450.
- Sakellarakis E., J. Sakellarakis (1972) Apothétis kerameikís tis teleftaías fásis ton proanaktorikón chronón eis Archánas (Αποθέτης κεραμεικής της τελευταίας φάσης των προανακτορικών χρονών εις Αρχάνας), *AEphem*, pp. 1–11γ.
- Sotirakopoulou P. (2007) Early Cycladic pottery from the investigations of the 1960's at Kavos-Daskaleio, Keros: A preliminary report, in: E. Alram-Stern (ed.), *Die Ägäische Frühzeit. 2. Serie. Forschungsbericht 1975–2000. 2. Band, Teil 1 und 2 Die Frühbronzezeit in Griechenland*, *Mykenische Studien* 21, Wien, pp. 1303–1358.
- Sotirakopoulou P. (2016) The pottery from Dhaskalio, in: C. Renfrew, O. Philaniotou, N. Brodie, G. Gavalas, M. J. Boyd (eds.), *The Sanctuary on Keros and the Origins of Aegean Ritual Practice*, 4, Cambridge.
- Stefani E. (1933) La grande tomba a Tholos di Haghia Triada, *ASAtene* XIII–XIV, pp. 147–154.
- Todaro S. (2003) Haghia Triada nel periodo Antico Minoico, *CretAnt* 4, pp. 69–96.

- Todaro S. (2011) The western Mesara before the rise of Phaistian Palace, in: *Pepragména I' Diethnoús Kritologikou Synedriou: Chaniá, 1-8 Oktovriou 2006 (Πεπραγμένα I' Διεθνούς Κρητολογικού Συνεδρίου: Χανιά, 1-8 Οκτωβρίου 2006)*, Chania, pp. 151-166.
- Todaro S. (2013) *The Phaistos Hills before the Palace: A Contextual Reappraisal*, Monza.
- Tsipopoulou M. (2017) Documenting socio-political changes in Pre- and Proto-palatial Patras: The house tomb cemetery, in: M. Tsipopoulou (ed.), *Petras, Siteia. The Pre- and Proto-palatial Cemetery in Context: Acts of a Two-Day Conference Held at the Danish Institute at Athens, 14-15 February 2015*, Aarhus, pp. 57-101.
- Tzedakis Y. (1966) Archaiótites kaí mnimeía dytikís Kritis (Αρχαιότητες και μνημεία δυτικής Κρήτης), *ArchDelt* 21 B', pp. 428-429.
- Tzedakis Y. (1967) Archaiótites kaí mnimeía dytikís Kritis (Αρχαιότητες και μνημεία δυτικής Κρήτης), *ArchDelt* 22 B', pp. 504-506.
- Tzedakis Y. (1968) Archaiótites kaí mnimeía dytikís Kritis (Αρχαιότητες και μνημεία δυτικής Κρήτης), *ArchDelt* 23 B', pp. 413-420.
- Tzedakis Y. (1984) Le passage au minoen ancien en Crète occidentale, in: Centre Gustave Glotz (ed.), *Aux origines de l'hellénisme: la Crète et la Grèce: hommage à Henri van Effenterre*, Paris, pp. 3-7.
- Warren P. (1972a) Knossos and the Greek mainland in the third millennium B.C., *AAA* 5, pp. 392-398.
- Warren P. (1972b) *Myrtos: an Early Bronze Age Settlement*, BSA Supplementary Volume 7, Oxford.
- Wiencke M. H. (2000) *The Architecture, Stratification, and Pottery of Lerna III*, Princeton.
- Wilson D. E. (1984) *The Early Minoan IIA West Court House at Knossos*, Ann Arbor.
- Wilson D. E. (1985) The pottery and architecture of the EM IIA West Court House at Knossos, *BSA* 80, pp. 281-364.
- Wilson D. E. (1999) *Keos. Ayia Irini: Periods I-III*, Mainz.
- Wilson D. E. (2007) Early Prepalatial (EM I-EM II), in: N. Momigliano (ed.), *Knossos Pottery Handbook*, London, pp. 49-78.
- Zapheirou F. (1975) Ostraka ek Kérou (Οστρακα εκ Κέρου), *AAA* 8-9, pp. 79-84.

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A CASE OF IDENTITY INVESTIGATING THE SYMBOLISM OF SPINDLE WHORLS IN EARLY AND MIDDLE CYPRIOT TOMBS¹



ABSTRACT: Spindle whorls are amongst the small objects most frequently recovered from Early and Middle Bronze Age cemeteries in Cyprus (c. 2400–1650 BC). Nonetheless, little has been done to investigate their meaning. This paper will explore the symbolism of spindle whorls and its possible implications for the construction of the deceased’s identity. In particular, we will discuss the concept of whorls as sex/gender markers, and how and to what extent these artefacts may have played a role in the ideological system of Early/Middle Cypriot society alluding to aspects of the personal, social, and group identities of the deceased. To do this, the investigation will follow a case-study design in which select burial contexts from the Early and Middle Cypriot sites of Erimi *Laonin tou Porakou*, Lapithos *Vrysi tou Barba*, and Galinoporni will be included. The analysis of different key elements related to the whorls’ deposition within the tombs examined (e.g. formal characteristics, evidence for use-wear, location, relationship with bodies, and association occurrences) and the identification of recurring patterns will facilitate a discussion on the reasons behind the transformation of these tools into grave goods.

KEYWORDS: Spindle whorls; Bronze Age Cyprus; Cemeteries; Erimi *Laonin tou Porakou*; Lapithos *Vrysi tou Barba*; Galinoporni; Gender; Identity.

INTRODUCTION

For their great variety of materials, colours, and design patterns, in tandem with their close relationship with human bodies, textiles have always played a pivotal role in the material expression of the identity of individuals, groups, and societies past and present. In light of this, they have been argued to offer “a unique opportunity to come very close to the prehistoric individual”.² This opportunity seems to be denied to archaeologists working in most of the areas facing

the Mediterranean, in which textiles are rarely preserved.³ However, whilst fabrics are rare and fragmentary, textile tools are common findings both in settlements and cemeteries.⁴

Although objects from diverse contexts might be charged with symbolic significance within specific circumstances, cemeteries are normally considered the places *par excellence* in which artefacts assume additional or special values. Grave goods, indeed, belong

1 We are extremely thankful to Dr Lindy Crewe for her support of our research projects and helpful feedback to this paper, and to Prof. Luca Bombardieri for his useful comments and permission to publish plans and pictures from the Archive of the Italian Archaeological Project at Erimi (Cyprus). Thanks are due to Martina Monaco and Alessandra Saggio, the excavators of T.429, for providing us with their field documentation on this tomb and the results of the preliminary analysis of the human remains.

We would also like to thank the anonymous reviewer whose comments and suggestions certainly improved this paper.

2 ANDERSSON STRAND *et al.* 2010, 150.

3 See SKALS *et al.* 2015 and Appendices A and B in ANDERSSON STRAND, NOSCH 2015 for a catalogue and re-examination of textile remains from the Bronze Age Aegean and the Eastern Mediterranean. See GLEBA, MANNERING 2012 for an analysis of archaeological textiles from Europe.

4 ANDERSSON STRAND *et al.* 2010, 161–162.

to a ‘constructed environment’ in which objects are selected to materialise abstract concepts and convey messages, such as the social image of the deceased.⁵

This seems particularly evident with reference to spinning tools. In fact, it is not infrequent that both ordinary tools and special objects are buried as grave goods.⁶ The metal spindles found in the Early Bronze Age cemeteries of Alaca Höyük, Horoztepe, and Karataş in Anatolia are a remarkable example of this.⁷ However, despite the potentialities of spindle whorls and other textile tools, research on the subject in the framework of Mediterranean prehistory and protohistory has often been restricted.⁸

In Early and Middle Bronze Age Cyprus (EC/MC, c. 2400–1650 BC), terracotta spindle whorls are amongst the ‘small finds’ most frequently recovered from tombs.⁹ In addition, a few special objects, such as terracotta models of spindles with whorls and a metal spindle, have been found in EC/MC cemeteries.¹⁰ Nonetheless, little has been done to investigate the significance of whorls as grave goods, almost exclusively relegating their informative potential to an indication of the gender of the deceased.¹¹

The aim of this paper is to explore the symbolism related to spindle whorls and its possible implications in the construction of the deceased’s identity by the members of the community who performed the funerary rituals. In order to do this, a select series of meaningful burial contexts in which spindle whorls were interred will be examined as case studies.

Different key elements, such as the number and characteristics of whorls, evidence for use-wear, their location in the burial space, their relationship with bodies, and association with special finds, will be considered to evaluate if and to what extent the presence of these artefacts in tombs was effectively and univocally related to one (*i.e.* gender) or diverse aspects of the deceased’s identity. This includes the personal identity as a possessor and user of these objects, their social identity as craftsmen/women, and the group identity as spinners within their kin-group.

LIMITATIONS

Before starting with our analysis of the case studies, it is necessary to introduce a number of issues with

the burial record on Cyprus, which has been affected by past excavation methods, looting, and preservation conditions. Skeletal material was often undervalued in earlier studies, overshadowed by a preference for fine objects, and repeated seasonal flooding of tombs has often caused the disturbance of remains and assemblages.¹² As a result, large numbers of graves have not been sufficiently recorded, and osteological analysis of skeletal remains has often been lacking. In addition, looting has resulted in an extensive amount of unprovenanced artefacts, incomplete burial assemblages, and disturbed remains.¹³ Despite these problems, the burials included in this paper are able to shed light on the symbolic role of whorls in tombs as it is still possible to explore the relationship between whorls, the deceased, and/or other grave goods in the tomb chamber, as well as the characteristics of the whorls themselves. Presenting a number of tombs in which whorls were interred has allowed us to highlight broader patterns of symbolism that are present within the burial record across a longer period of time.

ANALYSIS

In the following section, we will analyse select burial contexts from the cemetery clusters related to the MC settlement of Erimi *Laonin tou Porakou* (south coast of Cyprus), where textile production is attested as one of the main activities performed in a series of specialised working spaces (the so-called ‘workshop complex’),¹⁴ the EC/MC cemetery of Lapithos *Vrysi tou Barba* (north coast of Cyprus), and a single burial from Galinoporni (Karpas Peninsula) dated back to the MC III/LC I period, in which spindle whorls are particularly relevant as grave goods in terms of their placement within the tomb chambers (Tab. 1).

ERIMI LAONIN TOU PORAKOU

1) Tomb 230.

Tomb 230 is a single tomb chamber with a short horizontal *dromos* located in the upper terrace of the southern cemetery and found partially looted. For this reason, it was not possible to determine the exact sequence of burial, maintenance, and reopening.¹⁵ An area reserved for the deposition of grave goods can be identified to

5 RENGIFO CHUNGA, CASTILLO BUTTERS 2015, 117–118; MINA 2016.

6 See, for example, BORGNA 2003; SAUVAGE 2014.

7 See, for example, BARBER 1991, 60–62.

8 Exceptions are BORGNA 2003 and SAUVAGE 2014, where the significance of bone and ivory spinning tools in Late Bronze Age Italian, Aegean, and Eastern Mediterranean cemeteries is explored, and GLEBA 2009, where the significance of textile tools in Early Iron Age Italy burial contexts is discussed.

9 CREWE 1998, 37; KESWANI 2004, 197–213, tabs. 4.7–4.11.

10 CREWE 1998, 8; WEBB 2002, 364.

11 See ‘Discussion’ for references.

12 KESWANI 2004, 22–26; HARPER, FOX 2008, 2–3.

13 SNEDDON 2002, 5.

14 BOMBARDIERI 2014; 2017, 358–360.

15 BOMBARDIERI 2017, 74–80.

Tab. 1 Table of the burial contexts selected as case studies with number of whorls, metals, and ornaments, and number and sex of the deceased.

SITE	TOMB	NO. OF SPINDLE WHORLS	NO. OF METAL OBJECTS	NO. OF ORNAMEN-TAL OBJECTS	HUMAN REMAINS (MNI)	HUMAN REMAINS (SEX)
Erimi Laonin tou Porakou	T.230	3	-	3	2	F; U
Erimi Laonin tou Porakou	T.231	7	-	2	-	-
Erimi Laonin tou Porakou	T.428	4	1	-	4	F; M; U(2)
Erimi Laonin tou Porakou	T.429	12	10	-	2/3	U
Ypsonas-Vounaros/ Erimi Laonin tou Porakou	T.35	7	-	3	3	F(2); M?
Lapithos Vrysi tou Barba	T.322B	15	11	1	1+	F?
Galinoporni	T.1	3	4	-	5?	Unavailable

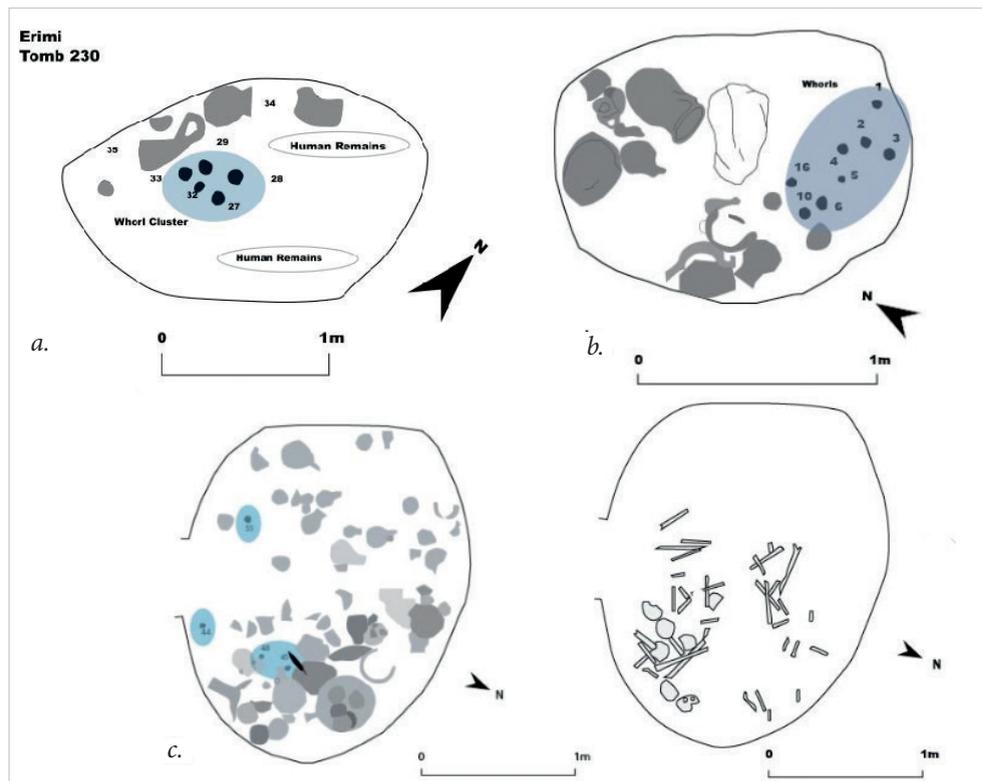


Fig. 1a. Erimi Laonin tou Porakou. Plan of T.230; b. Erimi Laonin tou Porakou. Plan of T.231; c. Erimi Laonin tou Porakou. Plan of T.428 (to the left, the assemblage of grave goods; to the right, the assemblage of human remains). The findspots of spindle whorls are circled (modified from BOMBARDIERI 2017, 76, fig. 3.100, 81, fig. 3.103, 115, fig. 3.144; courtesy of L. Bombardieri).

the north-west of the tomb, whilst fragmentary human remains were found in the remaining space.¹⁶ An MNI (Minimum Number of Individuals) of two adults was identified. Most of the osteological material recovered belongs to a female individual, and only two bone fragments can be attributed to one other individual of undetermined sex.¹⁷

Three spindle whorls were found grouped in the area reserved for the grave goods along with three perforated picrolite discs (T.230.31–33) (Fig. 1a).¹⁸ All the whorls are of the same type (truncated biconical/spherical or Crewe's type III)¹⁹ and show recurrent incised decorative motifs (e.g. sets of concentric arcs and dots, and sets of three parallel lines).²⁰ One whorl belongs to the class of light whorls, and the remainder are medium/heavy within the weight classes identified at Erimi.²¹ Use-wear traces can be observed around the perforations at the narrow terminal of all three whorls.

2) Tomb 231.

Tomb 231, located in the lower terrace of the southern cemetery, is of an architectural type showing mixed characteristics of a pit and tomb chamber without a *dromos*. A large stone slab divides the burial space into two distinct areas. The majority of the 21 artefacts from this tomb were found concentrated in the area to the north of the stone slab.²² Although no human remains were recovered at all, the area south of the slab is interpreted as a space reserved for bodies (Fig. 1b).²³ Bombardieri hypothesised that T.231 was a single burial followed by a single act of clearance at an early stage — *i.e.* before the skeletonisation of the body — based on the fact that the space is relatively limited and the deposition of grave goods in the 'offering deposit' seemed the result of a single act.²⁴ Only one other tomb at Erimi is similar to T.231 in architectural type, and this is the adjacent T.241. Although for safety reasons T.241 was only partially investigated, two episodes of deposition of the grave goods were documented, and no human remains were found.²⁵ Because a series of pits with disarticulated human remains were found immediately in front of these and other larger chambers, Bombardieri suggests

that human remains could have been moved from chambers to pits as part of the Erimi mortuary ritual.²⁶

Seven spindle whorls were recovered from T.231. Whilst only one whorl was from the 'offering deposit' (T.231.16), the remainder were found scattered in the space presumably reserved for the body along with two perforated picrolite discs and a bowl (Fig. 1b).²⁷ Except for T.231.16, which is of a very unusual shape,²⁸ these whorls are of the same type (truncated biconical or Crewe's type III²⁹), and two main groups can be distinguished based on decoration and fabric/surface treatment.³⁰ Two out of four weight classes identified at Erimi are represented within the whorl assemblage of T.231: three whorls belong to the class of medium-weighted whorls and four to the class of medium/heavy-weighted whorls.³¹ The majority show well-distinguishable traces of use-wear around the narrow terminal, including the 'double' whorl T.231.14.³²

3) Tombs 428 and 429.

T.428 and T.429, situated in the lower terrace of the southern cemetery, are two contiguous tomb chambers connected through an internal opening. T.428 was intact, whilst T.429 was partially looted with roughly two thirds of the tomb found undisturbed. Because of their special connection, the two tombs will be discussed together. It must be noticed that T.429, recently excavated during the fieldwork season of 2016, is currently under study and unpublished, and the results presented in this paper are preliminary.³³

A rich assemblage of 64 artefacts was found deposited over the floor of T.428, whilst human remains were gathered in the northern half of the chamber (Fig. 1c).³⁴ The MNI identified for this tomb is four: three adults (a male, a female, and one of undetermined sex) and one sub-adult of undetermined sex.³⁵ The composition of the pottery vessel assemblage suggests a long use of this tomb and its possible reopening for deposition of bodies and grave goods.³⁶

Four spindle whorls were found in T.428, all in the northern half the tomb. One of these (T.428.45) was found lying immediately next to a copper dagger

16 BOMBARDIERI 2017, 76, fig. 3.100.

17 ALBERTINI 2017, 309–310.

18 BOMBARDIERI 2017, 74, 78–79, 80, 76, fig. 3.100, 80, fig. 3.102; MUTI 2017, 222, fig. 6.2, 234.

19 CREWE 1998, 22, tab. 4.1/fig. 4.1.

20 MUTI 2017, 219, 221, 234, 222, fig. 6.2.

21 MUTI 2017, 226, 220 tab. 6.2.

22 BOMBARDIERI 2017, 81, fig. 3.103.

23 BOMBARDIERI 2017, 81; see also BOMBARDIERI 2014, 48.

24 BOMBARDIERI 2017, 81.

25 BOMBARDIERI 2017, 92.

26 BOMBARDIERI 2017, 359.

27 BOMBARDIERI 2017, 82–83, 81, fig. 3.103, 84, fig. 3.106.

28 Whorl T.231.16 is of a rare 'double' type, composed of two conjoined spherical whorls. For an analysis of the object and comparisons, see BOMBARDIERI 2014, 49; MUTI 2017, 224, 232, 235, fig. 6.10.

29 CREWE 1998, 22, tab. 4.1/fig. 4.1.

30 BOMBARDIERI 2017, 82–83; MUTI 2017, 219–223, 224, 234–235.

31 MUTI 2017, 234–235, 220, tab. 6.2.

32 MUTI 2017, 228, 234–235.

33 BOMBARDIERI 2016, 10–11; 2017, 113–114.

34 BOMBARDIERI 2017, 115, fig. 3.144.

35 MONACO 2017, 316–319.

36 BOMBARDIERI 2017, 114.

or spear head (T.428.39), which was the only metal artefact recovered from the tomb (Fig. 1c).³⁷

Spindle whorls from T.428 are relatively homogeneous in type (truncated biconical or Crewe's type III³⁸), fabric, and decoration and are characterised by arrangements of dashed lines inside parallel lines, triangles filled with dashes, or dashed framed rectangles, but they all belong to the four different weight classes identified at Erimi.³⁹ One whorl (T.428.45) shows use-wear traces in the form of a circular abrasion on both terminals, while no traces of use are visible on whorls T.428.48. Spindle whorls T.428.40 and T.428.55 are damaged at the terminals, and use-wear cannot be detected.⁴⁰

Within the undisturbed area of T.429, seven spindle whorls were found in the vicinity of the few human bones found on the chamber's floor and the largest amount of metal artefacts from a burial context at Erimi. Interestingly, some of these were found in fragments. Five more whorls were recovered from sieving the disturbed deposit.⁴¹ The *in situ* human remains can be attributed to a single adult individual, but bone fragments from sieving were found to indicate the presence of an additional one to two more individuals.⁴² Three main groups of whorls of the same type and showing recurrent design patterns can be identified (Fig. 2).⁴³ The majority of the intact or mended whorls from T.429 show traces of use-wear.⁴⁴

4) Tomb 35.

T.35 is an intact single chamber tomb rescue-excavated by the Department of Antiquities in 2012 at Ypsonas-Vounaros, a cemetery cluster situated to the east of the settlement at Erimi *Laonin tou Porakou*. Human remains and grave goods were found on the floor, in the southern half of the tomb.⁴⁵ The MNI of three adults (two females and a possible male) was identified. One of the individuals was found in anatomical position, extended and facing the *stomion*, whilst the disarticulated remains of the other individuals, including their skulls, were found in the south-east part of the tomb.⁴⁶

Seven spindle whorls were recovered from all around the area in which the disarticulated human remains were gathered, together with three pierced picrolite discs.⁴⁷ This part of the tomb is delimited



Fig. 2 Erimi Laonin tou Porakou. A group of spindle whorls showing recurring decorative motifs from T.429 (Archive of the Italian Archaeological Project at Erimi, Cyprus; courtesy of L. Bombardieri).

by three stone slabs, and two whorls were found on one of them.⁴⁸ In addition, it has been noted by the excavators that small and medium bowls were the only vessels found among the human remains in this part of the tomb, whilst other vessels were found concentrated in proximity to the articulated body.⁴⁹

Whorls from T.35 are relatively varied in terms of fabric colours, external surface colours, and size, and two types can be identified (*i.e.* conical/hemispherical or Crewe's type I and truncated spherical or Crewe's type III).⁵⁰ Referring to decoration, one whorl is undecorated, and the remainder show a series of decorative motifs on the bodies and broad terminals. Whilst T.35.7 and T.35.14 are "identical in shape, size, and decoration", the others show a series of different motifs, and the most recurrent ones are sets of solid or dotted lines.⁵¹ Traces of use-wear have been observed at terminals of all these whorls.⁵²

LAPITHOS VRYSI TOU BARBA

1) Tomb 322B.

Tomb 322 was excavated at the EC/MC cemetery site of Lapithos in 1927 by the Swedish Cyprus Expedition

37 BOMBARDIERI 2017, 115, fig. 3.144.

38 CREWE 1998, 22, tab. 4.1/fig. 4.1.

39 BOMBARDIERI 2017, 119–120, 126, fig. 3.154; MUTI 2017, 219, 220, tab. 6.2, 224, 234–235.

40 MUTI 2017, 234–235.

41 BOMBARDIERI 2016, 15.

42 MONACO personal communication (October 2017).

43 BOMBARDIERI 2016, 11–12.

44 MUTI personal analysis (October 2016).

45 CHRISTOFI *et al.* 2015, 133, 135, 136, fig. 3.

46 CHRISTOFI *et al.* 2015, 136, fig. 3.

47 CHRISTOFI *et al.* 2015, 136–137, fig. 3.

48 CHRISTOFI *et al.* 2015, 136, fig. 3.

49 CHRISTOFI *et al.* 2015, 136, 138.

50 CHRISTOFI *et al.* 2015, 141, fig. 9. See CREWE 1998, 22, tab. 4.1/fig. 4.1 for types.

51 CHRISTOFI *et al.* 2015, 141, fig. 9.

52 DOUGLAS personal analysis (April 2017).

and consisted of five chambers (A, B, C, D, and E) from two separate phases of tomb construction that had been built around a shared *dromos*.⁵³ At the southern end, chambers A, B, and C can be associated with the earlier phase tomb and chambers D and E with the later phase to the north.⁵⁴ Of the three chambers associated with the earlier phase of tomb construction, both chambers A and B contained spindle whorls. However, the selection of whorls interred within the EC III–MC I chamber B are of particular importance to this discussion as this deposit contained a significant cluster of 15 whorls of various styles and sizes (Fig. 3).

In terms of MNI, only one individual could be identified within the assemblage of grave goods and human remains interred within the tomb. Human bone from this chamber was analysed by Fischer, and he concluded that this was a burial of an adult female.⁵⁵ Fischer's analysis considered only the cranial remains, and whilst they are one of the most valuable areas of human skeletal anatomy for determining sex, this result must be cautiously accepted as post-cranial bones, including the pelvis and long bones, can provide a more accurate result when analysed in tandem with the skull. This would also potentially point to a higher MNI.

Whilst this tomb has been recorded as looted, it was not thoroughly pillaged, and Chamber B contained a total of nine copper-based artefacts including knives, tweezers, scrapers, a needle and a ring, as well as a plank-shaped figurine, a cluster of 15 spindle whorls, and a selection of ceramic vessels.⁵⁶ Whilst the vessels are relatively spread out across the tomb, the whorls and metal artefacts are grouped in the centre of the chamber floor (Fig. 4b). This central collection of grave goods can be loosely attributed to the remaining individual whose skull is visible on the tomb plan, and clustering of the spindle whorls within a relatively concentrated area suggests they are contemporary with one another. Webb has recently indicated that human remains may have been removed from all chambers of T.322;⁵⁷ therefore, it is of potential significance that the remaining female remains are associated with the whorls and metal tools located in the central region of the chamber.

The 15 whorls from this cluster consist of 14 Red Polished (RP) and one Black Polished (BP) tools of varying sizes and weights.⁵⁸ The whorls have been studied in detail by Crewe and fall into four weight categories including one very light (20 g), eight medium (31–48 g),



Fig. 3 *Lapithos Vrysi tou Barba*. The spindle whorl assemblage of T.322B. Use-wear traces are evident around the narrow perforation of the majority of the whorls (photograph by S. Douglas).

three heavy (76–85 g), and one very heavy (117 g).⁵⁹ In terms of decoration, the whorls display a variety of motifs on the body, with only the multiple line motif appearing frequently.⁶⁰ According to Crewe's analysis, designs on the upper terminal of the whorls are more restricted, and the decoration consists predominantly of radiating lines, whilst the slip and fabric of nine of the whorls indicate that they appear to have been manufactured by the same potter.

Varying levels of damage from use are visible on a total of six whorls from this assemblage, and it is also of interest that one of the whorls that does not display any use-wear has an off-centre hole, which indicates that it would be difficult to use within the practice of spinning.⁶¹

GALINOPORNI

1) Tomb 1 (1956).

Tomb 1 (1956) was excavated in the vicinity of the village of Galinoporni in the northern Karpas region of Cyprus during rescue operations by Mr. Hussein, an assistant at the Cyprus Museum, Nicosia.⁶² The grave good assemblage indicates that this tomb was in use for up to 200 years from the MC II to LC IA periods, and the tomb consisted of an oval chamber (2.20 × 1.80 m) with a short and narrow *stomion* (0.60 × 0.25 m).⁶³ Whilst the tomb assemblage points to long term use of the tomb with various mixed burial deposits, one extended interment within the tomb provides clear

53 GJERSTAD *et al.* 1934, 142.

54 GJERSTAD *et al.* 1934, 142.

55 FISCHER 1986, 29.

56 GJERSTAD *et al.* 1934, 158.

57 WEBB 2017, 5–9.

58 GJERSTAD *et al.* 1934, 158; CREWE 1998, 84, 85.

59 CREWE 1998, 53.

60 CREWE 1998, 54.

61 CREWE 1998, 53.

62 CREWE 2009, 89.

63 CREWE 2009, 91.

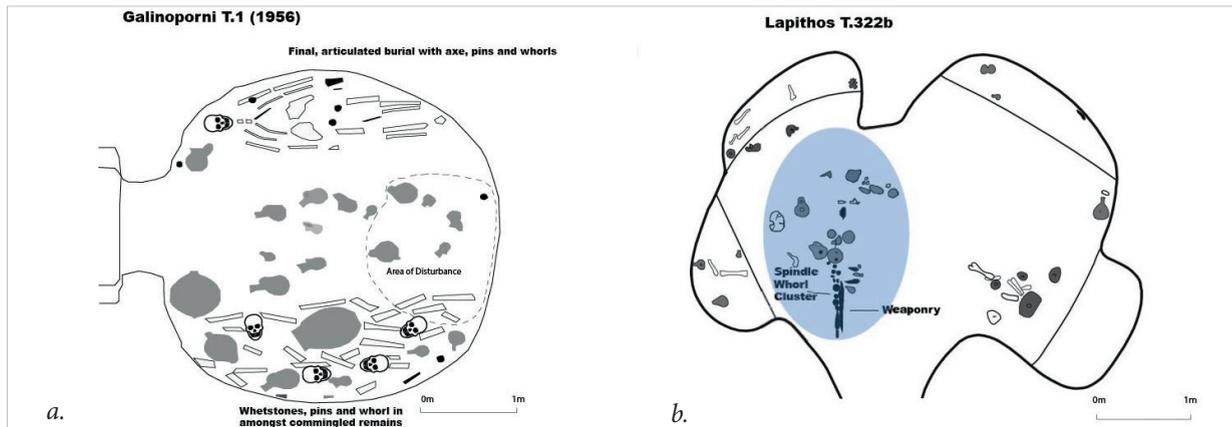


Fig. 4a. Galinoporni. Plan of T.1 (courtesy of L. Crewe, CREWE 2009); b. Lapithos Vrysi tou Barba. Plan of T.322B (modified from GJERSTAD *et al.* 1934, 145).

evidence of the intended relationships between the body and grave goods.

The official MNI as well as information related to sex and age is unavailable for this tomb as the skeletal remains have not been osteologically analysed. However, the sketch plan by Mr. Hussein (and modified by Crewe) indicates that a tentative number of at least five individuals can be identified.⁶⁴ The extended burial was laid out to the left of the entrance, and four skulls can be seen on the plan lying amongst disarticulated long bones to the right.⁶⁵ The presence of this mixed skeletal material suggests that these belonged to earlier burials, pushed to the side to make way for the final interment. This is typical of the period, as from MC to LC mixed burials with this pattern of deposition were a preferred funerary style.⁶⁶

A total of seven grave goods can be confidently assigned to the articulated burial, including three spindle whorls, a copper-base axe, and a selection of metal pins. According to the sketch, the whorls (3, 17, and 18) were placed close to the left shoulder and the right and left femurs of the deceased respectively, which indicates that they were originally positioned on top of the body or attached to the clothing. The axe (19) appears to have been placed in the left hand, and the pins (4, 20, and 16) were aligned along the chest and in close proximity to the leg bones (Fig. 4a).

The whorls were all undecorated and consisted of one unpainted Red on Red whorl (3), an unslipped pottery whorl (17), and a Red Slipped whorl (18). All the whorls were spherical in shape with several slight differences:

3 was spherical-biconical, 17 was misshapen-spherical, whilst 18 was compressed-spherical.⁶⁷ They were all of a similar height, ranging from 28 to 33 mm, with more variation in diameter that varied between 29, 36, and 42 mm, and their style is typical of the Karpass region.⁶⁸ Use-wear analysis of the three whorls associated with the articulated individual indicates that they were functional items, all displaying chips in the fabric and other physical signs of repeated use.⁶⁹

DISCUSSION

The above tombs are significant in facilitating a discussion of the symbolic role of spindle whorls, as they are able to shed light upon their relationship with the deceased and other artefacts within the tomb contexts and also on their functioning as tools in life. In the next section we will discuss these elements in order to explore their informative potential in relation to the deceased's identity. In particular, we will discuss the concept of whorls as sex/gender markers, as well as how and to what extent these artefacts may have been used to allude to the personal, social, and group identity of the deceased.

1) Gender identity. Whorls as gender markers?

The sexing of bodies according to associated grave goods was a common practice in earlier Cypriot literature,⁷⁰ and, left unchallenged, this has resulted in assumptions about bodies, gender, and objects. Progress has been made as some studies have begun to deal

64 CREWE 2009, 90 fig. 2, 91.

65 CREWE 2009, 91.

66 KESWANI 2004, 88, 92; CREWE 2009, 91, 92.

67 CREWE 2009, 93, 94.

68 CREWE 2009, 93, 94.

69 CREWE 1998, 22.

70 See, for example, GJERSTAD *et al.* 1934; STEWART, STEWART 1950.

directly with the nature of gendered practices and artefacts from the Bronze Age past. However, technological behaviour, in particular textile production, continues to be separated into male and female gendered domains. Webb has discussed the role of women during the Chalcolithic/Bronze Age transition and divided technologies according to sex, resulting in the gendering of associated material culture.⁷¹ She has suggested that the tasks of metallurgy, hunting, ploughing, animal husbandry, transport, and defence can be classified as male, whilst food processing and preparation, storage, child-rearing, and textile/pottery manufacturing can be considered as female.⁷² In relation to later periods, she argues that during the Middle Bronze Age women, men, and children most likely contributed to workshop-level production, and, therefore, there may have been less rigid task differentiation at this time.⁷³ However, she maintains that spindle whorls as textile tools share a close relationship with females in the grave.⁷⁴ This, again, places whorls within the realm of female gendered textile production.⁷⁵ These sentiments have often impacted on the interpretation of the burial record, and, due to the frequent *a priori* gendering of textile work,⁷⁶ it has often been assumed that bodies associated with whorls are biologically female. In reality, two decades ago, only 19 spindle whorls could be attributed to a total of seven sexed tombs.⁷⁷ Of these tombs, five contained multiple interments, highlighting further the difficulties of associating individual, osteologically sexed bodies with objects.

Whilst the body of demographic data collated from osteological analyses of Bronze Age Cypriot burials is growing, it cannot be argued based on the burial evidence that the inclusion of whorls as grave goods was restricted only to females, and the tombs presented here illustrate that point. Although whorls are found in association with females, as in T.230 at Erimi and Lapithos T.322B, and this relationship exists in tombs from other sites in which osteological analysis has been undertaken,⁷⁸ relating them solely to female bodies is problematic. The exact burial sequence of T.35 from Ypsonas-Vounaros is unclear, but it provides an example of a probable male interred in the tomb with whorls in a multiple burial and also highlights a communal relationship with whorls, which is also evident at Erimi. At Erimi, moreover,

textile production is mainly attested at a workshop level, where presumably the distribution of tasks was different than at a household level.⁷⁹ The Galinoporni tomb,⁸⁰ T.322B at Lapithos, and T.428 at Erimi also highlight the difficulties of the binary gendering of artefacts as in these examples whorls have been interred close to metal tools which have been traditionally associated with males. In this regard, Tombs 110 and 155 from the EC/MC North Coast site of Vounous, amongst others, provide additional examples of these mixed groupings of whorls with metal artefacts.⁸¹

2) Between social and personal identity: the deceased and their tools.

Moving away from gender, whorls can be understood as symbolic identity markers if we consider the characteristics of the assemblage, including evidence for use-wear that points to their role as functioning tools, as well as their relationship with bodies in the tomb chamber. Webb and Frankel have explored the concept of 'coincident biographies' between the deceased and metal weapons/tools that they used in life and were buried with.⁸² They argue for shared biographies between the dead and specific grave goods, largely based on the presence of bladed artefacts such as hook-tang weapons, that had been bent or broken before being interred. In this sense, these artefacts as personal possessions were prevented from functioning when they could no longer be used by their owner.

Spindle whorls from Cypriot burial contexts are not frequently interred in a damaged state. More often, they share a close relationship with the deceased and other artefacts within the tomb. It is evident from the case studies presented here that whorls were recurrently placed in proximity to bodies and in association with special objects. T.1 at Galinoporni offers an example of a more direct relationship between the deceased and spindle whorls as they had been placed intentionally very close to the body itself. Along with the pins that Crewe has suggested were used to fasten or decorate some sort of shroud or item of clothing, the whorls played a central role in the presentation of the body.⁸³ Even if no human remains were recovered, the same circumstance appears in T.231 at Erimi, in which whorls and picrolite ornaments were found all over the space likely reserved for the deceased.⁸⁴ The association

71 WEBB 2007.

72 WEBB 2007, 27, tab. 3.

73 WEBB 2015, 381–383.

74 WEBB 2015, 381–383.

75 SMITH 2002, 283–284.

76 COSTIN 2013, 180–183.

77 CREWE 1998, 38 after DAVIES 1995.

78 See OSTERHOLTZ 2015.

79 MUTI 2017, 231–232.

80 CREWE 2009, 92.

81 WEBB 1992; HAMILTON 2002, 383; KESWANI 2004, 69.

82 WEBB, FRANKEL 2015.

83 CREWE 2009, 92.

of picrolite ornaments and whorls in relation to the deceased can be identified as well in T.230 and T.35 at Ypsonas-Vounaros. In T.429, a remarkable quantity of metal artefacts, including ornaments, were recovered from the same findspot of the few human remains found *in situ* and three spindle whorls. The remainder of the whorls from the undisturbed part of the tomb were recovered in its immediate vicinity.

These examples further strengthen the notion that in the same sense as metal tools and ornaments, whorls shared a close relationship with some members of the Bronze Age society, perhaps skilled spinners and textile technicians, as functioning tools in life and as grave goods in death. Noticeably, spinning is a mobile activity, and it is not infrequent that spinners carry spindles around with them.

In this respect, the clustering of spindle whorls in T.322B at Lapithos is even more significant when we consider the fact that these whorls appear to represent a full spinner's 'tool kit.'⁸⁵ Despite the fact that functional parameters are not the only factors which determine the characteristics of products, these whorls represent a variety of tools of different weights and sizes that would have been able to spin a range of fine and more robust organic material.⁸⁶ Whorl assemblages with similar characteristics have been noticed in Tomb M-U1316 in the Moche settlement of Huacas de Moche (Peru) and several burials in Early Iron Age Italy, and they have been interpreted as indicators of the presence of 'specialist' or experienced spinners within the burial.⁸⁷

The spindle whorls from the Erimi tombs, however, show quite homogeneous functional parameters and fall into two main weight classes, which indicates that they operated in a similar way.⁸⁸ This appears to be even more contradictory, as at Erimi a certain degree of specialisation in textile activities is attested in the settlement.⁸⁹ Nonetheless, because textile dyeing seems to be one of the main activities carried out in the 'workshop complex', it has been noticed that yarn production could have been targeted to this activity, and this would explain why the majority of spindle whorls from Erimi show less variability in weight than those from other sites.⁹⁰ The fact that the spindle whorls recovered

from the cemetery do not differ in their functional parameters from those found in the workshop may be a reflection of the specific productive goals of this community. This supports the findings of Dugay who argues that use-wear patterns show that Cypriot EC/MC ceramic vessels were not made specifically for the grave.⁹¹

The vast majority of whorls from Galinoporni, Lapithos, and Erimi show distinctive (and, sometimes, extensive) use-wear patterns, supporting the notion that these whorls were used, functional tools that were potentially owned by the deceased as opposed to being token grave gifts.

3) Even closer to the individual? Personal and group identity.

Going deeper with our analysis of whorls in relation to the deceased's identity, it can be observed that stylistic elements, such as decoration and shape, can provide a further insight into the symbolism of whorls. The whorls from the Erimi tombs appear as one or more groups of analogous types and decoration. Similarly, the spindle whorls recovered from Lapithos T.322B show the recurrent use of a single decorative motif. Frankel and Webb have suggested that the use of certain design motifs could be related to kin-groups, and the diffusion of similar design patterns among neighbouring areas might signify both geographical continuity and an economic and social relationship.⁹² In particular, they suggest the movement of female spinners bringing their own tools with them.

Whilst the correlation between females and spindle whorls in tombs is less than immediate, as we have demonstrated above, a relationship between individuals or kin-groups and whorls seems evident, and, once more, the syntax in their decoration may have been used to construct and convey elements of the identity of the deceased.

CONCLUSIONS

The analysis of the different aspects of the deposition of spindle whorls in tombs, and the identification of patterns recurring within the select contexts discussed

84 As other small perforated artefacts, picrolite discs might have functioned as spindle whorls. It is not the aim of this paper to define stone pierced artefacts (see, for example, CREWE 1998, 9–14). However, in this paper we consider these artefacts as ornaments because of their aesthetic quality in combination with their light weight and a total absence of use-wear traces. Picrolite, in fact, is a very soft stone, and a prolonged use of these artefacts as spindle whorls should have produced use-wear similar to that on the terracotta examples.

85 CREWE 1998, 53–54.

86 CREWE 1998.

87 GLEBA 2009, 72, 75–76; RENGIFO CHUNGA, CASTILLO BUTTERS 2015, 130–131.

88 See, for example, FIRTH 2015.

89 BOMBARDIERI 2017.

90 MUTI 2017, 231.

91 DUGAY 1996 (also mentioned in CREWE 1998, 61).

92 FRANKEL, WEBB 1996, 193; 2006, 175.

here, has allowed us to explore the reasons behind the role of these tools as grave goods. Since the early studies of the EC/MC mortuary ritual, the assumption that spindle whorls were gendered artefacts solely associated with the female deceased has been prevalent within the literature. The model that describes the division of working tasks within the EC/MC communities as rigidly based on gendered divisions of labour, informed by biological sex, has strengthened the idea that an unambiguous relationship between tools and the gender of their users existed during life and was reflected in burial practices.

On the contrary, within the majority of the burial contexts analysed here, relating spindle whorls solely to female bodies is problematic. Apart from T.230 at Erimi, whorls are mostly recovered from tombs including multiple burials, in which they cannot be directly associated with the female deceased, or were interred close to metal tools, traditionally related to males. Whilst we cannot exclude the possibility that spindle whorls and females may have shared a closer relationship — perhaps barely visible because of the preference for multiple burials during the EC/MC period — the fact that not all the burials with females had whorls is a strong indicator that whorls were not buried to allude to the female status *tout court*.

The symbolism of whorls seems, indeed, more complex and related to individuals and their kin/community affiliation rather than categories, as proven

by the fact that whorls were recurrently placed in proximity to the deceased, or even over their bodies, in a similar way to other objects (e.g. metal objects and ornaments) that are normally considered as markers of the social identity of the deceased.⁹³ Because whorls are first of all spinning tools, it is logical to think that if they were related to certain members of the Bronze Age society, these were most likely skilled spinners. The presence of groups of whorls, identifiable as spinners' 'tool kits', certainly strengthens this idea, and the frequent presence of use-wear patterns supports the notion that these whorls were efficient tools potentially used and owned by the deceased.

Whorls may shed some light on more than one aspect of the deceased's identity. It is not infrequent that whorls or groups of whorls in the same tombs show recurring design motifs and shapes. Because these were likely transmitted through generations within the kin-group, they were, as a consequence, deliberately or unconsciously related to the identity of the individual as part of a familiar group.

In conclusion, spindle whorls can be seen as meaningful objects within the symbolic system of the EC/MC society. However, further targeted research on whorls and other grave goods which have a special relationship with the deceased, in addition to new data from ongoing excavations, is needed to shed further light on the ideas presented here. In the end, "the little things are infinitely the most important".⁹⁴

BIBLIOGRAPHY

- Albertini E. (2017) Human remains from Tombs 228–230, 248 and 328, in: L. Bombardieri, *Erimi Laonin tou Porakou. A Middle Bronze Age Community in Cyprus. Excavations 2008–2014*, SIMA 145, Uppsala, pp. 307–314.
- Andersson Strand E., K. M. Frei, M. Gleba, U. Mannering, M.-L. Nosch, I. Skals (2010) Old textiles – new possibilities, *EJA* 13:2, pp. 149–173.
- Andersson Strand E., M.-L. Nosch (eds.) (2015) *Tools, Textiles and Contexts. Textile Production in the Aegean and Eastern Mediterranean Bronze Age*, Ancient Textiles Series 21, Oxford, Philadelphia.
- Barber E. J. W. (1991) *Prehistoric Textiles. The Development of Cloth in the Neolithic and Bronze Ages with Special Reference to the Aegean*, Princeton.
- Bombardieri L. (2014) The second face of identity: processes and symbols of community affiliation in Middle Bronze Age Cyprus, in: J. M. Webb (ed.), *Structure, Measurement and Meaning. Studies in the Prehistory of Cyprus in Honour of David Frankel*, SIMA 143, Uppsala, pp. 43–55.
- Bombardieri L. (2016) *Excavations at Erimi Laonin tou Porakou. Preliminary report* (unpublished).
- Bombardieri L. (2017) *Erimi Laonin tou Porakou. A Middle Bronze Age Community in Cyprus. Excavations 2008–2014*, SIMA 145, Uppsala.
- Borgna E. (2003) Attrezzi per filare nella tarda età del Bronzo italiana: connessioni con l'Esgeo e con Cipro, *Rivista di Scienze Preistoriche* 53, pp. 519–548.
- Christofi P., E. Stefani, L. Bombardieri (2015) Bridging the gap: long-term use and re-use of Bronze Age funerary areas at Ypsonas-Vounaros and Erimi-Laonin tou Porakou, in: H. Matthäus, B. Morstadt, C. Vonhoff (eds.), *PoCA (Postgraduate Cypriot Archaeology) 2012*, Cambridge, pp. 130–169.

93 BOMBARDIERI 2014.

94 A. CONAN DOYLE, 'A Case of Identity' (1891).

- Costin C. L. (2013) Gender and textile production, in: D. Bolger (ed.), *A Companion to Gender Prehistory*, Hoboken (NJ), pp. 180–202.
- Crewe L. (1998) *Spindle Whorls. A Study of Form, Function and Decoration in Prehistoric Bronze Age Cyprus*, SIMA Pocket-Book 149, Jonsered.
- Crewe L. (2009) Tomb 1 (1956) at Galinoporni and the Middle–Late Bronze Age, *RDAC*, pp. 89–115.
- Davies P. (1995) *Mortuary Patterning and Social Complexity in Prehistoric Bronze Age Cyprus*, unpublished MA thesis, University of Melbourne.
- Dugay L. (1996) Specialised pottery production on Bronze Age Cyprus and pottery use-wear analysis, *JMA* 9:2, pp. 167–192.
- Firth R. (2015) Mathematical analysis of the spindle whorl and loom weight data in the CTR database, in: E. Andersson Strand, M.-L. Nosch (eds.), *Tools, Textiles and Contexts. Textile Production in the Aegean and Eastern Mediterranean Bronze Age*, Ancient Textiles Series 21, Oxford, Philadelphia, pp. 153–190.
- Fischer P. M. (1986) *Prehistoric Cypriot Skulls: a Medico-Anthropological, Archaeological and Micro-Analytical Investigation*, SIMA 75, Göteborg.
- Frankel D., J. M. Webb (1996) *Marki Alonia. An Early and Middle Bronze Age Town in Cyprus. Excavations 1990–1994*, SIMA 123.1, Jonsered.
- Frankel D., J. M. Webb (2006) *Marki Alonia. An Early and Middle Bronze Age Settlement in Cyprus. Excavations 1995–2000*, SIMA 123.2, Sävedalen.
- Gjerstad E., J. Lindros, E. Sjöqvist, A. Westholm (1934) *The Swedish Cyprus Expedition. Finds and Results of the Excavations in Cyprus 1927–1931*, 1–3, Stockholm.
- Gleba M. (2009) Textile tools and specialization in Early Iron Age female burials, in: E. Herring, K. Lomas (eds.), *Gender Identities in Italy in the First Millennium BC*, BAR International Series 1983, Oxford, pp. 69–78.
- Gleba M., U. Mannering (2012) *Textiles and Textile Production in Europe: From Prehistory to AD 400*, Ancient Textiles Series 11, Oxford, Oakville.
- Hamilton N. (2002) Women in Cypriot prehistory: The story so far, in: D. Bolger, N. Serwint (eds.), *Engendering Aphrodite: Women and Society in Prehistoric Cyprus*, American Schools of Oriental Research Archaeological Reports 7, Boston, pp. 381–396.
- Harper N. K., S. C. Fox (2008) Recent research in Cypriot bioarchaeology, *Bioarchaeology of the Near East* 2, pp. 1–38.
- Keswani P. (2004) *Mortuary Ritual and Society in Bronze Age Cyprus*, Monographs in Mediterranean Archaeology 9, London.
- Mina M. (2016) Dress to impress. Metal objects and embodied identities in Early and Middle Bronze Age Cyprus, in: M. Mina, S. Triantaphyllou, Y. Papadatos (eds.), *Prehistoric Bodies and Embodied Identities in the Eastern Mediterranean*, Oxford, pp. 63–70.
- Monaco M. (2017) Human remains from Tombs 427 and 428, in: L. Bombardieri (ed.), *Erimi Laonin tou Porakou. A Middle Bronze Age Community in Cyprus. Excavations 2008–2014*, SIMA 145, Uppsala, pp. 315–320.
- Muti G. (2017) Spindle whorls, in: L. Bombardieri (ed.), *Erimi Laonin tou Porakou. A Middle Bronze Age Community in Cyprus. Excavations 2008–2014*, SIMA 145, Uppsala, pp. 219–235.
- Osterholtz A. J. (2015) *Bodies in Motion: A Bioarchaeological Analysis of Migration and Identity in Bronze Age Cyprus*, unpublished PhD thesis, Department of Anthropology, University of Nevada.
- Rengifo Chunga D., L. J. Castillo Butters (2015) The Construction of Social Identity. Tombs of Specialists at San José de Moro, Jequetepeque Valley, Perú, in: P. Eeckhout, L. S. Lawrence (eds.), *Funerary Practices and Models in the Ancient Andes: The Return of the Living Dead*, Cambridge, pp. 117–136.
- Sauvage C. (2014) Spindles and distaffs: Late Bronze and Early Iron Age eastern Mediterranean use of solid and tapered ivory/bone shafts, in: M. Harlow, C. Michel, M.-L. Nosch (eds.), *Prehistoric, Ancient Near Eastern and Aegean Textiles and Dress. An Interdisciplinary Anthology*, Ancient Textiles Series 18, Oxford, Philadelphia, pp. 184–226.
- Skals I., S. Möller-Wiering, M.-L. Nosch (2015) Survey of archaeological textile remains from the Aegean and Eastern Mediterranean area, in: E. Andersson Strand, M.-L. Nosch (eds.), *Tools, Textiles and Contexts. Textile Production in the Aegean and Eastern Mediterranean Bronze Age*, Ancient Textiles Series 21, Oxford, Philadelphia, pp. 61–74.
- Smith J. S. (2002) Changes in the workplace: women and textile production on Late Bronze Age Cyprus, in: D. Bolger, N. Serwint (eds.), *Engendering Aphrodite: Women and Society in Prehistoric Cyprus*, American Schools of Oriental Research Archaeological Reports 7, Boston, pp. 281–312.
- Sneddon A. (2002) *The Cemeteries at Marki: Using a Looted Landscape to Investigate Prehistoric Bronze Age Cyprus*, BAR International Series 1028, Oxford.
- Stewart E., J. R. Stewart (1950) *Vounous 1937–38. Field-report of the Excavations Sponsored by the British School of Archaeology at Athens*, Lund.
- Webb J. M. (1992) Funerary ideology in Bronze Age Cyprus: towards the recognition and analysis

- of Cypriote ritual data, in: C. G. Ioannides (ed.), *Studies in Honour of Vassos Karageorghis*, Nicosia, pp. 87–89.
- Webb J. M. (2002) New evidence for the origins of textile production in Bronze Age Cyprus, *Antiquity* 76, pp. 364–371.
- Webb J. M. (2007) Tracking gender and technology in prehistory: a case study from Bronze Age Cyprus, *Iris* 20, pp. 20–29.
- Webb J. M. (2015) Women at home and in the community in prehistoric Bronze Age Cyprus, in: S. L. Budin, J. M. Turfa (eds.), *Women in Antiquity: Real Women Across the Ancient World*, London, New York, pp. 375–385.
- Webb J. M. (2017) Lapithos Tomb 322. Voice, context and the archaeological record, in: E. Minchin, H. Jackson (eds.), *Text and the Material World: Essays in Honour of Graeme Clarke*, SIMA Pocket-Book 185, Uppsala, pp. 1–12.
- Webb J. M., D. Frankel (2015) Coincident biographies. Bent and broken blades in Bronze Age Cyprus, in: K. Harrell, J. Driessen (eds.), *THRAVSMA Contextualising the Intentional Destruction of Objects in the Bronze Age Aegean and Cyprus*, Aegis 9, Louvain, pp. 117–142.

ANIMISM OR ANALOGISM? BIRD DEPICTIONS AND THEIR SIGNIFICANCE FOR THE RECONSTRUCTION OF CRETAN BRONZE AGE ONTOLOGIES¹



ABSTRACT: This article studies three aspects of Cretan avian iconography — nature scenes, cult scenes, and combinations/hybrids — with regard to their significance for the reconstruction of prevalent ontologies. The analysis is primarily based on the work of French anthropologist Descola who studied the four basic ontologies and their reflection in art. In this paper, the focus is on animism and analogism, both of which were suggested by scholars to have been prevalent in Bronze Age Crete. The study concludes that several aspects of Cretan art are consistent with characteristics of animist art.

KEYWORDS: Ontologies; Bird depictions; Animism; Iconography; Bronze Age Crete.

INTRODUCTION

The systematic analysis of various ontologies or world-views is a relatively new development in Aegean Bronze Age archaeology. Mycenaean Greece has usually been studied by looking at other hierarchical, (poly)theistic, and analogical societies, for example ancient Egypt, Classical Greece, or Medieval Europe.² This approach seems justified, given that we know from Linear B tablets and the architectural layout of the Mycenaean palaces that bureaucracy and a strict social hierarchy existed on the Greek mainland, at least from Late Helladic (LH) II onward. Moreover, several deities known from the Classical Greek pantheon are mentioned in the texts.

When studying the earlier Minoan culture on Crete, scholars have widely adopted a similar approach.³ However, some have also expressed uneasiness about using the above mentioned societies as templates because of

the profound differences between them and Cretan culture.⁴ Goodison, for example, remarked that neither the Christian nor the modern western attitudes towards animals seem to provide convincing models for the Cretan osteological and iconographical evidence.⁵ In recent years, some scholars have therefore suggested that we should actively rethink the models our interpretations of Minoan culture are based on.⁶

In the following, we will look at the anthropological study of ontologies and their reflection in art, before we move on to three case studies from Minoan iconography. Since the author has analysed Aegean Bronze Age bird depictions in detail in her doctoral thesis, these case studies will feature avian imagery, but they can provide a framework for examining other aspects of iconography.⁷

1 I would like to thank the organisers for inviting me to both conferences and providing a much-needed platform for early career researchers in the Aegean Bronze Age. I also thank the BSA for funding my participation by granting me the Vronwy Hankey Award 2017.
2 Cf. MORGAN 1995 and SHAPLAND 2013 for an interpretation of Aegean animal and lion imagery based on the use of such imagery in Egypt and the Near East.
3 Christian notions such as the appearance of the Holy Ghost in the form of a dove prompted EVANS (1921, 222–224) to identify avian epiphanies in LM I cult scenes. For the identification of adorants and one or more supernatural deities in iconography, see for example WARREN 1988, 34–36; NIEMEIER 1989; 1990; DICKINSON 1994, 257–260. For the identification of sacrificial animals in iconography by drawing comparisons to the Classical Greek evidence, see FORSTENPOINTNER 2010. LM II–III imagery has been interpreted as being directly influenced by Egyptian notions,

for example by WATROUS (1991, 296–298) and HILLER (2006A and 2006B).

4 For example regarding burial patterns, social relations, gender relations, absence of ruler iconography, absence of unequivocal evidence for animal sacrifice before LM II/III, absence of clearly and consistently identifiable deities, and the ideological importance of the natural environment.
5 GOODISON 2011. MACGILLIVRAY (2013, 147) called Minoan society “pantheist” and BLAKOLMER (2015, 35) noted the profound differences in the appearance and contexts of hybrids in Cretan vs. Egyptian/Near Eastern iconography. For an early account of the uniqueness of Minoan iconography, see GROENEWEGEN-FRANKFORT 1951.
6 BERG 2004; MORRIS, PEATFIELD 2004; HERVA 2006A; 2006B; CROOKS *et al.* 2016.
7 BINNBERG 2018.

ONTOLOGIES

Different ontologies have long been studied by anthropologists. The most recent and most comprehensive account is the structuralist model developed by Descola.⁸ His work provides a valuable basis for our analysis because he aims to present all possible ontologies and also studies the ways ontologies can be reflected in iconography. According to Descola, there are four basic ontologies — naturalism, totemism, analogism, and animism — one of which is usually dominant in a given culture, although aspects of other ontologies may be present as well. They differ from each other by the way interiority and physicality of other-than-human entities are understood as similar or different to those of humans (Fig. 1).⁹ Interiority refers to the mind, agency/intentionality, consciousness, feelings, and vital energy, while physicality is concerned with anatomical characteristics and external behaviour patterns, such as diet, way of movement, or habitat.

	PHYSICALITY DIFFERENT	PHYSICALITY SIMILAR
INTERIORITY DIFFERENT	Analogism	Naturalism
INTERIORITY SIMILAR	Animism	Totemism

Fig. 1 The four ontologies after DESCOLA 2013, fig.1.

Naturalism, which is the prevalent ontology in the west today, sees humans as subject to the same natural laws (e.g. by biological evolution) as animals or plants but maintains that they are unique in their mental and emotional capacities. Therefore, nature and (human-made) culture are separate ideological categories. Totemism — as prevalent among Australian Aborigines — contrasts sharply with naturalism because it sees both interiority and physicality of humans and animals as similar and, therefore, does not know a nature-culture divide.¹⁰

In the next two sections, we will have a more detailed look at animism and analogism, both of which have been suggested to have had a particular relevance in Bronze Age Crete. Herva proposed that animist

notions played a central role in Cretan everyday practices, a hypothesis which was not accepted by Shapland who argued that the type of human-nature relationship prevalent on both the Greek mainland and Minoan Crete was Descola's 'analogism'.¹¹ Before we turn to the question about how (bird) iconography can contribute to this debate, we introduce the two concepts and see how they are reflected in art.

ANIMISM

In animism people perceive non-human entities as having the same interiority as humans, but their physicalities are seen as different.¹² Animist ontologies seem to be most prevalent in societies which can be described as hunter-gatherers.¹³ This is the primary reason why Shapland thought that this model was not applicable to the stratified society of Bronze Age Crete.¹⁴ But animist ontologies or parts thereof can also be found in other societies, e.g. itinerant pastoralists (Saami of Lapland) or horticulturalists (Achuar of Amazonia).¹⁵ The Japanese religion of Shinto, which has many animist aspects, is an important part of a decidedly modern society.¹⁶

The concept of animism has a long history in anthropology and goes back to Tylor, who defined it as the belief that everything, even trees or stones, has a soul.¹⁷ In 1960, Hallowell, after studying the ontology of the Ojibwa people of Canada and North America, evoked a new interest in animism, which he defined as the view that personhood and agency are not only possessed by humans but also encompass animals, plants, things, spirits, places, and events.¹⁸

This principal idea is reflected in both form and content of animist iconography. According to Bird-David, animist ontology "educates the attention, to perceive and specify the environment".¹⁹ Thus, we can expect that the natural environment features prominently in art. Also, specific characteristics, poses, actions, and habitats of animals/plants are not only noticed but can be truthfully depicted, thus resulting in rather "naturalistic" images.²⁰ Descola observed that animist depictions do not privilege one "objective" viewpoint but try to adopt those of non-humans as well, often resulting in nature scenes which lack perspective and a coherent sense of space.²¹ However, since artistic naturalism

8 DESCOLA 2005; 2006; 2009; 2010; 2013.

9 DESCOLA 2013, 116.

10 INGOLD 2011, chapter 7, 111–131.

11 SHAPLAND 2009, 267; 2013.

12 DESCOLA 2006, 140–141; 2013, 3–25, 129–138.

13 BIRD-DAVID 1999, 78.

14 SHAPLAND 2013, 193–194.

15 DESCOLA 2013, 37–44, 46–47.

16 WILLIAMS 2005, 7.

17 TYLOR 1871.

18 HALLOWELL 1960; HARVEY 2005, 17–20; INGOLD 2011, chapter 6, 90–92.

19 BIRD-DAVID 1999, 77.

20 INGOLD 2011, 122.

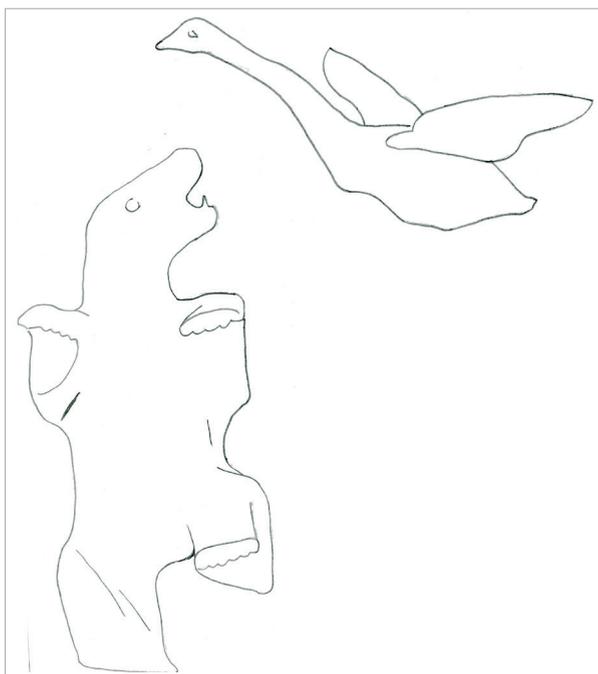


Fig. 2 Figurines of a bear and a waterbird made by the Inuit and Evenki people. Drawn by the author.

and the lack of a (central) perspective also occur in the art of non-animist societies, further characteristics need to be present.

Often, animist depictions are supposed to show the true underlying nature of entities.²² As Ingold put it, animist images serve to show the “powers of agency, intentionality, and sentience embodied in a living, moving being”.²³ Many animist societies consider movement to be a primary expression of animacy, and, therefore, animal depictions concentrate on movements and actions, sometimes at the expense of a realistic and/or more detailed rendering.²⁴ An example can be seen in carvings of animals and birds made by the Inuit of Canada and the Evenki of Siberia, which focus on specific movements rather than details of the anatomy (Fig. 2). Another example are Japanese paintings of Mount Fuji showing the mountain in an idealised fashion, which contrasts with the more naturalistic rendering of its surroundings.²⁵ Such idealisation reveals the awe-inspiring essence of the sacred mountain-person. This art style can be described as ‘idealised naturalism’. Another way to illustrate the shared interiority of various entities is the depiction of ambiguous or



Fig. 3 Painting of a Greenlander showing a relational encounter between a hunter and a gull-person (VITEBSKY 1995, 6–7). Courtesy of Nunatta Katersugaasivia Allagaateqarfialu/ Greenland National Museum and Archives.

hybrid images. For example, a pot may be seen as a living or animated entity, a view which can be expressed by attaching features of humans or animals to it.²⁶

Bird-David and Harvey have stressed that personhood is constituted in individuals primarily by mutual relations with other individual persons, usually established by one-on-one encounters.²⁷ People may look at, speak to, or touch animals, plants, or rocks, and the communicative abilities of various animals as conveyed by their voice, song, or body language can be perceived as attempts to relate to people. Rather than focussing on the veneration or adoration of a transcendent supernatural deity, animist rituals, therefore, concentrate on the direct interaction of humans with the omnipresent and immanent spirits of various beings.²⁸ In iconography, various different entities (humans, animals, trees, stones) are, therefore, shown with a focus on their relations. An example is a painting by a Greenlander which shows a hunter in a boat encountering a gull-person who is teaching him how to calm the storm (Fig. 3).²⁹ In such scenes, the animals appear as individual and equal participants — an aspect which contrasts with analogical iconography.³⁰

21 DESCOLA 2009, 6–7.

22 INGOLD 2011, 130.

23 INGOLD 2011, 121.

24 DESCOLA 2009, 31; INGOLD 2011, 115–121, 126–128.

25 YOSHIHIKO 2013.

26 DESCOLA 2009, 28; SIMANDIRAKI-GRIMSHAW 2010, 98; VANPOOL, NEWSOME 2012, 9–15; DESCOLA 2013, 135–138.

27 BIRD-DAVID 1999; HARVEY 2005; DESCOLA 2013, 141.

28 According to HARVEY (2005, 135), spirits are “other-than-human persons who are either immaterial or whose particular physicality or embodiment is temporary”.

29 VITEBSKY 1995, 7.

30 INGOLD 2011, 121.

Another possibility to establish relations with non-human entities is to shed one's physicality and interact directly with the spirit world, a task which is usually undertaken by shamans.³¹ Headdresses, costumes, and masks are often used to help transform the shaman so that (s)he can adopt the abilities of animals and spirits.³² To gain access and insight into the spirit world, the senses of the shaman need to be extended and amplified by altered states of consciousness.³³ Trance can be achieved through using psychoactive substances and activities (fasting, meditation, certain body postures, rhythmic movements/sounds/songs). During the first stages of trance, people often have auditory and visual hallucinations, *e.g.* they see certain abstract shapes called entoptic forms in neuropsychology.³⁴ In the course of a trance experience, iconic visions are interpreted as encounters with spirit beings.³⁵ Somatic sensations such as falling, flying, or shape-shifting occur, which are thought to enable the shaman to adopt the perspective of a non-human person.³⁶ Shamanic journeys and transformations are usually considered dangerous and require the help of tutelary entities.³⁷ Significantly, tutelary animals are often those which inhabit liminal zones, such as land–water, land–sky, or underground–land, like the shaman him/herself.³⁸ Important in our context is that flight is usually made possible with the help and guidance of birds or by changing into a bird.³⁹

Shamanism may be expressed by images directly inspired by trance experiences, for example entoptic imagery and spirit animals.⁴⁰ People in flight and/or with features of an animal or bird can be interpreted as showing shamans transforming into a spiritual entity or merging with their tutelary animals.⁴¹ Shamans are special people who have managed to control the transformation by mastering certain techniques and/or having special relations with tutelary animals. Therefore, in contrast to metamorphosis from animal to human, which expresses the shared interiority, the change from human to animal is a sign of the shamanic control over the transformation.⁴²

ANALOGISM

Analogism sees both interiority and physicality of humans and non-human entities as different from each other.⁴³ In this view, the world is composed of multiple, radically distinct beings, which are conceptually organised into a levelled, hierarchical structure. Connections between multiple distinct entities are conceptualised as various analogies/metaphors. European Medieval and Renaissance analogism, for example, used the criteria of existence, life, and reason/spirit to create a stratified chain of being with rocks at the bottom (only possessing existence) and God at the top (being the highest spiritual entity).⁴⁴ In analogical societies, supernatural transcendent deities are venerated and may confer a special status to specific human beings (*e.g.* kings, pharaohs), who often occupy a privileged place in such systems. Shapland has drawn attention to the fact that analogism is most prevalent in stratified societies, *e.g.* Ancient Egypt, Classical Greece, or Medieval Europe, because the rigid hierarchy of human and non-human entities often mirrors a similar social structure.⁴⁵

Analogism can be reflected in art in various ways.⁴⁶ The analogical system may be directly illustrated as for instance in European medieval images of the Great Chain of Being, where different entities (rocks, trees, quadrupeds, fish, birds, humans, angels, and God) are shown on mutually exclusive hierarchical levels.⁴⁷ One could also expect this hierarchy to be indirectly expressed, for example by differences in size between entities or by narratives showing some entities as clearly inferior or superior to others. In analogical imagery, entities often appear multiple times in identical fashion to emphasise the regularity of the prevalent order, which is often more relevant than the depiction of individual beings.

Other typical analogical motifs are depictions of composite beings which are constructed from distinct classes of entities, *e.g.* the Greek chimera.⁴⁸ Analogical hybrids appear rather static, and the visual emphasis does not lie on dynamic metamorphosis.⁴⁹ Thus, the chimera

31 ELIADE 1964; VITEBSKY 1995, 10–21; HARVEY 2005, 139–152; VANPOOL 2009. For Shinto, see WILLIAMS 2005, 30, 115–117.

32 VITEBSKY 1995, 82–84.

33 VITEBSKY 1995, 64–73; VANPOOL 2009, 180.

34 LEWIS-WILLIAMS, DOWSON 1988; LEWIS-WILLIAMS 2010, 142–146.

35 LEWIS-WILLIAMS 2010, 146.

36 LEWIS-WILLIAMS 2010, 147–149, 168–170.

37 VITEBSKY 1995, 66–69; VANPOOL 2009, 181–182; INGOLD 2011, 114–115.

38 VITEBSKY 2001, 70; VANPOOL 2009, 182.

39 VITEBSKY 1995, 68; VANPOOL 2009, 182.

40 VANPOOL 2009, 182.

41 VITEBSKY 1995, 66–69; DESCOLA 2009, 4; VANPOOL 2009, 182.

42 DESCOLA 2013, 136.

43 DESCOLA 2006, 145, 152; DESCOLA 2013, 201–231.

44 DESCOLA 2013, 202–205, 218.

45 SHAPLAND 2013, 193–194.

46 DESCOLA 2009, 34–36.

47 LOVEJOY 1936; DESCOLA 2013, 439–458.

48 DESCOLA 2009, 34.

49 DESCOLA 2013, 213, 215–216.



Fig. 4 The Blue Bird Fresco from Knossos, as reconstructed by David Cameron. Courtesy of BSA Archive.

is always composed of a lion's front part, a goat's head in the middle, with a snake as the tail. Wengrow has drawn attention to the modular thinking reflected by the creation of such hybrids, *i.e.* the perception that entities are composed of multiple irreducible parts which can be combined with one another in an anatomically correct way.⁵⁰ Another characteristic of analogical hybrids is that these beings, their origin and/or their defeat, are often embedded in narrative scenes. For example, the Greek chimera is shown being killed by Bellerophon. This is necessary to such conceptualisation because these beings are usually viewed as 'monstrous' given that they transcend the rigid inherent boundaries between entities.⁵¹

A third, and more abstract, way of expressing analogical notions is via the visual and contextual connections established between multiple heterogeneous beings in art. As there are many possible structuring criteria, it can be difficult to identify these metaphorical relationships.⁵² However, certain patterns should be detectable, which may make it possible to reconstruct these criteria. For example, if a certain animal depicted in a scene is substituted by a human in an identical scene, it could indicate that an analogy is established between this animal and the human being. Such analogies are, for example, created between warriors and lions in Early Mycenaean iconography.⁵³

In the following, we look at three important aspects of Minoan art — nature scenes, cult scenes, and images of hybrids and combinations — and see what they can contribute to the debate.

CASE STUDY — MINOAN NATURE SCENES

It has long been noted that Minoan art awards a very prominent place to natural phenomena. When we take glyptic imagery, for example, humans are depicted on just around 1000 seals, while animals are shown on over 5000.⁵⁴ Vase-paintings primarily show abstract or floral patterns and later on animals, but humans remain a rare motif throughout the Bronze Age. In the Neopalatial frescoes, the frequency and importance of 'nature scenes' where animals, plants, stones, and landscape features take centre stage has often intrigued scholars. In her discussion about monkeys in Minoan iconography, Marinatos remarked that "It might offend our modern sensibilities that for the Minoans and Therans an animal was deemed worthy of so much attention".⁵⁵ Most interpretations have seen these scenes as symbolically referencing a divine person, usually a nature goddess, even if no anthropomorphic agent is directly depicted.⁵⁶ Implicit in such interpretations is the western viewpoint that humans or divinities with their presumed unique interiority, and not doves, swallows, or plants, should be the protagonists of large-scale wall-paintings.⁵⁷

Let us take a closer look at one such nature scene, the so-called Blue Bird Fresco from the House of the Frescoes at Knossos dating to Late Minoan (LM) I (Fig. 4).⁵⁸ Large space — at least three walls of the room — was devoted to the elaboration of a narrative scene in the life of a group of rock doves (*Columba livia*), whose nests are being plundered by monkeys.

50 WENGROW 2013, esp. 21.

51 DESCOLA 2009, 811.

52 DESCOLA 2009, 34–36.

53 MARINATOS 1989, 19–21.

54 Cf. KRZYSZKOWSKA 2010, 177.

55 MARINATOS 1987, 420.

56 For example IMMERWAHR 1989, 46; MARINATOS 1993, 149–151; CHAPIN 2004, 54–59. For an overview, see HERVA 2006b, 225–226.

57 GROENEWEGEN-FRANKFORT 1951, 195–196; cf. CHAPIN 2004, 47.

58 CAMERON 1968, 1–31; IMMERWAHR 1989, 42–46, cat. no. Kn2; SHAW, CHAPIN 2006.

The monkeys are shown eating eggs, while most rock doves are fleeing in groups in opposite directions. These are accurate species-specific portrayals of animal behaviour, inspired by direct observation. Significantly, the artistic focus lies on movements and actions; the animals appear ‘animated’. Moreover, they are individualised by a great variety of poses: not all doves are flying, but two are shown sitting, and one of them is depicted in an unusual frontal view. Both aspects — animation and individualisation — can also be observed in other Cretan (animal) imagery.⁵⁹ Individualisation, for example, is present in the rendering of four Minoan-style octopuses on a metal cup from Dendra on the Greek mainland, prompting the excavator Persson to remark that “if it were a question of anything other than octopuses, one would be tempted to talk of an attempt at portraiture”.⁶⁰

When we take a look at the locale of the scene in the Blue Bird Fresco, we can note that the doves, monkeys, plants, and rocks are neither set in a definite perspective relationship to each other nor are they differentiated by size or relative position. Instead, as Groenewegen-Frankfort has observed, all the elements are “caught in a web of a living world that has indefinite orientation and indefinite multiple relations”.⁶¹ Such an arrangement suggests that the perspectives of the different entities are deemed to be of relatively equal status, which is a feature of animist imagery.

Various identifiable plants are shown, for example crocus, iris, mint, and pomegranate.⁶² Although they are all shown flowering, in reality they do not bloom at the same time. Beckmann interpreted this as calendar symbolism, but this feature is also consistent with the animist concept of idealised naturalism.⁶³ In addition, we can note the presence of some hybrid plants which display features of two or more different species. Herva interpreted this common feature of Cretan nature scenes as revealing the true interior nature of things in an animist fashion.⁶⁴ In fact, such hybrids seem to express a fluidity of categories which is compatible with the animist notion that all species share a common essence.

In sum, Cretan nature scenes display a combination of features which are consistent with characteristics of

animist imagery, such as the important status of non-human elements, the artistic focus on species-specific movements and behaviour, the individualisation by varying poses, a composition avoiding giving precedence of one perspective over another, and the presence of idealised features and hybridisms.

CASE STUDY — MINOAN CULT SCENES

When human beings are depicted in Cretan iconography, they are often interacting with non-human entities, such as trees, flowers, bulls, goats, or birds, and even non-living things such as boulders. Significantly, the types of interaction with animals are not restricted to hunting or sacrifice but encompass encounters that seem to fall outside of these categories. For example, there are images of seated females touching/feeding approaching individual goats.⁶⁵ When discussing such scenes, Goodison remarked that as they are “indicating interest in, contact with, and respect for, animals, it suggests a role for them in Minoan religion as yet not fully understood”.⁶⁶

Other imagery, sometimes called cult scenes, shows human beings shaking a tree or hugging a boulder.⁶⁷ On two gold rings from Kalyvia (*CMS* II,3 114) and Sellopoulo, birds are shown flying towards people hugging boulders.⁶⁸ Other people in these scenes may simply be shown standing and making various gestures, for example holding their hands to their breast or forehead. Small floating objects often appear, such as spikes, eyes, wavy lines, rayed objects, double axes with tassels, blobs with dots, and chrysalises.⁶⁹ Sometimes, tiny human figures — male and female — appear floating in the upper register, often carrying staffs.⁷⁰

Traditionally, the activities shown have been interpreted as a means to summon a supernatural entity by way of ecstatic rituals. Usually, the small anthropomorphic figure has been identified as a divine figure appearing in an epiphany.⁷¹ However, the identification of deities in these scenes is far from certain since these figures lack consistent attributes and are not inherently different from their ‘adorants’.⁷² Also, the attention of the gesturing people is not always focused on the floating figure; rather, they appear self-absorbed, and in some

59 For artistic emphasis on movement/animation/vitality as a hallmark of Minoan art overall, see for example GROENEWEGEN-FRANKFORT 1951, 185–216; HERVA 2006B, 224; MACGILLIVRAY 2013. BLAKOLMER (2007, 32) noticed the idealised/artificial character by calling it a „durch und durch übertriebene, unrealistische Lebendigkeit“ (translated by the author as “thoroughly exaggerated, unrealistic vitality”).

60 PERSSON 1931, 44.

61 GROENEWEGEN-FRANKFORT 1951, 201.

62 IMMERWAHR 1989, 42–46.

63 BECKMANN 2006.

64 HERVA 2006B, 234.

65 For example *CMS* II,6 030 and *CMS* VS1A 175.

66 GOODISON 2011, 191.

67 WARREN 1988; NIEMEIER 1989; THOMAS, WEDDE 2001, 5.

68 For the Sellopoulo ring, see POPHAM 1974, 217–219, cat. no. J8.

69 KYRIAKIDIS 2005, 140–143.

70 WEDDE 1992, 185; THOMAS, WEDDE 2001, 5–6.

71 For example MATZ 1958; WARREN 1988; WEDDE 1992, 185–186.

72 Also noticed by GROENEWEGEN-FRANKFORT 1951, 212–215; DICKINSON 1994; THOMAS, WEDDE 2001; BLAKOLMER 2010.

scenes the figure is absent.⁷³ Moreover, the gestures are also seen in the absence of a floating figure.⁷⁴ Thus, the identification of deities in these scenes presents profound difficulties, which notably contrasts with the iconography of predominantly analogical cultures such as Egypt or Classical Greece.

Significantly, the artistic focus lies on physical and direct interactions with non-human entities such as birds, trees, and boulders. In recent years, several scholars, such as Berg, Herva, Day, and Crooks *et al.*, have all suggested that these scenes show people communicating with sentient non-human persons and are thus indicative of an animist framework.⁷⁵ As we have seen, in animist societies, some stones are said to be alive, and touching the stones can be a respectful way to ask stone-persons to speak with humans.⁷⁶ Similarly, trees can be non-human persons, and they can be communicated with by speaking and/or touching.⁷⁷ Birds may also have been seen as sentient persons. Birds, most likely doves, are not only shown on the gold rings from Kalyvia and Sellopoulo but also in two related scenes, one on a Middle Minoan (MM) III bronze plaque from the Psychro Cave and another on a LM IIIA larnax from Knossos.⁷⁸ In the former three scenes, the birds are either in the focus of the composition or they are especially emphasised by their large size. In all images, they are shown on an equal or higher position than the humans. Birds and people seem to refer to each other, most conspicuously by physical proximity — they appear near people's heads on the gold rings and the larnax. On the sarcophagus, the gaze of the woman is directed towards the bird which is flying towards her. Significant in this context is that the birds are not passive but seem to have come actively. According to Harvey, in animist relational encounters “the unusual physical proximity that sometimes occurs in encounters between particular birds and particular humans can be considered to be deliberate acts of communicative intimacy.”⁷⁹

Furthermore, Morris and Peatfield have suggested that the cult scenes contain shamanic imagery. They have found that the gestures find ethnographic parallels in ‘trance-inducing’ postures which influence heart rate and blood circulation.⁸⁰ Trance experiences

may explain the dream-like floating objects, which can be compared to entoptic phenomena (Fig. 5).⁸¹ Moreover, shamanic imagery often features people who are flying, sometimes with the help of special liminal animals, such as birds. The anthropomorphic floating figures, which are more commonly identified as deities, would fit this description, especially when we include images of women being carried through the air by birds, as shown, for example, on a sealing from Knossos (CMS II,8 257) and a gold ring from Poros.⁸²

In sum, we can note that the Cretan cult scenes display several features which are compatible with animist and shamanic imagery, such as relational encounters with individual non-human entities focusing on voluntary proximity and mutual communication, and possible shamanic elements such as trance-inducing postures, entoptic phenomena, and people flying with the help of birds.

CASE STUDY — HYBRIDS AND COMBINATIONS

In our first case study, we noted the presence of hybrid plants in Cretan frescoes. In glyptic imagery there are even more — over 100 — depictions of hybrids and combinations (Fig. 6). These hybrids are characterised by the merging of human and animal, mostly bird, features in a correct anatomical way (*e.g.* CMS II,3 279; CMS III 364; CMS IV 161). Combinations, by contrast, rather randomly merge parts of birds, animals, humans, plants, and objects with each other (*e.g.* CMS II,7 086; CMS II,7 117; CMS II,7 166).⁸³

Combinations are especially frequently preserved in the Late Minoan IB sealing deposit from House A at Zakros.⁸⁴ Their unnatural and rather arbitrary appearance led Gill to postulate that they were created by a madman.⁸⁵ However, to infer from the hybridisation of various distinct elements that its creator must be mad reflects a view which draws a sharp ontological line between humans and other natural entities. As we have seen, however, in an animist framework all entities are said to share the same interiority as humans, a concept which allows to merge things such as double axes or helmets with human and animal parts. Their “kaleidoscopic” (Shapland) appearance may, thus, express

73 GROENEWEGEN-FRANKFORT 1951, 199.

74 WEDDE 1999.

75 BERG 2004; HERVA 2006A, 592–595; CROOKS *et al.* 2016.

76 HARVEY 2005, 37.

77 HARVEY 2005, 104–106.

78 For the Psychro plaque, see BOARDMAN 1961, 46–47, cat. no. 217.

For the Knossos larnax, see MORGAN 1987.

79 HARVEY 2005, 102–103.

80 GOODMAN 1986; MORRIS, PEATFIELD 2004.

81 Also suggested by MORRIS, PEATFIELD 2004, 44–45. KYRIAKIDIS

2005 shows enlarged pictures of these objects. Similarly, STEIN (2017, 513–518) suggested that geometric designs such as dots, lattices, or wavy lines on 4th–3rd millennium BC pottery and seals from eastern Anatolia and the Syro-Mesopotamian periphery were inspired by entoptic phenomena seen during trance experiences.

82 For the Poros ring, see DIMOPOULOU, RETHEMIOTAKIS 2000.

83 The categorisation is adopted from ANASTASIADOU 2016, 80–81 (here called organic vs. non-organic).

84 HOGARTH 1902; WEINGARTEN 1983.

85 GILL 1981, 85–86.

	 CMS II,3 252	 CMS XI 029						
	 CMS VS3 068	 CMS II,3 051	 Poros	 CMS II,3 103				
	 CMS II,3 114	 CMS II,3 051	 CMS VS2 106	 CMS II,6 001				
	 CMS I 126	 CMS II,3 051	 CMS VI 278	 CMS VS1A 142				
	 CMS I 219 (similar: CMS II,3 051; Sellopouto)	 CMS XI 029	 Poros	 CMS II,3 103	 CMS II,3 252	 CMS VS1A 142	 CMS II,3 015	 CMS II,6 020
	 CMS V 199	 CMS XI 028						

Fig. 5 Comparison of entoptic phenomena as seen in trance (left column) and floating objects in Cretan cult scenes. Drawn by the author.

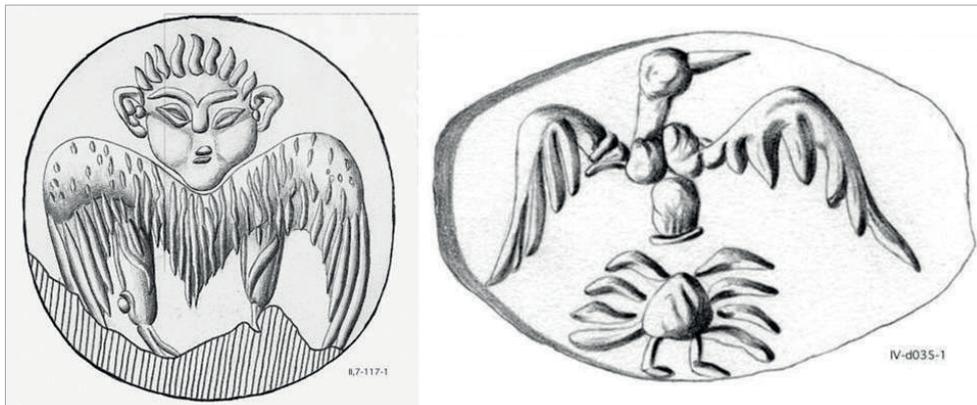


Fig. 6 A combination (CMS II,7 117) and a hybrid (CMS IV D035). Courtesy of Ingo Pini.

the concept of metamorphosis, which according to animist notions is an inherent capability of all kinds of beings.⁸⁶ Trance experiences make it possible to see such transformations directly taking place, which might be an explanation for their “dream-like” (Evans) forms.⁸⁷

In addition to the combinations, which have mostly been preserved in the Zakros sealings, depictions of human-animal hybrids come from various Cretan sites. Such hybrids appear for the first time in MM II and are most frequent in LM I.⁸⁸ The most common type, the so-called bird-ladies, are characterised by the combination of a female lower body, indicated by a skirt, feet, and sometimes breasts, with the upper body of a bird with a beaked head and wings. In some examples, the bird’s head can be substituted by that of a human or that of a mammal (e.g. CMS III 364).

Scholars have traditionally interpreted these hybrids as legendary/mythical creatures as we find them in analogical societies.⁸⁹ Weingarten considered them to be demons of the underworld.⁹⁰ In this case we would expect the hybrids to have clear roles which are shown in recurrent narrative situations. However, with one exception, which will be discussed below, the hybrids are never involved in complex scenes but are usually shown alone on the seal face.⁹¹ As Goodison has noted, they are not being worshipped either.⁹² Nevertheless — in contrast to the combinations — the hybrids, and especially the bird-ladies, display certain consistently recurring features which require an explanation. Bird parts, such as beaked heads, feathered tails, or wings, are exceptionally frequent. The significance of the wings is also corroborated by the poses because almost all the hybrids are shown with their wings displayed, even when the hybrid is standing or walking on the ground. In other depictions, the hybrids seem to be flying since there are no feet visible and the head is raised.

The importance of parts of flying birds in these hybrids corresponds to the central role of flying and

birds as helpers in trance experiences.⁹³ As we have seen, the controlled change of a human into an animal is typically the domain of shamans. The hybrids on the seals which are shown in flight may thus be shamans who have successfully adopted the abilities of birds. A further way to achieve this transformation is the donning of masks and costumes in a ceremonial setting.⁹⁴ Such a context could be an explanation for some hybrids that are shown walking on the ground. Evidence for a ritual context is also provided by a LM I shell plaque from Phaistos, where the human-animal hybrids are depicted carrying staffs like those held by people in cult scenes.⁹⁵

In sum, Cretan depictions of combinations and hybrids seem to display characteristics of animist art. While the quite variable combinations may express the notion of a shared interiority of different entities, the more stable human-animal hybrids are compatible with depictions of shamanic trance experiences and rituals.

CONCLUSION

To conclude, the study of both form and content of Cretan nature scenes, cult scenes, as well as hybrids and combinations seems to provide further evidence for animism as an important part of Cretan ontology. Not only could we observe a focus on individualised species-specific actions expressing the personhood of animals and birds but also idealisation and hybridisation, which in animist iconography serve to reveal the numinousness and metamorphic ability of all entities. Moreover, encounters with non-human beings, such as boulders, trees, or birds, are characterised by an emphasis on the creation of relationships. Depictions of trance-inducing postures, entoptic phenomena and people in flight, sometimes carried by birds, are consistent with shamanic imagery.

86 SHAPLAND 2009, 236. EVANS (1921, 702–703) and SIMANDIRAKI-GRIMSHAW (2010, 98) also emphasised the importance of metamorphosis in the Zakros series.

87 EVANS 1921, 702. See STEIN (2017, 516) for an interpretation of hybrid and composite beings depicted on eastern Anatolian pottery dating to the 4th millennium BC as having been influenced by visions during deep trance experiences.

88 WEINGARTEN 1983, 91–95; SIMANDIRAKI-GRIMSHAW 2010, 95.

89 Cf. HOGARTH (1902, 92) and LEVI (1925–26, 192–201) for extensive comparisons of human-animal hybrids with Egyptian, Near Eastern, and later Greek monsters.

90 WEINGARTEN 2009, 145.

91 Also noted by BLAKOLMER (2016, 63).

92 GOODISON 2011, 187.

93 Although she does not use the term shamanism, GOODISON (2011, 187) also suggests that such hybrids depict people transforming into birds during trance experiences.

94 KRYSZKOWSKA (2005, 152) and FOSTER (2016) also considered it possible that the hybrids are people with costumes and masks.

95 PERNIER (1902, 130–132) thought that they are women and noted the connection to ritual ceremonies.

BIBLIOGRAPHY

- Anastasiadou M. (2016) Small puzzles in LM I Zakros, in: E. Alram-Stern, F. Blakolmer, S. Deger-Jalkotzy, R. Laffineur, J. Weilharter (eds.), *METAPHYSIS. Ritual, Myth and Symbolism in the Aegean Bronze Age. Proceedings of the 15th International Aegean Conference, Vienna, Institute for Oriental and European Archaeology, Aegean and Anatolia Department, Austrian Academy of Sciences and Institute of Classical Archaeology, University of Vienna, 22–25 April 2014*, *Aegaeum* 39, Leuven, Liège, pp. 77–85.
- Beckmann S. (2006) Conscious of time. Minoan ‘calendar’-symbolism in the ‘Blue Bird Fresco’, in: E. Tampakaki, A. Kaloutsakis (eds.), *Pepragmena Th’ Diethnous Kritologikou Synedriou, Elounta, 1–6 Oktovriou 2001*, A3, Heraklion, pp. 65–82.
- Berg I. (2004) Performing religion: practitioners and cult places in Minoan Crete, in: T. Insoll (ed.), *Belief in the Past: The Proceedings of the 2002 Manchester Conference on Archaeology and Religion*, Oxford, pp. 27–36.
- Binnberg J. (2018) *Birds in the Aegean Bronze Age*, unpublished PhD thesis, University of Oxford.
- Bird-David N. (1999) “Animism” revisited. Personhood, environment and relational epistemology, *CurrAnthr* 40 (S1), pp. 67–91.
- Blakolmer F. (2010) A pantheon without attributes? Goddesses and gods in Minoan and Mycenaean iconography, in: J. Mylonopoulos (ed.), *Divine Images and Human Imaginations in Ancient Greece and Rome*, Leiden, Boston, pp. 21–61.
- Blakolmer F. (2015) Was the ‘Minoan Genius’ a god? An essay on Near Eastern deities and demons in Aegean Bronze Age iconography, *JAIEI* 7:3, pp. 29–40.
- Boardman J. (1961) *The Cretan Collection in Oxford: the Dictaeon Cave and Iron Age Crete*, Oxford.
- Cameron M. (1968) Unpublished paintings from the ‘House of the Frescoes’ at Knossos, *BSA* 63, pp. 1–31.
- Chapin A. (2004) Power, privilege, and landscape in Minoan art, in: A. Chapin (ed.), *CHARIS: Essays in Honor of Sara A. Immerwahr*, Princeton, pp. 47–64.
- Crooks S., C. J. Tully, L. A. Hitchcock (2016) Numinous tree and stone: re-animating the Minoan landscape, in: E. Alram-Stern, F. Blakolmer, S. Deger-Jalkotzy, R. Laffineur, J. Weilharter (eds.), *METAPHYSIS. Ritual, Myth and Symbolism in the Aegean Bronze Age. Proceedings of the 15th International Aegean Conference, Vienna, Institute for Oriental and European Archaeology, Aegean and Anatolia Department, Austrian Academy of Sciences and Institute of Classical Archaeology, University of Vienna, 22–25 April 2014*, *Aegaeum* 39, Leuven, Liège, pp. 157–164.
- Descola P. (2005) *Par-delà nature et culture*, Paris.
- Descola P. (2006) Beyond nature and culture, *ProcBritAc* 139, pp. 137–155.
- Descola P. (2009) L’Envers du visible: ontologie et iconologie, in: T. Dufrene, A-C. Taylor (eds.), *Cannibalismes disciplinaires. Quand l’histoire de l’art et l’anthropologie se rencontrent*, Paris, pp. 25–36.
- Descola P. (ed.) (2010) *La fabrique des images*, Paris.
- Descola P. (2013) *Beyond Nature and Culture*, Chicago.
- Dickinson O. T. P. K. (1994) Comments on a popular model of Minoan religion, *OJA* 13:2, pp. 173–184.
- Dimopoulou N., G. Rethemiotakis (2000) The ‘Sacred Conversation’ ring from Poros, in: I. Pini (ed.), *Minoisch-mykenische Glyptik: Stil, Ikonographie, Funktion. V. Internationales Siegel-Symposium, Marburg, 23.–25. September 1999*, CMS Beiheft 6, Berlin, pp. 39–56.
- Eliade M. (1964) *Shamanism: Archaic Techniques of Ecstasy*, Princeton.
- Evans A. (1921) *The Palace of Minos. The Neolithic and Early and Middle Minoan Ages*, 1, London.
- Forstenpointner G. (2000) Stierspiel oder Bocksgesang? Archäozoologische Aspekte zur Interpretation des Hornviehs als Opfertier in der Ägäis, in: F. Blakolmer (ed.), *Österreichische Forschungen zur Ägäischen Bronzezeit 1998. Akten der Tagung am Institut für Klassische Archäologie der Universität Wien 2.–3. Mai 1998*, Wien, pp. 51–65.
- Foster K. P. (2016) Animal hybrids, masks, and masques in Aegean ritual, in: E. Alram-Stern, F. Blakolmer, S. Deger-Jalkotzy, R. Laffineur, J. Weilharter (eds.), *METAPHYSIS. Ritual, Myth and Symbolism in the Aegean Bronze Age. Proceedings of the 15th International Aegean Conference, Vienna, Institute for Oriental and European Archaeology, Aegean and Anatolia Department, Austrian Academy of Sciences and Institute of Classical Archaeology, University of Vienna, 22–25 April 2014*, *Aegaeum* 39, Leuven, Liège, pp. 69–75.
- Gill M. A. V. (1981) The human element in Minoan and Mycenaean glyptic art, in: W.-D. Niemeier (ed.), *Studien zur minoischen und helladischen Glyptik*, CMS Beiheft 1, Berlin, pp. 83–90.
- Goodison L. (2011) Beyond feasting: Activities with animals at the Mesara-type tombs, in: E. Kapsomenos, M. Andreadaki-Vlazaki, M. Andrianakis (eds.), *Pepragmena Th’ Diethnous Kritologikou Synedriou, Chania, 1–8 Oktovriou 2006*, A, Chania, pp. 179–195.
- Goodman F. D. (1986) Body posture and the religious altered state of consciousness: an experimental investigation, *Journal of Humanistic Psychology* 26:3, pp. 81–118.

- Groenewegen-Frankfort H. (1951) *Arrest and Movement*, London.
- Hallowell A. I. (1926) Bear ceremonialism in the northern hemisphere, *AmAnthropol* 28, pp. 1–175.
- Hallowell A. I. (1960) Ojibwa ontology, behavior and world view, in: S. Diamond (ed.), *Culture in History: Essays in Honor of Paul Radin*, New York, pp. 19–52.
- Harvey G. (2005) *Animism. Respecting the Living World*, London.
- Herva V.-P. (2006a) Flower lovers after all? Rethinking religion and human-environment relations in Minoan Crete, *WorldArch* 38:4, pp. 586–598.
- Herva V.-P. (2006b) Marvels of the system. Art, perception and engagement with the environment in Minoan Crete, *ArchDial* 13:2, pp. 221–240.
- Hiller S. (2006a) The rise of the pictorial style and the art of Amarna, in: E. Rystedt, B. Wells (eds.), *Pictorial Pursuits: Figurative Painting on Mycenaean and Geometric Pottery. Papers from Two Seminars at the Swedish Institute at Athens in 1999 and 2001*, Skrifter utgivna av Svenska institutet i Athen 53, Stockholm, pp. 63–71.
- Hiller S. (2006b) Spätminoische Pyxiden aus SM II/IIIA:1 und die Fresken aus dem Palast von Amenophis III. in Malkata, in: E. Czerny, I. Hein, H. Hunger, D. Melman, A. Schwab (eds.), *Time-lines: Studies in Honour of Manfred Bietak*, Leuven, pp. 149–165.
- Hogarth D. G. (1902) The Zakro sealings, *JHS* 22, pp. 76–93.
- Immerwahr S. A. (1989) *Aegean Painting in the Bronze Age*, London.
- Ingold T. (2011) *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill*, London.
- Krzyszowska O. (2005) *Aegean Seals: An Introduction*, London.
- Krzyszowska O. (2010) Impressions of the natural world: landscape in Aegean glyptic, in: O. Krzyszowska (ed.), *Cretan Offerings: Studies in Honour of Peter Warren*, London, pp. 169–188.
- Kyriakidis E. (2005) Unidentified floating objects on Minoan seals, *AJA* 109, pp. 137–154.
- Levi D. (1925–26) Le cretule di H. Triada e di Zakro, *ASAtene* 8–9, pp. 71–156.
- Lewis-Williams J. D. (2010) *Conceiving God: The Cognitive Origin and Evolution of Religion*, London.
- Lewis-Williams J. D., T. A. Dowson (1988) The signs of all times: entoptic phenomena in Upper Palaeolithic art, *CurrAnthr* 29, pp. 201–245.
- Lovejoy A. O. (1936) *The Great Chain of Being: a Study of the History of an Idea*, Cambridge.
- Macgillivray J. A. (2013) Animated art of the Minoan renaissance, in: R. B. Koehl (ed.), *Amilla: The Quest for Excellence. Studies Presented to Guenter Kopcke in Celebration of His 75th Birthday*, Philadelphia, pp. 145–148.
- Marinatos N. (1987) The monkey in the shrine: A fresco fragment from Thera, in: L. Kastriaki, G. Orphanou, N. Giannadakis (eds.), *Eilapinē: tomos timētikos gia ton kathēgētē Nikolao Platōna (Ειλαπινή: τόμος τιμητικός για τον καθηγητή Νικόλαο Πλάτωνα)*, pp. 417–421.
- Marinatos N. (1989) Man and animal in Cretan-Mycenaean art, in: *Philia epe eis Georgion E. Mylonan (Φιλιά επε εις Γεώργιον .H. Μυλωναν)*, 3, Athens, pp. 19–24.
- Marinatos N. (1993) *Minoan Religion. Ritual, Image, and Symbol*, Columbia.
- Matz F. (1958) *Göttererscheinung und Kultbild im minoischen Kreta*, Mainz.
- Morgan L. (1987) A Minoan larnax from Knossos, *BSA* 82, pp. 171–200.
- Morgan L. (1995) Of animals and men: The symbolic parallel, in: C. Morris. (ed.), *Klados: Essays in Honour of J. N. Coldstream*, London, pp. 171–184.
- Morris C., A. Peatfield (2004) Experiencing ritual: Shamanic elements in Minoan religion, in: M. Wedde (ed.), *Celebrations: Selected Papers and Discussions from the Tenth Anniversary Symposium of the Norwegian Institute at Athens, 12–16 May 1999*, Bergen, pp. 35–59.
- Niemeier W.-D. (1989) Zur Ikonographie von Gottheiten und Adoranten in den Kultszenen auf minoischen und mykenischen Siegeln, in: I. Pini (ed.), *Fragen und Probleme der Bronzezeitlichen Ägäischen Glyptik. 3. Internationales Marburger Siegel-Symposium, 5.–7. September 1985*, CMS Beiheft 3, Berlin, pp. 163–186.
- Pernier L. (1902) Scavi della mission italiana a Phaestos 1900–1901, *MontAnt* 12, pp. 5–142.
- Persson A. W. (1931) *The Royal Tombs at Dendra near Midea*, Acta Regiae Societatis Humaniorum Litterarum Lundensis 15, Lund.
- Popham M. R., H. W. Catling (1974) Sellopoulo tombs 3 and 4, two Late Minoan graves near Knossos, *BSA* 69, pp. 195–257.
- Shapland A. (2009) *Over the Horizon: Human-Animal Relations in Bronze Age Crete*, unpublished PhD thesis, University College London.
- Shapland A. (2013) Shifting horizons and emerging ontologies in the Bronze Age Aegean, in: C. Wyatts (ed.), *Relational Archaeologies. Humans – Animals – Things*, Abingdon, pp. 190–208.
- Shaw M., A. Chapin (2006) The frescoes from the House of the Frescoes at Knossos: A reconsideration of their architectural context and a new reconstruction of the Crocus Panel, *BSA* 101, pp. 57–88.

- Simandiraki-Grimshaw A. (2010) Minoan animal-human hybridity, in: D. B. Counts, B. Arnold (eds.), *The Master of Animals in Old World Iconography*, Budapest, pp. 93–106.
- Stein D. (2017) The role of stimulants in Early Near Eastern society: Insights through artifacts and texts, in: Y. Heffron, A. Stone, M. Worthington (eds.), *At the Dawn of History: Ancient Near Eastern Studies in Honour of N. Postgate*, Winona Lake, pp. 507–534.
- Thomas C., M. Wedde (2001) Desperately seeking Potnia, in: R. Laffineur, R. Hägg (eds.), *POTNIA. Deities and Religion in the Aegean Bronze Age. Proceedings of the 8th International Aegean Conference/8e Rencontre égéenne internationale, Göteborg, Göteborg University, 12–15 April 2000*, Aegaeum 22, Liège, pp. 3–14.
- Tylor E. B. (1871) *Primitive Culture*, London.
- Vanpool C. (2009) The signs of the sacred: Identifying shamans using archaeological evidence, *JAnthArch* 28, pp. 177–190.
- Vanpool C., E. Newsome (2012) The spirit in the material: A case study of animism in the American Southwest, *AmerAnt* 77:2, pp. 1–19.
- Vitebsky P. (1995) *The Shaman: Voyages of the Soul, Trance, Ecstasy and Healing from Siberia to the Amazon*, London.
- Warren P. (1988) *Minoan Religion as Ritual Action*, Gothenburg.
- Watrous L. V. (1991) The origin and iconography of the Late Minoan painted larnax, *Hesperia* 60, pp. 285–307.
- Wedde M. (1992) Pictorial architecture: for a theory-based analysis of imagery, in: R. Laffineur, J. L. Crowley (eds.), *EIKON. Aegean Bronze Age Iconography: Shaping a Methodology. Proceedings of the 4th International Aegean Conference/4e Rencontre égéenne internationale, University of Tasmania, Hobart, Australia, 6–9 April 1992*, Aegaeum 8, Liège, pp. 181–203.
- Wedde M. (1999) Talking hands: a study of Minoan and Mycenaean ritual gesture – Some Preliminary Notes, in: Ph. P. Betancourt, M. H. Wiener (eds.), *MELETEMATA. Studies in Aegean Archaeology Presented to Malcolm H. Wiener as He Enters His 65th Year*, Aegaeum 20, 3, Liège, Austin, pp. 911–920.
- Weingarten J. (1983) *The Zakro Master and His Place in Prehistory*, SIMA Pocket-Book 26, Göteborg.
- Weingarten J. (2009) The Zakro Master and questions of gender, in: K. Kopaka (ed.), *FYLO. Engendering Prehistoric ‘Stratigraphies’ in the Aegean and the Mediterranean. Proceedings of an International Conference, University of Crete, Rethymno 2–5 June 2005*, Aegaeum 30, Liège, Austin, pp. 139–149.
- Wengrow D. (2013) *The Origins of Monsters: Image and Cognition in the First Age of Mechanical Reproduction*, Princeton.
- Williams G. (2005) *Religions of the World: Shinto*, Philadelphia.
- Yoshihiko M. (2013) *Iconology of Fuji Painting: Japanese Psyche in Perspective of Animism, Shamanism and Mountain Worship*, Kindle Edition.

MINOAN POTTERY KILNS

A RE-EVALUATION OF THEIR MORPHOLOGY, TECHNOLOGY, AND FUNCTION¹



ABSTRACT: This paper examines the Cretan kilns dating back to the Bronze Age (3100–1050 BC).² The comparative study of 51 structures located at 21 different sites in Crete, as well as of 11 structures from three sites outside Crete, allows for the re-evaluation of the typological distinction of Bronze Age kilns. What is more, constructional peculiarities are highlighted, which can help reconstruct the development of the firing process through the study of the firing area itself. The so-called channel kilns are discussed in detail since they were a particular feature of Minoan pyro-technology, which requires further discussion. Finally, a brief overview of the kiln-working space relationship is discussed, aiming at identifying the parameters that declare a particular space as a ceramic workshop.

KEYWORDS: Crete; Minoan; Pottery kiln; Firing process; Workshop; Bronze Age.

INTRODUCTION

Pottery is an integral part of human material production and is one of the most common types of remains of human activity recovered during fieldwork. It is the final result of a complex technological process that begins from: 1) acquiring raw materials, 2) their processing, 3) formation of a vessel, and then 4) the final firing. Several factors influence the process: a) the kind of clay and its processing (pounding, clay purification, adding inclusions), b) the type of kiln, c) the fuel used for firing.³

Pottery production in Crete, beginning from the 3rd millennium BC, is extremely interesting as well as rich in shapes and decorative patterns, many of which would have been achieved through demanding procedures. It appears that the use of kilns on the island had been developed technologically through various experiments, which indicates the inhabitants' increased need

for pottery with a high level of aesthetic value, since most groups of pottery are characterised by complicated and aesthetically unique patterns.⁴

The scope of this paper includes the re-examination of all excavated kiln sites, the critical study of the existing bibliography, and the evaluation of the typological classification of Minoan kilns. Through the examination of the construction features of the kilns, the development of Minoan firing technology will be evaluated.

PREVIOUS RESEARCH ON MINOAN KILNS

The first publication regarding the Minoan ceramic kilns was by Kostis Davaras, who in 1973 tried to categorise them based on their shape (single chamber kilns without *eschara* and double chamber kilns with *eschara*).⁵

1 This paper is an updated synopsis of my Master Thesis submitted to the University of Crete in 2013 and written under the supervision of Prof. Katerina Kopaka, whom I sincerely thank for her advice and support. I also wish to thank Dr Eleni Nodarou for reading the paper and making valuable comments. The research presented in this paper is part of my PhD dissertation, which is being prepared at the University of Crete, entitled “*Γπνοποιών έργα: Ceramic technology viewed through the material record in the Bronze Age Aegean and the Eastern Mediterranean*”.

2 The chronological periods that are mentioned in the text follow the Aegean Prehistoric Archaeology webpage by Jeremy B. Rutter

(http://www.dartmouth.edu/~prehistory/aegean/?page_id=67, accessed: 10.12.2018): Final Neolithic (FN, 4500–3100 BC); Prepalatial period: Early Minoan–Middle Minoan IA (EM–MM IA, 3100–1900 BC); Protopalatial period: Middle Minoan IB–Middle Minoan IIB (MM IB–MM IIB, 1900–1720 BC); Neopalatial period: Middle Minoan III–Late Minoan IB (MM III–LM IB, 1720–1470 BC); Postpalatial period: Late Minoan II–Late Minoan IIIC (LM II–LM III, 1470–1050 BC).

3 RYE 1981, 16–28; RICE 1987, 31–124; NODAROU 2010, 63–71; CUOMO DI CAPRIO 2017.

4 BETANCOURT 2008, 13–32.

5 DAVARAS 1973, 75–80.

Since the 1980s, constant discoveries, both on the island of Crete and other Aegean sites, have led to several publications about kilns and workshop areas. Regarding Crete, in 1980 15 Minoan kilns from 11 sites had been published,⁶ whereas by 2016 these numbers increased to 51 and 26, respectively.⁷

Clelia Laviosa (1980) studied the kilns of Phaistos and Ayia Triada and claimed that the rounded kilns are probably an evolution of domestic ovens, whereas the kilns with channels (see below) were used for the firing of large *pthoi*.⁸ Nicoletta Momigliano (1986), discussing Davaras' typology, argued that additional criteria are required for determining a kiln's use, such as examining whether it is an above-ground construction overall or partly under the ground.⁹ She noticed that the discovery of artefacts in the area of firing is of significant importance for the characterisation of the use. Then, Martina Seifert (1993) described the basic methods of firing and suggested three main features for distinguishing a ceramic kiln: a) the size, b) the type of the stoking tunnel, and c) the form of the firing chamber. As far as the Minoan kilns are concerned, she reported that the nature of their use is impossible to determine by the shape of their firing chamber and suggested that some kilns were adequate for firing different kinds of vessels.¹⁰

In 2000, Doniert Evely reviewed the potting activity overall in his two-volume work *Minoan Crafts*. He recorded and reviewed all the published kilns and their properties, while he tried to discuss the nature of the function of pottery workshops.¹¹ In the same year, Andrea H. Streily worked on the evolution of pottery production through a more technological and economical approach.¹² She combined morphological criteria with their relevance to the functionality of a kiln. Her approach also included factors such as the thermal qualities of the combustion chamber. Her classification was based on the following criteria: a) the number of chambers, b) air supply and draught, c) the system of firing, d) the ground/outline plan of the chambers, e) the shape and construction of the combustion chamber, f) the top part of the firing chamber.

In 2002, Eleni Hasaki offered a complete typological classification for all types of kilns dated from

the Early Bronze Age to the Byzantine times.¹³ Her criteria are based on a) shape and b) supporting system of the perforated floor. She emphasised that these categories would most likely not correspond to the distinctions ancient potters might have made. In 2006, Philip Betancourt, based on Evely's typological distinction, discussed the rectangular kilns with a single combustion chamber divided into channels.¹⁴ Finally, in 2012, Francesco Tomasello re-examined the kiln of Ayia Triada and presented new technological and morphological features of the channel kiln.¹⁵ Later, he suggested that this type of kiln was an intermediate stage in the development of the Minoan technology of firing vessels.¹⁶

TYPOLGY

Based on the aforementioned studies,¹⁷ the Bronze Age ceramic kilns of Crete come under a conventional classification based on the form, the size, and the presence or not of the perforated floor.¹⁸ There are two main types of kilns.

Type 1 has a rounded shape, usually pear-shaped. Its dimensions range from almost 1 m up to more than 2 m (inner diameter) (Tab. 1). It is half-sunken in the ground, and it is differentiated in its inner part, influencing the place of vessels in the chamber. These features play a significant role in the way of firing and provide indirect information about the know-how of the kilns' construction. Type 1 is divided into 4 subtypes, *i.e.* kilns with a grate supported by: a) a central pillar or a similar construction, b) one or two long small walls, c) kilns without a grate, and d) kilns with an all-round inner bench for placing vessels.

Type 2 includes rectangular or horseshoe-shaped kilns, usually of significant size, with side dimensions from 2 m up to 9 m (Tab. 1). Their technological peculiarity is the presence of small walls under the firing chamber forming channels appearing usually in U-shape. Evidence of a grate has not been detected with certainty.¹⁹ The lack of constructions for the separation of the firing chamber from the combustion chamber indicates that it should be conventionally identified as a single-chamber kiln. Fifty one kilns from 20 sites

6 DAVARAS 1980, 115–127.

7 PAPPAS 2013, 23–64.

8 LEVI, LAVIOSA 1979–80, 7–42; LAVIOSA 1986, 199–204.

9 MOMIGLIANO 1986, 75–76.

10 SEIFERT 1993, 99–100.

11 EVELY 2000, 260–322.

12 STREILY 2000.

13 HASAKI 2002.

14 BETANCOURT 2011, 357–366.

15 TOMASELLO 2012, 127–199.

16 TOMASELLO 2016, 33–50.

17 CUOMO DI CAPRIO 1973; DAVARAS 1980; EVELY 2000; STREILY 2000; HASAKI 2002; PAPPAS 2013.

18 The typology of the kilns is based mainly on their structural features. The most recent classification has been proposed by Hasaki, who followed Cuomo di Caprio's original classification on typology. In this paper, the typological distinction by HASAKI (2002) will be followed, but emphasis will be given to the types and subtypes of kilns located in Bronze Age Crete.

19 The presence of a type of grate is referred to in the case of the kiln of Ayia Triada by LAVIOSA (1986) and TOMASELLO (2012).

Tab. 1 General dimensions of kilns.

DIMENSIONS OF KILNS*															
NO.	SITE	TYPE	SIZE	NO.	SITE	TYPE	SIZE	NO.	SITE	TYPE	SIZE	NO.	SITE	TYPE	SIZE
1	Kavousi	1a	2.13 × 1.88 m	10	Priniatikos Pyrgos	1b	1.00 m (diam.)	18	Mochlos (Artisan Quarter)	1c	1.00 m (diam.)	26	Kato Gouves	1	(?)
2	Mochlos (Chalinomouri)	1a	1.00 × 1.60 m	11	Phaistos (urban area to the west of the palace)	1b	2.50 m (diam.)	19	Mochlos (Artisan Quarter)	1d (?)	1.00 m (diam.)	27	Kato Gouves	1	(?)
3	Phaistos (Chalara Quarter)	1a	1.20 m (diam.)	12	Stylos	1b	2.30 m (diam.)	20	Achladia	1d	2.00 × 1.35 m	28	Kato Gouves	1	(?)
4	Kato Gouves	1a	0.70 m (diam.)	13	Kato Gouves	1b	1.15 m (diam.)	21	Palaikastro	1d	2.68 m (diam.)	29	Kato Gouves	1	(?)
5	Zominthos	1a	2.20 m (diam.)	14	Kato Gouves	1b	(?)	22	Khamalevri	1a (?)	2.50 × 4.00 m	30	Pigadia (Karpathos)	1	0.80 m (diam.)
6	Miletus	1a	0.90 m (diam.)	15	Kato Gouves	1b	(?)	23	Phaistos (east court)	1	2.80 m (?) (diam.)	31	Halasmenos	1a+2	3.30 × 2.80 m
7	Miletus	1a	0.90 m (diam.)	16	Miletus	1b	1.30 m (diam.)	24	Knossos (western quarter of the town)	1 (?)	1.20 m (diam.)				
8	Miletus	1a	0.90 - 1.10 m (diam.)	17	Pigadia (Karpathos)	1b	2.50 m (diam.)	25	Malia (Quarter Theta)	1	2.00 m (diam.)				
32	Knossos (near the house of monolithic pillars)	2	(?)	37	Knossos (near the house of monolithic pillars)	2	2.20 × 1.35 m	42	Knossos (western quarter of the town)	2	2.10 × 0.90 m (?)	57	Knossos (western quarter of the town)	2	2.94 × 1.30 m
33	Priniatikos Pyrgos	2	3.50 × 1.50 m	38	Kastelli	2 (?)	(?)	43	Kato Gouves	2	2.20 × 1.10 m	58	Miletus	2	3.30 × 3.20 m
34	Zakros	2	4.70 × 2.20 m	39	Miletus	2	(?) × 3.00 m	44	Haghia Triada	2	9.00 × 3.40 m	59	Malia (NE palace)	(?)	(?)
35	Sfaka Zakrou	2	4.40 × 1.30 m (?)	40	Kommos	2	5.40 × 3.40 m	45-55	Gournia	2 (?)	LM IA	60	Malia (NE palace)	(?)	(?)
36	Zou	2	2.30 × 1.70 m	41	Vathypetro	2	4.20 × (?)	56	Ialyso (Rhodes)	1b or 2	2.00 m (diam.)	61	Pigadia (Karpathos)	(?)	(?)

* In Type 1 kilns the diameter of the combustion chamber is referred to, whereas in Type 2 kilns the general dimensions.

** The use of (?) in the field of dimensions equals with the absence of relevant information in the kiln's publication.

Tab. 2 Kilns per site.

NO.	SITE	TYPE	PERIOD	NO.	SITE	TYPE	PERIOD	NO.	SITE	TYPE	PERIOD	NO.	SITE	TYPE	PERIOD
1	Kavousi	1a	LM IIIC	10	Priniatikos Pyrgos	1b	EM II-III	18	Mochlos (Artisan Quarter)	1c	LM IB	26	Kato Gouves	1	LM IIIB
2	Mochlos (Chalimouri)	1a	LM IB	11	Phaistos (urban area to the west of the palace)	1b	MM III - LM I	19	Mochlos (Artisan Quarter)	1d (?)	LM IB	27	Kato Gouves	1	LM IIIB
3	Phaistos (Chalara Quarter)	1a	LM II - LM III	12	Stylos	1b	LM IIIB	20	Achladia	1d	LM III	28	Kato Gouves	1	LM IIIB
4	Kato Gouves	1a	LM IIIB	13	Kato Gouves	1b	LM IIIB	21	Palaikastro	1d	LM IIIB	29	Kato Gouves	1	LM IIIB
5	Zominthos	1a	LM	14	Kato Gouves	1b	LM IIIB	22	Khamalevri	1a (?)	LM IIIC	30	Pigadia (Karpathos)	1	LH III
6	Miletus	1a	LH IIIA 1-2	15	Kato Gouves	1b	LM IIIB	23	Phaistos (east court)	1	MM III - LM I	31	Halasmenos	1a+2	LM IIIC
7	Miletus	1a	LH IIIA 1-2	16	Miletus	1b	LH IIIA 1-2	24	Knossos (western quarter of the town)	1 (?)	LM I - LM IB				
8	Miletus	1a	LH IIIA 1-2	17	Pigadia (Karpathos)	1b	LH III	25	Malia (Quarter Theta)	1	MM III - LM I				
32	Knossos (near the house of monolithic pillars)	2	LM II - LM III	37	Knossos (near the house of monolithic pillars)	2	LM II - LM III	42	Knossos (western quarter of the town)	2	LM I - LM IB	57	Knossos (western quarter of the town)	2	LM I - LM IB
33	Priniatikos Pyrgos	2	LM IA	38	Kastelli	2(?)	LM IIIA-B	43	Kato Gouves	2	LM IIIB	58	Miletus	2	LH IIIA 1-2
34	Zakros	2	MM III - LM IA	39	Miletus	2	LH IIIA 1-2	44	Haghia Triada	2	LM IA - LM IB	59	Malia (NE palace)	(?)	MM IIIA - B
35	Sfaka Zakrou	2	LM IA	40	Kommos	2	LM IA	45-55	Gournia	2(?)	LM IA	60	Malia (NE palace)	(?)	MM IIIA - B
36	Zou	2	MM III - LM IA	41	Vathypetro	2	LM IA - LM IB	56	Ialysos (Rhodes)	1b or 2	LH IIB - LH IIIA2	61	Pigadia (Karpathos)	(?)	LH III



Fig. 1 Map of Crete with the kiln sites.

in Crete as well as 10 kilns from three sites outside the island are recorded in this paper (Tab. 2; Fig. 1).

CHRONOLOGICAL DISTRIBUTION OF KILNS

No evidence of remains of Neolithic pottery firing structures have been detected so far on the island of Crete;²⁰ thus, the best indirect ‘witness’ of the firing technology are the vessels themselves.²¹ In the EM period (3100–1900 BC), apart from the kiln found in Priniatikos Pyrgos (Tab. 2, 10), no other kiln has been identified with certainty. The small kiln of Priniatikos Pyrgos is carved from a natural rock and belongs to Type 1b.²² The minimal quantity of pottery found inside dates to EM II–III, except for two sherds of MM I. In the stratum removed before its detection, *Vasilike* ware fragments were collected. Just south of the kiln, remains of a room of unknown usage were found. In its SW corner evidence of fire and EM pottery were detected, similar to the pottery from the kiln.²³

In MM Crete (1900–1720 BC), the population growth, which is attested by the development of new cities, the expansion of the old ones, but also

the establishment of the first palaces, marks a development at several levels (financial, social, political).²⁴ The new centres include complexes of buildings organised around a central courtyard. Parts of these complexes include areas characterised as workshops. In addition to the palaces, workshop facilities are also detected in the cases of big settlements. Unfortunately, the brutal destruction of the first palaces at the end of MM IIB and their rapid reconstruction in the MM III–LM I have left only a faint shadow of the kilns.

At Malia, a MM kiln (Tab. 2, 25) has been detected in a very bad state. It is outside Quarter Theta, and it probably worked in conjunction with the nearby workshops. Nevertheless, it is not yet clear that finds from this area — tentatively identified as the potter’s tools — are contemporaneous with the kiln.²⁵ Two other constructions in the NE part of the Malia Palace are characterised as kilns (Tab. 2, 59–60).²⁶ This argument is problematic and rather incorrect. Their position in an inner area is not functional, since the smoke during their use would cause suffocating atmosphere in the whole building.²⁷

The only known MM pottery workshop is in Quarter M;²⁸ however, it does not preserve remains

20 A FN–EM ceramic kiln on Gavdos island is mentioned in KOPAKA, THEOU 2015, 40.

21 VITELLI 1997, 21–40.

22 HAYDEN *et al.* 2006, 33–39; HAYDEN, TSIPOPOULOU 2012, 507–584.

23 An interesting experimental project about the reconstruction of the EM kiln from Priniatikos Pyrgos is presented by Jo Day and Maggie Kobik at the Irish Institute of Hellenic Studies at Athens

(http://www.iihsa.ie/IIHSA%20EXPARCH%20Workshop_programme4.pdf, accessed: 18.03.2018).

24 BRANIGAN 1987, 245–249; TREUIL *et al.* 1996, 219–224; SCHOEP 2006, 37–64; McENROE 2010.

25 DAUX 1961, 947; EVELY 2000, 312.

26 CHAPOUTHIER, DEMARGNE 1942, 16.

27 EVELY 2000, 315.

28 POURSAT 1996, 8–43.

of a kiln, and it does not provide enough information about the working conditions and the status of the potters.²⁹ According to the excavators, the organisation and the variety of the finds indicate a technology of significant level.³⁰ They also indirectly show a small number of craftsmen, since the vessels were found in limited working areas.

The existence of a sole example of a workshop cannot be considered as a safe guide for a discussion on the nature of MM workshops overall. Thus, only by studying the MM pottery can we indirectly collect data regarding the potters' work and the technological level of the firing process. A representative example is the Kamares ware, which demands excellent decoration skills, achievement of the colour variety, specialised knowledge, and a specific skill as far as its creation and the managing of the temperature is concerned. It is important to notice that the temperatures for firing the Kamares wares were very high (950°–1080°C),³¹ and the potter could achieve them only in certain kilns.³²

In the late MM period (1720–1650 BC), an extended reconstruction of the palaces took place. A wider flourishing of the whole island is evident, while each region was evolving at its own rate and developing special local characteristics. The administrative structure becomes more complicated with the presence of palace-like building complexes (villas) that maintain relations with the palaces. The identity of the owners of the villas and the status of these relationships have constituted one of the most popular and intriguing subjects among researchers until now.³³ During this period, the majority of kiln installations' remains are found inside the palaces, in the villas, and at the borders of large residential areas (Tab. 3a). In particular, the MM III–LM I period is represented by at least three kiln sites (Phaistos, Zakros, and Zou), whereas during the LM IA–LM IB period eight sites are recorded with plenty of information on the production activity and the potters' technical skills.

Despite the fact that the pottery of a kiln usually provides a *post quem* dating, the previous usage of the kilns is not excluded. Almost all palaces of the LM I period and many villas have at least one kiln (Zakros, Phaistos, Knossos, Ayia Triada, Zou, Vathypetro). During the same period, kilns belonging to Type 2 appear as well as all variants of Type 1. Type 2 is detected from the start of the LM period up to the end of the Late Bronze Age, but it might have also existed in the Old Palace Period. It is found in palaces, villas, settlements, and in organised working areas (Tab. 3a).

Tab. 3a. Kilns during MM III–LM IB (1720–1470 BC).

SITE/ SETTLEMENT	PERIOD	NUMBER OF KILN(S)	TYPE/ SUBTYPE
Zou/ Farmhouse	MM III - LM IA	1	2(;
Zakros/ Palatial Complex	MM III - LM IA	1	2
Phaistos/ Palatial settlement	MM III - LM I	1	1b
Phaistos/ Palatial Complex	MM IIB (F. Tomasello) MM III - LM I (N. Platon)	1	1
Priniatikos Pyrgos/ Harbour settlement	LM IA	1	2
Vathypetro/ Villa	LM IA - B	1	2
Knossos/ Palatial settlement	LM IA - B	3	2, 1
Haghia Triada/ Villa	LM IA	1	2
Kommos/ Harbour settlement	LM IA	1	2
Sfaka Zakrou/ Workshop	LM IA	1	2
Mochlos/ Artisans' Quarter	LM IA	2	1d, 1c
Chalinomouri/ Farmhouse	LM IB	1	1a

Tab. 3b. Kilns during LM II–LM IIIC (1470–1050 BC).

SITE/ SETTLEMENT	PERIOD	NUMBER OF KILN(S)	TYPE/ SUBTYPE
Kavousi/ Settlement	LM IIIC	1	1a
Achladia/ Farmhouse	LM III	1	1d
Phaistos - Chalara/ Settlement	LM II - III (?)	1	1a
Stylos/ Farmhouse?	LM IIIB (?)	1	1b
Chalasmenos/ Settlement	LM IIIC	1	1+2
Knossos/ Palatial Complex	LM II - LM III	2	2
Gouves/ Pottery workshop	LM III	9	1a, 1b, 1, 2
Kastelli/ Settlement	LM IIIA-B	1	2

29 PELON 1987, 270.

30 POURSAT 1996, 42–43.

31 NODAROU 2010, 90.

32 BETANCOURT 1985, 140–145; FABER *et al.* 2002, 130.

33 BETANCOURT, MARINATOS 1997, 91–98; REHAK, YOUNGER 1998, 104–106; THALER 2002, 112–122.

At the end of LM IB (1490–1470 BC), a succession of disasters of significant settlements on the island took place. Although some resettlements are indicated in some sites (Malia, Zakros), only in Knossos is a continued existence evident. Nevertheless, this existence is affected by the Mycenaean element from the end of LM II onwards.³⁴ This last period of the Bronze Age (1470–1050 BC) is quite interesting, since seven new sites with remains of kilns appear (Stylos, Kavousi, Kastelli, Halasmenos, Achladia, Khamalevri, Kato Gouves) (Tab. 3b). Notably, there is a great interest in Kato Gouves, for it is the only known organised pottery workshop on Crete that comprises a variety of ceramic kilns (Tab. 1, 4, 13–15, 26–29, 43).³⁵

In addition, during this period, there were exchanges and interactions between Crete and other sites, which are also reflected in the remains of kilns in sites outside Crete (*i.e.* Miletus, Ialysos). Worth mentioning is also the discovery of Mycenaean vessels in sites of Asia Minor, Syria and Palestine region, Cyprus and Egypt.³⁶ In particular, remains of Type 2 kilns are found in at least three new sites: in Miletus (Asia Minor), in Rhodes, and perhaps in Karpathos. They coexist in some cases with Type 1 kilns and present some constructional peculiarities. The author strongly believes that these peculiarities (see below) have a clear technological nature, and they are an indirect evidence of the potters' constant experimentations as far as the firing process is concerned.

Starting from the channel kiln in Miletus (Tab. 2, 58), according to the excavators, it is concluded that the heat flow from the stoking pit to the firing chamber was achieved through a circumferential channel, facilitating temperature control within the kiln.³⁷ The channels are differently situated compared to other kilns of the same type. In Ialysos (Rhodes), the kiln (Tab. 2, 56) has features from both Type 1 and Type 2. Its shape is approximately circular and corresponds to Type 1b.³⁸ The existence of three strong walls forming channel-shaped air ducts can be characterised as an influence both from the Minoan channel kilns and from the circular updraft kilns with two or more walls in the combustion chamber. In Pigadia (Karpathos) (Tab. 2, 30), the discovery of two buildings with a shared yard, in which is also located a circular kiln with two thin inner walls forming channel-shaped air ducts, also indicates a possible Minoan influence.³⁹ At the three aforementioned cases, no certain traces of a grate have been discovered.

These experiments are not found only in sites outside Crete. In the recent publication on the kiln discovered at Halasmenos settlement, Ierapetra, Crete,⁴⁰ a kiln with features of both types was presented. It is approximately circular and double chambered (Tab. 2, 31). Both the combustion and firing chamber are separated by a ceramic, perforated floor, and several channels formed air ducts ensuring heat diffusion underneath. The particular kiln dates back to the end of the Bronze Age (LM IIIC), and it is an example of a Type 1 kiln, implementing characteristics of Type 2 in its combustion chamber. The second, possibly similar, example could be the kiln at the Khamalevri settlement in Rethymno (LM IIIC) (Tab. 2, 22).⁴¹

It becomes apparent that at the end of the LM period, potters were experimenting with the firing process. That is apparent from various morphological peculiarities of the kilns (Miletus, Halasmenos, Ialysos, and the interior of the firing chamber, Kato Gouves), as well as from the co-existence of kilns either of both types or of the same type but of a different sub-type (Mochlos, Kato Gouves).

To sum up, in the case of Pre-palatial Crete (3000–1900 BC), the recording of just one kiln cannot offer enough evidence for the nature of the firing structures. In the Protopalatial period (1900–1720 BC), the information about pyrotechnology is derived from the vessels themselves, since no certain kiln has been found. The picture changes in the Neopalatial period, since 27 kilns from 14 sites (Tab. 2) have provided invaluable information about the firing process. In the second half of the 2nd millennium BC, the evolution of ceramic pyrotechnology continues to be interesting, since the identification of 17 kilns from seven sites on Crete and 10 kilns from three sites outside Crete create a broad field of research.

THE CHANNEL KILNS. A SPECIAL CASE?

The brief presentation of the studied sites sets out research questions on the nature and the function of all kilns, and also on their connection with the workshops. The biggest challenge of this research is to track the origin of the channel kiln (Type 2): was it a foreign technology or a result of local experimentation? In the cases of channel kilns, no secure remains of a grate have been discovered. Recently, Tomasello suggested that in the channel kilns there was a type of grate from

34 TREUIL *et al.* 1996, 560–561; REHAK, YOUNGER 1998, 149–150.

35 CHATZI-VALLIANOU 1997, 333–345.

36 TREUIL *et al.* 1996, 233–234; KANTA 1998, 33.

37 NIEMEIER 1997, 350.

38 MARKETOU 2004, 133–143.

39 ZERVAKI 2003, 55–69; 2006, 13–50.

40 RUPP, TSIPOPOULOU 2015, 559–575.

41 ANDREADAKI-VLAZAKI, PAPADOPOULOU 2005, 353–397.

mudbricks.⁴² This is an interesting theory that could be confirmed by the discovery of similar materials at sites with kilns of the same type, e.g. at Gournia.⁴³ If Tomasello's view proves to have been right, then the existence of a grate could have been an integral part of Type 2 kilns.

Doubtless, the argument for the existence or not of a grate in the channel kilns is of crucial importance in terms of technology. But another equally important matter is the clear separation of chambers, especially since the difference between firing chambers and combustion chambers is not clear. Sometimes it is hard to understand the way the areas are divided inside the channel kiln. Having a closer look at the LBA kilns of the Greek mainland we realise that these kilns have two or three or sometimes five walls which support the grate. These walls are always located in the combustion chamber and divide the space of the chamber into 'oblong' parts. Under certain heating conditions, I believe that these parts can operate as a kind of air ducts. This hypothesis can be tested only through an experimental project. If it proves to be correct, then we realise that there is a technological similarity between the Minoan channel kilns and the circular kilns with three or more walls from the Greek mainland. In my view, the presence of channels in the Minoan kilns actually defines a combustion chamber and separates it from the firing chamber, providing a kiln with three main areas: 1) the combustion chamber at the lowest level,⁴⁴ 2) the channel area acting as a part of the combustion chamber, and 3) the firing chamber. I suggest that the presence of channels as an intermediate 'stage' between the combustion and firing chamber reflects the constant worry of the potters to control the temperature in the chambers, and, as Tomasello underlines, the channels were actually a precursor of the grate.⁴⁵

The channel kilns cannot be securely considered neither as downdraft nor as updraft structures. Although no remains of kiln superstructures have ever been discovered at these sites, a fact that restricts the studies on their structure and performance, Betancourt's remark on the position and size of a chimney can be critical for a better understanding of its function. Betancourt, based on the remains of the Anagama kilns in Japan (1st millennium AD), concluded that the existence of a high, throat-like chimney, located at the narrow part of the kiln opposite to the lower combustion chamber, results in updraft conditions and facilitates

Tab. 4a. Dimensions of Type 2 kilns during MM III–LM IB.

KILN TYPE 2		
SITE	PERIOD	SIZE
Zakros	MM III – LM IA	4.70 × 2.20 m
Sfaka Zakrou	LM IA	4.40 × 1.30 m (?)
Kommos	LM IA	5.40 × 3.40 m
Haghia Triada	LM IA – LM IB	9.00 × 3.40 m
Vathypetro	MM III – LM IA	4.20 × (?) m

Tab. 4b. Dimensions of Type 2 kilns during LM II–LM IIIC.

KILN TYPE 2		
SITE	PERIOD	SIZE
Knossos	LM II – LM III	2.20 × 1.35 m
Kato Gouves	LM IIIB	2.20 × 1.10 m
Miletus	LH IIIA	3.30 × 3.20 m
Ialysos*	LH IIB – LH IIIA2	1.96 × 2.00 m

Tab. 4c. Sites with different type/subtype(s) of kilns.

SITE	PERIOD	NUMBER OF KILNS	TYPE AND SUBTYPE OF KILNS
Mochlos	LM IA	2	1c, 1d
Knossos	LM I – LM II	3	2,2,1
Kato Gouves	LM III	9	1a, 1b, 1, 2
Miletus	LH IIIA	7	1a, 1b, 2

hot gaseous mass transfer through the channels.⁴⁶ If the above assumption is correct, then these specific kilns could be capable of reaching very high temperatures.

Recently, Anno Hein, Noemi Muller, and Vasilis Kylikoglou have attempted to develop 3D kiln models based on the archaeological data, and they have calculated the temperature distribution by using computational fluid dynamics (CFD).⁴⁷ The kiln from Ialysos (Rhodes) (Tab. 2, 56) was their case study.

42 TOMASELLO 2012, 153.

43 WATROUS 2015, 12.

44 This chamber was operated both as a stoking pit and as a combustion chamber.

45 TOMASELLO 2016, 41.

46 BETANCOURT 2011, 362–363.

47 HEIN *et al.* 2017, 99–104.

The kiln is almost circular and its inner diameter is 2 m. The preserved height of its combustion chamber is 0.90 m. It has been dated by Toula Marketou to the LH IIB–LH IIIA2 period.⁴⁸ Although the data regarding the form of the superstructure as well as the position and the shape of the chimney were not adequate, they nevertheless are of great importance. At first, the researchers have observed that, in addition to the shape of the kiln, its construction materials play a significant role: a) to ensure the stability of the structure, b) to create a construction of low thermal conductivity, which is achieved through the coating made of mud or clay mortar. The choice of using stones inside the kilns is deliberate, since this is the only material able to withstand high temperatures.

The researchers who have decided a chimney was placed in the middle of the superstructure have observed that the temperature distribution inside the firing chamber was not homogeneous despite air current conditions. Maximum temperatures are quite different between the front and the back part of the fire chamber. The result of their research is quite interesting, since it confirms Betancourt's argument indirectly, in terms of the importance of the placement of the chimney inside the channel kilns, while it provides a field of experimental research related to the firing procedure. The choice of the Ialysos kiln is interesting because this specific structure is not a Type 1 distinct kiln (double chambered, with a grate), but rather it consists of walls that form a kind of air ducts/channels.

The question immediately arising is why Type 1 predominates instead of Type 2, but it is difficult to give a firm answer. Over the years, various theories have been proposed on this subject. Laviosa suggested they were used for the firing of big *pithoi*.⁴⁹ Hasaki continued this thought suggesting that channel kilns were used for firing large *pithoi* and *larnakes*, being in that way a part of the palatial economy, since these particular vessels were impossible to move safely; thus, their production was taking place near the place of their usage, namely the palatial complexes.⁵⁰ The publication of the kilns of Kommos (Tab. 2, 40) has shown that the channel kilns had been used for the firing of small vessels, not *pithoi*, since sherds of small vessels of different types were mainly found inside the kilns.⁵¹ This was also suggested in the first publication of wasters from the Ayia Triada channel kiln (Tab. 2, 44).⁵² However, in his reassessment of the Ayia Triada material, Puglisi suggested

that in the kiln both small and large vessels were fired at the same time, since only in that way could the consumption demands of the settlement be satisfied.⁵³

Nevertheless, if we examine the types of vessels that were fired inside channel kilns, we might be able to offer a possible explanation. Regarding that issue, the author suggests that the spacious firing chamber of this specific kiln enables the firing of various types of vessels, which are placed at an appropriate inner area according to the required firing temperatures. Probably, the Minoan potters took advantage of the fact that in these kilns it was impossible to achieve perfect temperatures in all parts of the firing chamber, because of its size, in order to fire a variety of vessels. Examining the size of the channel kilns (Tab. 4a–b), we realise that after LM IB they have smaller size, while in the same time they coexist not only with structures of the same type (Knossos) but also with structures of a different type (Kato Gouves, Miletus) (Tab. 4c). It seems that this change in the morphology of the kilns was directly related to the changing nature of pottery production, which was focused on more specific shapes and standardised decorative patterns, while it secured a faster and better firing process. Furthermore, smaller kilns were more easily controlled and repaired, and thus could be used more frequently.

Since the published archaeological material or the existing analyses have not yet produced a satisfying interpretation for the overall function of the channel kilns, it seems that only an experimental reconstruction and use of a large kiln with channels, inside of which firing of different types of vessels is carried out, might provide definite answers to various questions, such as the choice of specific types of structure, the types of fired vessels, and the exact temperature in the firing chamber.⁵⁴

The experimental kiln will be constructed in the shape of a horseshoe. It will be partially dug in the ground, and its overall dimensions will be 5 m (length) per 3.30 m (width) per 2.50 m (height),⁵⁵ following more or less the dimensions of the Kommos kiln. The kiln will consist of the stoking pit, while the combustion chamber will be divided into channels by three long walls. The kiln will be stone-built and lined internally with a thick layer of clay plaster. Its superstructure will be originally ellipsoidal, made of clay, soil, pottery sherds, and small stones. Its chimney will consist of parts of a large pithos put together with mud.

48 MARKETOU 2004, 13–143.

49 LAVIOSA 1986, 204.

50 HASAKI 2002, 209.

51 SHAW *et al.* 2001, 102–106.

52 BIELFORE *et al.* 2007, 621–653.

53 PUGLISI 2012, 199–269.

54 The experimental reconstruction and the firing process of a channel kiln are a significant part of the author's ongoing PhD research.

55 Together with the height of the chimney, the kiln's total height will reach 3.40 m.

The experimental project aims at recording the whole firing process, from the beginning until the end: the construction of a kiln, the attempt to fire vessels, the constant calculation of the temperature at different points of the kiln's interior during the firing process, as well as the observation and the recording of the imprecise parameters that may occur during the process.

THE CONTEXT OF MINOAN KILNS

It is interesting to examine the relationship between the ceramic process in total and the workshop area. The study of kiln sites, and in particular their spatial relation with a workshop area, can shed light on that subject.

Remains of 15 kilns dating to the New Palace period (MM III–LM IB) have been discovered on 12 Cretan sites (Tab. 5a).⁵⁶ The vast majority of them date to the LM I period. As far as their spatial planning is concerned, they are found in almost every palace complex (Zakros, Phaistos, Knossos), in four villas (Ayia Triada, Zou, Vathypetro, Chalinomouri), in three settlements (Kommos, Priniatikos Pyrgos, Phaistos), and in two organised workshops (Mochlos, Sfaka Zakros?). Typologically, they include both types (Tab. 3a). During the last period of the 2nd millennium (1470–1050 BC), 18 remains of kilns from nine different sites have been discovered (Tab. 5b), half of which are in the same locations. Five of them have been detected in settlements (Kavousi, Chalaria, Kastelli, Halasmenos, Khamalevri), two of them in villas (Achladia, Stylos?), nine of them in one workshop (Kato Gouves), and two of them inside the palace of Knossos.

The kilns are rarely related to a large amount of artefacts or constructions that attest to the existence of organised workshops on the site. They are all built outdoors, normally near the areas characterised as working spaces. Most of them have been found isolated, except from those in Kato Gouves (9 kilns), Knossos (3 kilns), and Mochlos (2 kilns).⁵⁷ Of them, only the Mochlos and Kato Gouves kilns are located within the limits of pottery workshops. Surprisingly, no kilns have been found in other areas where pottery workshops had been identified, e.g. Pitsidia and Quarter M in Malia.⁵⁸

Identifying an area as a pottery workshop proves to be difficult in most of the cases. The identification of some sites as pottery workshops has troubled many scholars. Some have set the criteria for the identification

Tab. 5a. Sites and kilns during MM III–LM IB.

SITE	PERIOD	NUMBER OF KILN(S)	SETTLEMENT
Zou	MM III – LM IA	1	Farmhouse
Zakros	MM III – LM IA	1	Palatial complex
Phaistos	MM III – LM I	1	Palatial settlement
Phaistos	MM III – LM I	1	Palatial complex
Priniatikos Pyrgos	LM IA	1	Harbour settlement
Vathypetro	LM IA - B	1	Villa
Knossos	LM IA - B	3	Palatial settlement
Haghia Triada	LM IA	1	Villa
Kommos	LM IA	1	Harbour settlement
Sfaka Zakrou	LM IA	1	Workshop (?)
Mochlos	LM IA	2	Workshop
Mochlos - Chalinomouri	LM IB	1	Farmhouse

Tab. 5b. Sites and kilns during LM II–LM IIIC.

SITE	PERIOD	NUMBER OF KILN(S)	SETTLEMENT
Kavousi	LM IIIC	1	Settlement
Achladia	LM III	1	Farmhouse
Phaistos - Chalaria	LM II – III (?)	1	Settlement
Stylos	LM IIIB (?)	1	Farmhouse
Halasmenos	LM IIIC	1	Settlement
Knossos	LM II – LM III	2	Palatial complex
Gouves	LM III	9	Workshop
Kastelli	LM IIIA–B	1	Settlement
Khamalevri	LM IIIC	1	Settlement

of one area as a pottery workshop,⁵⁹ while others have analysed the type of a workshop. In fact, they have concluded that the detection of different kinds of activities in the same area could mean the presence of various

56 The 11 kilns from Gournia are not included, since they have not been fully published.

57 We can also include the 11 unpublished kilns in Gournia.

58 CHATZI-VALLIANOU 1995, 1035–1058; POURSAT 1996, 43.

59 TOURNAVITOU 1988, 447–467; MICHAELIDIS 1993, 7–39; HASAKI 2002, 251–263; HASAKI 2011, 11–28.

craftsmen, but it could also imply the coexistence of craftsmen of different skills and 'faculties' inside the same working place.⁶⁰

A kiln structure demands special treatment before and after its use, daily or periodically. It needs to be cleaned, coated, and in some cases partly rebuilt. Thus, they tended to be constructed near workshops rather than near the natural sources of raw materials. On the other hand, the presence of raw materials at the site is a strong indication for the operation of a workshop, since, depending on the size of production, each workshop should have the necessary material stock, which can be detected through the archaeological research (excavation, lab analyses). What is more, one of the most common criteria for recognising workshop activity are the tools. In Crete, only a few known sites have provided a significant number of potters' tools. More likely to be found are the clay mats and wheels, which are conserved mainly due to the resistance of their construction material.⁶¹

In addition to the information provided by the existence of the aforementioned material remains, a workshop's identification and the study of its function should carefully look for evidence pointing to the existence of solid structures, such as benches, basins, and of course kilns. These structures are the only secure indications for the size and the nature of a workshop's production. In the author's view, one should be very careful when identifying a working area as a 'pottery workshop', especially in the cases where the aforementioned structures are absent. Thus, in many cases, due to poor preservation or absence of structures related to firing, what is left is the final product of the whole process, namely the vessels. These are often the only evidence of the ceramic process, which, however, only recounts part of the history of the pottery activity overall.

CONCLUDING REMARKS

This article offered an updated record of the Bronze Age (3100–1050 BC) Minoan kilns based on their typology but also on their distinct morphological features. Two types of Minoan kilns are evident. Type 1 includes rounded or pear-shaped kilns, usually sunken into the ground, with an inner diameter from 0.90 m to over 2.50 m. Four subtypes can be distinguished: one with a circumferential bench and three with a grate but different supports. Type 2 includes rectangular or horseshoe-shaped kilns, with side dimensions from 2 m

up to 9 m and small walls under the firing chamber forming U-shaped channels. Additionally, all types of Bronze Age kiln sites were presented (farmhouse, palatial complex, harbour or palatial settlement, organised workshop), thus indirectly shedding light on the relation between kiln structures and ceramic workshops. Particular importance was given to channel kilns, which were approached through a technological perspective based on their morphological characteristics: a) updraft kilns, b) kilns divided into three parts, c) kilns without secure evidence of a grate, d) kilns where different types of vessels were fired at the same time, e) kilns that coexisted with Type 1, f) kilns that provide evidence of experimentation by the potters. Furthermore, the parameters for the recognition of a space as a pottery workshop were briefly commented on. On that subject, the author suggests that the identification of a pottery workshop should depend on the presence of the following evidence: a) raw materials, b) tools, c) vessels, d) facilities, and e) solid structures.

To conclude, it is evident that the thorough study of the characteristics of the Minoan kilns, especially those that are dated to the 2nd millennium BC, reveals that this was a period of continuous technological evolution in the field of firing, which is clearly reflected both in the vessels produced and the kilns. Undisputable evidence about that evolution is the presence of both types of kilns in the same workshops. This not only enhances the above idea but also, at the same time, it indirectly introduces the idea of craft specialisation. Certainly, the level of specialisation would be different per region and would probably be affected by several factors. The specialisation of the Minoan potters could only be the result of their continuous experiments in various fields, including the construction of various types of kilns.

The discussion related to the nature of the pottery workshops in Minoan Crete will continue as long as new evidence and new facilities are discovered and published. Their study can provide important insights into socio-economic changes in Crete from the appearance of the first palaces to the fall of the Mycenaean world. The experimental construction and use of a Minoan channel kiln can be a crucial contribution towards a better understanding of Minoan pyrotechnology, because it will provide additional information about the use of raw materials, the degree of employment of human resources, and the difficulties of completing a multi-purpose process like the production of ceramic vessels.

60 PLATON 1993, 103–122.

61 EVELY 2000, 261–286.

BIBLIOGRAPHY

- Andreadaki-Vlazaki M., E. Papadopoulou (2005) The habitation at Khamalevri, Rethymnon, during the 12th century B. C., in: A. D'Agata, J. A. Moody (eds.), *Ariadne's Threads. Connections between Crete and the Greek Mainland in Late Minoan III (LM IIIA2 to LM IIIC): Proceedings of the International Workshop Held at Athens, Scuola Archeologica Italiana, 5–6 April 2003*, Tripodes 3, Athens, pp. 353–397.
- Betancourt P. P. (1985) *The History of the Minoan Pottery*, Princeton.
- Betancourt P. P. (2008) *The Bronze Age Begins: The Ceramics Revolution of Early Minoan I and the New Forms of Wealth That Transformed Prehistoric Society*, Philadelphia.
- Betancourt P. P. (2011) The Minoan channel kilns, in: *Pepragméná I' Diethnoús Kritologikou Synedriou, Chaniá, 1–8 Oktovriou 2006*, A1 (*Πεπραγμένα I' Διεθνούς Κρητολογικού Συνεδρίου, Χανιά, 1–8 Οκτωβρίου 2006*, τ. Α1), Chaniá, pp. 357–366.
- Betancourt P. P., N. Marinatos (1997) The Minoan villa, in: R. Hägg (ed.), *The Function of the Minoan Villa, Proceedings of the Eighth International Symposium at the Swedish Institute at Athens, 6–8 June 1992*, Acta Instituti Atheniensis Regni Sueciae, Series in 4°, 46, Stockholm, pp. 91–98.
- Bielfore C. M., P. M. Day, A. Hein, V. Kilikoglou, V. La Rosa, P. Mazzoleni, A. Pezzino (2007) Petrographic and chemical characterization of pottery production. The Late Minoan I kiln at Aghia Triada, Crete, *Archaeometry* 49, pp. 621–653.
- Branigan K. (1987) The economic role of the First Palaces, in: R. Hägg, N. Marinatos (eds.), *The Function of the Minoan Palaces, Proceedings of the Fourth International Symposium at the Swedish Institute in Athens, 10–16 June 1984*, Acta Instituti Atheniensis Regni Sueciae, Series in 4°, 35, Stockholm, pp. 245–49.
- Chapouthier F., P. Demargne (1942) *Fouilles exécutées á Mallia: troisième rapport. Exploration du palais bordures orientale et septentrionale (1927, 1928, 1931, 1932)*, ÉtCrét 6, Paris.
- Chatzi-Vallianou D. (1995) Minoiká kerameiká ergastíria. Mia ethnografikí proséngisi me néa dedoména (Μινωικά κεραμεικά εργαστήρια. Μια εθνογραφική προσέγγιση με νέα δεδομένα), in: *Proceedings of the 7th International Cretological Congress, Rethymnon 1991*, Rethymnon, pp. 1035–1058.
- Chatzi-Vallianou D. (1997) The potters' quarter in LM III Gouves, in: R. Laffineur, P. P. Betancourt (eds.), *TEXNH. Craftsmen, Craftswomen and Craftsmanship in the Aegean Bronze Age, Proceedings of the 6th International Aegean Conference, University of Liège 18–21 April 1996*, Aegaeum 16, Liège, pp. 333–345.
- Cuomo Di Caprio N. (1971–72) Proposta di classificazione delle fornaci per ceramica e laterizi nell'area italiana, dalla preistoria a tutta l'epoca romana, *Sibrium* 11, pp. 371–414.
- Cuomo Di Caprio N. (2017) *Ceramics in Archaeology: from Prehistoric to Medieval Times in Europe and the Mediterranean: Ancient Craftsmanship and Modern Laboratory Techniques*, Rome.
- Daux G. (1961) Mallia, *BCH* 85, pp. 940–953.
- Davaras K. (1973) Stýlos Chaníon (Στύλος Χανίων), *AE* 75, pp. 75–80.
- Davaras K. (1980) A Minoan pottery kiln at Palaikastro, *BSA* 75, pp. 115–27.
- Evely R. D. G. (2000) *Minoan Crafts: Tools and Techniques*, 2, SIMA 92, Göteborg.
- Faber E. W., V. Kilikoglou, P. M. Day, D. E. Wilson (2002) A Technological study of Middle Minoan polychrome pottery from Knossos, Crete, in: V. Kilikoglou, A. Hein, Y. Maniatis (eds.), *Modern Trends in Scientific Studies on Ancient Ceramics, Papers Presented at the 5th European Meeting on Ancient Ceramics, Athens 1999*, BAR International Series 1011, Oxford, pp. 129–141.
- Hasaki E. (2002) *Ceramic Kilns in Ancient Greece: Technology and Organization of Ceramic Workshops*, unpublished PhD thesis, University of Cincinnati.
- Hasaki E. (2011) Crafting spaces: Archaeological, ethnographic and ethnoarchaeological studies on spatial organization in pottery workshops in Greece and Tunisia, in: M. Lawal, J. Lund (eds.), *Pottery in the Archaeological Record: Greece and Beyond, Acts on the International Colloquium Held at the Danish and Canadian Institutes in Athens, 20–22 June 2008*, Gösta Enbom Monographs 1, Aarhus, pp. 12–24.
- Hayden J. B., M. Tsipopoulou (2012) The Priniatikos Pyrgos Project: Preliminary report on the rescue excavation of 2005–2006, *Hesperia* 81:4, pp. 507–584.
- Hayden J. B., Y. Basiakos, T. Kalpaxis, A. Sarris, M. Tsipopoulou (2006) Priniatikos Pyrgos. A primary harbor settlement and emporium in Eastern Crete, *Expedition* 48, pp. 33–39.
- Hein A., N. S. Muller, V. Kilikoglou (2017) In and out: CFD modelling of the temperature distribution inside an ancient updraft pottery kiln, in: G. Vavouranakis, M. Katsianis, Y. Papadatos, M. Moulou, P. Petridis (eds.), *Digital Pasts for the Present, Proceedings of the 2nd Conference on Computer Applications and Quantitative Methods in Archaeology, Athens, 20–21 December 2016*, Athens, pp. 99–104.

- Kanta A. (1998) Episkórisi ton schéseon metaxý Kritis, Aigaíou kai Engýs Anatólis stin Epochí tou Chalkoú (Episkópsihē ton schéseon metaxý Kríthē, Aigaíou kai Engýs Anatólēs stin Epochí tou Chalkoú), in: N. Stampilídīs, A. Karétsou (eds.), *Anatolikí Mesógeios, Kýpros, Dodekánisa, Kríti, 16os–6os ai. p.CH. (Anatolikí Mesógeios, Kýpros, Dodekánhssa, Kríthē, 16os–6os ai. p.X.)*, Irákleio, pp. 30–52.
- Koraka K., E. Theou (2015) Neolithiká apó ti Gávdo (Neolithiká apó ti Gaúdo), in: P. Karanastási, A. Tzinkounáki, CH. Tsigonáki (eds.), *Archaiologikó érgo Krítis 3. Praktiká tis 3is Synántisis, Réthymno, 5–8 Dekemvríou 2013 (Archaiologikó érgo Kríthē 3. Praktiká tis 3is Synántisis, Réthymno, 5–8 Dekemvríou 2013)*, Réthymno, pp. 31–47.
- La Rosa V., F. Tomasello, D. Puglisi, P. Militello (2012) La fornace da vasaio TM IB di Haghia Triada, *CretAnt* 12, pp. 127–287.
- Laviosa C. (1986) Sul forno minoico di Haghia Triada, in: *Pepragména E' Diethnoús Kritologikou Syne-driou, Ágios Nikólaos 29 Avgoustou–3 Septemvríou 1981*, A1 (*Pepragména E' Diethnoús Krithologikou Syne-driou, Ágios Nikólaos 29 Avgoustou–3 Septemvríou 1981*, A1), Irákleio, pp. 199–204.
- Levi D., C. Laviosa (1979–1980) Il forno minoico da vasaio di Haghia Triada, *ASAtene* LVII–LVIII, pp. 7–42.
- Marketou T. (2004) Mykinaikós keramikós klívanos ston proístorikó oikismó Ialysoú (Triánta, Ródos) (Mykinaikós keramikós klívanos ston proístorikó oikismó Ialysoú [Triánta, Ródos]), in: *Althellenische Technologie und Technik. Von der prähistorischen bis zur hellenistischen Zeit mit Schwerpunkt auf der prähistorischen Epoche, 21–23.03.2003*, Ohlstadt, pp. 133–143.
- McEnroe J. C. (2010) *Architecture of Minoan Crete. Constructing Identity in the Aegean Bronze Age*, Austin.
- Michaelidis P. (1993) Potters' workshops in Minoan Crete, *SMEA* 32, pp. 7–39.
- Momigliano N. (1986) Fornaci minoiche per ceramica, *RdA* 10, pp. 75–76.
- Niemeier W. D. (1997) The Mycenaean potter's quarter at Miletus, in: R. Laffineur, P. P. Betancourt (eds.), *TEXNH. Craftsmen, Craftswomen and Craftsmanship in the Aegean Bronze Age, Proceedings of the 6th International Aegean Conference, University of Liège, 18–21 April 1996*, Aegaeum 16, Liège, Austin, pp. 347–351.
- Nodarou E. (2010) Análysi archaías keramikís: Charaktirismós, proélefsi, technología (Análysi archaías keramikís: Charaktirismós, proélefsi, technología), in: I. Lyritzís, N. Zachariás (eds.), *Archaio-Yliká. Archaiologikés, archaiometrikés kai politismikés prosengíseis (Archaio-Yliká. Archaiologikés, archaiometrikés kai politismikés prosengíseis)*, Athína, pp. 63–102.
- Pappas I. (2013) *Chóroi óptisis kerameikís kai ópse-is tis téchnis tou kerameá stin Kríti tis Epochís tou Chalkoú (Xóroi óptisis kerameikís kai ópseis tis téchnis tou kerameá stin Kríthē tis Epochís tou Chalkoú)*, unpublished MA thesis, University of Crete, <https://elocus.lib.uoc.gr/dlib/4/9/3/metadata-dlib-1425368023-561302-15064.tkl>, accessed: 28.6.2013.
- Pelon O. (1987) Minoan Palaces and Workshops: New Data from Malia, in: R. Hägg, N. Marinatos (eds.), *The Function of the Minoan Palaces, Proceedings of the Fourth International Symposium at the Swedish Institute in Athens, 10–16 June 1984*, Acta Instituti Atheniensis Regni Sueciae, Series in 4°, 46, Stockholm, pp. 269–271.
- Platon L. (1993) Ateliers palatiaux minoens: une nouvelle image, *BCH* 117, pp. 103–122.
- Poursat J. C. (1996) *Fouilles exécutées á Malia. Le Quartier Mu II. Artisans minoens: les maisons-ateliers du Quartier Mu*, ÉtCrét 32, Paris.
- Puglisi D. (2012) La fornace da vasaio TM IB di Haghia Triada. Le ceramiche e il sistema di produzione, distribuzione e consumo, *CretAnt* 12, pp. 199–271.
- Rehak P., J. G. Younger (1998) Review of Aegean Prehistory VII: Neopalatial, Final Palatial, and Postpalatial Crete, *AJA* 102, pp. 91–173.
- Rice P. M. (1987) *Pottery Analysis: A Sourcebook*, Chicago.
- Rupp D. W., M. Tsiopoulou (2015) The hybrid pottery kiln at LM III C Halasmenos (Monastiraki-Ierapetra), in: P. Karanastási, A. Tzinkounáki, C. H. Tsigonáki (eds.), *Archaiologikó érgo Krítis 3. Praktiká tis 3is Synántisis, Réthymno, 5–8 Dekemvríou 2013 (Archaiologikó érgo Kríthē 3. Praktiká tis 3is Synántisis, Réthymno, 5–8 Dekemvríou 2013)*, Réthymno, pp. 559–575.
- Rye O. S. (1981) *Pottery Technology: Principles and Reconstruction*, Manuals on Archaeology 4, Washington D.C.
- Schoep I. (2006) Looking beyond the first palaces: elites and the Agency of power in EM III–MM II Crete, *AJA* 110:1, pp. 37–64.
- Seifert M. (1993) Pottery kilns in mainland Greece and on the Aegean islands, *RdA* 17, pp. 99–100.
- Shaw J. W., A. Van Moortel, P. M. Day, V. Kilikoglou (2001) *A LM IA Ceramic Kiln in South-Central Crete*, Hesperia Supplement 30, Athens.
- Streily A. H. (2000) *Bronzezeitliche töpferwerkstätten in der Ágäis und in Westanatolien*, unpublished PhD thesis, University of Mannheim.
- Thaler U. (2002) Open door policies? A spatial analysis of Neopalatial domestic architecture with special

- reference to the Minoan 'villa', in: G. Muskett, A. Koltsida, M. Georgiadis (eds.), *SOMA 2001, Symposium on Mediterranean Archaeology, Proceedings of the Fifth Annual Meeting of Postgraduate Researchers, University of Liverpool, 23–25 February 2001*, Oxford, pp. 112–122.
- Tomasello F. (2012) La fornace da vasaio TM IB di Haghia Triada. *L'impianto CretAnt* 12, pp. 127–287.
- Tomasello F. (2016) Alcune fornaci della Messara (Creta), in: N. Cucuzza, B. M. Giannattasio, S. Pallecchi (eds.), *Archeologia delle produzioni ceramiche nel mondo antico. Spazi, prodotti, strumenti e tecniche. Atti del convegno, Genova, 1–2 dicembre 2014*, Genova, pp. 33–50.
- Tournavitou I. (1988) Towards an identification of a workshop space, in: F. B. French, K. A. Wardle (eds.), *Problems in Greek Prehistory, Papers Presented at the Centenary Conference of the British School of Archaeology at Athens, Manchester, April 1986*, Bristol, pp. 447–467.
- Treuil R., P. Darcque, J. C. Poursat, J. Touchais (1996) *Oi politismoí tou Aigaiou katá ti Neolithikí kai tin epochí tou Chalkou (Oi politismoí tou Aigaiou katá ti Neolithikí kai tin epochí tou Chalkou)*, Athína.
- Vitelli K. A. (1997) Inferring firing procedures from sherds: Early Greek kilns, in: W. D. Kingery, P. M. Rice (eds.), *The Prehistory and History of Ceramic Kiln, Proceedings of the 98th Annual Meeting of the American Ceramic Society in Indianapolis, 14–17 April 1996*, Westerville, pp. 21–40.
- Watrous V. L. (2015) Gournia 2015: Progress toward publication, *KENTRO. The Newsletter of the INSTAP Study Center for East Crete* 18, pp. 12–13.
- Zervaki F. (2003) I enkatástasi sta Pigádia Karpáthou katá tin 'Ysteri epochí tou Chalkou: Mia próti proséγγisi (H εγκατάσταση στα Πηγάδια Καρπάθου κατά την Ύστερη εποχή του Χαλκού: Μια πρώτη προσέγγιση), *Karpathiaká (Καρπαθιακά) A*, pp. 55–69.
- Zervaki F. (2006) I Kárpathos katá ti Neolithikí período kai tin epochí tou Chalkou, méssa apó ta ekthémata tou Mouseíou Karpáthou (H Kárpathos katá ti Neolithikí período kai tin epochí tou Chalkou, méssa apó ta ekthémata tou Mouseíou Karpáthou), *Karpathiaká (Καρπαθιακά) B*, pp. 13–50.

THE KITCHEN OF THE PALACE
AND THE COOKING AREAS OF THE HOUSES
IN A MINOAN NEOPALATIAL TOWN
THE EXAMPLE OF KATO ZAKROS¹



ABSTRACT: This paper examines Minoan food preparation areas belonging to the last phase of the Neopalatial period, Late Minoan (LM) IB. The settlement of Zakros is used as a case study, and some selected cases of food preparation areas from it are presented. The most basic criteria for recognising food preparation areas are defined. Reference is made both to the Palace and the houses of the town. The Palace, on the one hand, is the only building where a real kitchen can be identified. This indicates the importance of food preparation and consumption for the palatial complex. On the other hand, evidence from the houses can help recognising variations of cooking areas in them, as well as connecting the use of those areas with some landmarks in the evolution of the town and with the groups of people that shared the space of these houses. This can be the basis for establishing correlations with LM IB finds related to food from other sites as a part of the effort for explaining the history of this period.

KEYWORDS: Minoan settlements; Neopalatial period; East Crete; Kato Zakros; Cooking; Dining; Food preparation and consumption equipment; Food preparation and consumption areas; Palatial architecture; Domestic spaces; Neopalatial communities.

INTRODUCTION

Food preparation areas are generally thought to be difficult to identify in Neopalatial buildings.² However, several cases of areas characterised as kitchens by their excavators can be listed — in buildings at sites like Chania-Kastelli, Vrysses Kydonias, Zominthos, Sklavokampos, Poros, Amnissos, Prassa, Vathypetro, Kommos, Pitsidia, Galatas, Kastelli Pediados, Mallia, Pseira, Mochlos,

Papadiokampos, Petras, Zou, Achladia, Palaikastro, and Chryssi.³ Different types of cooking equipment (consisting mainly of tripod cooking pots, tripod trays and trays without feet,⁴ spit supports,⁵ clay grills,⁶ ‘baking plates’/‘cooking dishes’/‘*plathanoi*’⁷) are the most common kind of findings that can indicate an area associated with food preparation. Such an interpretation

1 I would like to deeply thank my professor, Dr Lefteris Platon, the University of Athens, and all the members of the Zakros team, especially the conservator Kostis Nikakis. This paper was completed with funding from the programme for PhD scholarships in Greece provided by the State Scholarships Foundation (IKY) and the National Bank of Greece (2014–2015). I would also like to thank Paul Barford for the language proofreading and — last but not least — the organisers of the Aegean Symposium in Warsaw.

2 HAZZIDAKIS 1934, 58; GRAHAM 1987, 215; REHAK, YOUNGER 1998, 107; BROGAN, BARNARD 2011, 186.

3 See BIRTACHA *et al.* 2008, 358 (with references for Chania Kastelli, Vrysses Kydonias, Sklavokampos, Prassa, Vathypetro, Kommos, Galatas, Pseira, Zou, Achladia). See also DESHAYES, DESSENE 1959, 12–13, 25 (Mallia, Maison Zβ), 106 (Mallia, Maison E); SACKETT *et al.* 1965, 264–268 (Palaikastro, House N); VAN EFFENTERRE, VAN EFFENTERRE 1969, 94, 96–98 (Mallia, Quartier Λ); RETHEMIOTAKIS 1992–1993, 40, 41–48, 53–60

(Kastelli Pediados); SCHÄFFER 1992, 144 (Amnissos); ANDREADAKI-VLASAKI 2002, 160–162 (Chania); SAKELLARAKIS, PANAGIOTOPOULOS 2006, 125–131 (Zominthos); TSIPOPOULOU, DIERCKX 2006 (Petras, House I.1); APOSTOLAKOU *et al.* 2010, 147–148 (Chryssi island); BANOU 2011, 503–505 (Poros); BROGAN, BARNARD 2011 (Mochlos); CHATZI-VALLIANOU 2011, 346, 348, 350, 354, 362–367 (Pitsidia); MAVROUDI 2011, 123–124 (Petras, House II.1); TSIPOPOULOU, ALBERTI 2011, 465–466, 482–492; GOMREE *et al.* 2012, 90–92 (Mallia, Πα); SOFIANOY, BROGAN 2012 (Papadiokampos).

4 BETANCOURT 1980; MARTLEW 1988; ISAAKIDOU 2007; TSIPOPOULOU, ALBERTI 2011.

5 SCHEFFER 1984; TSIPOPOULOU, ALBERTI 2011.

6 For example HEMINGWAY *et al.* 2011, 526–527.

7 BETANCOURT 1980; MOOK 1999; GERONTAKOU 2000; BARNARD *et al.* 2003, 82–84.

becomes stronger when hearths,⁸ burnt soil, ecofacts, and stone tools are present.⁹ The shape and construction of the vessels, traces on them, and modern experiments can help us understand their use:¹⁰ tripod vessels and grills were put over an open fire or charcoal for cooking (and then the food was transferred in tripod pots or trays without feet), while spit supports consisted of two parts, the fire being between them. The constructions usually called ‘baking plates’ or ‘cooking dishes’ could be interpreted as immovable clay hearths placed inside the floor. The term used by the Zakros publication team for this type of construction is *plathanos*.¹¹

The Neopalatial town of Zakros, consisting of a palace and more than thirty houses excavated so far, can add crucial information for the study of the use of food in Neopalatial communities. The first results of the excavations¹² offered clear evidence about the role of Zakros as a major Minoan port and about the influence of Knossos that had led to the establishment of the palace at the site. They also presented a good general outline of the town arrangement. After the excavations were completed, the exhaustive — and still on-going — study of the material has now made it possible to look much deeper at specific aspects of life in the ancient town. Food consumption is one of the most important.

In the houses, it seems very probable that meals would have been taking place in some of the largest rooms, appropriate for the concentration of the inhabitants and visitors. According to their architectural form, these rooms can be divided into types, the most common of which are rooms with a central column and rooms with pier-and-door partitions.¹³ However, the interpretation of remnants of food consumption activities in these rooms is often not very clear because other functions took place in them — for example, the same room could be a social activities area, a working area, a place for keeping household utensils, and even a bedroom. Moreover, food consumption would also have taken place in upper floor areas, which are destroyed. So, any examination of data related to food has to start not from food consumption but from food preparation areas. The latter should be easier

to identify by the presence of features like hearths, ash/charcoal, and animal bones.

The Kitchen Complex of the Palace (which will be described below) is the only real kitchen in the town, because of the multiple functions that the rooms serving as kitchens in the other townhouses used to have. This phenomenon is generally attested in Neopalatial settlements, where real kitchens are found only in palatial buildings, like Galatas and Aghia Triada.¹⁴ Therefore, a division between the ‘kitchen’ (food preparation area of the Palace) and the ‘cooking areas’ (food preparation areas of the smaller houses) is adopted in this paper. However, the Kitchen of the Palace provides the basic criteria for recognising cooking areas in the houses as well. The main difference is that in the food preparation areas of the houses some of these criteria may be absent, while criteria for defining other, coexisting functions (except food preparation), can be found.

The criteria for recognising food preparation areas, provided by the Kitchen of the Palace, can be briefly listed as follows:

- hearths, which are usually constructed in a corner or next to a wall, so that the fire is more easily controlled and the temperature higher;
- other fixed elements, like enclosures or benches;
- doors or windows for ventilation;
- concentrations of animal bones;¹⁵
- small-scale storage of commodities (like olive oil or flour, as indicated by the presence of amphoras, jars, medium size *pithoi*) and storage of equipment (mainly stone tools — and probably also wooden equipment, which has not survived);
- easy access to areas where the food was consumed;
- and the ability to easily provide food to a large number of people (perhaps visitors or personnel members) by having access to a large room or an external area.

THE PALACE

Room XXXII of the Palace was identified by the excavator Nikolaos Platon as a Kitchen.¹⁶ It is a large hall

8 About Late Minoan hearths, see MUHLY 1984; KOPAKA 1989; SHAW 1990.

9 BROGAN, BARNARD 2011.

10 MORRISON *et al.* 2015.

11 Eleni Gerontakou, on the basis of such vessels from Zakros where most of the fragments were preserved and could be completely restored, was the first to support the idea that these constructions were fixed hearths (GERONTAKOU 2000). It should be noted here, however, that replicas, like the one exhibited in the Siteia Museum, have a much thicker bottom than the actual vessels. The very thin bottom is a crucial point for considering these constructions as impossible to move without being destroyed. This hypothesis

is now being tested by the Zakros team through experimental archaeology methods. Our results will be presented soon.

12 PLATON N. 1971A; 1974.

13 For these architectural elements, see DRIESSEN 1982; MIHAILIDOU 1987; HITCHCOCK 2011. Yet, in the Zakros houses, the rooms with pier-and-door partitions do not form ‘Minoan halls’ and are of a provincial character; *cf.* PLATON L. 2000.

14 WATROUS 1984, 124; RETHEMIOTAKIS 1999.

15 Remains of goats, sheep, pigs, and bovines are common in the Zakros material. Seashells are also present, but we have not many fish bones (flotation was unfortunately not used at the time of the excavation).

16 PLATON N. 1964, 152–153; 1971A, 204.



Fig. 1 Palace, Rooms LI-L, from the south, with the area of the hearth marked in red (PLATON N. 1974, Fig. 110).

(c. 9 × 12 m) with six pillar bases. A hearth with a tripod cooking pot was preserved in the north-eastern corner of the room, and a stone enclosure, with bones found in it,¹⁷ was constructed against the eastern wall. A tall bench (or a base for a cupboard) lies next to the southern wall. Next to the hearth, a door leads to an open area — maybe a garden — to the north. The excavator hypothesised that the personnel of the palace would eat their meals inside the Kitchen because of its big dimensions.¹⁸ Extending his hypothesis, it could be suggested that food rations were given to individuals, as payment, in the same area.

There are three other small rooms which communicate only with Kitchen XXXII. To the west, there is the storeroom XXXIII. To the east, there are two rooms called ‘The Subsidiary Rooms of the Kitchen’ (Figs. 1, 4).¹⁹ The first one, room LI, had a hearth in its south-eastern corner. In this room, cooking pots, parts of clay grills, medium size storage vessels, some miniature vessels, the head of an animal figurine, and stone

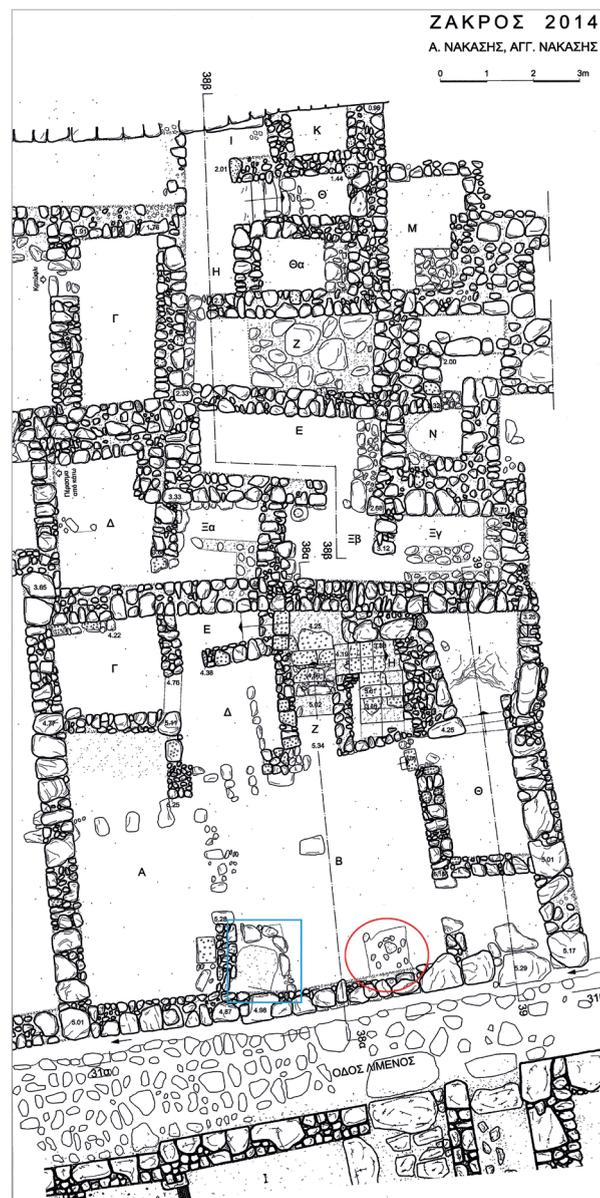


Fig. 2 Polythyron House, the hearth (red) and enclosure (blue) in room B of the lower terrace (plan by Athanasios and Agelos Nakassis).

tools were found. In the second one (room L), among its finds were cooking pots, a clay grill, medium and small size vessels, and a concentration of animal bones next to the north wall.

The food that was cooked in the Kitchen and its subsidiary rooms could be easily transferred, via corridors, to the areas where banquets may have taken place: the large halls with pier-and-door partitions in the West²⁰ and East Wing, the Central and North-eastern

17 According to the excavator, bird bones may have been included, but the zooarchaeological study has not yet been completed.

18 PLATON N. 1971A, 208.

19 PLATON N. 1965, 194–195; 1971A, 204–206.

20 PLATON N. 1971A, 170–173.

Court and, via a staircase, to the upper floor, where a Banquet Hall with six columns probably existed above the Kitchen with the six pillars.²¹

THE TOWN HOUSES

Some selected examples of houses in the settlement of Zakros will be briefly presented in order to approach three basic research questions:

- How can cooking areas be recognised in the houses, since all rooms had multiple functions?
- Why did the function of some cooking areas change through time?
- For whom was the food, cooked in the different buildings, prepared?

RECOGNISING COOKING AREAS

The *Polythyron* House (Fig. 2), on the north side of the Harbour Road, was built on two terraces. The lower terrace part²² is of an almost rectangular shape and has a fore hall, a big room with a central column (room B, in the centre of the house), another room with pier-and-door partitions (room A) just next to room B, two clusters of smaller rooms, and a staircase leading to the upper floor and also providing a connection with the upper terrace. Next to the south wall of room B, a hearth was found and — next to it — a stone enclosure, constructed in the south-western corner of the room.

It seems that, in this case, the central room (the room with the column) was itself functioning as a cooking area. The architectural arrangement (the presence of a room with pier-and-door partitions on its northern and eastern walls) was probably an attempt to imitate the palatial architecture.²³ Maybe some of the more ‘formal’ functions were transferred into this room, instead of the room with the column.

The Strong Building²⁴ lies opposite the main entrance of the Palace. However, its architecture is slightly irregular (the excavator thought that it was an annex of the palace). Room A (Fig. 3),²⁵ on the west side of the house, is a small room that can be interpreted as a cooking area also used as a pantry. In the north-eastern corner of the room, a built construction was recognised by the excavator as a hearth. Next to it, a large

stone with flat top could have been used as a table.²⁶ At the time of the destruction, an inverted basin, an amphora, and a jug were placed inside the built construction. Another basin was found on the floor. Although the use of the construction as a hearth is not totally clear (it may be an enclosure), because of the presence of burnt soil, animal bones, and fragments of clay hearths (*plathanoi*) there, cooking was seemingly taking place in the room.

Two similar clay hearths (*plathanoi*) were constructed in the nearby House of the Pottery Deposits in the small room A (actually a fore hall, so that the air would be refreshed via the entrance of the house).²⁷ The central chamber of this house (B) is a room with a column. Many grinding tools were found in it.²⁸ Rooms with grinding tools, usually characterised as workshops,²⁹ seem to have been involved in flour production and, consequently, linked with the preparation of bread and food. Sometimes, concentrations of grinding tools are found in central rooms, like room B, but they are also common in small rooms or pantries, like room Λ of the same house, room Φ of the nearby House H, and room E VI of the Oblique building (Fig. 4).³⁰



Fig. 3 Strong Building, room A, from the west, with the built construction marked in yellow (Zakros archive).

21 PLATON N. 1971A, 208; The existence of banquet halls on the upper floors of Minoan palaces had originally been proposed by Graham (GRAHAM 1987, 125–128).

22 PLATON N. 1976, 432–438; 1978, 279–282; 1979, 295–299.

23 For palatial architectural influences on the houses of Zakros, see PLATON L. 2000.

24 PLATON L. 2011A, 158.

25 PLATON N. 1971B, 245–246.

26 Papadiokampos (e.g. Room 8 of House A.1) provides very good parallels: SOFIANOU, BROGAN 2009; SOFIANOU, BROGAN 2010, 134–135.

27 GERONTAKOU 2000, 213–214.

28 PLATON N. 1969, 219–221.

29 PLATON L. 1988, 242–258.

30 PLATON N. 1969, 227; 1971B, 253–254, 262–263.



Fig. 4 North Wing of the Palace and part of the town: a. Palace, room XXXII; b. Palace, room LI; c. Palace, room L; d. Palace, area LV; e. Strong Building, room A; f. Strong Building, room ΓΥ; g. House of the Pottery Deposits, room B; h. House of the Pottery Deposits, room Λ; i. House H, room Φ; j. Oblique Building, room E VI.

AREAS THAT STOPPED BEING USED FOR FOOD PREPARATION OR BECAME FOOD PREPARATION AREAS AT A LATER STAGE

In the Palace and some houses that had two floors preserved, it has been recognised that there were two periods of destruction, the second of those being the final destruction of the Neopalatial settlement. These two destruction events were close to each other in time, since the pottery of both floors is dated to late LM IB.³¹ The short period between the two events (maybe a few years or even months) was a difficult time of crisis during which the population of Zakros was trying to repair the damaged buildings. This is perfectly shown in the Palace, where large bronze saws were found on the floor of the Ceremonies Hall

(one of the most luxurious areas of the palace), probably for cutting wood. A half-sawn marble block was found in another room, while thin walls were added at several spots as additional support for the upper floor. Thus, the Palace (and other buildings as well) were obviously under reconstruction, so it is very probable that the function of some areas had changed at this stage, before the second (final) destruction.

For example, in the North Wing of the Palace, the former staircase LV was out of use, and a hearth was constructed in it.³² So, the narrow area LV was used at the final phase as a storeroom for vessels, especially cups, as well as a cooking place, along with Kitchen XXXII (and rooms LI-L). Two more hearths, probably in use at the latest phase, were found in open areas to the north of the Palace.³³

31 PLATON L. 2011B; 2011C.

32 PLATON N. 1965, 197; 1971A, 209.

33 PLATON N. 1967, 171; 1972, 188.

Some architectural changes (like the construction of additional walls, blocking of doorways, filling of ground rooms) are obvious in most of the houses, although it is not always certain whether all these belong to the last period of the crisis.

Two of the three entrances on the eastern side of the Strong Building were found blocked.³⁴ On the southern side of the same house, a new wall was constructed some metres to the north of the original south wall, reducing the size of the building on this side. As a result, some rooms went out of use or became smaller.³⁵ One of the chambers that became disused was room Γγ. Among its finds were many conical cups but also grinding tools and animal bones. It is, therefore, possible that this auxiliary room had maybe been used for food preparation, rather than storage.

House Δα of the *Agios Antonios* Sector³⁶ had two central rooms (V and X, Figs. 5a, 5b). The house had several transformations in the final phase: room X was originally a large room (parts of older walls were found at a lower level) with a central column and a pier-and-door partition at its western side; in the final phase, a zigzag wall was constructed just west of the column, thus creating a new space (area VII). Moreover, in the same phase, doorways were blocked and additional walls (especially in the small rooms of the western side of the house) were constructed. At the time before the final destruction, tripod cooking pots were used both in the spacious room V (which also contained a large stone mortar) and in the small rooms II and IV (a large dish and part of a clay grill were also found there).

Another transformation, attested in House B of the *Agios Antonios* Sector, is the blocking of a pier-and-door partition in room I. After the blocking, this room probably served as a cooking area, since a clay hearth was added as a permanent feature.³⁷

Similar transformations were common in buildings of the LM IB period. After such transformations, industrial or food preparation activities were added in the areas that were now created or modified. Such processes are seen in, for example, the Vathypetro and Amnissos 'villas', House II.1 at Petras, some Mochlos island houses (in those cases their pantries are late additions), and Kommos Building T.³⁸

The reasons for these transformations are not yet fully understood. They may be the result of a general

historical situation during the LM IB period in Crete, or they may be connected to the history of the specific buildings and the groups that were occupying them.

WHO WERE THE PEOPLE THAT CONSUMED THE FOOD PREPARED IN THE DIFFERENT BUILDINGS?

First of all, we do not know whether the food was prepared, in some cases, by professionals and whether they were men or women.³⁹ Without written sources, we may never be able to understand the kind of relations between the people eating together, the different groups that would take part in different kinds of meals (in the houses and in the Palace), or the composition of these groups and the different rights of attending the various dining areas of the Palace. We know from ancient Greek authors that meals were important for the citizens of all city-states, especially the Cretans who had some very characteristic institutions (*andreia* and *prytaneia*). Several researchers during the last twenty years or so (using also ideas from ethnographic studies) have emphasised the use of the social role of eating and drinking in Minoan societies as a way of political control.⁴⁰ However, politically-oriented meals (which are partly hypothetical, due to the absence of written sources and iconographic representations) would have been only a small part of all the different kinds of meals (for example meals where friends, neighbours, people with a similar 'profession', hunters or fishers or shepherds, relatives, people of the same age, members of religious or cultural or athletic groups, *etc.* might participate), all of which are of equal interest for a researcher.

The situation becomes much more complicated when dealing with the settlement as a functioning entity. Some kinds of meals could have been organised in the houses for the same or similar reasons as those organised in the Palace, while some others could have been taking place only in the houses. Some of the people living in the houses could have been daily eating in the Palace or obtaining food for themselves and maybe also for their families from it. A lot of meals would probably be taking place in working areas (in the settlement or outside it). The consumption of products like wine, meat, olive oil, grain, and flour has to be examined together with the economic mechanisms

34 PLATON N. 1968, 158.

35 PLATON N. 1971B, 246.

36 PLATON N. 1984, 421–432; 1985, 248–256; 1986, 263–278.

37 PLATON L. 2011A, 155–157.

38 SCHÄFFER 1992, 144; DRIESSEN, SAKELLARAKIS 1997, 67–6, 74–77; RUTTER 2004, 67–72; BROGAN, BARNARD 2011, 192–194; TSIPOPOULOU, ALBERTI 2011, 465–466.

39 In Linear B documents, men related to the preparation of bread are referred to as *a-to-po-qo/artopogwoi* (VENTRIS, CHADWICK 1973, 130, 535). It is possible that servants existed in Minoan society; see BROGAN, BARNARD 2011, 197–198.

40 *E.g.* HAMILAKIS 1999; BORGNA 2004; GIRELLA 2007.

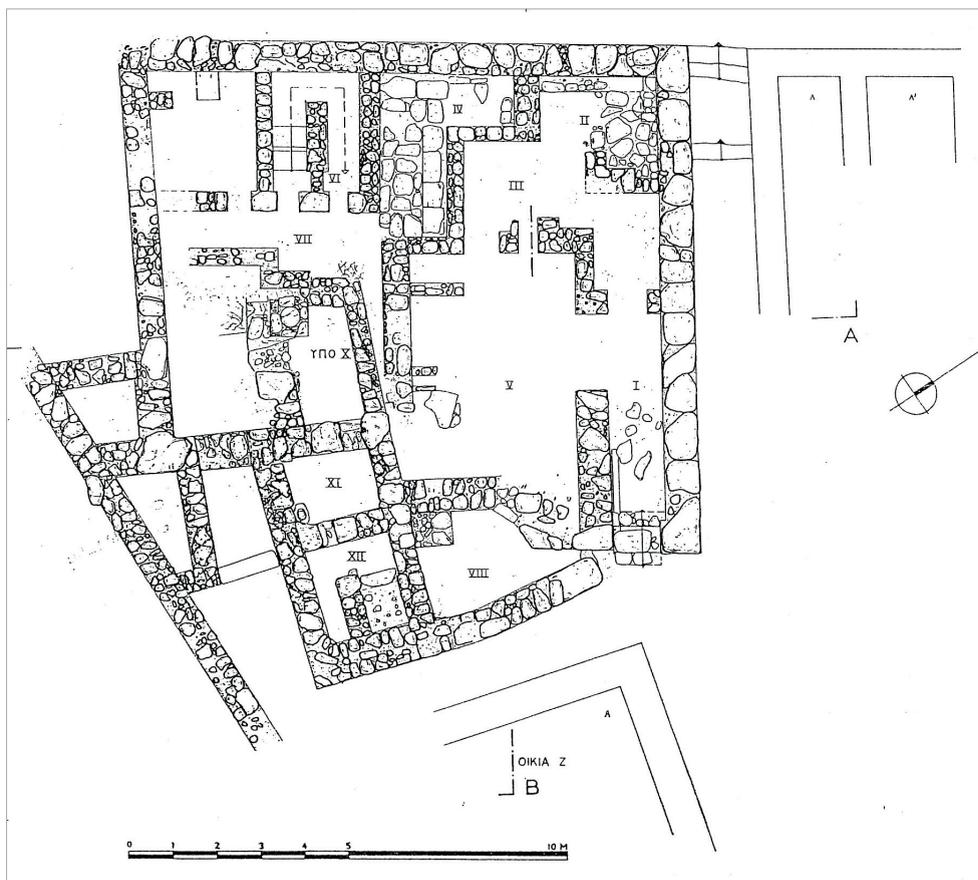


Fig. 5a. A plan of House Δα (PLATON N. 1986, Fig. 3).



Fig. 5b. House Δα, with rooms V (red) and X (green) marked, photo from the northwest (Zakros archive).

that linked the families to each other, the families with the Palace, and the settlement with several other towns and villages.

CONCLUSIONS

The case of Zakros seems to confirm that there are mainly two kinds of food preparation areas in Neopalatial houses: 1) central rooms, 2) smaller rooms in industrial and storage sectors.⁴¹ Rooms of these two types exist not only in the houses referred to in this paper but in all Zakros houses. However, it should not be forgotten that all rooms probably had more than one function.

This agrees with what is found at other sites.⁴² The 'villas' of Pitsidia, Sklavokampos, and Zominthos, as well as several houses in Kommos (North House, House with the Press), Prassa, Mallia (Houses Ζβ, Ε, Πα, Α-Maison 'de la façade à redans'), Mochlos (Houses Β.2, C.1, C.2, C.3, C.7, C.5 on the island, Artisans' Quarter), Papadiokampos (Houses Α.1, Β.1), and Palaikastro (House Ν) are good examples. Moreover, the kitchen

of the Zakros Palace finds parallels in other palatial buildings (Galatas Palace and *Villa Reale* of Aghia Triada). It should be stressed that only a few things are known about the upper floors⁴³ and food preparation and consumption in them. In the Cycladic settlement of Akrotiri,⁴⁴ a private sector and a semi-private sector (for the communication with the outside world) can be recognised; a third sector, covering the needs for storage and food production, is linked with the private sector. The occasional Cretan evidence of food preparation activities on upper floors (e.g. from Palaikastro and Pseira⁴⁵) may indicate a similar pattern.

LM IB is a period with many architectural transformations that probably reflect a society where new institutions were introduced and maybe were not always accepted. The end of the period is marked by the evidence of a major destruction. More effort needs to be applied to the attempts to link the historical events of the time with the remnants of a basic human activity, such as food consumption.

BIBLIOGRAPHY

- Andreadaki-Vlasaki M. (2002) Are we approaching the Minoan Palace of Khania, in: J. Driessen, I. Schoep, R. Laffineur (eds.), *MONUMENTS OF MINOS. Rethinking the Minoan Palaces, Proceedings of the International Workshop "Crete of the Hundred Palaces?" Held at the Université Catholique de Louvain, Louvain-la-Neuve, 14-15 December 2001*, *Aegaeum* 23, Liège, pp. 157–165.
- Apostolakou V., P. P. Betancourt, T. M. Brogan (2010) Anaskafikés érvnes stin Pacheiá Ámmo kai ti Chrysí Ierápetras (Ανασκαφικές έρευνες στην Παχειά Άμμο και τη Χρυσή Ιεράπετρας), in: M. Andrianakis, I. Tzachili (eds.), *Archaiologikó Έργο Κρήτης*, 1, Rethymno, pp. 143–150.
- Banou E. S. (2011) An introduction to the LM IB pottery from Poros: a response to Metaxia Tsipopoulou and Emanuela Alberti, in: T. Brogan, E. Hallager (eds.), *LM IB Pottery. Relative Chronology and Regional Differences*, Monographs of the Danish Institute at Athens 11:2, Athens, pp. 499–506.
- Barnard K. A., T. M. Brogan, A. M. Nicgorski, E. Mary, J. S. Soles (2003) The Neopalatial pottery: a catalog, in: K. A. Barnard, T. M. Brogan (eds.), *Mochlos IB: Period III. Neopalatial Settlement on the Coast: The Artisans' Quarter and the Farmhouse at Chalinomouri: The Neopalatial Pottery*, Prehistory Monographs 8, Philadelphia, pp. 33–98.
- Betancourt P. P. (1980) *Cooking Vessels from Minoan Kommos. A Preliminary Report*, Occasional Paper 7, Los Angeles.
- Birtacha K. (2008) 'Cooking' installations in LC IA Akrotiri on Thera: A preliminary study of the 'Kitchen' in 'Pillar Shaft 65', in: N. Brodie, J. Doole, G. Gavalas, C. Renfrew (eds.), *Horizon. A Colloquium on the Prehistory of the Cyclades*, Cambridge, pp. 349–376.
- Borgna E. (2004) Aegean feasting: A Minoan perspective, in: J. C. Wright (ed.), *The Mycenaean Feast*, *Hesperia Suppl.* 73:2, Princeton, pp. 127–159.
- Brogan T., K. Barnard (2011) Household archaeology at Mochlos: Statistical recipes from the Late Minoan I Kitchen, in: K. T. Glowacki, N. Vogeikoff-Brogan (eds.), *ΣΤΕΦΑ: The Archaeology of Houses and Households in Ancient Crete*, *Hesperia Suppl.* 44, Princeton, pp. 185–198.
- Chatzi-Vallianou D. (2011) LM IB pottery from the rural villa of Pitsidia: a response to Jeremy Rutter, in: T. Brogan, E. Hallager (eds.), *LM IB Pottery. Relative Chronology and Regional Differences*,

41 New excavations should focus on these types of rooms when putting questions about food preparation and consumption, and samples for organic residue analyses should be chosen primarily from such rooms.

42 See references in notes 3 and 14 above.

43 DRIESSEN 2005.

44 MIHAILIDOU 2001, 427–428, 435–437, 469 (English summary).

45 FLOYD 1998, 205–212; HEMINGWAY *et. al.* 2011, 525–528.

- Monographs of the Danish Institute at Athens 11:2, Athens, pp. 345–373.
- Deshayes J., A. Dessene (1959) *Fouilles exécutées à Mallia. Exploration des maisons et quartiers d'habitation (1948–1954)*, 2, ÉtCrét 11, Paris.
- Driessen J. (1982) The Minoan Hall in domestic architecture on Crete: to be in vogue in Late Minoan IA?, *ActaArchLov* 21, pp. 27–74.
- Driessen J. (2005) On the use of the upper floors in Minoan Neopalatial architecture, in: I. Bradfer-Burdet, B. Detournay, R. Laffineur (eds.), *KPHΣ TEXNITHΣ. L'artisan Crétois. Recueil d'articles en honneur de Jean-Claude Poursat, publié à l'occasion des 40 ans de la découverte du Quartier Mu*, Aegaeum 26, Liège, Austin, pp. 83–88.
- Driessen J., J. Sakellarakis (1997) The Vathypetro complex: some observations on its architectural history and function, in: R. Hägg (ed.), *The Function of the Minoan Villa*, Skrifter utgivna av Svenska institutet i Athen 40, 46, Stockholm, pp. 63–77.
- Floyd C. R. (1998) *Pseira III. The Plateia Building*, University Museum Monograph 102, Philadelphia.
- Gerontakou E. (2000) Lekánes se schíma skáfis apó ti Zákro (Λεκάνες σε σχήμα σκάφης από τη Ζάκρο), in: *Pepragména I' Diethnoús Kritologikou Syne-driou (Πεπραγμένα Η' Διεθνούς Κρητολογικού Συνεδρίου)*, A1, Irakleio, pp. 211–222.
- Girella L. (2007) Forms of commensal politics in Neopalatial Crete, *CretAnt* 8, pp. 135–168.
- Gomree T., C. Langohr, M. Pomadere (2012) Excavations in the Pi area at Malia (2005–2010), in: M. Andrianakis, P. Varthalitou, I. Tzachili (eds.), *Archaio-logikó Érgo Krítis (Αρχαιολογικό Έργο Κρήτης)*, 2, Rethymno, pp. 89–94.
- Graham J. W. (1987, third ed.) *The Palaces of Crete*, Princeton N. J.
- Hamilakis Y. (1999) Food technologies/technologies of the body: the social context of wine and oil production and consumption in Bronze Age Crete, *WorldArch* 31:1, pp. 38–54.
- Hazzidakis J. (1934) *Les villas minoennes de Tyllisos*, ÉtCrét 3, Paris.
- Hemingway S., J. A. MacGillivray, L. H. Sackett (2011) The LM IB Renaissance at postdiluvian Pre-Mycenaean Palaikastro, in: T. Brogan, E. Hallager (eds.), *LM IB Pottery. Relative Chronology and Regional Differences*, Monographs of the Danish Institute at Athens 11:2, Athens, pp. 513–530.
- Hitchcock L. A. (2011) Fluid and flexible: Revisiting the vernacular tradition on Bronze Age Crete, Thera, and Cyprus, in: K. T. Glowacki, N. Vogeikoff-Brogan (eds.), *ΣΤΕΓΑ: The Archaeology of Houses and Households in Ancient Crete*, Hesperia Suppl. 44, Princeton, pp. 233–245.
- Isaakidou V. (2007) Cooking in the Labyrinth: Exploring 'cuisine' at Bronze Age Knossos, in: C. Mee, J. Renard (eds.), *Cooking up the Past: Food and Culinary Practices in the Neolithic and Bronze Age Aegean*, Oxford, pp. 5–24.
- Kopaka C. (1989) Les foyers fixes en Crète du Bronze Moyen au Bronze Récent, in: R. Laffineur (ed.), *Transition. Le monde égéen du Bronze Moyen au Bronze Récent. Actes de la deuxième Rencontre égéenne internationale de l'Université de Liège, 18–20 avril 1988*, Aegaeum 3, Liège, pp. 21–28.
- Mavroudi N. (2011) Interpreting domestic space in Neopalatial Crete: A few thoughts on House II at Petras, Siteia, in: K. T. Glowacki, N. Vogeikoff-Brogan (eds.), *ΣΤΕΓΑ: The Archaeology of Houses and Households in Ancient Crete*, Hesperia Suppl. 44, Princeton, pp. 119–124.
- Martlew H. (1988) Domestic coarse pottery in Bronze Age Crete, in: E. B. French, K. A. Wardle (eds.), *Problems in Greek Prehistory: Papers Presented at the Centenary Conference of the British School of Archaeology at Athens, Manchester, April 1986*, Bristol, pp. 421–424.
- Mihailidou A. (1987) Το domátio me ton kíona sto minoikó spíti (Το δωμάτιο με τον κίονα στο μινωικό σπίτι), in: *Amitós. Timitíkos tómos ston kathigiti Manóli Andróniko (Αμητός. Τιμητικός τόμος στον καθηγητή Μανόλη Ανδρόνικο)*, Thessaloniki, pp. 509–525.
- Mihailidou A. (2001) *Akrotíri Thíras. I meléti ton orófon sta ktíria tou oikismou (Ακρωτήρι Θήρας. Η μελέτη των ορόφων στα κτήρια του οικισμού)*, Vivliothiki tis en Athínais Archaio-logikís Etaireías (Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας) 212, Athens.
- Mook M. S. (1999) Cooking dishes from the Kastro, in: P. P. Betancourt, V. Karageorghis, R. Laffineur, W.-D. Niemeier (eds.), *MELETEMATA. Studies in Aegean Archaeology Presented to Malcolm H. Wiener as He Enters His 65th Year*, Aegaeum 20, 2, Liège, Austin, pp. 503–508.
- Morrison J. E., C. Sofianou, T. M. Brogan, J. Alyounis, D. Mylona (2015) Cooking up new perspectives for Late Minoan IB domestic activities: an experimental approach to understanding the possibilities and the probabilities of using ancient cooking pots, in: M. Spataro, A. Villing (eds.), *Ceramics, Cuisine and Culture: The Archaeology and Science of Kitchen Pottery in the Ancient Mediterranean World*, Oxford, pp. 115–124.

- Muhly P. (1984) Minoan hearths, *AJA* 88, pp. 107–122.
- Platon L. (1988) *The Workshops and Working Areas of Minoan Crete. The Evidence of the Palace and Town of Zakros for a Comparative Study*, unpublished PhD thesis, University of Bristol.
- Platon L. (2000) Anaktoriká charaktiristiká sti minoikí oikiakí architektonikí (Ανακτορικά χαρακτηριστικά στη μινωική οικιακή αρχιτεκτονική), in: *Pepragméná I' Diethnoús Kritologikou Synedriou (Πεπραγμένα Η' Διεθνούς Κρητολογικού Συνεδρίου)*, A2, Irakleio, pp. 51–71.
- Platon L. (2011a) Studying the character of the Minoan “Household” within the limits of the Neopalatial Settlement of Zakros, in: K. T. Glowacki, N. Vogeikoff-Brogan (eds.), *ΣΤΕΓΑ: The Archaeology of Houses and Households in Ancient Crete*, Hesperia Suppl. 44, Princeton, pp. 151–161.
- Platon L. (2011b) Zakros: one or two destructions around the end of the LM IB Period, in: T. Brogan, E. Hallager (eds.), *LM IB Pottery. Relative Chronology and Regional Differences*, Monographs of the Danish Institute at Athens 11:2, Athens, pp. 595–612.
- Platon L. (2011c) Το ανάκτορο και ο μινωικός οικισμός tis Zákrou, líges móno óres prin apó ti megáli katastrofí (Το ανάκτορο και ο μινωικός οικισμός της Ζάκρου, λίγες μόνο ώρες πριν από τη μεγάλη καταστροφή), in: *Pepragméná I' Diethnoús Kritologikou Synedriou (Πεπραγμένα του I' Διεθνούς Κρητολογικού Συνεδρίου)*, A2, Chania, pp. 439–460.
- Platon N. (1964) Anaskafáí Zákrou (Ανασκαφαί Ζάκρου), *Prakt* 1964, pp. 142–168.
- Platon N. (1965) Anaskafáí Zákrou (Ανασκαφαί Ζάκρου), *Prakt* 1965, pp. 187–224.
- Platon N. (1967) Anaskafáí Zákrou (Ανασκαφαί Ζάκρου), *Prakt* 1967, pp. 162–194.
- Platon N. (1968) Anaskafáí Zákrou (Ανασκαφαί Ζάκρου), *Prakt* 1968, pp. 149–183.
- Platon N. (1969) Anaskafáí Zákrou (Ανασκαφαί Ζάκρου), *Prakt* 1969, pp. 197–237.
- Platon N. (1971a) *Zakros. The Discovery of a Lost Palace of Ancient Crete*, New York.
- Platon N. (1971b) Anaskafáí Zákrou (Ανασκαφαί Ζάκρου), *Prakt* 1971, pp. 231–275.
- Platon N. (1972) Anaskafáí Zákrou (Ανασκαφαί Ζάκρου), *Prakt* 1972, pp. 159–192.
- Platon N. (1974) *Zakros. To neon minoikon anaktoron (Ζάκρος. Το νέον μινωικόν ανάκτορον)*, Athens.
- Platon N. (1976) Anaskafáí Zákrou (Ανασκαφαί Ζάκρου), *Prakt* 1976:2, pp. 419–439.
- Platon N. (1978) Anaskafáí Zákrou (Ανασκαφαί Ζάκρου), *Prakt* 1978, pp. 259–299.
- Platon N. (1979) Anaskafáí Zákrou (Ανασκαφαί Ζάκρου), *Prakt* 1979, pp. 282–322.
- Platon N. (1984) Anaskafáí Zákrou (Ανασκαφαί Ζάκρου), *Prakt* 1984:2, pp. 392–439.
- Platon N. (1985) Anaskafáí Zákrou (Ανασκαφαί Ζάκρου), *Prakt* 1985, pp. 218–262.
- Platon N. (1986) Anaskafáí Zákrou (Ανασκαφαί Ζάκρου), *Prakt* 1986, pp. 243–297.
- Rehak P., J. G. Younger (1998) Review of Aegean Prehistory VII: Neopalatial, Final Palatial and Postpalatial Crete, in: T. Cullen (ed.), *Aegean Prehistory. A Review*, *AJA Suppl.* 1, pp. 383–473.
- Rethemiotakis G. (1992–1993) Το μινωικό «κεντρικό κτίριο» στο Kastélli Pediádas (Το μινωικό «κεντρικό κτίριο» στο Καστέλλι Πεδιάδας), *ArchDelt* 47–48 A', pp. 29–64.
- Rethemiotakis G. (1999) The hearths of the Minoan palace at Galatas, in: P. P. Betancourt, V. Karageorghis, R. Laffineur, W.-D. Niemeier (eds.), *MELETEMATATA. Studies in Aegean Archaeology Presented to Malcolm H. Wiener as He Enters His 65th Year*, *Aegaeum* 20, 3, Liège, Austin, pp. 721–727.
- Rutter J. (2004) Ceramic sets in context: One dimension of food preparation and consumption in a Minoan palatial setting, in: P. Halstead, J. Barrett (eds.), *Food, Cuisine and Society in Prehistoric Greece*, *Sheffield Studies in Aegean Archaeology* 5, Oxford, pp. 63–89.
- Sackett H. L., M. R. Popham, P. M. Warren (1965) Excavations at Palaikastro VI, *BSA* 60, pp. 248–314.
- Sakellarakis J., D. Panagiotopoulos (2006) Anaskafí Zomínthou (Ανασκαφή Ζωμίνθου), *Prakt* 2006, pp. 121–142.
- Schäffer J. (1992) *Ammisos: nach den archäologischen, historischen und epigraphischen Zeugnissen des Altertums und der Neuzeit*, Berlin.
- Scheffer C. (1984) Aegean, Bronze-Age, spit supports with scalloped tops, *OpAth* 15, pp. 155–162.
- Shaw M. (1990) Late Minoan hearths and ovens at Kommos, Crete, in: P. Darque, R. Treuil (eds.), *L'habitat égéen préhistorique. Actes de la Table Ronde internationale organisée par le Centre national de la Recherche Scientifique, l'Université de Paris I et l'École Française d'Athènes*, *BCH Suppl.* XIX, Athens, pp. 231–254.
- Sofianou C., T. Brogan (2009) The excavation of House A.1 at Papadiokampos, *Kentro* 12, pp. 6–9.
- Sofianou C., T. M. Brogan (2010) Μινωικός οικισμός Papadiókampou Siteías. I anaskafí tis Oikías V.1 κατά το 2008 (Μινωικός οικισμός Παπαδιόκαμπου Σητείας. Η ανασκαφή της Οικίας Β.1 κατά το 2008), in: M. Andrianakis, I. Tzachili (eds.), *Archaiologikó Érgo Kritis (Αρχαιολογικό Έργο Κρήτης)*, 1, Rethymno, pp. 134–138.

- Sofianou C., T. M. Brogan (2012) Papadiokampos and the Siteia Bay in the second millennium BC: exploring patterns of regional hierarchy and exchange in eastern Crete, in: M. Tsipopoulou (ed.), *Petras, Siteia – 25 Years of Excavations and Studies*, Monographs of the Danish Institute at Athens 16, Athens, pp. 327–337.
- Tsipopoulou M., H. Dierckx (2006) Υστερομινωικό ΙΑ Σπίτι Ι.1 στον Πετρά Σητείας: δομή, λειτουργία και κατανομή των ευρημάτων (Υστερομινωικό ΙΑ Σπίτι Ι.1 στον Πετρά Σητείας: δομή, λειτουργία και κατανομή των ευρημάτων), in: *Pepragména tou TH' Diethnoús Kritologikou Synedriou (Πεπραγμένα του Θ' Διεθνούς Κρητολογικού Συνεδρίου)*, Α1, Irakleio, pp. 297–310.
- Tsipopoulou M., E. Alberti (2011) LM IB Petras: the pottery from Room E in House II.1, in: T. Brogan, E. Hallager (eds.), *LM IB Pottery. Relative Chronology and Regional Differences*, Monographs of the Danish Institute at Athens 11, 2, Athens, pp. 463–498.
- Van Effenterre H., M. van Effenterre (1969) *Fouilles exécutées à Mallia: Le centre politique I. L'Agora (1960–1966)*, ÉtCrét 17, Paris.
- Ventris M., J. Chadwick (1973), *Documents in Mycenaean Greek*, Cambridge.
- Watrous L. V. (1984) Ayia Triada: a new perspective on the Minoan Villa, *AJA* 88, pp. 123–134.

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THE RULES OF THE GAME

CYPRriot BRONZE AGE GAMING STONES: THEIR ‘INFORMATIVE PERSPECTIVE’ ABOUT SOCIAL PRACTICES¹



ABSTRACT: Gaming stones are stone gaming boards that have a characteristic pattern of fields that forms a game path. Gaming stones are widely documented among the materials from surveys and systematic excavations on Cyprus. They range in date between the beginning of the Early to the Late Bronze Age periods. This class of materials has previously been extensively analysed from typological, distributive, and functional perspectives. This paper aims to propose a different methodology to investigate gaming stones by adopting a contextual approach which focuses on the potential information given by different types of contexts in which they are found. The ‘informative potential’ can be considered as a parameter useful to establish the degree of information carried by single objects in order to investigate gaming stones as social connectors. After a preliminary selection applied to the entire corpus of objects based on find context, four categories will be presented. Through these analytical tools, we can investigate various aspects of early societies. Thus, gaming stones will be presented as a means for approaching and analysing the problem of the development of social complexity in Cyprus.

KEYWORDS: Cyprus; Bronze Age; Gaming tables; Methodology; Potential; Find context.

As always, our material for study consists of things, but what we are really looking for is the people behind the things.

–David H. Trump

INTRODUCTION: SPEAKING THE LANGUAGE OF OBJECTS

Scholars have long debated the nature of archaeological objects. However, they normally agree that such artefacts are not just mute things but speaking witnesses of the past. What each of them tells us, if we are eager enough to listen, is its own peculiar story. As archaeologists, one of our main aims is to listen to as many objects as we can and try to put together pieces of ancient conversations, which allows us to analyse cultures, identify continuity and changes in communities, societies, and empires, as well as recreate a vivid, truthful image of them.

Nonetheless, objects speak their own language, which is not always easy to interpret. Sometimes, they are less

keen to disclose their stories, other times they provide us with intertwined pieces of information, but many times they leave us with unsolved questions and doubts even greater than those we had when we started our investigation.

In recent years, archaeology has become increasingly multidisciplinary, and a plethora of methods from hard sciences (as well as from many other disciplines, e.g. ethnography, anthropology, epigraphy, sociology, etc.) have been applied to integrate the information obtained by using traditional archaeological methodologies. This has allowed us to gain a deeper understanding of certain problems and to formulate new hypotheses and interpretative models. Nevertheless, it is our duty to push the borders and investigate the ‘intangible’ by using a combination of methodologies which go beyond the traditional ‘observation and classification’ approach. These should be used both to examine objects but also (and, perhaps, more importantly) the people behind them² or, in other words, the societies that

¹ I would like to express my thanks to Giulia and Luca for their help and support. I am also grateful to Juuli, whose enthusiasm and curiosity reminded me how much still needs to be done.

produced and consumed them within and as part of their material culture.

A material culture can be defined as the result of the interaction between practical actions, which derive from — and are characteristic of — the relationship connecting people to the surrounding material world, and the knowledge and experiential baggage acquired as part of a specific group or society, as well as through personal experience. With this in mind, each artefact is not just the result of a series of actions but also the physical transposition of the mindset (*i.e.* a set of beliefs, symbols, traditions) typical of a certain culture.³ Every attempt must be made to disclose this invaluable patrimony of knowledge masterfully hidden by objects in their most private essence. In order to deepen our understanding of their function and meanings, as well as of the mechanisms behind their production and uses and the values associated with them, we need to turn ourselves into polyglots, capable of speaking the language of objects and, at the same time, the many languages of our methodological approaches. Theoretically, it is important to consider material culture as the “materialisation of a culture”⁴ and extrapolate single objects as vectors of social and ideological information.

A culture can be described as “a polythetic of specific and comprehensive artefact type categories which consistently recur together in assemblages within a limited geographical area”.⁵ Following this definition, it can be observed that the concept of culture derives from a combination of three primary components: knowledge, social practice, and materials. Given this complex polynomial equation of archaeological theory, is it possible to disclose the remaining elements if only one is known? And to what extent? Because of the intrinsically archaeological nature of this study, it seems prosaic yet essential to recall that materials are our ‘known’ element, the starting point of our investigation.

Considering the theoretical and methodological framework delineated above, a selected class of materials will be investigated as a group of objects: similar, sometimes apparently identical, items but each one telling a different story, the story of a unique life regarding production, use, disuse, secondary use, *etc.* As good writers promise, and cognisant readers expect, there is no story exclusively about the protagonist. Rather, a story always involves an engaging plot of actions and characters within an appropriate setting. The selected objects will, thus, be evaluated not just as tellers of their ‘personal’

stories but also as observant witnesses of the social and ‘physical’ environment which had produced them and in which they acted.

Through this lens, objects and their contexts will be analysed in parallel, and a context will be defined not only as the findspot of an artefact but also, and in particular, as a unique, incidental set of relationships that cannot be generalised.⁶ The main aim of this study is to determine a method to calculate and attribute to objects a value derived from pieces of information obtained from the artefact itself and its context. Although the method will be designed for and applied to a specific class of materials, it will potentially be applicable to all types of materials, provided that they can be contextualised.

A series of concepts and related terms for their description has been traced and will recur throughout the study. In the first part of this paper, these concepts will be defined and illustrated. Then, a scale of values based on potential answers to pivotal research questions about contexts will be established. In the second part, this methodology will be applied to a pilot case study, *i.e.* the so-called ‘gaming stones’, widespread on Cyprus between the Early and initial Late Bronze Age.

SEEKING DEFINITIONS. INFORMATIVE POTENTIAL BETWEEN POTENTIAL (ITY) AND INFORMATIVENESS

Before explaining how the method illustrated below works and can be applied to study specific cases, it is necessary to unpack the relevant concepts and terminology on which this investigative methodology is built. In the following sections, a series of key terms, such as potentiality, informativeness, and informative potential, will be clarified.

1) Potential and potentiality.

Characteristic of scientific language, and mainly used as mathematical concepts, the terms ‘potential’ and ‘potentiality’ find various applications and may have different semantic hues in the modern language. Diverse definitions have been provided by various dictionaries. For example, it is stated in the Cambridge Dictionary that potentiality is “an ability for development, achievement, or success that is natural or has not been used”,⁷ whilst in the Oxford Dictionary the same term is defined as “power or quality that exists but has not been developed”.⁸

2 BURSTRÖM 2014, 66–67.

3 DE MARRAIS 2010, 11–12.

4 DE MARRAIS 2010, 13.

5 CLARKE 1968, 206.

6 GIANNICCHEDDA 2002, 90.

7 <http://dictionary.cambridge.org>, accessed: 7.04.2018.

8 <https://www.lexico.com/en/definition/potential>, accessed: 17.06.2019.

From these definitions, it is clear that these words are used to indicate not yet expressed properties of living or inanimate subjects. But how can these be adapted to archaeology? In other words, what is the definition of the potential or potentiality of an archaeological object? A complete formulation of this concept is far from being reached, but it may be used to refer to different research uses of an archaeological object. Based both on the 'physical' aspect of an object (*i.e.* stylistic, material, and typological features) and its social values, the terms 'potential' and 'potentiality' will be used to refer to a spectrum of research. It refers to the uses to which an object can be put but which are not yet achieved or in use. The concept of potential/potentiality is closely related to that of materialisation of culture, as it helps to explore both the object and its relationship with the human beings who produced, used, and interacted with it.

2) Informativeness.

Literally, 'informativeness' indicates the capacity to inform. This term is often used in relation to written texts, and it is not very common in spoken language. As observed for the previous definition, the concept, although borrowed from communication sciences, can be applied to archaeological objects. The concept of informativeness will be used to evaluate what the capacity to inform of an archaeological object is and how this may vary among objects belonging to the same class. To answer these questions, different parameters will be taken into account, but two basic levels of informativeness must be distinguished: one related

to the 'physical' aspects and the other referable to its social and symbolic values.

3) Informative potential.

The concept of 'informative potential' is a result of the combination of the two terms previously described and their significances. In particular, we indicate as 'informative potential' (IP) a value, expressed through a percentage, determining what degree of information is provided by an object or a class of objects. This value is calculated on the basis of positive or negative answers to a series of questions formulated by a researcher in the case of a particular object and its context. Because this value is expressed through numbers but is not based on a mathematical formula, the informative potential must not be regarded as an absolute, irrefutable value. Rather, it is the observer who establishes its validity, case by case. As illustrated in the scheme (Fig. 1), the investigative process is linear and based on questions strictly related to the contextual information of a specific class of material. Each answer can be either positive or negative, and the percentage of positive or negative answers produces a series of different categories within the analysed dataset. Each category differs from the others for its IP value. A 0% to 100% scale of values will be elaborated, where the extreme of 0% indicates that no information is provided about the context, whilst 100% corresponds to the maximum IP values expressed by the object in its context. Again, it is useful to recall that this value is merely descriptive of the degree of information related to an object.

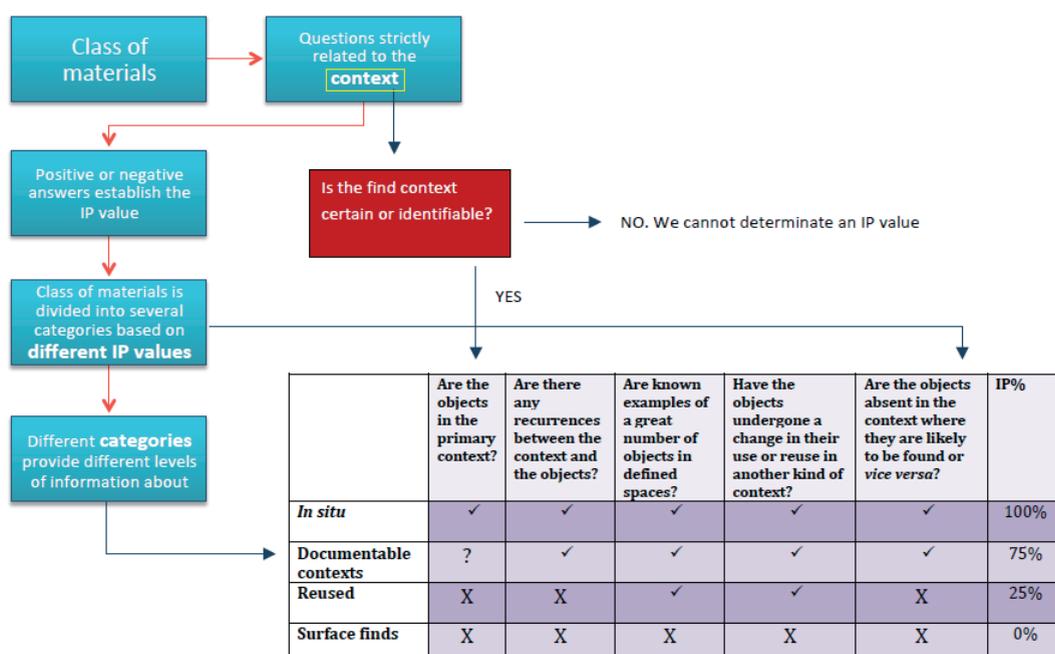


Fig. 1 Scheme illustrating the methodological approach of this study.

Each category will provide a different degree of information. As a result, this will provide different types of clues (or evidence) on socio-economic, cultural, environmental, and ideological aspects, both within short and long-term perspectives.

CASE STUDY: THE CYPRIOT GAMING STONES

In the second part of this paper, the method discussed above will find a practical application using a specific class of materials, the Cypriot gaming stones. Different categories will be identified and described below. Each will be characterised by a different value of IP, which is based on positive and negative answers shown in the table (Fig. 1; see above). Before analysing these categories, gaming stones will be briefly introduced as an important class of objects in prehistoric Cyprus.

Ranging from the end of the 3rd millennium to the middle of the 2nd millennium BC, gaming stones were widely diffused throughout the island.

Early theories about the function of these artefacts stressed their possible use as offering tables,⁹ highlighting their similarities with the Minoan *kerno*. Although almost unanimously accepted, this hypothesis was sharply rejected when Stuart Swiny, to whom we owe the first definition and comprehensive study dedicated to this peculiar assemblage in the 1970s, proposed the interpretation of these objects as gaming tables. It can be assumed that the Cypriot gaming stones had their origin in the Egyptian gaming tables, known as Senet and Mehen, following two factors: their coincidence in chronology and morphological similarity. They need not have spread to Cyprus by direct contact with Egypt. It is perhaps more likely that this occurred through the mediation of the Levant.¹⁰ The strong resemblance between the Levantine and Cypriot examples and the differences between those and the Egyptian models strongly supports this hypothesis.

Cypriot gaming stones are usually flat slabs provided with a series of carved round cavities which may create two patterns, such as a grid composed of three rows of 10 cavities and a spiral of varying number of depressions. These two patterns are well-diffused over a wide area, comprising the Aegean and the Eastern Mediterranean.

The most widespread model on the island, both in geographic and quantitative terms, is the type with a surface with 30 carved cavities, usually arranged in three — approximately parallel — rows, and each of them is composed of 10 cavities. The second pattern diffused

in the island forms a spiral path. The number of cavities is not standard in the spiral model, and their number fluctuates from five to 88.

In most cases, the stones have not been recovered complete (especially the earliest examples). We find a higher percentage of complete materials during the Late Bronze Age period, and this fact can be explained by their being reused as a building material.

There is also a third type of gaming stones, the bifacial one. It is less frequent than the other types and is organised in three subgroups based on which games are carved on the surfaces.

All the three types previously described show a common feature, *i.e.* the presence of an oval cavity, bigger and deeper if compared to the others, which is defined as accessory or additional. This cavity, most probably not part of the game path, was placed at one end of the stone in the 10 × 3 model (both at the short and long side) and in the middle or at the start of the game path in the spiral model. Stuart Swiny hypothesised that its function was to contain seeds or small stones, used as pawns, when the game table was stored or while playing (*e.g.* pawns eliminated from the game).¹¹ While this hypothesis is extremely sensible, based both on ethnography and common sense, it is not at all verifiable. The presence of the additional cavity seems not to recur in any particular type nor to follow any particular standard. Since it is not placed in all the gaming stones, then it does not seem to be functional to the game path.

Early studies on this class of material focused on the typology, distribution, and function of the objects, but their social and symbolic meanings, which they likely embodied as recreational tools and social lubricants, were not examined in depth.

The limits of studying this class of materials are basically related to the study of contexts. Unfortunately, only relatively few of these stones have been found in primary contexts because a lot of them have been reused in secondary contexts (especially as building materials). This fact does not allow us to study in depth the spaces dedicated to this activity or the frequency of their contexts. In order to evaluate the informative potential of the Cypriot gaming stones in context, four main categories have been identified (see above), each with a different value of IP expressed as a percentage and ranging from a minimum of 25% to a maximum of 100%. Finally, a fourth category, that of the surface finds, was necessary, and within this category even an IP of 0% has been assigned.¹²

⁹ KARAGEORGHIS 1976, 880; SWINY 1976, 43–47.

¹⁰ SWINY 1980, 69–73.

¹¹ SWINY 1986.

¹² SAGGIO 2016, 275.

SITE	SUPPORT	UNIT	ROOM'S FUNCTION
Sotira Kaminoudhia	Division wall	Area C/Unit 22-23	Multifunctional
Sotira Kaminoudhia	Floor	Area B Complex 12	Potentially ritual space
Sotira Kaminoudhia	Bedrock	Road	/
Marki Alonia	Bench	Unit C III	Domestic unit
Erimi Laonin tou Porakou	Bedrock	SA V	Working area
Dhenia Kafkalla	Bedrock	/	Cemetery
Alambra Mouttes	Treshold	Room 7/3	"General activity"
Hala Sultan Tekke	Treshold	Building C room 14	??
Maa Paleokastro	Treshold	76/96	Courtyard
Maa Paleokastro	Treshold	77/Street	Passageway

Fig. 2 Table showing the examples of fixed gaming stones known from the Bronze Age sites in Cyprus.



Fig. 3 Example of a fixed gaming stone from Erimi Laonin tou Porakou (BOMBARDIERI 2017, 58, Fig. 3.70).

1) The gaming stones *in situ*.

This category is composed of gaming stones from primary secure contexts because they are heavy and fixed gaming boards. The portability of game boards is determined by their weight, and those beyond the upper bracket (>12 kg) are assumed to be intentionally heavy,¹³ immobile objects. Moreover, gaming boards can also be found incised directly on the bedrock, and these are certainly an example of fixed boards.

Gaming stones *in situ* have the highest IP among this class of materials, and thanks to their certain find context, we can deduce several pieces of information. Below, the known examples are listed with a brief discussion of the data that they communicate.

Gaming stones placed on static supports have been found on seven sites: Sotira Kaminoudhia, Marki Alonia, Erimi Laonin tou Porakou, Alambra Mouttes, Dhenia Kafkalla, Hala Sultan Tekke, Maa Paleokastro (Figs. 2–3).

¹³ CRIST 2016B, 263–264.

There are two gaming stones from Sotira. One was found in a space with heterogeneous objects, suggesting the room was multifunctional, which is very common in the Early and Middle Cypriot settlements. The gaming stone *in situ* is not the only one in this room — another one, which is not permanent, was found lying on the floor. The table was situated on the surface of a division wall (Area C, unit 22–23), and on the same surface of the 10 × 3 scheme there was mortar as well.¹⁴ The second gaming stone comes from the entrance to Complex 12 in Area B of the site, which is a large open-air structure composed of a series of spaces divided by low walls.¹⁵

The assemblage of these spaces is quite unusual, and it is unlike the arrangements known from workshop or domestic complexes of this period, while the division of spaces resembles that of cultic spaces known in the Bronze Age. These two elements suggest a ritual function of this area.¹⁶

The gaming stone from Marki *Alonia*¹⁷ was found on the northeastern side of a bench running through the wall of a room. On the example from Erimi *Laonintou Porakou*,¹⁸ the grid of cavities is in the workshop area of the site. It is carved into the bedrock which was the floor of a unit (SA V).

The gaming stones from Alambra *Mouttes*¹⁹ and Maa Paleokastro²⁰ are both a part of two thresholds. The gaming stone from Hala Sultan Tekke²¹ is the only one that can be contextualised from this site (all other examples have been reused as building materials). The gaming board was found on the floor of room 14 in Area C.

It is clear from this short list that gaming boards in fixed position are quite rare, considering that a total of 400 objects are known so far to have come from the whole island.

Despite this, it is worth remarking that this type of gaming board was placed in a specific place, a reserved space. This helps us in providing a definition of what could be a ‘gaming space’ for the Bronze Age communities, and, therefore, the identification of specific places for those activities that have been of particular importance for a community or a group, and this importance is expressed through the creation of a static and long-lasting relationship between an object (a gaming board) and a space itself.

With reference to the type of spaces where the gaming stones appear, a recurring correspondence between

open spaces and gaming stones can be noticed. Indeed, four examples (out of the seven listed) have been found in open courtyards or in passageway areas that allow access (Fig. 2). As anticipated before, the intended use of the rooms in which the games were found shows common traits: in three cases (Sotira, Marki,²² and Maa) the archaeological evidence has suggested that practices related to the consumption of food and liquids took place within these units. It is likely that these activities probably accompanied the gaming practice.

There is a second important piece of evidence related to fixed gaming stones for us to note. This might connect this category of artefacts to a ritual context and comes from the necropolis of Dhenia *Kafkalla*,²³ representing a unique case among the Bronze Age necropoleis excavated on the island. At Dhenia, in fact, some boards were found carved directly on the bedrock and situated near chamber and pit tombs. Unfortunately, the evidence is scant. If we accept the interpretation that the boards of Dhenia had a role in the funerary ritual, we will have made a very important observation: the stones are not located within the tomb chambers but in a ‘shared’ space, visible to everyone attending the cemetery, which leads us to hypothesise that the gaming stones at Dhenia might have been used in association with collective rituals rather than in private and familial activity (which would have been carried out inside the tombs or near them).²⁴

The case of Dhenia represents a suitable example to use to answer the question displayed in the scheme (Fig. 1): “are the objects absent in contexts where they are likely to be found or vice versa?” In fact, gaming stones in funerary contexts are extremely rare on the island, and this information combined with the rarity of fixed gaming boards allows us to understand how the occurrence of this situation can be surprising.

2) Gaming stones from stratified contexts.

The second group of gaming stones I wish to explore has been classified with an IP of 75%. These are the gaming stones from stratified deposits, meaning that all gaming stones coming from documented contexts belong to this category.

This group of material has been separated from the first one because these gaming stones are transportable objects, and we can assume that they were not

14 SWINY *et al.* 2003, 50.

15 SWINY 2008, 48–50.

16 There is a third fixed gaming stone from Sotira Kaminoudhia. It was pecked into the bedrock in the east part of the site. It does not have an identified archaeological context (SWINY *et al.* 2003, 232).

17 FRANKEL, WEBB 2006, 244–246.

18 BOMBARDIERI 2017, 57–58

19 COLEMAN 1996, 35–38.

20 KARAGEORGHIS, DEMAS 1988, 46–50.

21 ÅSTRÖM 1984, 44.

22 FRANKEL, WEBB 1996.

23 FRANKEL, WEBB 2007.

24 SAGGIO 2017, 73–74.

in their original position. For the same reason, I attributed a lower IP value (75%) to them.

Within this category, the domestic context is the most recurrent one, but artefacts in workshop and funerary contexts are recorded as well. Gaming stones from stratified deposits provide good information, almost equal to fixed gaming boards.

Ten spaces have been identified with multiple games from Episkopi *Phaneromeni* and Sotira *Kaminoudhia* (eight of these were in the latter). It is likely that community activities took place in these units, although not exclusively gaming activities. This contextual information supports the idea, suggested by the fixed gaming stones, that the Bronze Age communities could have had spaces that were reserved specifically for playing. What we do not know is whether these game boards had an owner or were made available to all those who wanted to use them.²⁵

Obviously, many other gaming stones are known in primary contexts coming from most of the Bronze Age sites on the island, but in these cases there is a single gaming stone per unit. The analysis of these materials confirms a recurring connection between gaming stones, unroofed areas, passageways, and entrances. Gaming stones seem to be often associated with architectural features such as benches or, more generally, flat surfaces on which gaming tables might have been

placed to facilitate the viewing of players and possibly also an audience.²⁶ Another important piece of information with which stratified gaming stones provide us is about their probable involvement in ritual community activities. The site of Sotira *Kaminoudhia* can be used as an example of this. Here, in fact, a large area (unit 10 in Area C)²⁷ was excavated and interpreted as a large internal courtyard used for some kind of feasting activities. Six portable gaming stones come from this space. This may mean that Cypriot people used gaming stones as social lubricants and within community rituals.

3) Gaming stones from reused contexts.

It is not unusual in Cyprus to find gaming stones re-used as building material, in particular in wall structures (or collapsed walls). These artefacts (Fig. 4) correspond to the third category, and the lowest IP (25%) has been attributed to them because of their secondary use.

The incorporation of gaming stones into building structures appears as a regular occurrence in Cypriot LBA sites. This kind of evidence is contemporary to the decrease of the number of finds and, in consequence, to the loss of 'popularity' of these objects.

By analysing the evidence, we cannot discern any pattern in their deposition. There is, for instance, no common function of the rooms in which they have been found; nor a recurring position within the construction.



Fig. 4 Example of a reused gaming stone from Erimi Laonin tou Porakou (BOMBARDIERI 2017, 65, Fig. 3.79).

25 CRIST 2016A, 162.

26 FRANKEL, WEBB 2006, 244–246.

27 SWINY *et al.* 2003.

For these reasons, this practice seems not to be linked with ritual behaviours, and it is difficult to assess the level of intentionality and, therefore, the meaning behind these actions.

The reuse of gaming stones as a building material, however, results into two significant considerations: with a high level of certainty, these stones belonged to a previous phase of the use of the site, since it would be unlikely that they were specifically made to be included in a wall structure. This observation implies a second one: it is clear that their purpose and their social value had changed through time, and we can interpret this change as 'negative', considering the drastic decrease of the number of gaming stones during this period as possible evidence *ex-silentio* of a loss of interest in such objects.

4) Surface finds.

This last category includes gaming stones with an IP equal to 0%. Indeed, surface finds do not answer any of the questions shown in the scheme (Fig. 1), as they do not have a known or identifiable context.

About 50% of gaming stones in Cyprus belong to this group, which means that for about a half of this class of material it is not possible to attribute them to a period or to investigate their social and cultural aspects in relation to contexts. They are, therefore, unsuitable for any study other than typological classification.

DISCUSSION AND CONCLUSIONS

This brief analysis shows that within the same class of material, different categories providing a different amount of information can be identified, allowing an analysis of the same object type from different viewpoints.

Gaming stones as a category can be considered as material with a high informative potential, and the variety of find contexts, in fact, allow us to formulate

various hypotheses about gaming practices and the social significance they held for the Bronze Age communities in Cyprus. Their high informative potential is, in a sense, directly proportional to their relevance as objects with a deep social importance. If the practice of the games concerned had not been so deeply rooted in the customs of these communities, we would certainly not have such a large number of discoveries, nor probably such a framework of varied discovery contexts.

Looking at the presence and use of these materials throughout the Bronze Age, it is no coincidence that the presence of gaming stones decreases with the appearance of important socio-economic developments of the society. Indeed, it is exactly during the transition between the MC and LC periods that a new urban society develops on the island.²⁸ The emergence of urban situations²⁹ certainly activated radical changes within the 'concept of free time', the management of it, and the interactions between individuals or groups of individuals. Within these transformations, there was apparently no longer a place for the practices of gaming related to the gaming stones. As a result, these 'negative' changes, concerning the class of materials examined, cause a decrease of the informative potential.

In conclusion, there are many different pieces of evidence that define a gaming stone as a type of object functional to social aggregation and charged with several symbolic and identity-related meanings. However, these are only hypotheses (this is a preliminary study which requires further research for these hypotheses to be definitively proven), which can be confirmed or falsified by further studies. In spite of the numerous knots that still remain to be untangled, Cypriot gaming stones represent an important resource and means by which to continue to investigate the Bronze Age Cypriot society, making an important contribution to the understanding of the social and ideological universe of these prehistoric communities.

BIBLIOGRAPHY

- Åström P. (1984) Stones with cavities at Hala Sultan Tekke, in: Centre Gustave Glotz (ed.), *Aux origines de l'hellénisme: la Crète et la Grèce: hommage à Henri van Effenterre*, Paris, pp. 43–45.
- Bombardieri L. (2017) *Erimi Laonin tou Porakou. A Middle Bronze Age Community in Cyprus Excavations 2008–2014*, SIMA 145, Uppsala.
- Clarke D. L. (1968) *Analytical Archaeology*, London.
- Coleman J. E., N. H. Gale (1996) *Alambra: A Middle Bronze Age Settlement in Cyprus. Investigation by Cornell University in 1974–1985*, SIMA 118, Jonsered.
- Crist W. (2016a) *Games of Thrones. Board Games and Social Complexity on Bronze Age Cyprus*, unpublished PhD thesis, Arizona State University.

28 GRAZIADIO 2006, 13–48.

29 KNAPP 2013.

- Crist W. (2016b) Playing spaces: the sociality of games in Bronze Age Cyprus, in: G. Bourogiannis, C. Muhlenbock (eds.), *Ancient Cyprus Today: Museum Collections and New Research*, Uppsala, pp. 261–272.
- De Marrais E. (2010) The materialization of culture, in: E. De Marrais, C. Gosden, C. Renfrew (eds.), *Rethinking Materiality*, Cambridge, pp. 11–22.
- Frankel D., J. M. Webb (1996) *Marki Alonia: An Early and Middle Bronze Age Town in Cyprus. Excavations 1990–1994*, SIMA 123, Jonsered.
- Frankel D., J. M. Webb (2006) *Marki Alonia: An Early and Middle Bronze Age Settlement in Cyprus. Excavations 1995–2000*, SIMA 123:2, Sävedalen.
- Frankel D., J. M. Webb (2007) *The Bronze Age Cemeteries at Dhenia in Cyprus*, SIMA 135, Sävedalen.
- Giannichedda E. (2002) *Archeologia teorica*, Roma.
- Graziadio G. (2006) Alcune riflessioni sul processo di urbanizzazione a Cipro nell'Età del Bronzo, *Studi Classici e Orientali* 52, pp. 13–48.
- Karageorghis V. (1988) *Excavation at Maa-Paleokastro 1979–1986*, RDAC 1–3, Nicosia.
- Knapp A. B. (2013) *The Archaeology of Cyprus. From Earliest Prehistory through the Bronze Age*, Cambridge.
- Saggio A. (2016) *Gaming Stones. Caratteri, influenze e connotazioni sociali del gioco e delle tavole da gioco all'interno delle comunità cipriote dell'Età del Bronzo*, unpublished MA thesis, Università degli Studi di Torino.
- Saggio A. (2017) Gaming and death. Gaming tables in funerary context from Egypt and Cyprus in the Bronze Age. Their potential ritual use, in: L. Bombardieri, M. Amadio, F. Dolcetti (eds.), *Ancient Cyprus: An Unexpected Journey: Communities in Continuity and Transition*, Torino, pp. 63–80.
- Swiny S. (1976) *Stone Offering Tables from Episkopi Phaneromeni*, RDAC, Nicosia, pp. 43–56.
- Swiny S. (1980) *Bronze Age Gaming Stones from Cyprus*, RDAC, Nicosia, pp. 54–78.
- Swiny S. (1986) *The Kent State University Expedition to Episkopi Phaneromeni, Part 2. The Lithic Industry of Episkopi Phaneromeni and Pre-Late Cypriot sites in the region*, SIMA 74:2, Göteborg.
- Swiny S. (2008) Of cow, copper, corners, and cult: The emergence of the Cypriot Bronze Age, *NEA* 71:1–2, pp. 41–51.
- Swiny S., E. Herscher, G. R. Rapp (eds.) (2003) *Sotira Kamonoudhia, an Early Bronze Age Site in Cyprus*, CAARI 4, Boston.

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MATERIALISING MYTHOLOGY THE CUP OF NESTOR FROM SHAFT GRAVE IV AT MYCENAE



ABSTRACT: Whilst excavating Mycenae Grave Circle A, a unique gold cup was unearthed that Schliemann himself described as “vividly reminiscent” of the *Iliad*’s famed Cup of Nestor. Since then, scholars have argued over the degree of resemblance between them, despite the impossibility of reconstructing the appearance of the Cup of Nestor from Homer’s description. This disagreement has eclipsed the study of the cup from Mycenae in its own right. Its many idiosyncrasies and inconsistencies as well as the inspiration behind its creation have remained unexplored. One possibility, which would also account for the minor similarities between the Mycenae cup and the Cup of Nestor as well as the lack of archaeological parallels for the former, is that they were linked by a common ancestor from mythology. Materialising mythological motifs into a physical reality may have been intended to associate the owners and users of such objects with the social messages present within a shared mythical past.

KEYWORDS: Archaeological parallels; Cup of Nestor; *Iliad*; Materialisation; Mycenae; Mythology; Schliemann.

In archaeological and classical scholarship, there are three separate objects upon which the title of ‘Cup of Nestor’ has been bestowed.¹ The first is known only by a description given in the *Iliad* of a cup that belonged to Nestor, King of Pylos. Henceforth, this cup will be referred to as the ‘Homeric Cup’. The second was a gold cup, recovered by Schliemann from Shaft Grave IV of Grave Circle A at Mycenae (Fig. 1).² To avoid confusion, this cup will be referred to as the ‘Mycenae Cup’. The third is a drinking cup found in a grave at Pithecussae dated to the 720s BC, which has an inscription scratched into the surface that begins “I am the Cup of Nestor, good to drink from”.³

This paper is an investigation of the relationship between the Homeric Cup and the Mycenae Cup. Initially, similarities between these two objects were considered so striking that it was thought natural to compare them.⁴ Later, various objections were raised against the existence of a direct connection. Scholarship has



Fig. 1 The Mycenae Cup. Photograph by the author.

1 I would like to thank the organising committee for putting together a marvellous conference and for their kind invitation to contribute to this volume. I would also like to thank the anonymous reviewer who made several helpful suggestions to improve this paper; all remaining errors and omissions are the responsibility of the author.

2 National Archaeological Museum of Athens inv. 412; KARO 1930, 100 no. 412, pl. CIX; DAVIS 1977, 183–186 no. 63, figs. 148–150.

3 SEG XIV, 130 no. 604; LSAG, 239 no. 1, pl. 47; LANE FOX 2009, 157. Whether this inscription is making reference to the Homeric Cup specifically is still disputed (WĘCOWSKI 2014, 132).

4 EVANS 1935, 391.

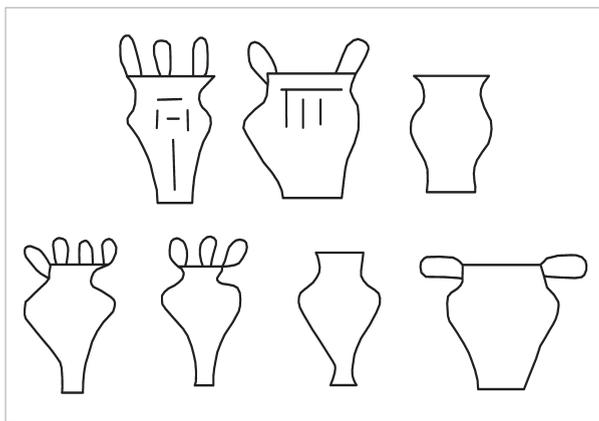


Fig. 2 The Linear B ideograms associated with the term 'di-pa'. Drawing by the author.



Fig. 3 The vessel shape that Schliemann believed was connected to the term 'δέπας'. Drawing by the author.

generally sought to resolve this argument by establishing the exact degree of their resemblance through close study of the two objects.

THE HOMERIC CUP

The Homeric Cup appears in the *Iliad* XI: 632–635.

*πᾶρ δὲ δέπας περικαλλές, ὃ οἴκοθεν ἦγ' ὁ γεραῖός,
χρυσεῖοις ἦλοισι πεπαρμένον: οὔατα δ' αὐτοῦ
τέσσαρ' ἔσαν, δοιαὶ δὲ πελειάδες ἀμφὶς ἕκαστον
χρύσειαι νεμέθοντο, δύο δ' ὑπὸ πυθμένες ἦσαν.*

The exact translation of this passage is still open to interpretation, but generally the following is widely accepted:⁵

*She placed beside them a splendid goblet, which
the old man had brought with him from home;
it was studded with golden pins (or rivets/bosses);
it had four handles, on (or around) each pecked
(or fed/stood) two golden doves; the goblet had two
bottoms (or supports/stems).*

The old man from this passage is the elderly King Nestor of Pylos, who accompanied the Achaeans to Troy. His cup is remarkable as, despite frequent references to eating and drinking, it was the only one described in detail in the Homeric Epics. Nevertheless, its description is rather vague. For example, apart from

the use of gold pins, rivets, or bosses, the other materials used to manufacture it are not listed.⁶

The Homeric Cup attracted much attention from Ancient Greek scholars, and several competing theories, which have survived to the present day through the writings of Athenaeus, were put forward concerning its reconstruction.⁷ Asclepiades of Myrlea cited anonymous sources for the suggestion that its four handles were placed equidistantly.⁸ Aristarchus of Samothrace proposed that it had twin sets of two vertical handles placed on either side of the vessel; this version was physically recreated by Dionysius of Thrace and described by Promathidas.⁹ A refinement, suggested by Apelles and followed by Asclepiades, was that these twin handles rose above the rim and were joined together at the attachment points to the body.¹⁰

The use of the word 'δέπας' in this description has also swept the Homeric Cup into another debate, as the Mycenaean Greek meaning of this term has been much disputed. Δέπας has been linked to the Linear B term 'di-pa',¹¹ yet the ideograms associated with di-pa do not have the appearance of a drinking vessel (Fig. 2).¹² The di-pa was probably a mixing vessel¹³ and may have had a ceremonial role within feasting activities.¹⁴ Prior to his discoveries at Mycenae, Schliemann argued that he had found examples of a specific δέπας (δέπας ἀμφικύπελλον) shape at Troy (Fig. 3), which bears very little resemblance to the Mycenae Cup.¹⁵

5 Based upon an amalgamation of translations offered by scholars that have contributed to this debate. See bibliography.

6 von WILAMOWITZ-MOELLENDORFF 1920, 201.

7 ATHENAEUS *Deipnosophistae* XI 76–85.

8 ATHENAEUS *Deipnosophistae* XI 76–85; FURUMARK 1946, 43.

9 ATHENAEUS *Deipnosophistae* XI 76–85; FURUMARK 1946, 44.

10 ATHENAEUS *Deipnosophistae* XI 76–85; SCHLIEMANN 1878, 238; FURUMARK 1946, 44.

11 SHERRATT 2004, 199.

12 VENTRIS, CHADWICK 1973, 326–327; although one version of the ideogram does have four handles.

13 HILLER 1976, 27. VERMEULE (1964, 309) suggests it was a storage jar.

14 SHERRATT 2004, 199.

15 SCHLIEMANN 1875, 313–314.

COMPARING THE HOMERIC AND MYCENAE CUPS

The vagueness of the description means there are only five details that provide evidence regarding the appearance of the Homeric Cup.¹⁶ These have been compared by various scholars to the Mycenae Cup, resulting in many different interpretations.

1) The Homeric Cup was studded with golden pins, rivets, or bosses.

This line has been used to infer two things: that the golden pins, rivets, or bosses on the Homeric Cup were decorative, and, therefore, it was not made of gold.¹⁷ The use of pins and studs for metal vessel ornamentation is known from the Aegean Late Bronze Age. A silver vessel fragment from the same tomb as the Mycenae Cup was covered with small projecting round pins surrounded by some form of inlay.¹⁸ A silver ewer from Kato Zakro had strips decorated with tiny bosses (Fig. 4).¹⁹ Whether this is the type of decoration described in the passage remains unclear. It is worth noting that Homer does not explicitly state the pins, rivets, or bosses were only ornamental. The rivets on the Mycenae Cup were functional and made of gold.²⁰



Fig. 4 The silver vessel from Kato Zakro decorated with gold studs. Photograph by the author.

Although it does, therefore, fulfil the description set out in the *Iliad*, it is difficult to be certain whether it matches the spirit of what was intended. The inclusion of gold rivets in the description may have been intended to signify the cup's high value whilst also retaining a marked separation between objects such as the Homeric Cup and the material culture used by gods or particularly favoured mortals.²¹

The decorative use of gold would not necessarily rule out gold as the primary constituent material for the cup.²² Alloying was used in Aegean metalwork to widen the colour palette available so that, for example, two different shades of gold were used to differentiate the manes from the bodies of the lions on the famous Lion Hunt dagger.²³ Such polychromy could have enabled gold pins, rivets, or bosses to be visually differentiated from a gold vessel surface. Also in cases where plastic ornament is applied to metal vessels, and such examples are very few and far between,²⁴ the colour matches the vessel body. It is, therefore, merely an assumption that, because the use of gold for the pins, rivets, or bosses was explicitly mentioned, the rest of the vessel was manufactured from a different material.

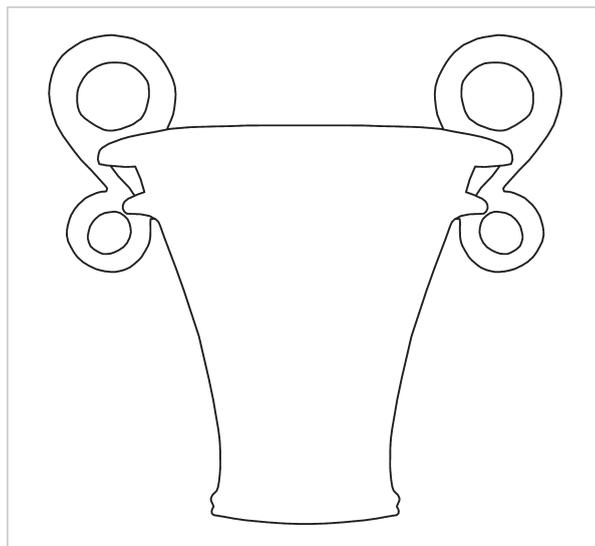


Fig. 5 The configuration of the handles found on the polychromy vessel from Isopata Tomb 5. Drawing by the author.

16 As the cup was brought to Troy and therefore existed before the Trojan War some scholars have suggested this implies it was 'old', even already patched or considered an heirloom (MYRES 1950, 236; MARINATOS 1954, 11). There is, however, no evidence that it was any older than the other artefacts brought to the campaign by the Achaeans.

17 SCHLIEMANN 1878, 238; LORIMER 1950, 331; MARINATOS 1954, 11; HILLER 1976, 26.

18 Athens NM 479; DAVIS 1977, 197–198 no. 73, fig. 161.

19 DAVIS 1977, 103 no. 13.

20 DAVIS 1977, 184.

21 HAINSWORTH 1993, 293.

22 *Contra* SCHLIEMANN 1878, 239.

23 Athens NM 394; OGDEN 1993, 41.

24 See the discussion regarding the three-dimensional ornament below.

2) The Homeric Cup had four handles.

As discussed above, the presence of four handles on the Homeric Cup has led to much speculation as to their positioning on the vessel. Modern scholars have continued to struggle to reconstruct the handle configuration in a way that fits with the ancient text yet produces a viable drinking vessel. One suggestion is that the four handles were placed two upon each other, as seen in the polychromy vessel from Isopata Tomb 5 (Fig. 5).²⁵

There are two indisputable handles on the Mycenaean Cup; these are the twin Vapheio-style spool handles found on either side of the bowl. Evans proposed that the structure of the spool handle, with two flat plates connected to the vessel body, could be interpreted as a double handle, thus satisfying the description of four handles.²⁶ Schliemann suggested that the other two handles are in fact the two openwork struts that sit beneath the spool handles connecting them with the foot of the cup.²⁷ However, these same appendages have been interpreted in a very different way to meet another of the criteria, as explained below. The term used for the handles implies they were upright,²⁸ which would not match those on the Mycenaean Cup.

3) The Homeric Cup has two feeding or standing doves per handle.

In general, this line has been taken at face value both by ancient and modern scholars. Schliemann argued that if the handles did join together at the point at which they were attached to the vessel, the Homeric Cup may have only had four rather than eight doves.²⁹ Schliemann's motivation for this argument was to lessen the discrepancy between the Homeric Cup and the Mycenaean Cup he recovered. Nevertheless, this is another example of the vagueness of the *Iliad's* description and the difficulty in ascertaining its intended meaning.

Like the Homeric Cup, the Mycenaean Cup is decorated with three-dimensional representations of birds. Birds are not an unusual subject for the ornamentation of Aegean Late Bronze Age vessels; examples include a Late Helladic (LH) IIIA1 silver cup from Dendra Tomb 10, which has five birds arranged circumferentially around its body,³⁰ a copper alloy vessel from Tiryns with a simple bird on its rim,³¹ and a copper alloy jug

from Sellopoulo Tomb 4 with a bird protome also on its rim.³² However, the addition of a three-dimensional animal ornament to metal vessels of this period was a relatively uncommon phenomenon. The majority of the examples, including the Tiryns and Sellopoulo specimens, are much later; the only possible contemporaries to the Mycenaean Cup are the dog-head handled gold goblets from the Acropolis Treasure at Mycenaean.³³ However, the date of this material is disputed.

The birds on the Mycenaean Cup were initially identified as doves.³⁴ This remained the accepted interpretation until challenged by Marinatos;³⁵ they are now identified as falcons.³⁶

There are two further discrepancies concerning the bird decorative motif. The Mycenaean Cup only has two birds, so even if we accept Schliemann's reinterpretation it still falls short in terms of the number of birds. Furthermore, the birds on the Mycenaean Cup are not feeding or standing;³⁷ instead, they are apparently lying down. The flattened position of the birds on the Mycenaean Cup has been suggested to indicate flight or a courtship ritual.³⁸ Whichever was the case, neither suggestion matches the *Iliad's* specific description of feeding or standing birds.

4) The Homeric Cup had two bottoms/supports/stems.

This part of the description has proven to be its most controversial aspect because the word 'πυθμίνες' is open to interpretation. Schliemann translated it as 'bottom' and argued that the Mycenaean Cup did indeed have two of these: the base of the bowl and the base of the foot.³⁹ Others have suggested that the πυθμίνες were the openwork supports beneath the handles and either sought alternative explanations for the four handles or accepted a discrepancy in the number of handles between the two cups.⁴⁰ The term does appear again later in the *Iliad* to refer to the leg of a tripod vessel,⁴¹ which may lend some support to this interpretation. Karo suggested that the second base was a now missing separation plate that divided the foot from the bowl.⁴² Others have argued that it must relate to a completely different vessel shape, such as a brazier with a space between the floors for burning coals.⁴³

25 LORIMER 1950, 330; for details of this vessel, see EVANS 1914, 25 pl. IV.

26 EVANS 1935, 391 note 5.

27 SCHLIEMANN 1878, 238.

28 HILLER 1976, 22.

29 SCHLIEMANN 1878, 238.

30 PERSSON 1942, 89–90 no. 37.

31 MATTHÄUS 1980, 252 no. 360, fig. 42.

32 POPHAM, CATLING 1974, 236 no. 28 (B 2), fig. 23.

33 THOMAS 1938–39, 66–70 no. Ia-d, AMN 957–960.

34 SCHLIEMANN 1878, 236.

35 MARINATOS 1954, 16.

36 BINNBERG 2017, 85; WEBSTER 1958, 112.

37 The exact word used is '*hapax legomenon*' and has been translated through an analysis of related terms (HAINSWORTH 1993, 293).

38 LORIMER 1950, 331.

39 SCHLIEMANN 1878, 237.

40 NILSSON 1933, 137–138; EVANS 1935, 391 note 5.

41 HAINSWORTH 1993, 293.

42 KARO 1930, 230.

43 MARINATOS 1954, 15.

5) The Homeric Cup could only be lifted with ease by Nestor himself.

Most scholars have understood this to mean that the Homeric Cup was exceedingly heavy, especially as it had to be large enough to mix a beverage within.⁴⁴ The Mycenae Cup is not particularly heavy; when empty it weighs 295.8 g.⁴⁵ Based on an estimate of its capacity,⁴⁶ when completely full it would have weighed approximately 594 g. This would suggest another point of divergence between the two cups. However, throughout the *Iliad* Nestor complains about his waning strength.⁴⁷ Thus, there is an inconsistency between, on the one hand, the description of Nestor as old and increasingly frail and, on the other hand, his ownership of a heavy cup that only he had the power to lift. That only Nestor could lift his cup may not have been linked to its weight but to its status as an object so precious only its owner could have the correct use of it.⁴⁸ A similar motif is applied to various possessions of Achilles throughout the *Iliad*, and it is perhaps understandable that one of the heroic characters would have a cup reserved for their sole use.⁴⁹ The Homeric Cup is used to quench the thirst of two men, but, as the Mycenae Cup would offer them approximately 149 ml each (less than half a regular can of soft drink), it has been argued that the latter would be too small to accomplish this.⁵⁰ However, this argument depends upon a subjective definition of ‘quenching thirst’.

SUMMARY

Overall, it can be seen that the degree of similarity between the two cups is utterly dependent on the exact interpretation of the text and the object. Multiple and contradictory arguments are used to support the same claim. The rejection of certain suggestions is often based upon subjective judgements or assumptions extrapolated from what is a vague description. The features described are those considered distinctive, with the underlying implication that the shape itself was recognisable from the epithet ‘δέπας’. Homer may not have sought to provide an accurate description of an actual object, instead incorporating metaphorical or symbolic elements. Frame suggests that the description

emphasises that the Homeric Cup was twice as elaborate as an ordinary cup to reinforce the message that Nestor was equivalent to two men.⁵¹ Ancient scholars also contemplated such explanations.⁵² Hainsworth stressed that the richness of the description provided for the Homeric Cup cannot, as and of itself, be used as evidence for the actual existence of exactly such an object.⁵³

Despite these difficulties, we can be certain of some similarities between the two cups. Both incorporated multiple three-dimensional bird ornaments that were associated with their handles. Gold was used in their manufacture. In addition, it is probable that, like the Mycenae Cup, the Homeric Cup had an unusual shape, given that it was deemed necessary to provide a description of particular elements of its form rather than relying on the term ‘δέπας’ alone.

This debate has been complicated by the strong feelings that the Mycenae Cup has generated amongst scholars, which coloured their approach to this object. For example, Lorimer, who did not agree with the theory of a link between the two cups, described the Mycenae Cup as possessing an ‘unpleasing shape’⁵⁴ and went on to state its dimensions as smaller than is actually the case.⁵⁵ In contrast, Leaf and Bayfield, who supported a direct link between the two cups, overstated its height.⁵⁶

The main obstacle preventing further headway being made in this debate is its framing in terms of a direct link between the Homeric Cup and the Mycenae Cup. Previously, the only acceptable answers were either that a direct link existed between them or that there was no link whatsoever. It has also been assumed that this argument could be resolved by ascertaining the degree of similarity between the two objects, which is effectively impossible to achieve because of the vagueness of the description provided by Homer. That is not to say that the sustained efforts made to clarify and improve the translation of this passage have been unnecessary or fruitless; indeed, they have added much to our understanding of the Homeric Cup. However, the use of similarity as the basis upon which this discussion can be settled is, in itself, highly questionable. This is because the biological sciences teach us that, in addition to a direct link, similarities can be explained

44 MARINATOS 1954, 11; WACE, STUBBINGS 1962, 536; HILLER 1976, 26–27.

45 DAVIS 1977, 183.

46 The volume was calculated using the geometric shapes method and the weight of the contents modelled using the weight of pure water at a pressure of 1 atmosphere. The weight of wine under the same conditions is exceedingly similar.

47 LEAF, BAYFIELD 1965, 519.

48 von WILAMOWITZ-MOELLENDORFF 1920, 201; FURUMARK 1946, 53.

49 HAINSWORTH 1993, 293.

50 FURUMARK 1946, 53.

51 FRAME 2009, 606.

52 ATHENAEUS *Deipnosophistae* XI 78–83; FARNOUX 2005, 91.

53 HAINSWORTH 1993, 293.

54 LORIMER 1950, 331.

55 LORIMER 1950, 328.

56 LEAF, BAYFIELD 1965, 519.

through two other mechanisms: convergent evolution or a shared common ancestor.

SIMILARITY AND INTERCONNECTION

Convergent evolution occurs when the same or very similar traits evolve in unrelated organisms because they are a good solution to a frequent problem. Flight is an excellent example of convergent evolution, as forms of flight are or have been found in insects, birds, mammals, amphibians, reptiles, plants, and fish.

Shared common ancestry covers situations where two species are effectively cousins within their biological family trees. For instance, snow leopards (*Panthera uncia*), sabre-toothed cats (*Smilodon fatalis*), and domestic cats (*Felis catus*) all share a common ancestor that is now extinct. In this case, the similarities between the members of the cat family are not due to a direct link between each cat species but because they ultimately all share a link to a specific common ancestor, even if the details of that link vary.

Crucially, the degree of similarity does not determine which of these scenarios is correct. After all, hummingbirds, although almost identical to hummingbird moths with respect to their appearance, feeding mechanism, and flight pattern, are actually more closely related to *Tyrannosaurus rex*. Therefore, two species can appear more similar through convergent evolution than through sharing a common ancestor. Unfortunately, the most important type of biological evidence available to distinguish cases of convergent evolution and common ancestry, DNA, is not applicable to the study of artefacts.

However, what this does help to illustrate is that the debate surrounding the link between the Homeric Cup and Mycenae Cups has been effectively built upon a set of false premises. The process of convergent evolution demonstrates that the degree of similarity between two things cannot be used to prove or disprove a direct link between them. The similarities that can be generated through common ancestry show that, so long as a mechanism for transmission is in place (in this case the oral transmission of epic poetry), then the length of time between two things is less important than it would be when attempting to draw a direct link between them.

Due to the length of time separating the deposition of the Mycenae Cup and the setting down of the *Iliad* it is difficult to sustain the argument that the latter was directly inspired by the former. The likelihood of convergent evolution in this case is also quite low. Although such an argument could be put forward to explain



Fig. 6 The Minoan chalice form. Drawing by the author.

examples such as the addition of handles, shapes of vessel bodies, and other important affordances or functional elements that could be regarded as a common solution to a frequent problem, it is less suited to the very specific similarities between the Homeric Cup and the Mycenae Cup, such as the association of their handles with three-dimensional bird ornaments.

I believe that it is worthwhile exploring the possibility that the Homeric Cup and the Mycenae Cup are linked by a common ancestor. This is motivated rather more by the curious nature of the Mycenae Cup, which has never been adequately discussed or explained, rather than the degree of similarity between the two. The remainder of this paper is dedicated to the investigation of a possible common ancestor. First, however, it is necessary to reiterate the idiosyncratic features of the Mycenae Cup.

THE IDIOSYNCRASIES OF THE MYCENAE CUP

The Mycenae Cup exhibits several features that are without parallel within the Aegean metal vessel assemblage; other peculiarities linked to its design, manufacture, and usage are also present.

The shape of the Mycenae Cup is completely unique. It is best understood as a stemmed Vapheio Cup. The Vapheio Cup is found first in the Minoan ceramic corpus from Middle Minoan (MM) II onwards and was incorporated into the Mycenaean pottery repertoire from MH until LH IIB.⁵⁷ It is well known

⁵⁷ MOUNTJOY 1993, 34.

in metal, with many specimens found in the Mycenaean shaft graves,⁵⁸ yet the Mycenaean Cup is the only stemmed example. Its unusual shape has led to suggestions that it was modified over time.⁵⁹ However, when Davis examined this vessel, she found no evidence of any such alterations and concluded that its current appearance was the original design.⁶⁰ Stemmed vessels were popular in mainland ceramic and metal vessel assemblages during this period,⁶¹ and there is another example from the same tomb of a Cretan shape transposed onto a stem to create a hybrid vessel.⁶² However, the stem of the Mycenaean Cup was more akin to that found on a Minoan chalice than contemporary Helladic forms (Fig. 6).⁶³

The decision to incorporate two handles in the design of a vessel so small and lightweight is atypical. Most metal stemmed vessels have only one, and those with two were considerably larger in capacity and thus much heavier when in use; the inclusion of the second handle was, therefore, for added practicality⁶⁴ rather than a desire for symmetry.⁶⁵ The choice to use spool or Vapheio-style handles was also uncommon amongst vessels deposited in the shaft graves. Only five vessels, aside from the Mycenaean Cup, had a spool handle. One of these was the stemmed carinated cup.⁶⁶ Fitting spool handles to the Mycenaean Cup may have been intended to emphasise its link to the Vapheio cup form.

Another peculiar feature of the Mycenaean Cup is its workmanship. The design is exceedingly complex, involving multiple components and the manufacture of a complicated body from a single gold billet. Difficulties were encountered during production, especially during handle assembly. Each handle consisted of three parts: a top end plate, base end plate, and cylindrical hollow spool. An attempt had been made to attach them together by a soldering/fusion technique often found

on Aegean metal vessels; however, in this case, the process went wrong.⁶⁷ Small lumps were left around the spools' ends, and gold pieces were inserted into gaps between the spools and their end plates. These would have been clearly visible to those holding the cup. Ultimately, rivets were inserted to make the attachment secure.⁶⁸ These noticeable flaws were left in place despite the care taken to minimise the visual impact of other manufacturing traces on the handles by orientating the seams of the spools to face inwards.⁶⁹

Other inconsistencies in the quality of its manufacture were present. A compass was employed during the initial process of raising the vessel⁷⁰ to improve the regularity of its form.⁷¹ Yet, unusually, visible tool marks were not removed.⁷² Moreover, the saddle-shaped attachment plates for the struts were far less regular than those produced for the handles.⁷³ Despite this variability in the quality of manufacture, the entire cup was made of the most highly-valued metal used in metal vessel production: gold.⁷⁴

The openwork struts lack analogies in the Aegean metal vessel corpus. Wright suggested they were intended to parallel the ribbon handles found on contemporary *kantharoi*.⁷⁵ Openwork as a decorative style is otherwise unknown for Aegean metal vessels. The struts play no structural role,⁷⁶ and their inclusion had grave consequences for the vessel's functionality. To attach them to the cup, rivets were punched right through the foot.⁷⁷ As the body was manufactured from a single piece of gold, the stem was hollow; any liquid poured into the cup would have entered both the stem and cavity of the foot.⁷⁸ With no internal heads, these rivets could not have been finished from the inside, thus compromising the water-tightness of the vessel.⁷⁹ This problem could have been easily resolved through the insertion of an inner lining, as found on a silver goblet from

58 Seven were found in Grave IV, with another thirteen present in Circle A and five in Circle B (KARO 1930; MYLONAS 1972–73).

59 STRONG 1966, 39; MARINATOS 1954, 17–18.

60 DAVIS 1977, 185.

61 Four other metal stemmed cups were discovered in Grave IV, and another two were present elsewhere in Circle A (KARO 1930).

62 In this case a carinated cup (Athens NM 390; KARO 1930, 94–95; DAVIS 1977, 208–213 no. 83).

63 EVANS 1935, 391; FURUMARK 1972, 57.

64 Either to more evenly distribute the weight of the vessel or to facilitate the passing of communal vessels between multiple individuals.

65 Four two-handled stemmed vessels formed part of the Acropolis Treasure (THOMAS 1938–39), and one later example comes from the Kokla tholos tomb (DEMAKOPOULOU 1990).

66 The other four were Vapheio cups (KARO 1930, 112 no. 517, 122 no. 630, 137 no. 755, 149 no. 866). A stray spool handle base plate was found in Grave V (KARO 1930, 149 no. 868).

67 This is the only known failure. Successfully soldered spool handles are found on vessels from Dendra, Mycenaean, and Vapheio (DAVIS

1977, nos. 38, 39, 70, 103–105, 109, 117, and 132). The same technique was also carried out successfully for more complicated tasks, such as the joining of the bowl and stem on Athens NM 390 (DAVIS 1977, 208–213 no. 83).

68 The combination of soldering and riveting was apparent on the bull head rhyton from Grave IV, but there are no indications on this vessel that the soldering had failed (DAVIS 1977, 188 no. 64).

69 DAVIS 1977, 183.

70 DAVIS 1977, 183.

71 DAVIS 1977, 350–351.

72 DAVIS 1977, 183.

73 DAVIS 1977, 184.

74 AULSEBROOK 2012, 137–139.

75 WRIGHT 2004, 97; although *kantharoi* handles usually extended above the rim.

76 DAVIS 1977, 186; *contra* MYRES 1950, 236.

77 DAVIS 1977, 184.

78 As confirmed by KARO 1930, pl. CIX.

79 Of course, this cannot be physically tested without the risk of damage.

Grave III in Mycenae Circle A.⁸⁰ However, the Mycenae Cup was left unlined. Furthermore, the addition of the struts made it harder to use the handles⁸¹ and they were too light to compensate for the top-heavy design, which would have made it quite unstable, especially when full.

Therefore, we are left with a particularly unusual vessel, made from the most highly-valued metal of the period and possessing several unique features, that was rather poorly made and potentially unusable. These contradictions require explanation. Overall, it seems likely that its maker wished to produce a very specific and special type of cup, but for some reason lacked the skills or time to do so. From where did the inspiration for such a strange vessel originate, and why would its appearance be prioritised above its functionality? Taking a cue from the Homeric Cup, I would like to suggest that we consider the role of mythology in the manufacture of the Mycenae Cup.

MATERIALISING MYTHOLOGICAL OBJECTS

Myths are full of people, creatures, places, and objects. These objects often play an important role in the narrative; they may, like the Golden Fleece, be the goal of a quest or, like the mirror shield used by Perseus, be required to fulfil a quest. Objects are also used to identify or define people and deities, such as Odysseus' brooch, and were given as rewards and gifts.⁸² Myths were often materialised through decorative imagery, for example on Ancient Greek vase paintings. It has been suggested that some Aegean Bronze Age frescoes showed scenes or imagery linked to mythology.⁸³ Mythological objects could also be materialised through the production of replicas. One famous example is the Winchester Round Table, an imitation of the round table in the legend of King Arthur, manufactured during the Middle Ages amid a revival of chivalric ideals.⁸⁴ The Homeric Cup was itself subjected to such treatment,⁸⁵ as were other Homeric objects, such as the Shield of Achilles,⁸⁶ however, the primary motivation for their production was as a proof-of-concept rather than to act as a focus for social behaviours related directly to the object's mythical role.

Before the advent of widespread literacy, the ability to quickly recognise a materialised mythological object and grasp its significance without recourse to the written word would have been imperative. This could have been achieved through speech, but it is more than likely that clear indicators of its status would have been provided through the medium of the object itself. In these circumstances, a materialised mythological object can be understood as a type of inscribed object,⁸⁷ an object that has been specifically marked out as socially powerful and/or valuable. I suggest that the following four characteristics may be pertinent to this concept:

- The incorporation of unique traits that draw a direct parallel between the mythological object and its materialised form.
- The incorporation of exotic, foreign, or otherwise rare traits that differentiate the materialised mythological object from the wider material culture world.
- The use of highly-valued materials to emphasise the significance of the materialised mythological object.
- A reduced or complete absence of functionality and/or practicality in the materialised mythological object as it was intended for a specific context of use with particular stress laid upon its presence and symbolic, rather than practical, suitability for a task.

The Mycenae Cup exhibits all of these characteristics. The combination of the openwork struts, overall shape, and the three-dimensional bird decoration make it instantly recognisable. The Vapheio cup shape was originally a Minoan form and was quite distinct from the lineage of Helladic drinking shapes. The Mycenae Cup was further differentiated from the ordinary sphere of material culture by being produced in gold, which appears to have been the most valued of the metals used in vessel production. Gold is also associated with qualities such as incorruptibility and immutability,⁸⁸ and perhaps, therefore, was even symbolically linked to the notion of immortality and the realm of the gods.⁸⁹ The puncturing of the foot to affix the struts would have broken its watertight seal, thus effectively preventing its use as a drinking cup. Along with its top-heaviness,

80 Athens NM 122, 151b; KARO 1930, 60, 62–63. This problem was resolved for some later vessels, such as the two hollow-stemmed silver goblets and one hollow-stemmed silver krater from the LH IIIA1 Tomb 10 at Dendra, by inserting a dividing plate between the bowl and stem that was held in place with a rivet (DAVIS 1977, 273–275). No evidence of such a plate was observed on the Mycenae Cup. That the separation plate is now missing (KARO 1930, 100; FURUMARK 1972, 57) is exceedingly unlikely given that the cup was found inside another larger vessel and they had been crushed together. Furthermore, any such disc must have been fixed as merely resting it inside at the top of the opening into

the stem would not have been enough to prevent seepage into the foot (DAVIS 1977, 185–186).

81 DAVIS 1977, 186.

82 BENNET 2004, 95.

83 NORDQUIST 2008, 108; CHAPLIN 2016.

84 BIDDLE, CLAYRE 2000, 44–45.

85 See the above discussion.

86 FARNOUX 2005, 93, 95.

87 MARSHALL 2008, 64.

88 WHITTAKER 2008, 94.

89 WHITTAKER 2011, 138; GILLIS 2012, 584.

the Mycenae Cup would have been more suited to a display-orientated purpose.

I propose that the common ancestor of the Mycenae Cup and the Homeric Cup, if one did exist, may have been mythological. Despite several centuries separating the deposition of the Mycenae Cup and the appearance of the Homeric Cup in the *Iliad*, the possibility of shared ancestry is still plausible. Analysis of certain parts of the epic poems indicates that particular passages were written in a form of Greek older than that recorded in the Linear B tablets.⁹⁰ Some scholars believe that the Homeric Cup was a traditional motif, brought into the narrative of the *Iliad* as part of the process of interweaving elements from various sources into a single story.⁹¹ The notion of such a cup may therefore have predated the Mycenaean Palatial Period. It could have undergone changes over time and split into multiple variants before one single version was crystallised in the *Iliad*. Whether this common ancestor ever physically existed is immaterial; it may have originated as a purely mythological object.

The Mycenae Cup was one of a number of smaller precious metal vessels that were found inside the silver battle krater, which was associated with the westernmost of the north-south orientated bodies in Grave IV.⁹² This skeleton (O or MYC3 IV) was of a male, aged between 17 and 20; one of the youngest adults identified in Circle A.⁹³ His placement in Grave IV, one of the richest of the Circle A tombs, confirms that his status within the community at Mycenae must have been exceedingly high. The decision to deposit this specific vessel with him was, therefore, highly meaningful and may have related to the role that the Mycenae Cup played in the mythological world.

That the Mycenae Cup may have been manufactured specifically for the funerary sphere cannot be ruled out. It has no repair plates or internal strengthening elements that would confirm it had been used or had been intended to be used by the living. However, neither of these features would be expected on a cup of this design and material.⁹⁴ The walls were quite thin, but this may relate to the expected absence of need for practicality if the outcome of the addition of the struts was already well understood. Many of the lapses in quality were related to processes that must have occurred towards the end of the manufacturing process, which may indicate an unexpected need for greater speed.

The existence of a deadline in the form of the funeral, not necessarily in terms of a specific date but simply as a known obligation, could possibly explain the apparently hurried nature of certain elements. If the Mycenae Cup was made specifically for the funeral of this high-status male youth, it would imply that its presence at these proceedings was far more meaningful than a simple display of wealth and is perhaps reflective of the emotions this particular death provoked.

CONCLUSIONS

The suggestion of a common ancestor for the Mycenae and Homeric Cups is only a theory, which could account for the minor similarities between them but cannot be confirmed on the basis of current evidence and is unlikely to ever be so. However, the main purpose of this paper is to emphasise that the Mycenae Cup, whether linked in any way to the Homeric Cup or not, is a fascinating and contradictory artefact worthy of study in its own right. The shaft graves contained many objects that were unusual or the only known example in a particular material. Yet even within this astonishing collection of material culture, the Mycenae Cup stands out. It is a unique vessel, an ambitious project, yet in many ways rather poorly crafted and ultimately not even usable as a cup. Invoking a mythical origin for the Mycenae Cup resolves the paradox as to how the producers of this vessel had such a definite design in mind without any parallels in the contemporary archaeological record.

Generally, bringing mythology into reality in this way may have been a forceful assertion of social status. It would have given individuals within a society an opportunity to directly associate themselves with the meanings behind mythological objects, whether that was the favour of the gods, the innate right to wield a particular power, or a direct link to an important lineage.

These observations regarding the materialisation of mythical objects may also be applicable to other Aegean Bronze Age artefacts that have been interpreted as status insignia. The awareness of a deep past in Aegean Bronze Age societies and strong continuity in material culture and practices has often been remarked upon; perhaps the process of materialising mythological objects should be expected when discussing cultures with these traits.

90 WEST 1988, 156; SHERRATT 1990, 815; RUIJGH 2004, 531.

91 POWELL 2007, 52. If the motif was transplanted from a tradition featuring a younger and stronger Nestor, this may explain the line that states Nestor alone was capable of lifting the cup.

92 PAPAZOGLU-MANIOUDAKI *et al.* 2010, 162.

93 PAPAZOGLU-MANIOUDAKI *et al.* 2010, 169.

94 AULSEBROOK 2012, 272; 2017, 21.

BIBLIOGRAPHY

- LSAG: Jeffery L. H., A. W. Johnston (1990) *The Local Scripts of Archaic Greece*, Oxford.
- SEG: *Supplementum Epigraphicum Graecum*.
- Aulsebrook S. (2012) *Political strategies and metal vessels in Mycenaean societies: deconstructing prestige objects through an analysis of value*, unpublished PhD thesis, University of Cambridge.
- Aulsebrook S. (2017) Repair, recycle or modify? The response to damage and/or obsolescence in Mycenaean metal vessels during the Prepalatial and Palatial Periods and its implications for understanding metal recycling, *SMEA NS* 3, pp. 7–26.
- Bennet J. (2004) Iconographies of value: words, people and things in the Late Bronze Age Aegean, in: J. C. Barrett, P. Halstead (eds.), *The Emergence of Civilisation Revisited*, Oxford, *Sheffield Studies in Aegean Archaeology* 6, pp. 90–106.
- Biddle M., B. Clayre (2000) *The Castle Winchester: Great Hall and Round Table*, Winchester.
- Binnberg J. K. (2017) *Birds in the Aegean Bronze Age*, unpublished PhD thesis, University of Oxford.
- Chapin A. P. (2016) Mycenaean mythologies in the making: The frescoes of Pylos Hall 64 and the Mycenae Megaron, in: E. Alram-Stern, F. Blakolmer, S. Deger-Jalkotzy, R. Laffineur, J. Weilhartner (eds.), *METAPHYSIS. Ritual, Myth and Symbolism in the Aegean Bronze Age. Proceedings of the 15th International Aegean Conference, Vienna, Institute for Oriental and European Archaeology, Aegean and Anatolia Department, Austrian Academy of Sciences and Institute of Classical Archaeology, University of Vienna, 22–25 April 2014*, *Aegaeum* 39, Leuven, Liège, pp. 459–466.
- Davis E. N. (1977) *The Vapheio Cups and Aegean Gold and Silver Ware*, New York.
- Demakopoulou K. (1990) The burial ritual in the tholos tomb at Kokla, Argolis, in: R. Hägg, G. C. Nordquist (eds.), *Celebrations of Death and Divinity in the Bronze Age Argolid. Proceedings of the Sixth International Symposium at the Swedish Institute at Athens, 11–13 June 1988*, *Skrifter utgivna av Svenska institutet i Athen* 40, Stockholm, Göteborg, pp. 113–123.
- Evans A. J. (1914) The Tomb of the Double Axes, *Archaeologia* 65, 1–94.
- Evans A. J. (1935) *The Palace of Minos: A Comparative Account of the Successive Stages of the Early Cretan Civilisation as Illustrated by the Discoveries at Knossos*, IV.2, London.
- Farnoux A. (2005) Art et littérature: la coupe de Nestor, in: I. Bradfer-Burdet, B. Betournay, R. Laffineur (eds.), *KPHΣ TEXNITHΣ. L'Artisan Crétois: Recueil d'articles en l'honneur de Jean-Claude Poursat, publié à l'occasion des 40 ans de la découverte du Quartier Mu*, *Aegaeum* 26, Liège, Austin, pp. 89–96.
- Frame D. (2009) *Hippota Nestor*, Washington.
- Furumark A. (1946) Nestor's cup and the Mycenaean dove goblet, *Eranos* 44, pp. 41–53.
- Furumark A. (1972) *Mycenaean Pottery. Vol. I: Analysis and Classification*, Stockholm.
- Gillis C. (2012) Color for the dead, status for the living, in: M.-L. Nosch, R. Laffineur (eds.), *KOSMOS. Jewellery, Adornment and Textiles in the Aegean Bronze Age. Proceedings of the 13th International Aegean Conference, University of Copenhagen, Danish National Research Foundation's Centre for Textile Research, 21–26 April 2010*, *Aegaeum* 33, Leuven, Liège, pp. 579–588.
- Hainsworth J. B. (1993) *The Iliad. A Commentary. Volume III: Books 9–12*, Cambridge.
- Hiller S. (1976) Der Becher des Nestor, *AntW* 7, pp. 22–31.
- Karo G. (1930) *Die Schachtgräber von Mykenai*, Munich.
- Lane Fox R. (2009) *Travelling Heroes in the Epic Age of Homer*, New York.
- Leaf W., M. A. Bayfield (1965; first ed. 1895) *The Iliad of Homer. Volume I: Books I–XII*, London.
- Lorimer H. L. (1950) *Homer and the Monuments*, London.
- Marinatos S. (1954) Der "Nestorbechers" aus dem IV. Schachtgrab von Mykene, in: R. Lullies, W. Schadewalt (eds.), *Neue Beiträge zur klassischen Altertumswissenschaft*, Stuttgart, pp. 11–18.
- Marshall Y. (2008) The social lives of lived and inscribed objects: a Lapita perspective, *Journal of the Polynesian Society* 117, pp. 59–101.
- Matthäus H. (1980) *Die Bronzegefäße der kretisch-mykenischen Kultur*, Munich.
- Mountjoy P. (1993) *Mycenaean Pottery: An Introduction*, Oxford.
- Mylonas G. E. (1972–1973) *O tafikós kýklos B tón Mykinón (O ταφικός κύκλος Β των Μυκηνών)*, Athens.
- Myres J. L. (1950) Homeric art, *BSA* 45, pp. 229–260.
- Nilsson M. P. (1933) *Homer and Mycenae*, London.
- Nordquist G. (2008) Feasting: participation and performance, in: L. A. Hitchcock, R. Laffineur, J. Crowley (eds.), *DAIS. The Aegean Feast, Proceedings of the 12th International Aegean Conference, University of Melbourne, Centre for Classics and Archaeology, 25–29 March 2008*, *Aegaeum* 29, Liège, Austin, pp. 105–109.

- Ogden J. (1993) Aesthetic and technical considerations regarding the colour and textures of ancient gold-work, in: S. La Niece, P. Craddock (eds.), *Metal Plating and Patination: Cultural, Technical and Historical Developments*, Oxford, pp. 39–49.
- Papazoglou-Manioudaki L., A. Nafplioti, J. H. Musgrave, A. J. N. W. Prag (2010) Mycenae revisited part 3: the human remains from Grave Circle A at Mycenae. Behind the masks: a study of the bones of shaft graves I–V, *BSA* 105, pp. 157–224.
- Persson A. W. (1942) *New Tombs at Dendra near Midea*, Skrifter utgivna av Kungl. Humanistiska vetenskapssamfundet i Lund 34, Lund.
- Popham M., H. W. Catling (1974) Sellopoulo Tombs 3 and 4, two Late Minoan graves near Knossos, *BSA* 69, pp. 195–257.
- Powell B. B. (2007; second ed.) *Homer*, Malden.
- Ruijgh C. J. (2004) The source and the structure of Homer's epic poetry, *European Review* 12, pp. 527–542.
- Schliemann H. (1875) *Troy and Its Remains: A Narrative of Researches and Discoveries Made on the Site of Ilium, and the Trojan Plain*, London.
- Schliemann H. (1878) *Mycenae: A Narrative of Researches and Discoveries of Mycenae and Tiryns*, London.
- Sherratt E. S. (1990) 'Reading the texts': Archaeology and the Homeric question, *Antiquity* 64, pp. 807–824.
- Sherratt E. S. (2004) Feasting in Homeric epic, in: J. C. Wright (ed.), *The Mycenaean Feast*, Hesperia Suppl. 73, Princeton NJ, pp. 181–217.
- Strong D. E. (1966) *Greek and Roman Gold and Silver Plate*, Ithaca.
- Thomas H. (1938–39) The Acropolis Treasure, *BSA* 39, pp. 65–87.
- Ventris M., J. Chadwick (1973; second ed.) *Documents in Mycenaean Greek*, Cambridge.
- Vermeule E. (1964) *Greece in the Bronze Age*, Chicago.
- Wace A. J. B., F. H. Stubbings (1962) *A Companion to Homer*, London.
- Webster T. B. L. (1958) *From Mycenae to Homer*, London.
- West M. L. (1988) The rise of the Greek epic, *JHS* 108, pp. 158–159.
- Węcowski M. (2014) *The Rise of the Greek Aristocratic Banquet*, Oxford.
- Whittaker H. (2008) The role of drinking in religious ritual in the Mycenaean Period, in: L. A. Hitchcock, R. Laffineur, J. Crowley (eds.), *DAIS. The Aegean Feast. Proceedings of the 12th International Aegean Conference, University of Melbourne, Centre for Classics and Archaeology, 25–29 March 2008*, Aegaeum 29, Liège, Austin, pp. 89–96.
- Whittaker H. (2011) Exotica in Early Mycenaean burials as evidence for the self-representation of the elite, in: A. Vianello (ed.), *Exotica in the Prehistoric Mediterranean*, Oxford, Oakville, pp. 137–146.
- von Wilamowitz-Moellendorf U. (1920) *Die Ilias und Homer*, Berlin.
- Wright J. C. (2004) Mycenaean drinking services and standards of etiquette, in: P. Halstead, J. C. Barrett (eds.), *Food, Cuisine and Society in Prehistoric Greece*, Sheffield Studies in Aegean Archaeology 5, Oxford, pp. 90–104.

AEGEAN HEADBANDS: A FUNCTIONAL APPROACH MACROSCOPIC, MICROSCOPIC, AND EXPERIMENTAL STUDIES¹



ABSTRACT: Although there is an extensive body of literature on headbands, there are few advanced studies on this subject. This paper wishes to lay the foundations for a new methodological approach for studying this type of ornament. We have observed microscopic use-wear traces with an optical camera, and these observations allow the lifetime of these objects from their manufacturing to their uses to be reconstructed. The traces of wear that have been detected on some Bronze Age headbands show that they had been worn, and the ultimate objective is to reconstruct the ways they were worn.

KEYWORDS: Headband; Aegean; Bronze Age; Macroscopic; Microscopic; Experimental studies; Functional approach.

INTRODUCTION

Metal headbands,² considered to have been precious ornaments, were part of the tradition of the prehistoric Aegean for nearly two millennia. Ninety-three headbands³ from the Early Bronze Age to the Late Bronze Age have been identified so far. In Crete and the Cyclades, they are dated between the Early Minoan (*c.* 3200–2000 BC) and Middle Minoan period (*c.* 2000–1600 BC, the first palace period). On the Mainland, a significant majority belongs to the transition period between the Middle and Late Helladic periods (*c.* 1700–1500 BC, the shaft grave period). Finally, the latest of these objects are found in the north of Mainland Greece (Epirus, Thessaly, Macedonia) at the end of the Late Bronze Age (*c.* 1500–1100 BC). There are numerous and varied studies on Bronze Age headbands from the Aegean. The most common are catalogues included in works dealing with metallurgy⁴ and site monographs⁵ which list a large number of headbands within specific regions and periods. These studies

examine the head-band mainly as an attribute of gender or status and apply a typological and stylistic approaches. Likewise, the headbands are often seen in terms of aesthetic objects that provide pleasure to the contemporary archaeologist and to the public.⁶ Advanced analyses on this subject are rare and very restricted.⁷ In order to develop a functional analysis of headbands, the development of an accurate methodology is necessary.

METHODOLOGY

A visual examination is essential for identifying traces of manufacture as well as use wear traces. This study should take into account taphonomy, restoration, or even modern conservation conditions that can alter the state of surfaces.

The macroscopic approach is performed with the naked eye and applied to a large number of objects.⁸ Yet, some of them have only been described in the

1 This article presents some preliminary observations on headbands obtained during my research for my PhD thesis. I would like to thank Prof. H. Procopiou for her corrections and her precious advice. I am very grateful to the Museums as well as to the archaeologists that permitted me to study their headband collections: National Archaeological Museum, Chora Museum, Herakleion Museum, Haghios Nikolaos Museum, and K. Nikolentzos, P. Kalogeropoulou, I. Galli, N. Panoutsopoulos.
2 The majority of these objects are made in gold, but some are in silver and copper. The silver headbands come from Syros and Amorgos in the Cyclades (BRANIGAN 1974, figs. 2138a, 2182),

and the copper headband is from Glava-Kato Merope at Epirus (ANDREOU, ANDREOU 1999, fig. 12).

3 Finds less than five centimetres in length have not been taken into account because of identification problems.

4 BRANIGAN 1974; EFFINGER 1996; VASILAKIS 1996; HICKMAN 2008.

5 SEAGER 1912; KARO 1930–1933; MYLONAS 1973.

6 CIFARELLI 2010.

7 DE CHECCHI 2006; HICKMAN 2011.

8 Twenty-seven in Heraklion Museum (HM), one in Aghios Nikolaos Museum (MA), twenty-eight in National Museum (NM), and two in Chora Museum (CM).

publications but not illustrated.⁹ The macroscopic approach enabled us to distinguish recurring patterns of manufacture and decoration, as well as to identify some patterns of wear. However, this observation does not permit the analysis of micro-traces, which are significant for a functional analysis.

To solve this problem, we used an optical camera to allow microscopic observation.¹⁰ Given the great fragility of the headbands, but also their attractiveness in museums, they are difficult to remove from their supports. Therefore, this analysis was restricted to fewer headbands¹¹ than the macroscopic one, and two scales of magnifications ($\times 50$, $\times 240$) were applied on the front and back of headbands where possible.

Experimentation is an essential starting point for deepening, validating, or refuting hypotheses.¹² For this reason, I worked with a goldsmith, F. Allier, expert on ancient gold working.¹³ These experiments tried to reproduce the same conditions and to use the same materials as those attested in the Bronze Age. We thus used fine gold (98%)¹⁴ for the reproduction of two headbands, and the thickness of the bands matched the originals (less than 1 mm). It's an important technical parameter that also determines the visibility of the traces of manufacture.

MANUFACTURE PROCESS

The observations of previous researchers, but also our own, show that all the headbands share the common characteristic of having been shaped by hammering. For this purpose, a goldsmith alternates hammering and annealing¹⁵ in order to avoid the band cracking or even breaking completely. Indeed, the hammering hardens the metal, and, thus, there is a loss of ductility of the material.

Indeed, during our experiments, after a few minutes, the edges of the hammered band were broken. Annealing is therefore essential to give a good plasticity to gold but requires skills to control the combustion,

which must attain a high temperature (around 500°C for near pure gold) for a short period of time. Evidence for this is provided when annealing is too strong or lasts too long. A gold band reaches its melting point and returns to the shape of a small ingot. This action was done in the goldsmith's workshop on fine coal using a gas-fired flamer. During the Bronze Age, a goldsmith obtained this temperature with a simple oil lamp and a mouth blow torch.¹⁶

Our experiments have also tested the type of support used while hammering. The hammering tests were carried out using a small and rounded steel hammer tapping against the gold band which was placed on a bronze surface covered with leather. The latter permits to isolate the strip from the support and avoids the texture of the hard surface being impressed on the underside. Without the leather band, the hammering prints the traces of the surface on which the headband is placed. Similarly, when we hammered on a textile, the band of gold prints the structure of the latter.¹⁷ This proves that the craftsman needs to choose a smooth material in order to obtain a band without roughness.

These tests also show that hammering can sometimes crumple a headband. Indeed, once a band becomes thinner, it is very difficult to preserve its smoothness, and during the hammering a simple slip of the tool can crumple a band. We can assume that headbands' puckering observed in the archaeological record derives from manufacture by hammering, and it is not due to taphonomic conditions or to wear, as is widely considered.

Finally, these experiments show that arriving to a certain threshold of thinness (around 0.04–0.05 mm) it is difficult to obtain a particular shape, even for an experienced goldsmith like F. Allier. It seems that cutting with a bronze tool or a flint to achieve the ornament is necessary.¹⁸ This action can be attested by the examination of a headband from Mochlos¹⁹ where traces of cutting occur at the right end (Fig. 1a). A trace left by another tool, more likely a chasing tool, had been created previously in order to help the craftsman

9 For instance, the headband from the circular wall of Pylos (BLEGEN *et al.* 1973, fig. 108). Only a drawing is provided in the publication, but it depicts the decorations upside down and so introduces a bias in the analysis.

10 The device used for our approach is DinoLite, model 7013.

11 Five from Mochlos preserved at the Heraklion Museum (HM 273, 275, 491, 492, 493), one from Mochlos preserved at Aghios Nikolaos Museum (MA 4313), two from Pylos preserved at Chora Museum (CM 2100, 2527). I am most grateful to these Museums and to the Greek Archaeological Service for giving me the permission to examine these headbands.

12 ARMBRUSTER, GUERRA 2003, 59.

13 In this workshop, F. Allier recreates ancient jewellery in collaboration with archaeologists. For example, he has reproduced Bronze Age granulation with R. Prevalet (PREVALET 2013).

14 The archaeological headbands are made of fine gold, and the native gold is always alloyed with silver (MOOREY 1991, 217). Nowadays, the percentage of alloy is higher and by this bias are less malleable.

15 For a complete definition, see EVANS 1936, 28.

16 This longer annealing process is still used nowadays in Burkina Faso within workshops of goldsmiths and bronze metallurgists according to F. Allier. R. Prévalet used an oil lamp (PREVALET 2013).

17 Our experiments were conducted in order to understand how the traces of impressions of a textile in a Protoattic headband (8th century) were produced (HACKENS 1980, 1).

18 Bronze chisels are known during the Bronze Age and could be used for this technique (BRANIGAN 1968, 31; EVELY 1993, figs. 2, 3, 4, 5).

19 SEAGER 1912, 22, HM 273.

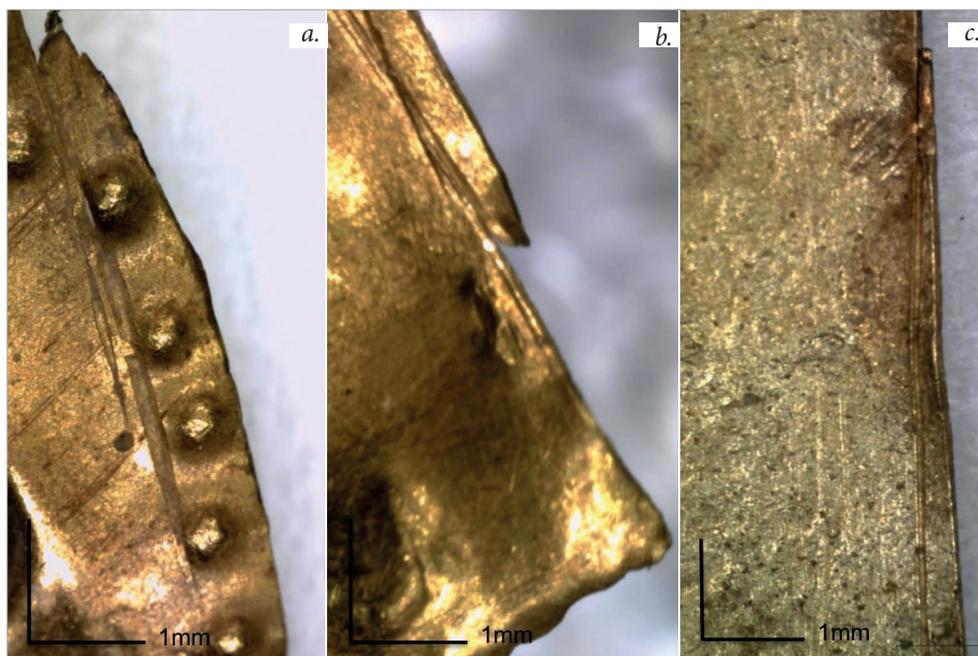


Fig. 1a. Traces of cutting, headband from Mochlos (HM 273); b. Headband from Mochlos (MA 4313); c. Headband from Platanos (HM 473).

to obtain a straight shape. This type of trace is also present on other Minoan headbands, such as the bands from Mochlos (Fig. 1b)²⁰ and Platanos (Fig. 1c).²¹ Traces on another Mochlos headband²² can also suggest the action of cutting. Indeed, this object has a flange along the entire length. During our experiments, this flange appeared when we cut the object without annealing. However, no traces of cutting or a flange appear on the Mycenaean bands. This absence may be due to a partial examination of the corpus. For the items observed, this absence might show that craftsmen obtained the shape of the bands without cutting. Nevertheless, the large size of these headbands (the biggest was 65 cm long)²³ suggests that it is almost impossible to obtain this shape without cutting. Does it signify that the know-how (hammering and/or cutting) of the Mycenaean craftsmen was higher than in Minoan times? Or is this effect due to a bias in the observation of the headbands?

In order to erase the traces of hammering, but also to obtain a shiny surface, the bands received a surface treatment. On the objects examined, traces of burnishing²⁴ (thin, parallel, and unidirectional striations) were

detected (Fig. 2). To obtain a similar effect, burnishing experiments were carried out using a small green agate stone.²⁵ This hard stone has a smooth surface and is still used nowadays by craftsmen for burnishing. For A. Thouvenin,²⁶ an animal's tooth or a wood/bone tool with a smooth surface could have been used as burnishing tools. R. Prevalet²⁷ evokes the use of another material, the convex side of a small hammer.

The polished stone was rubbed on the surface with a back-and-forth movement. This treatment involves a new annealing in order to return the gold to a good malleability, simplifies the application of *repoussé*, and avoids the deformation of the headband. Burnishing finally produces a smoother and brighter surface.

DECORATION

Most headbands are decorated by the technique of *repoussé*. It's a punched-dot decoration which permits the drawing of several forms, whether figurative or abstract. The most common is a line of points following the outline of the ornaments.²⁸ Our microscopic observations allow tools and supports for this

20 DAVARAS 1975, 103-104, MA 4313.

21 BRANIGAN 1974, 71, HM 493.

22 SEAGER 1912, 72, HM 275.

23 KARO 1930, 43, NM 282.

24 PREVALET 2013, 85.

25 The use of agate is attested in the Minoan and Mycenaean periods, OGDEN 1982, 109, 117.

26 THOUVENIN 1973, 41.

27 PREVALET 2013, 278.

28 With a percentage of 71% on decorated headbands. The headbands without decoration and those which were not illustrated are excluded.

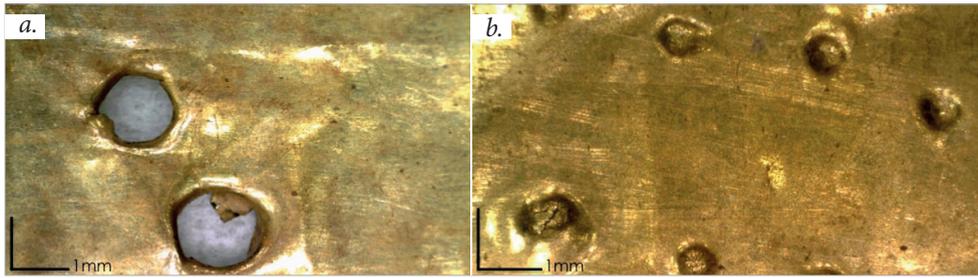


Fig. 2a. Traces of burnishing — headband from Mochlos (HM 275); b. Microscopic picture of the surface — headband from Pylos (CM 2100).



Fig. 3a. Repoussé decoration on leather support; b. Repoussé decoration on bronze support; c. Repoussé decoration on wooden support.

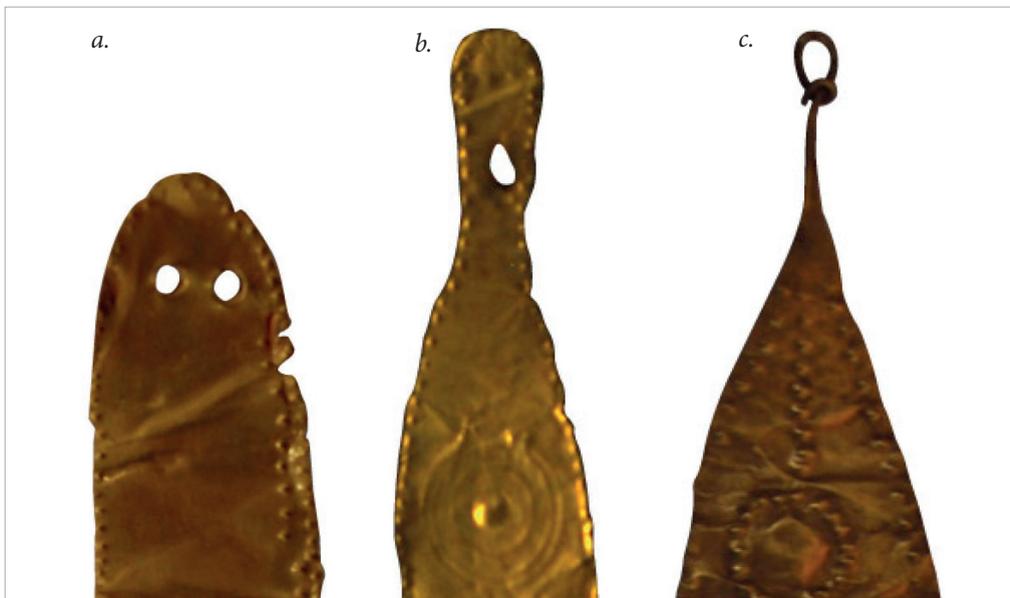


Fig. 4a. Perforated end; b. Perforated and expanded end; c. Loop end.

action to be identified. The tools would have been rigid but not too hard (for example a bronze tool), as otherwise the metal would have been punctured. Bone and wood seem the more suitable raw materials that were employed during the Bronze Age. For the experiments with wood, the tip was made with a kind of scalpel and was adapted to the desired size of the dots. Once the tool was created, a 0.05 mm thin gold sheet was placed on various supports: leather, bronze, and wood

(Fig. 3). The first one does not allow points to be created because it is too flexible and the sheet deforms (Fig. 3a). The second support is too hard, and so the points do not really mark the surface (Fig. 3b). Finally, a wooden board appeared as the most suitable support (Fig. 3c). Only a slight deformation is present, and the points can be applied easily. The size of the latter depends on both the size of the tool but also the strength of the pressure: the stronger the pressure, the bigger the dot.

THE VARIOUS ENDS

To reconstruct the manner of wearing a headband, it is important to focus on the shape of the ends. Indeed, the latter evolved during the Bronze Age. The ends were pierced in Greece from the Early Bronze Age to the Late Bronze Age (Fig. 4a), and this was the most common form.²⁹ But a variant form appears in the Shaft Grave period, which marks the transition from the Middle to Late Bronze Age and persists until the end of the Bronze Age (Fig. 4b). These headbands have expanded ends with a hole. This concerns about ten headbands, most of which come from Mycenae (eight pieces),³⁰ one piece was found in Médéon,³¹ and another one in Bikiorema-Stavros.³² Could these ends be considered as an evolution making it easier to attach headbands to the head?

In this same perspective, another type of end is attested: the loop form (Fig. 4c). Its geographical and chronological distribution is very restricted. Indeed, there are many headbands with this form of end from Argolis (Mycenae,³³ Argos,³⁴ and Asine³⁵), one from Corinth,³⁶ and two from the islands of Aegina³⁷ and Kea (Aghia Irini).³⁸ The earliest comes from Kea, dated to

Middle Minoan IIB–Middle Minoan IIIA.³⁹ The Corinth headband is dated to Middle Helladic II–III,⁴⁰ and the one from Asine belongs to Middle Helladic III.⁴¹ The bands from Argos are dated to Middle Helladic IIIB according to S. Dietz.⁴² Finally, those from Mycenae belong to the transition period between Middle Helladic II and Late Helladic I.⁴³

This is the only area in the Mediterranean where looped ends are attested. With the exception of Kea band,⁴⁴ this type of end is absent during the Minoan period. We can assume that the invention of the loop shows the appropriation and adaptation of the Minoan band by the Mycenaeans. At the same time, this extremity appears more solid than the end with a hole. If this was the case, why was this promising innovation abandoned? Finally, these different types of extremities could suggest different ways to fix the headband in the hair, and, thus, they could reflect an evolution of fashion.

THE PERFORATED ENDS

The perforations at the ends are 1 mm in diameter, and some of them are deformed⁴⁵ (Fig. 5). Indeed, their

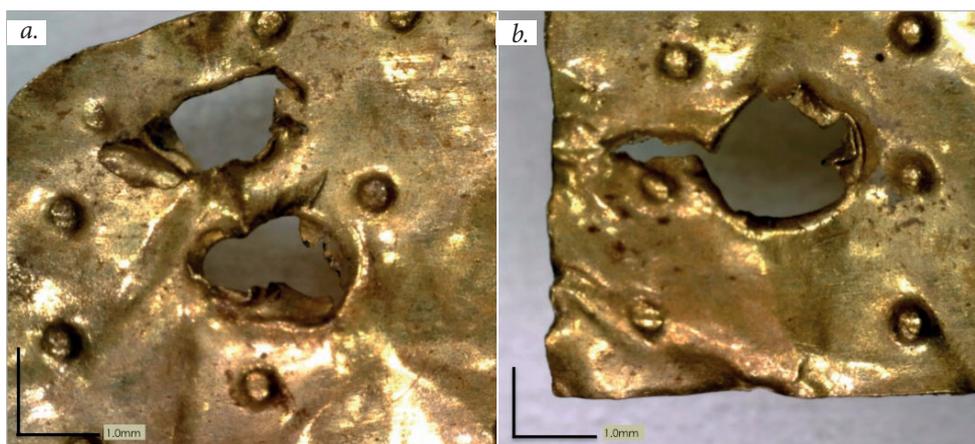


Fig. 5 Deformation of the end perforation: a. Headband from Mochlos (HM 275); b. Headband from Mochlos (HM 273).

29 With a percentage of 47% of our corpus.
 30 NM 229, 230, 281, 287, 8599, 8600, 8664 preserved at the National Museum of Athens.
 31 MÜLLER 1995, fig. E47 (MD 61).
 32 DAKORONIA 1990, Fig. 2.
 33 NM 219, 231, 232, 234, 235, 236, 282, 286, 8625, 8645, 8665, 8706.
 34 PROTONOTARIOU 1980; 2009, fig. E10.
 35 STYRENIUS, SOREN 1980, 30, fig. 20, 21 (F70-12).
 36 BLEGEN *et al.* 1964, 9, pl. 4 (T 2755).
 37 KILIAN-DIRLMEIER 1997, 54, fig. 8; FITTON 2009, fig. 66, n°683 and n°684.
 38 CASKEY 1972, 357–401, fig. E40 (K4.224).

39 CASKEY 1972, 386.
 40 BLEGEN *et al.* 1964, 9.
 41 It was originally dated to Middle Helladic II by Dietz (DIETZ 1980, 83–84), but a radiocarbon analysis gives a later date: Middle Helladic III (VOUTSAKI, INGVARSSON-SUNDSTRÖM, DIETZ 2012, 450).
 42 DIETZ 1991, 139.
 43 KARO 1930; MYLONAS 1973; DICKINSON 1977; KILIAN-DIRLMEIER 1986; GRAZIADO 1988; DIETZ 1991.
 44 During this period Kea was under Minoan influence.
 45 Observation valid for the Minoan headbands but not for the Mycenaean ones.

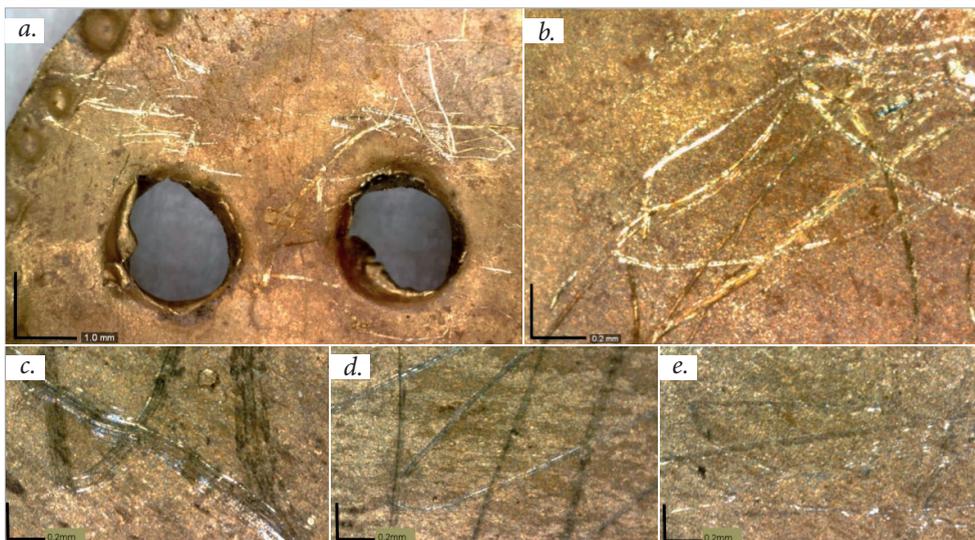


Fig. 6a. and b. Whitish traces on a headband from Mochlos (HM 273); c. Experimental traces made with the same bronze tool that was used to perforate the ends; d. Experimental traces made with a thinner bronze tool; e. Experimental traces made with a silver tool.

original round shapes have been altered on the part closest to the headband's edge. Our experiments invalidated the hypothesis that the wearer's hair would be threaded through these perforations. The orifices are too small to insert several locks of hair. Furthermore, as the edges of the holes through the metal were sharp, the hair was cut at each test. This deformation could be due to the pressure of a thread used to attach the metal to textile or to attach the headband directly to the hair, even if no trace of this type of use has been observed in huge magnification.

The raw material of the thread is debatable. Some gold threads have been discovered near to Cretan perforated bands dating to the Prepalatial period.⁴⁶ Other evidence is provided by the Minoan headband from Lebena which has a gold thread hanging from its ends.⁴⁷ Other materials, like wool or animal hair, can also be used but no archaeological remains were discovered.

It is difficult to identify the raw material employed for Minoan and Mycenaean threads. Our experiments have shown that whatever material was used, the characteristics of the deformations are very similar, but a gold thread deforms a band quicker than a wool or hair thread. If a headband had been worn for a long period, a gold thread is less efficient as the ornament will be quickly deteriorated. A thread made of another material seems indeed more suitable. At the same time,

the preference of the wearer can also be discussed. For example, choosing a gold thread forms a coherent whole with the rest of the ornament. Furthermore, the wearer's perception of comfort can vary according to the different materials. However, only a few gold threads were found during excavations, but we can assume that they were recycled.⁴⁸ For this purpose, the family of the deceased could have removed the threads easily as they are independent of the headband. The latter can then be melted and serve to produce other objects. Davaras⁴⁹ evokes this possibility for the extension of one headband from Mochlos. The deceased is not dishonoured as the object is still partially included in the grave.

Few macroscopic or microscopic traces were found that would allow the identification of the tool used to insert the thread. Nevertheless, on both ends of the headband from Mochlos⁵⁰ many fine whitish traces are visible (Fig. 6a–b),⁵¹ and some of these scratches on the surface continue into the perforation. Darker traces of corrosion exist on these traces. That is why we can state that these whitish scratches are not to be connected with the conservation or a modern manipulation of the artefact.

We tried to reproduce experimentally this kind of trace. Given their fineness, these holes are clearly the result of the use of a sharp object, such as a needle or a pin. Several materials have been tested: wood, bronze,

46 PREVALET 2013, 99.

47 HICKMAN 2008, 344. HM 749. It is nowadays exhibited in this connection in the Heraklion Archaeological Museum.

48 For the question of metal recycling, see in particular HAKULIN, 2013.

49 DAVARAS 1975, 110.

50 HM 273.

51 Traces of the same type are visible on another headband from Mochlos, HM 491.

and silver. The wooden tool is very flexible and sharp,⁵² and it has not left visible traces. During the first test, in order to perforate the headband we used a bronze tool (Fig. 6c). It turned out that this tool leaves much more visible traces than those seen on the archaeological headbands. We thus used a thinner bronze tool that left traces close to the archaeological ones (Fig. 6d). Finally, a silver tool also produced similar traces (Fig. 6e). The use of a pointed metal tool is the most likely. This could be a needle, given the thinness of the tip, used to thread a wire into the hole. In addition, these traces suggest that this action was repeated.

Similar traces have not been observed on other headbands. Could this absence reflect misrecognition during the examination of the headbands? Or is it another type of tool which has been used? Likewise, the experiments show that a thread could be inserted into the hole without a needle. This insertion is slower but also efficient. In order to answer these questions, it is necessary to examine microscopically the entire corpus.

THE LOOP ENDS

Examination of this type of ends was made only on the macroscopic scale.⁵³ Nevertheless, these ends were also reproduced experimentally. Firstly, the loop end is more complex and requires more time to be created than a perforated end. Its manufacture begins with the shaping of the headband, as it is essential to keep a thin gold thread at each end. The loop end is, thus, a part of the hammered band and is not an addition welded to the object. With a piece of wood,⁵⁴ we drew a line in the middle of these small bands at the ends. This line serves as a base to roll the gold threads on themselves in order to make them more resistant. This action is also essential to form the loop. During the experiments, we observed that it is impossible to form a loop by these means without twisting the wire. This twist has, however, not been observed macroscopically on the headbands examined. It is clear that we have reached here the limits of the study and that more microscopic studies of all the headbands with loop ends need to be done to identify the manner in which they were created.

A PERISHABLE SUPPORT?

Wear traces have only been detected on the Minoan perforated headbands. Indeed, their perforations are deformed and show some traces of repair. In the case of the headband of Mochlos, R. Seager⁵⁵ observed two groups of pinholes at its ends. These holes show that the metal was pierced over and over again in order to attach the object solidly on the wearer's head. These numerous perforations are also visible to the naked eye and are also discernible on other Minoan headbands.⁵⁶ These marks could be a sign of wear over a longer period. In addition, one headband from Tomb XIX of Mochlos⁵⁷ has two holes made on both sides of a small crack. It is likely that they were executed to prevent the tear getting bigger, and that the band continued to be worn after the damage occurred. The same action is visible on another band.⁵⁸ J. Hickman⁵⁹ explains that the perforation to the right of the break is made from the back of the object, while the left perforation was done from the front. For this author, this indicates that a needle was used to pierce the metal and to reattach the two pieces with a wire. This repair implies that the ornament had been worn at least twice.

When headbands are worn,⁶⁰ the principal question is how they were attached to the head. F. Allier explains that given the extreme fineness of the bands, an intermediate element appears necessary, otherwise the band would be deformed too quickly or even torn. I would like to argue that a backing of a perishable material, such as cloth or leather, could fulfil this role. In addition, these perishable materials could be tied behind the head to ensure better attachment of the headband in the hair.

This is not the first time that such hypothesis has been advanced. A good illustration of this is the *spondylus* found in the female grave 245 of the Neolithic site of Durankulak in Bulgaria. It is incorporated as parts of a diadem that, according to the authors,⁶¹ was sewn onto a piece of leather or textile to form an original hairstyle or headdress. In the same way, headbands related to a textile are evidenced from some Bronze Age Near Eastern sites. At Arslantepe in Anatolia, three gold bands accompanied an adult male and four teenagers who were sacrificed.⁶² The artefacts, found still *in situ*

52 Boxwood tool.

53 The headbands in the National Museum could not be taken out of their support.

54 Boxwood tools may also be used for punched-dot decoration by *repoussé*.

55 1912, 27; HM 268.

56 For instance, SEAGER 1912, 26, 27; HM 270 and 277.

57 SEAGER 1912, 72; HM 275.

58 HM 269.

59 2008, 212, pl. 45B.

60 Hypothesis formulated for the Minoan headbands.

61 TODOROVA, VAJSOV 2001, 42–43; AVRAMOVA 2002, 194;

TODOROVA 2002, 41.

62 3000 BC, cist grave, FRANGIPANE *et al.* 2011.

on the foreheads of the individuals, wore traces of linen on their inner faces. At Ur, L. Woolley⁶³ observed that some bands had 'gauze-like net' imprints, which might suggest that they had been attached to some kind of textile. E. Mackay,⁶⁴ during the excavations of the Kish Cemetery A, also found traces of textile printed under a piece of silver headband. For S. Müller, the possibility of a support made of perishable material is suggested by a brownish alteration on the back of the headband from Médéon.⁶⁵ Later, the gold headband of the Lady of Aigai dated to 500 BC was also sewn onto a textile.⁶⁶ Regarding some gold strips of a length of about 30 cm from the Bronze Age⁶⁷ found in the province of La Corogne and Pontevedra in Spain, B. Perez Outeiriño⁶⁸ argues that if these strips had been associated with a leather or textile band, they could have reached the size to surround the circumference of a head.

Comparison between the archaeological and iconographical evidence offers further information. Headbands are widely depicted and several types appear during the Bronze Age: rigid or flexible, used alone or as a composite with other material, in the shape of a circle or a semi-circle. However, only one occurrence of the combination of a headband with leather or textile appears in the iconography of the Aegean Bronze Age.⁶⁹ A fresco on the north wall from the Xesté 3 in Thera could show the combination of a metal band (in yellow, probably depicting gold) with a band in perishable material (in blue, maybe a textile or leather)

on the head of one of the young girls. Even if the iconographic data are rare, they reinforce the hypothesis of a metal band being associated with a leather or cloth material. These perishable materials would rarely survive burial in the soil.

CONCLUSION

To conclude, this functional approach allows the verification of certain assumptions already expressed by previous researchers on the techniques of manufacturing and decoration of these objects. It indicates that the skill of the goldsmith of the Bronze Age had to be high to obtain such a headband. It also permits new hypotheses to be advanced particularly on the importance of the ends. On some of them, the detection of the traces of a thread leads us to wonder how the headband was worn. We thus propose the existence of a perishable support under the metallic headband to ensure a better fixation on the head. During our experiments, two headbands were reproduced in collaboration with a goldsmith: a life-size reproduction of the Mochlos band⁷⁰ and a smaller-scale reproduction of the Mycenaean band.⁷¹ In order to go further with the analysis, experiments with a hairdresser are planned to test the importance of a perishable support. We will also test if the different types of extremities reflect a different type of attachment. Finally, this paper aims to present a preliminary and synthetic overview of a new functional approach to headbands.

BIBLIOGRAPHY

- Andreou I., I. Andreou (1999) I koilada tou Gormou sto Pogoni tis Ipeirou, kentro zois kai anaptyxis kata tin Proimi epochi tou Sidirou, in: E. Phroussou (ed.), *I Periphereia tou mykinaïkou kosmou: a' diethnès diepistimoniko symposio Lamia (H Periphereia tou mykinaïkou κόσμου: α' diethnès diepistimonikó sympóσιο Λαμία)*, Lamia, pp. 77–90.
- Armbruster B., M. F. Guerra (2003) L'or archéologique, une approche interdisciplinaire, *Technè* 18, pp. 57–62.
- Avramova M. (2002) Der Schmuck aus den Gräbern von Durankulak, in: H. Todorova (ed.), *Durankulak, 2. Die Prähistorischen Gräberfelder*, Sofia, pp. 191–206.
- Blegen C. W., H. Palmer, R. S. Young (1964) *The North Cemetery, Corinth: Results of Excavations Conducted by the American School of Classical Studies at Athens*, 13, Princeton.
- Blegen C. W., M. Rawson, W. Taylour, W. P. Donovan (1973) *The Palace of Nestor at Pylos in Western Messenia*, Princeton.
- Branigan K. (1968) *Copper and Bronze Working in Early Bronze Age Crete*, SIMA 19, Lund.
- Branigan K. (1974) *Aegean Metalwork of the Early and Middle Bronze Age*, Oxford Monographs on Classical Archaeology, Oxford.
- Caskey J. L. (1972) Investigations in Keos, *Hesperia* 41, pp. 357–401.
- Cifarelli M. (2010) Adornment, identity, and authenticity: Ancient jewelry in and out of context, *AJA* 114, pp. 1–9.

63 Around 2500 BC. WOOLLEY 1934, 246.

64 Around 3000 BC. MACKAY 1929, 178–179.

65 Late Helladic; MÜLLER 1995, 417, fig. E 47 (MD 61).

66 DESCAMPS 2011, 276.

67 Between 1500 BC and 1300 BC.

68 PEREZ OUTEIRIÑO 1994, 30.

69 Many textile bands are depicted on frescoes. These headbands could have been cheaper substitutes for metal headbands; see DOUMAS 1992, fig. 10; 102, 105, 119, 121, 124, 125, 130.

70 HM 273.

71 NM 286.

- Dakoronia P. (1990) O Achilleas kai i koilada tou Sperchiou, *Archeologia* 34:2, pp. 40–43.
- Davaras C. (1975) Early Minoan jewellery from Mochlos, *BSA* 70, pp. 101–114.
- De Checchi C. (2006) Les techniques d'orfèvrerie minoenne: l'apport des objets de Mochlos, in: G. Nicolini (ed.), *Les Ors des Mondes Grec et «Barbare», Actes du colloque de la Société d'Archéologie Classique du 18 novembre 2000*, Paris, pp. 17–33.
- Descamps S. (dir.) (2011) *Au royaume d'Alexandre le Grand: la Macédoine antique*, Exposition, Musée du Louvre, Paris, exhibition catalogue.
- Dickinson O. T. P. K. (1977) *The Origins of Mycenaean Civilisation*, SIMA 49, Göteborg.
- Dietz S. (1980) *Asine II: Results of the Excavations, East of the Acropolis 1970–1974; 2. The Middle Helladic Cemetery; The Middle Helladic and Early Mycenaean Deposits*, Skrifter utgivna av Svenska institutet i Athen 24, Stockholm.
- Dietz S. (1991) *The Argolid at the Transition to the Mycenaean Age: Studies in the Chronology and Cultural Development in the Shaft Grave Period*, Copenhagen.
- Doumas Ch. (1992) *The Wall Paintings from Thera*, Athens.
- Effinger M. (1996) *Minoischer Schmuck*, Oxford.
- Evans F. T. (1936) *Hammered Metalwork*, London.
- Evely R. D. G. (1993) *Minoan Crafts: Tools and Techniques: An Introduction*, SIMA 92, 1, Jonsered.
- Fitton J. L. (ed.) (2009) *The Aigina Treasure, Aegean Bronze Age Jewellery and a Mystery Revisited*, London.
- Frangipane M., M. G. Di Nocera, A. Hauptmann, P. Morbidelli, A. Palmieri, L. Sadori, T. Schmidt-Schultz, M. Schulz (2001) New Symbols of a new power in a “Royal” Tomb from 3000 BC Arslantepe, Malatya (Turkey), *Paléorient* 27:2, pp. 105–139.
- Graziado G. (1988) The Chronology of the Graves of Circle B at Mycenae: A new hypothesis, *AJA* 92:3, pp. 343–372.
- Hackens T. (1980) *Études sur l'orfèvrerie antique*, Louvain-la-Neuve.
- Hakulin L. (2013) *Metals in LBA Minoan and Mycenaean Societies on Crete: A Quantitative Approach*, unpublished PhD thesis, University of Helsinki.
- Hickman J. (2008) *Gold Before The Palace: Crafting Jewelry and Social Identity in Minoan Crete*, unpublished PhD thesis, University of Pennsylvania.
- Hickman J. (2011) The Dog Diadem from Mochlos, in: P. P. Betancourt, S. C. Ferrence (eds.), *Metallurgy: Understanding How, Learning Why: Studies in Honor of James D. Muhly*, Philadelphia, pp. 91–103.
- Karo G. (1930–1933) *Die Schachtgräber von Mykenai*, Munich.
- Kilian-Dirlmeier I. (1986) Beobachtungen zu den Schachtgräbern von Mykenai und zu den Schmuckbeigaben mykenischer Männergräber, *JRGZM* 33, pp. 159–198.
- Kilian-Dirlmeier I. (1997) *Alt-Ägina IV, 3. Das mittelbronzezeitliche Schachtgrab von Ägina*, Kataloge vor- und frühgeschichtlicher Altertümer 27, Mainz.
- Mackay E. (1929) *A Sumerian Palace and the “A” Cemetery at Kish, Mesopotamia*, Chicago.
- Moorey P. R. S. (1999) *Ancient Mesopotamian Materials and Industries: The Archaeological Evidence*, Winona Lake.
- Müller S. (1995) *Les tombes mycéniennes de Médéon de Phocide*, unpublished PhD thesis, University Lyon II.
- Mylonas G. E. (1973) *O Taphikos kyklos B ton Mykenon (O Ταφικός κύκλος Β των Μυκηνών)*, Athens.
- Ogden J. (1982) *Jewellery of The Ancient World*, London.
- Perez Outeiriño B. (1994) Ouriveria prehistórica do Noroeste peninsula. Primeiras manifestações, *Boletín Auriense* 24, pp. 17–44.
- Prevalet R. (2013) *La décoration des pièces d'orfèvrerie-bijouterie en Méditerranée orientale à l'âge du Bronze: techniques, productions, transmissions*, unpublished PhD thesis, University Paris I – Panthéon Sorbonne.
- Protonotariu-Deilaki E. (1980) *I timvi tu Argu (Οι τύμβοι του Άργους)*, unpublished PhD thesis, University of Athens.
- Seager R. (1912) *Explorations in the Island of Mochlos*, Boston.
- Styrenius C-G., S. Dietz (1980) *Asine II: Results of the Excavations East of the Acropolis 1970–1974. The Middle Helladic Cemetery; The Middle Helladic and Early Mycenaean Deposits*, Skrifter utg. av Svenska institutet i Athen 24:2, Stockholm.
- Thouvenin A. (1973) La soudure dans la construction des œuvres d'orfèvrerie antique et Ancienne, *RAE* 24:1, pp. 11–68.
- Todorova H. (2002) *Die Prähistorischen Gräberfelder*, Sofia.
- Todorova H., I. Vajsov (2001) *Der Kupferzeitliche Schmuck Bulgariens*, Stuttgart.
- Vasilakis A. S. (1996) *O chrysos kai o argyros stin Kriti kata tin Proimi Periodo tou chalkou (Ο χρυσός και ο αργυρός στην Κρήτη κατά την Πρώιμη Περίοδο του χαλκού)*, Iraklion.
- Voutsaki S., A. Ingvarsson-Sundström, S. Dietz (2012) Tumuli and social status: a re-examination of the Asine tumulus, in: E. Borgna, S. Müller Celka (eds.), *Ancestral Landscapes: Burial Mounds in the Copper and Bronze Ages*, Lyon, pp. 445–461.
- Woolley C. L. (1934) *Ur Excavations, Volume II: The Royal Cemetery. A Report on the Predynastic and Sargonid Graves Excavated between 1926 and 1931*, New York.

BETWEEN CRETE AND ANATOLIA METAL FINDS OF THE SO-CALLED LOWER INTERFACE IN THE LBA¹



ABSTRACT: This paper aims to provide a typological analysis of bronze objects from the area of the lower part of the East Aegean-West Anatolian Interface in the Late Bronze Age and a comparison to the contemporary finds from Crete. The concept of the Interface was defined by Penelope Mountjoy in 1998 based on ceramics, settlement, and funeral activities. She argued that this territory differs from the neighbouring power centres, such as the island of Crete, the Greek mainland, and Central Anatolia. In this paper, only the lower part of the Interface will be discussed, including the Dodecanese islands and the adjacent Anatolian coast up to Miletus. Some metal finds from the lower part of the Interface seem to have been produced locally, but influence from Crete is still apparent. Furthermore, the typology of metal finds from Crete, such as swords, daggers, razors, and similar items, will be briefly defined. In the second part of this contribution the character of the Lower Interface finds will be represented, and in the final part the two datasets will be compared. To sum up, in the case of typology, some of the bronze items from the Lower Interface show strong Minoan-Mycenaean influence, which is also mixed with influences from other regions (Anatolia, Near East).

KEYWORDS: Late Bronze Age; East Aegean-West Anatolian Interface; Crete; Anatolia; Metal finds.

The goal of this paper is a typological analysis of all currently known bronze objects from the area of the so-called Lower East Aegean-West Anatolian Interface dating to the Late Bronze Age (LBA) and to compare them to contemporary finds from Crete. In geographical terms, the territory of this Interface consists of the eastern Aegean islands, such as Lesbos, Lemnos, Chios, Samos, and Dodecanese, along with the coastal regions of Anatolia facing these islands. The concept of the Interface was defined by Penelope Mountjoy in 1998,² based largely on the Mycenaean decorated pottery but also on the settlement and funeral evidence. Mountjoy argued that this territory differs from the current powerful centres, such as the island of Crete, the Greek mainland, or Central Anatolia. She also argued that the region of the Interface itself can be divided into a lower part, which was culturally at some point a part of the Minoan and Mycenaean sphere of influence, and an upper

part, which seems to have been following Anatolian developments to a greater degree. Other scholars have also embraced this perspective.³ It truly seems that this territory adapted, adopted, and mixed multiple influences, creating its own cultural synthesis.⁴ There was considerable mobility of people in the lower part of the Interface, and cultural interactions flourished there.⁵ According to Hittite written sources, it seems the inland western LBA Anatolia was politically organised into several kingdoms, alternately competing or creating alliances.⁶ By comparing the local ceramic traditions and trends, Peter Pavúk also divided the same territory into several ceramic zones.⁷ While the character of the material in the area of the East Aegean and West Anatolian Interface differs from inland Western Anatolia in detail, at the same time the Interface accepted cultural influences from the East and followed its trends as well.

1 This paper was written as part of a student project supported by the Grant Agency of Charles University in Prague, grant no. 643316, affiliated with the Faculty of Arts.
2 MOUNTJOY 1998.
3 GEORGLADIS 2003; MAC SWEENEY 2008; GIRELLA, PAVÚK 2015; PAVÚK 2015.

4 GREAVES 2007; VAESSEN 2016.
5 MOKRIŠOVÁ 2016, 52.
6 HAWKINS 1998.
7 PAVÚK 2015.

So far, the metal finds from the Interface region dating to the 2nd millennium BC have not been sufficiently dealt with. This article, therefore, deals primarily with the connections between the Lower Interface and Crete, although it should be emphasised that the whole Interface zone was affected by multiple influences not only from Crete but also from the Greek mainland, Central Anatolia, the Levant, the Balkans, and Central Europe for centuries. In a previously published text on the topic, I introduced a comparison between the East Aegean and West Anatolian Interface and the wider spectrum of Mediterranean and Aegean influences.⁸ There, I already stated some typological divergences of the metal finds of the East Aegean and West Anatolian Interface, highlighting the local particularities of this area and its multiple influences not only from Crete and the Greek mainland. This paper, therefore, aims to provide a closer typological overview of some metal finds from the Lower Interface, which includes the Dodecanese islands and the adjacent Anatolian coast up to Miletus, and to find their connection to the island of Crete. Furthermore, attention will be paid to the different regions of production of the chosen Lower Interface metal items. It should be noted that the article focuses primarily on weapons and other distinctive objects found mostly in graves, and offers observations on and comparison of the typological aspects of the bronze items, rather than the means and technology of their production. All the available data were collected by the author in his unpublished Master thesis.⁹

THE CRETAN PART OF THE STORY

Since the beginning of the 2nd millennium BC, Crete shows evidence of skilled and well-developed metallurgy, which probably comprised one of the essential elements of the palace economy. Most of the finds come from settlements and especially Knossos. Only one third of the finds was found in the funerary context. Weapons represent a rather large group (about 20 percent) of all the Cretan metal finds.¹⁰

It was Nancy Sandars who first systematically classified Aegean swords,¹¹ but in her classification of the earliest Aegean sword types she has followed the work of Georg Karo.¹² Therefore, this paper uses her typology.

A later different classification was created by Imma Killian-Dirlmeier.¹³ Two scholars dealt with the classification of spearheads: first Olaf Höckman,¹⁴ followed by Robert Avila,¹⁵ whose typology is used in this paper. There is only one comprehensive publication of Aegean knives, that is the one from 1955 by Nancy Sandars,¹⁶ but it should be updated based on new findings. The work of Keith Branigan¹⁷ focused on Aegean axes, while Hayat Erkanal examined those from Anatolia.¹⁸ Arrowheads were classified by Hans-Günter Buchholz¹⁹ and then, applying a different approach, by Robert Avila.²⁰ Avila's arrowhead typology is preferred in this article. And finally, razors have been briefly discussed by several authors, but for the present needs the work of Klaus Weber, who collected the majority of all known Aegean razors, is sufficient.²¹

Crete is considered to be the birthplace of the first Aegean sword type — Karo's type A — with finds from Malia, the cave of Arkalochori, and Knossos.²² Such examples have a long blade with a midrib, no shoulders, and only a short narrow tang. Most of them have rivet holes. They were probably used for stabbing. There is not sufficient evidence of the typical forms of type B swords found on Crete so far (though a possible close example comes from Ayia Triada).²³ Type B swords are very common in the Peloponnese. The blade resembles those of type A, but the tang is longer and flatter and can already be termed almost a sort of a hilt. The guard has shoulders, usually flanged. Later sword types dating to Late Helladic (LH) II and onward appear all over Crete as well, whereas Sandars' types C and D (horned and cruciform swords) are more numerous than the next generation of swords (types E, F, G of mostly LH IIIB date), which are, in turn, more common in Mainland Greece.²⁴ Swords of type C inherit the shape of type B, but they have a long tang and shoulders. The flanges run along the whole hilt, including tang and shoulders. A new feature are horns on the hilt guard. Type D swords have a different hilt design. The most significant feature is the cross-shaped shoulders on the hilt for swordsman's hand protection. Also, specimens of this type are much shorter than the earlier sword forms. Types E and F are usually just of dagger size. Their blade is wider and flatter, mostly without a midrib. Their flanged hilt with rivets commonly ends with a T-shaped

8 ROHÁČEK 2018.

9 ROHÁČEK 2015.

10 HAKULIN 2004, 3, 8.

11 SANDARS 1961; 1963.

12 KARO 1930.

13 KILLIAN-DIRLMEIER 1993.

14 HÖCKMANN 1980.

15 AVILA 1983.

16 SANDARS 1955.

17 BRANIGAN 1974.

18 ERKANAL 1977.

19 BUCHHOLZ 1963.

20 AVILA 1983.

21 WEBER 1996.

22 SANDARS 1961.

23 SANDARS 1961, 27, pl. 18, 1; KILLIAN-DIRLMEIER 1993.

24 SANDARS 1963.

pommel extension, like some of the type D swords. Type G is similar to type C. It has horns and blade of the same design, but also has a T-shaped pommel at the end of the tang. Finally, the sword type Naue II is known on Crete through several specimens of its subvariant C.²⁵ This subvariant is also very common in Greece, Central Europe, and northern Italy.²⁶ Naue II did not have an Aegean origin, and it is the only sword type that continued in the Iron Age. The hilt with short shoulders is fully developed. The blade is suited for both stabbing and cutting. From the base to the tip, the blade is usually narrower in the first third, and closer to the tip there is a widening. Type C of the Naue II swords is distinguished by a cross-like shape of the tang extension at the end of the hilt.

The spearheads represented among the Cretan finds do not have good parallels in Mainland Greece. There are not many certain examples of Avila's first three types on Crete. It is only his type IV that is more widely represented on this island, often in a typologically modified form when compared to those from Mainland Greece. Type IV has a long, narrow leaf-shaped blade with midrib, sometimes with a sort of a shoulder at its base, and a socket. Such examples come from Ayios Ioannis.²⁷ However, in the case of Crete, a type of long thin spearhead with a flat midrib and a short socket (in the original called by Avila "*Mittel- und Spätminoische Tüllenlanzenspitzen*") is typical, with examples coming from Knossos and Isopata.

Avila also created a classification of Aegean arrowheads and divided them into two major classes with further subvariants. However, Crete does not possess many arrowheads: the known examples (mostly from around Knossos) belong to a subvariant of both of Avila's classes (1c and 1e; and 2a and 2d) with a similar design to examples from Mainland Greece but with territorial differences.²⁸ A detailed description of the subvariants of both classes is not needed here. In general, the first class has a triangular shape and no tang, and sometimes the head has holes in it. The second class also has a triangular shape, but the body of the arrowhead is narrower than the previous class, and the blade is tanged and barbed.

Knives have been found relatively frequently in central and eastern Crete; especially examples belonging to Sandars' Class I. This class is spread widely across the whole of the Aegean region and beyond. It is the most

common shape, with a single-edged blade with holes for rivets on its short tang. Other chronologically later knife types are represented by one specimen only.²⁹ Various variants of double-edged (a dagger-like blade usually with a short tang and rivets) and one-edged razors (a sickle-like curved blade with longer tang and rivets/or fully cast rivetless hilt) are also quite numerous on Crete, and are typologically similar to those from Mainland Greece.³⁰

Flat axes of single- and double-edged varieties appear on Crete since Early Minoan (EM) I. Those axes are very common in the whole of the Aegean.³¹ Cretan specimens from the beginning of the 2nd millennium BC, for example a double-edged axe, come from the site of Chamaezi.³²

Finally, metal pins are not common finds, though there are a few examples from Knossos, Malia, and Kamilari. Their appearance differs from pins from the North-Eastern Aegean and Anatolia. While most of the pins from Crete have a simple half-bent tip not connected to the body, the North-Eastern Aegean and Anatolian specimens occur in a variety of types with heads of various shapes (most common forms are knob-headed pins and loop-headed pins).³³

THE EVIDENCE FROM THE LOWER INTERFACE

Altogether 28 swords have been identified by the author in the Lower Interface region,³⁴ especially in the Dodecanese. Interestingly, currently there is no evidence of any swords of Karo's Cretan type A in the whole area of the Interface, even though their distribution includes Mainland Greece, the Cyclades, and even the Ionian islands. By contrast, swords of Sandars' type B, which according to her originated in Mainland Greece and more precisely in the Argolid, are known in the area of the Lower Interface, and their variants exist also in inland Anatolia. The Dodecanese and Anatolian specimens are typologically not too dissimilar from the swords in Mainland Greece, but there are some divergences that point to a localised tradition of their manufacture. While their appearance is similar to type B swords, they also have some features of later type C swords.³⁵ In this work, however, the focus will be on some other swords from the Lower Interface that show strong affinities to Crete.

25 KILIAN-DIRLMEIER 1993, pls. 34–36.

26 JUNG, MEHOFER 2008, 114.

27 AVILA 1983, pls. 8–9.

28 AVILA 1983, pl. 60, figs. a–b, pl. 61, fig. b, pl. 62.

29 SANDARS 1955. Also, see here a definition of other knife classes.

30 WEBER 1996.

31 BRANIGAN 1974, 164.

32 EVANS 1921, 194, fig. 141.

33 BOEHMER 1972; BRANIGAN 1974; MÜLLER-KARPE 1974.

34 ROHÁČEK 2015, 26–41.

35 ROHÁČEK 2018, 20.

One of the 'transitional type B/C' swords from the so-called Old Tomb 4 from Ialysos on Rhodes dated to LH IIIA2 (Fig. 1), which has already been discussed by the author from the perspective of its affinities to Mainland Greek features, will be now considered in terms of its Cretan affinities.³⁶ The sword is unusually long, its shoulders resemble the horns of horned swords, and the general shape of the sword is close to type C swords, although the form of the guard is also reminiscent of those of type B swords from the Shaft Graves in Mycenae. Sandars noted the relationship of the Ialysos sword to the type B swords, but in her opinion the typological features of type C prevail. Moreover, she observed close relationships with Cretan swords. She pointed out, for instance, that although the hilt is broken, the rivet holes in it can be clearly observed. Such a feature is typical of type C swords from Crete, which are well exemplified by high quality finds with decorated midribs from Knossos and Zapher Papoura.³⁷

Another typical, but fragmented, long type C sword from a chamber tomb (tomb 74) from Ialysos dated to LH IIIA1 can be compared with parallels from Knossos or with a damaged sword from Chersonisos.³⁸ The Ialysos example has a typical type C shaped hilt, a guard, and its rivetless hilt and horns on the guard are of the same design as the swords from Knossos and Chersonisos. Only the Cretan examples have a differently grooved midrib.

Among the swords from Ialysos is a horned sword that should belong to the so-called Siana group.³⁹ This group is typologically described as a short mid-ribbed sword with horned shoulders, and the hilt has an extension in the form of a tang at its end. It might be a unique sword type from the area of the East Aegean and West Anatolian Interface called the Siana type by Sandars (classified within her type H) and dated primarily to the end of the 14th and the beginning of the 13th century BC (LH IIIA2–LH IIIB).⁴⁰ This particular example was found in a chamber tomb (tomb 53) at Ialysos on Rhodes (Fig. 2) accompanied by pottery and precious objects of LH IIIB date. It has interesting horns and a midrib that has close affinities with the Cretan sword from Zapher Papoura.⁴¹ The Ialysos sword has a non-metallic hilt covering the projection into the midrib,

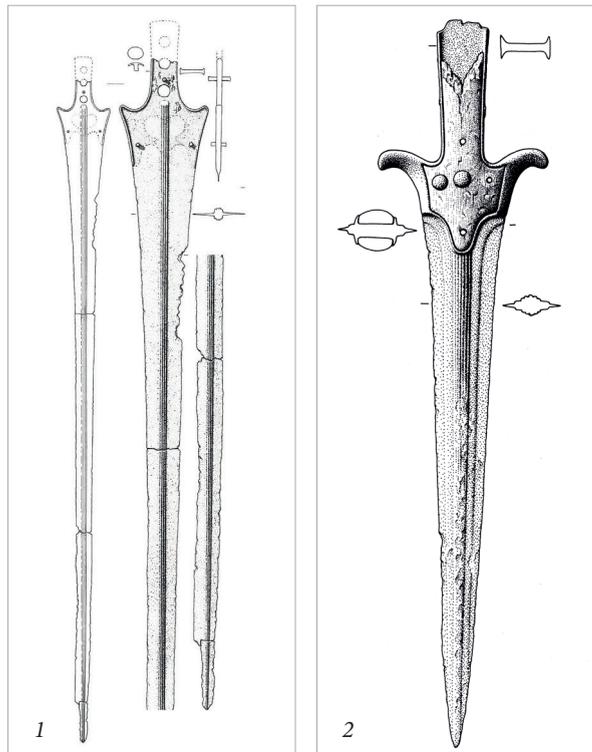


Fig. 1 Type 'B/C' sword from Ialysos, Rhodes (after KILIAN-DIRLMEIER 1993, pl. 14, fig. 72).

Fig. 2 Sword of Siana type from Ialysos, Rhodes (after KILIAN-DIRLMEIER 1993, pl. 18, fig. 100).

but its hilt, the shape, and the way of casting of the horns have a similar design as the Zapher Papoura example, so both swords are comparable and also a connection can be suggested.

Another similar Lower Interface Siana sword comes from Bodrum.⁴² Although this sword now lacks the non-metallic covering of the hilt, it can still be observed that it used to have one, and it was modified in the same way as in the case of the swords from Zapher Papoura and Ialysos. Other features, such as horns and tang extension, are of the same or similar shape as other Siana swords.

There are three swords belonging to type D, all of which come from Ialysos on Rhodes. The first example, with a damaged hilt, comes from an unnumbered

36 ROHÁČEK 2018, 20.

37 SANDARS 1963, 144, pl. 21, fig. 1; KILIAN-DIRLMEIER 1993, 43–44, pl. 10, figs. 52, 53.

38 KILIAN-DIRLMEIER 1993, pls. 12–13, figs. 63, 65.

39 This group has already been discussed and defined in ROHÁČEK 2018, where this example was not considered as a Siana sword (Sandars' type H). Benzi considers this sword an example of type G (BENZI 2005, 18). On the other hand, Killian-Dirlmeier put this example in the same group with the real Siana swords

(KILIAN-DIRLMEIER 1993, 49). The author of this paper, however, has now decided to include this example in the Siana group swords because of the projection of the hilt into the midrib as in the case of the Bodrum sword discussed in this paper.

The broken hilt of the Ialysos sword complicates its classification, as this sword might belong to type H or even a different type.

40 SANDARS 1963, 40–42; BENZI 2005, 18.

41 KILIAN-DIRLMEIER 1993, pl. 17, fig. 93.

42 YALCIKLI 2006, 30, figs. 1, 2.

chamber tomb.⁴³ The hilt with two rivets is broken, as is one shoulder. The midrib is grooved. The second sword was found in rich chamber tomb 4⁴⁴ together with other metal objects like a knife, spearheads, razors, and jewellery.⁴⁵ The sword's shoulders are not damaged, and the hilt has a T-shaped pommel cast together with the rest of the sword. The first and second swords have similarly ribbed midribs and modified hilts. The damaged sword from the unnumbered tomb has, unfortunately, a broken end of the hilt, so the pommel design cannot be observed, and we do not know whether it also had T-shaped pommel or not. The third sword from Ialysos,⁴⁶ which was found together with the already mentioned long sword of 'type B/C' from the Old Tomb 4, represents yet another example of a type D sword that shares similar features with the previously discussed Ialysos type D examples, including the design of the midrib and the hilt, which is ended by a T-shaped pommel. All three finds can be compared to Cretan swords, for example from Knossos, Ayios Syllas, or Chania, which share a similar typological design of the shoulders, hilt, and midribbed blade.⁴⁷ This design suggests a strong connection to Cretan workshops.

The same seems to hold true also in the case of the other four type D swords. These have simpler general design than the previously discussed type D swords, and their blades have a single flat midrib. They come from Eleona on Kos, Ialysos on Rhodes, and Izmir. It was suggested that they might originally have come from the Lower Interface region,⁴⁸ especially when comparing these examples to Cretan swords. It should be noted, however, that their design still shows close affiliation with the Cretan examples, such as the swords from Knossos and Pigi.⁴⁹

Examples of the last Late Bronze Age sword form, the so-called Naue II type (the predecessor of later iron swords), are known from Langada on Kos and Bodrum. Their form is known in Greece as type A, and there are a lot of parallels in Central Europe (type Reutlinger) and Italy (type Cetona),⁵⁰ which is defined by a 'fish-tail' at the end of the hilt. This feature is something that both Naue II swords from the Lower Interface region have in common. As already noted, on Crete only Naue

II type C swords have so far been discovered.⁵¹ An interesting fact about the sword from Langada is that it is now considered to be one of the earliest examples of Naue II swords in the Eastern Mediterranean.⁵² This example comes from Tomb 21 and is dated to LH IIIB.⁵³

Bronze spearheads in the Lower Interface also generally follow the same typology as those from Crete and the Greek mainland, although they appear to show strong local peculiarities.⁵⁴ In terms of typology, this paper follows the classification by Avila.⁵⁵ He recognised and differentiated various types and series. All types up to number IV appear primarily on the Greek mainland, and type IV appears in similar versions also on Crete. In the Dodecanese, there are several finds of Avila's type IV, which are very similar in design to mostly mainland parallels, as well as some Cretan ones.⁵⁶

The shape of the blade is long, leaf-shaped, and it has a socket. The same can be observed in the case of spearheads of Avila's type V and VI (type V has a much bigger and wider blade and only a short socket; type VI is a smaller and more robust version of type IV) from the Dodecanese. The typological connection with Mainland Greece is possibly stronger than with that of Crete.⁵⁷ Overall, it can be stated that after further observations on the general appearance of spearheads from the Lower Interface, the Dodecanese spearheads may be seen as a locally-made group, which stands apart from the Aegean examples. However, there is still a typological connection to the Cretan spearheads.⁵⁸

One of the most frequent types of spearheads that appear on Crete is the previously-mentioned type identified by Avila, which is a long, thin spearhead with a flat midrib and a short socket.⁵⁹ This form of a spearhead is also known on Rhodes (Fig. 3), Kos, and Karpathos. So far, five examples have been found.⁶⁰ The earliest find of this kind of a spearhead is known from the warrior graves in Knossos of LH II or LH IIIA1, and later specimens were dated to LH IIIA–B.⁶¹ It should be noted that although the connection with Crete is obvious, in terms of their decoration and elaboration, the Lower Interface examples seem to appear more like a humble and simple version of the Cretan spearheads. Its distribution is concentrated mostly around Knossos,⁶² and it seems that

43 KILIAN-DIRLMEIER 1993, pl. 25, fig. 139.

44 Not to be confused with the so-called 'Old Tomb 4'.

45 KILIAN-DIRLMEIER 1993, pl. 27, fig. 146.

46 MAIURI 1926, 98, figs. 15, 19.

47 KILIAN-DIRLMEIER 1993, pl. 23, fig. 120, pl. 28, figs. 136–137.

48 ROHÁČEK 2018.

49 KILIAN-DIRLMEIER 1993, pl. 22, figs. 114–116.

50 JUNG, MEHOFER 2008, 114.

51 KILIAN-DIRLMEIER 1993; JUNG, MEHOFER 2008, 114.

52 JUNG 2008, 72.

53 BENZI 2009, 157.

54 ROHÁČEK 2015, 42–49.

55 AVILA 1983.

56 AVILA 1983, pls. 9–10.

57 ROHÁČEK 2018, 23.

58 AVILA 1983, 29.

59 AVILA 1983, 133, pls. 33–34.

60 AVILA 1983, pls. 32–33; MELAS 1985, 152.

61 AVILA 1983, 133.

62 HÖCKMANN 1980, 56, 61.

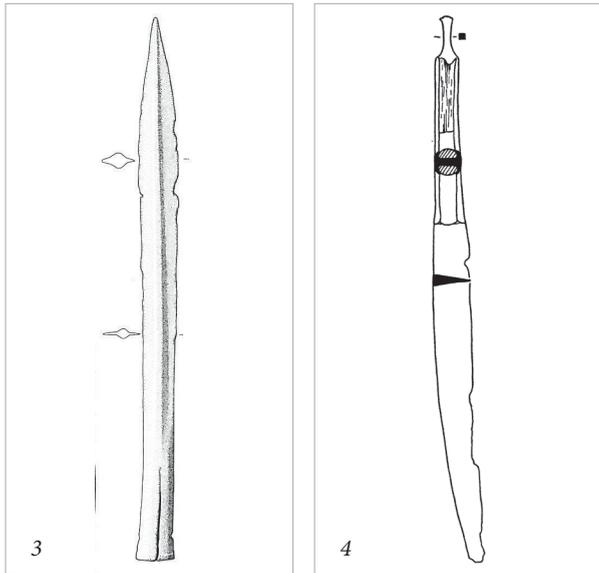


Fig. 3 Long, thin spearhead with a flat midrib and a short socket from Ialysos, Rhodes (after AVILA 1983, pl. 32, fig. 864).

Fig. 4 Siana knife, from Siana, Rhodes (after SANDARS 1963, 140, pl. 27, fig. 54).

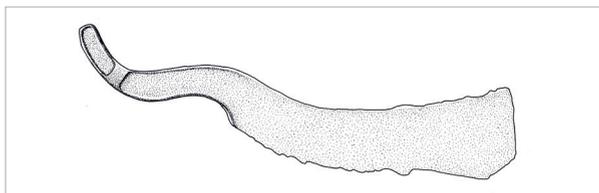


Fig. 5 Razor from Ialysos, Rhodes (after WEBER 1996, pl. 39, fig. 336).

this type spread to the islands as part of Cretan influence. Höckmann saw this weapon as a deadly bayonet type spearhead, the appearance of which suggested to him that specifically this form was a penetrating weapon.

At the end of the Bronze Age, the variability of spearhead types increased. In general, their design still followed the Aegean patterns, with additional stylistic affiliations with the Near East, but influences from the Balkans and Central Europe now appeared.⁶³ To summarise, the whole Late Bronze Age development, the spearheads from the Lower Interface, particularly those from the islands of Kos, Rhodes, and Karpathos (though spearheads from tombs in Müsgebi can also be mentioned here),⁶⁴ show a close connection to the Aegean,

while at the same time products in the local tradition were being created. If we compare spearheads of the Lower Interface with the rest of the Aegean, the number of the Lower Interface spearhead types is limited. The frequency is also smaller when compared to Mainland Greece. On Crete, however, there are not so many forms either, and certain types that appear in the Lower Interface and the Greek mainland do not appear on Crete.

With regard to knives, the situation is not very clear. There is still a lack of comprehensive research on Aegean knives. Essentially, there is only one proper paper on the topic.⁶⁵ Knives occurred virtually in the entire Interface, although Rhodes stands out as the region with most finds. In general, the knives from the Lower Interface show only a few deviations from those found in the other parts of the Aegean. Most of them have a simple single-edged blade with rivet holes on a short tang. One of the more interesting finds is a flat, one-edged, decorated blade with a pommel in the shape of a ring with rivet holes from Ialysos.⁶⁶ The knife, now broken, was found in a tomb, which included several burials ranging from LH IIIA to IIIC. According to parallels with a similar knife from Enkomi on Cyprus, the Rhodian example could date to the LH IIIA period.⁶⁷ Its possible function as ritual tool was already discussed by the author in his earlier article.⁶⁸ This knife has a Minoan-like depiction on its blade. A knife with a similar decoration was discovered by Mario Benzi in Phaistos on Crete, which was described by Jan Bouzek as a mixture of Aegean and European influences.⁶⁹ However, the hilt of Phaistos knife is broken. In the case of the knife from Ialysos, Benzi believes that the depiction was incised as a secondary act.⁷⁰

A really unique phenomenon in Dodecanese and the adjacent Anatolian coast is the occurrence of 'a knife version' of the Interface's Siana sword type, which is not known on Crete. The first known example comes from the site of Siana on Rhodes (Fig. 4), where the first sword of this type was found too. This knife (and other examples of Siana knives) have the same long tang at the end of the hilt for the fixation of the pommel like the swords,⁷¹ but the knife's blade is single-edged, thin, and slightly curved. The dating of this type ranges from the 14th through the 12th centuries BC (LH IIIA to LH IIIC), and, as in the case of the swords of the same

63 JUNG 2009, 75.

64 AKYURT 1998, fig. 35.

65 SANDARS 1955.

66 For a list of scholars who commented on this knife, see ROHÁČEK 2018, 21.

67 BENZI 2009, 160.

68 ROHÁČEK 2018, 21.

69 BOUZEK 1985, 147.

70 BENZI 2009, 162.

71 ROHÁČEK 2018.

name, this item shows a mix of Aegean and Eastern influences.⁷²

In the Interface, the bronze razors appear only in the lower part, although there is one published exception from Panaztepe.⁷³ Double- and single-edged razors (mostly found in graves on Rhodes, Kos, and Müsgebi) are very numerous (more than thirty examples) and comprise of various shapes that find parallels on Crete.⁷⁴ From a typological point of view, there are two remarkable examples of single-edged razors with fully cast handle from the islands of Kos (Fig. 5) and Rhodes that stand out from the other Aegean material because of their interesting slight modification of the haft. The design of their handle cannot be paralleled anywhere else, potentially suggesting it to be a local invention. Most of the more than two dozen known examples from the Dodecanese date to the 14th century.⁷⁵ There is one interesting single-edged razor with a handle from Langada on Kos found in tomb 37, dated to LH IIIC. This razor is decorated with a geometric incised decoration on the handle. The decoration is considered to have come from Central Europe.⁷⁶ From a typological point of view, the Lower Interface generally appears to have a similar typology of razors to that of Crete. Yet, the number of razor variants found on Crete is much larger than in the Lower Interface. It should be mentioned that Crete also produces material that is typologically similar to Mainland Greece. But there are also forms of razors on Crete that do not occur in the area of the Lower Interface. These are, for example, a double-edged razor type with a handle and Weber's type IV with additional subvariants, which occur mostly on Crete, rarely on the Greek mainland, but which are not known from the Dodecanese and the surroundings.⁷⁷ It should be noted that in the case of razors, the Lower Interface shares the same influences as Crete. From a utilitarian point of view, a razor is a tool connected with personal appearance, hygiene, and shaving,⁷⁸ and its presence can be connected with tweezers and mirrors, which also occur in the Lower Interface. For example, Langada's tomb 11 on Kos contains a razor and a tweezer together.⁷⁹ Also, finds of bronze mirrors are known from Rhodes.⁸⁰

Arrowheads are among frequent finds not only from graves but also from settlements. This paper utilises Avila's classification, which divides arrowheads into two

classes: without a tang (the earlier type) and with a tang (the later type). In general, the Lower Interface finds are close to the Cretan finds, especially the examples of Avila's Class 2f (regularly leaf-shaped blade narrowed at both ends with a thin tang), which is known from a few finds from Ayios Ioannis.⁸¹ In contrast to Crete, Avila's first class of non-tanged arrowheads is completely missing in the whole region of the Interface. Altogether, a mix of arrowheads that come from this area can also be found on Crete, the Greek mainland, and Anatolia.

Some remaining classes of metal artefacts will be noted only briefly. In the case of axes, there are two Anatolian types (according to the classification made by Erkanal,⁸² in general description, the axes have a blade with protrusions in the middle) and the Aegean one- and double-edged axe types (simple one-edged blade or with edges on both ends). In terms of small metal finds, it is interesting that there are not many known finds of metal pins in the Lower part of the Interface. There are finds from the Upper part of the Interface, and, in general, metal pins were very common in Anatolia and in the North-Eastern Aegean during the Early Bronze Age (EBA) and the 2nd millennium BC.⁸³ In the South and West Aegean, pins were not a regular item like in Anatolia. We know of precious pins from the Shaft Graves period on the Mainland.⁸⁴ Branigan reports pins from Crete but not in substantial numbers, with many from the EBA.⁸⁵ This might suggest that the manner of clothing in the Dodecanese and the surrounding areas was probably not the same as in Anatolia.

DISCUSSION

The bronze artefacts from the Lower part of the East Aegean-West Anatolian Interface show features that set them apart from the surrounding regions, even though the Aegean influences are very strong there. While the 'most Minoan' sword type (Sandars' type A) is absent in the Lower Interface region, all the later types are represented and are similar to the Cretan swords in most cases. They accept Cretan features but do not avoid the impact of Mainland Greece either. Type B swords, typical for the Greek mainland, have not been found on Crete, but uncanonical versions are present in the Lower Interface. Interestingly, they sometimes do show Cretan

72 ERSOY 1988, 67–68.

73 ERSOY 1988, 58, figs. 3, 4.

74 WEBER 1996; AKYURT 1998, fig. 36.

75 WEBER 1996, 148–150, pl. 39.

76 ERSOY 1988, 68–69.

77 WEBER 1996, pl. 60, A.

78 WEBER 1996, 20.

79 MORRICONE 1967, 112, fig. 93.

80 BENZI 1992, pl. 180, figs. g, h.

81 AVILA 1983, pl. 28.

82 ERKANAL 1977.

83 LAMB 1936; BRANIGAN 1974; MÜLLER-KARPE 1974; BERNABÒ BREA 1976.

84 KILIAN-DIRLMEIER 1984, pls. 3–4, figs. 86–102, 104–110.

85 BRANIGAN 1974.

impact, as the example of a very long type C sword from Ialysos, which mixes an Argive type B design with a Cretan type C hilt, suggests. There are examples of type C and type D swords, which have definite connection with Crete, but some of them can still be considered local products.

Really unique to this area are only the Siana type swords, as well as the knives of this group. Neither Cretan nor Mainland Greek craftsmen knew or embraced this type. The connections and inspiration for the creation of Siana swords could rather be linked to the so-called Ugarit type sword,⁸⁶ which is known from the Levant and has the same pommel extension on its hilt as the Siana swords. The Ugarit swords are unknown on Crete and Mainland Greece, but four specimens come from the West Anatolian coast and the island of Samos.⁸⁷ Two Naue II swords from the Lower Interface are also of a different form than those from Crete. The ring-pommel knife from Ialysos might be, based on its decoration and the associated pottery, considered a Cretan import, but it might have also been a local product that incorporated multiple influences, not only those from Crete.

The spearheads seem to follow Cretan examples or simply reflect Cretan influences. The long thin Cretan spearhead with a flat midrib and a short socket is quite common in the Dodecanese. By looking at their design, just two specimens of razors from the Lower Interface can be distinguished from those of Crete. In terms of quantity, the number of variants of razors found on Crete is much larger than in the Lower Interface. Moreover, there are some Cretan types that have not been found in the Dodecanese, such as the razor type with a handle. The arrowheads in the Lower Interface seem to be more or less the same as on Crete. Anatolian axe types are not common on Crete. By contrast, finds

of Anatolian and typical Aegean axe types are known from the Lower Interface. And finally, there are not many finds of pins so far in the Lower Interface.

There are typological differences between the Lower and Upper Interface which were not discussed here. In general, however, it can be briefly stated that the Upper part seems to be following Anatolian precedents more. The Upper Interface has fewer bronze finds than the Lower one. In many cases, it seems that the Dodecanese might have been the main source of bronze finds as interesting patterns emerged here, changing through time and space. When comparing the Lower Interface and Crete in terms of metal finds, we can select some examples from the Dodecanese and the adjacent Anatolian coast that stand out in their design and support the theory that the Lower Interface can be considered as a separate sphere with its own dynamics. This observation is not based on pottery only but also settlements and funeral activities, as well as the analysis of metal finds. We can point out the differences between this area and the rest of the Aegean world, although the Interface stills remains an integral part of the larger Aegean sphere.

To sum up, after LH II, the whole Aegean seems to have followed the Mycenaean influence. The Lower Interface had contacts mainly with the Greek mainland, but the influence of Crete remains present as well, not to forget the impact from the East either. Nevertheless, just observing and typologically evaluating metal products is not enough to understand completely the problem of metal production. In the future, this study will focus on the context of finds to better understand the wider dynamics of the entire area. Moreover, research on technological procedures should also be included in order to identify the possible origin of the bronze items.

BIBLIOGRAPHY

- Akyurt I. (1998) *M. Ö. 2. binde Anadolu'da ölü gömme adetleri*, Ankara.
- Avila R. (1983) *Bronzene Lanzen- und Pfeilspitzen der Griechischen Spätbronzezeit, Prähistorische Bronzefunde V:1*, München.
- Benzi M. (1992) *Rodi e la civiltà micenea*, Roma.
- Benzi M. (2005) A group of Mycenaean vases and bronzes from Pyli, Kos, in: B. Adembri, M. Cristofani (eds.), *AEIMNESTOS: Miscellanea di Studi per Mauro Cristofani*, Firenze, pp. 15–24.
- Benzi M. (2009) Dodecanese – Italy – Europe. Rediscovering some long known objects, *ASAtene* 87, pp. 157–68.
- Bernabò Brea L. (1976) *Poliochni. Città preistorica dell'isola di Lemnos II*, Roma.
- Boehmer R. M. (1972) *Die Kleinfunde von Bogazköy*, Berlin.
- Bouzek J. (1985) *The Aegean, Anatolia and Europe: Cultural Interrelations in the Second Millenium B.C.*, Praha.

86 JUNG, MEHOFER 2008, 118.

87 ROHÁČEK 2018, 21.

- Branigan K. (1974) *Aegean Metalwork of the Early and Middle Bronze Age*, Oxford.
- Buchholz H.-G. (1962) Der Pfeilglatterausdem VI. Schachtgrab von Mykene und die helladischen Pfeilspitzen, *JdI* 77, pp. 1–58.
- Erkanal H. (1977) *Die Äxte und Beile des 2. Jahrtausends in Zentralanatolien*, Prähistorische Bronzefunde IX:8, München.
- Ersoy Y. (1988) Finds from Menemen/Panaztepe in the Manisa Museum, *BSA* 83, pp. 55–82.
- Evans A. J. (1921) *The Palace of Minos at Knossos*, 1, London.
- Georgiadis M. (2003) *The South-Eastern Aegean in the Mycenaean Period: Islands, Landscape, Death and Ancestors*, BAR International Series 1196, Oxford.
- Girella L., P. Pavúk (2015) Minoanisation, acculturation, hybridisation: The evidence of the Minoan presence in Northeastern Aegean between Middle and Late Bronze Age, in: N. Stampolidis, Ç. Maner, K. Kopanias (eds.), *NOSTOI. Indigenous Culture, Migration and Integration in the Aegean Islands and Western Anatolia during the Late Bronze and Early Iron Age*, Istanbul, pp. 387–420.
- Hakulin L. (2004) *Bronzeworking on Late Minoan Crete: A Diachronic Study*, Oxford.
- Höckmann O. (1980) Lanze und Speer im spätminoischen und mykenischen Griechenland, *JRGZM* 27, pp. 13–158.
- Jung R. (2009) Pirates of the Aegean: Italy – the East Aegean – Cyprus at the end of the second millennium BC, in: V. Karageorghis, O. Kouka (eds.), *Cyprus and the East Aegean, Intercultural Contacts from 3000 to 500 BC, An International Archaeological Symposium Held at Pythagoreion, Samos, October 17–18 2008*, Nicosia, pp. 72–93.
- Jung R., M. Mehofer (2008) A sword of Naue II Type from Ugarit and the Historical Significance of Italian-Type Weapon in the Eastern Mediterranean, *AEA* 8, pp. 111–135.
- Karo G. (1930) *Die Schachtgräber von Mykenai*, Munich.
- Kilian-Dirlmeier I. (1984) *Nadeln der frühhelladischen bis archaischen von der Peloponnes*, Prähistorische Bronzefunde XIII:8, München.
- Kilian-Dirlmeier I. (1993) *Die Schwerter in Griechenland (Außerhalb der Peloponnes), Bulgarien und Albanien*, Prähistorische Bronzefunde IV:12, München.
- Lamb W. (1936) *Excavation at Thermi in Lesbos*, London.
- Mac Sweeney N. (2008) The meaning of ‘Mycenaean’, in: O. Menozzi, M. L. Di Marzio, D. Fossataro (eds.), *SOMA 2005: Proceedings of the IX Symposium on Mediterranean Archaeology, Chieti (Italy), 24–26 February 2005*, BAR International Series 1739, pp. 105–110.
- Maiuri A. (1923–1924) Jalisos: Scavi della Missione Archeologica Italiana e Rodi (Parte I e II), *ASAtene* 06–07, pp. 83–340.
- Melas E. (1985) The island of Karpathos, Saros and Kasos in the Neolithic and Bronze Age, *SIMA* 68, Göteborg.
- Morricone L. (1965–1966) Eleona e Langada: Sepolcreti della tarda età del Bronzo a Coe, *ASAtene* 43–44, pp. 5–311.
- Mountjoy P. (1998) The East Aegean–West Anatolian Interface in the Late Bronze Age: Mycenaeans and the Kingdom of Ahhiyawa, *AnatSt* 48, pp. 33–67.
- Müller-Karpe A. (1974) *Altanatolisches Metallhandwerk*, Neumünster.
- Pavúk P. (2015) Western Anatolia in the 2nd millennium. Between the Aegeans and the Hittites, in: N. Stampolidis, Ç. Maner, K. Kopanias (eds.), *NOSTOI. Indigenous Culture, Migration and Integration in the Aegean Islands and Western Anatolia during the Late Bronze and Early Iron Age*, Istanbul, pp. 353–385.
- Roháček M. (2015) *Metalurgie podél východoegejského a západoanatolského rozhraní ve 2. tisíciletí př. n. l.*, unpublished MA thesis, Charles University, Prague.
- Roháček M. (2018) Approaching the East Aegean – West Anatolian Interface through metal finds, in: F. Franković, A. Popović, M. Fileš, J. Kramberger (eds.), *Through the Eyes of a Stranger – Appropriating the Foreign and Transforming the Local Context. Proceeding of International Graduate and Doctoral Student Conference, Zagreb, 14–15 October 2016*, Zagreb, pp. 18–29.
- Sandars N. K. (1955) The antiquity of the one-edged bronze knife in the Aegean, *PPS* 20, pp. 174–197.
- Sandars N. K. (1961) The first Aegean swords and their ancestry, *AJA* 65, pp. 17–29.
- Sandars N. K. (1963) Later Aegean bronze swords, *AJA* 67, pp. 117–153.
- Weber K. (1996) *Die Rasiermesser in Südosteuropa*, Prähistorische Bronzefunde VIII:5, München.
- Yalcikli D. (2006) Zwei Bronzeschwerter aus Westanatolien, *IstMitt* 56, pp. 29–41.

CRISIS AT THE CULT CENTRE EVIDENCE FROM THE MEGARON BASEMENTS¹



ABSTRACT: This paper uses Driessen's concept of 'crisis architecture' to explore a particular case study that demonstrates the response of the community at Mycenae to a probable earthquake that took place during the Late Bronze Age Palatial period. The Megaron was one of five complexes on the south-western slope of the acropolis collectively known as the 'Cult Centre'. Recent restudy of this building has revealed the repairs and adaptations carried out within the Megaron complex's basement level in the immediate aftermath of the destruction event. Despite these actions, and the lack of evidence for substantial damage to the structure of the building, the Megaron complex apparently fell out of regular usage before its eventual destruction at the end of the Palatial period. This paper questions whether it is reasonable to interpret the actions undertaken in this building as an example of 'crisis architecture', and suggests that the treatment of the Megaron complex shows there was a significant realignment of socio-cultural priorities after this mid LH IIIB earthquake, which appears to have affected the role of the entire Cult Centre in the community at Mycenae.

KEYWORDS: Architecture; Crisis; Cult; Earthquake; Mycenae; Late Bronze Age.

The term 'crisis architecture' was introduced into the field of Aegean studies by Driessen. In this seminal paper, Driessen attempted to systematise the study of possible architectural indicators of crisis by focusing on specific and sudden short-term architectural modifications made in response to changes to socio-cultural conditions.² Despite recent general interest in the concepts of crisis and collapse in Aegean and East Mediterranean studies,³ this interesting and potentially powerful concept has, however, not received the full attention that it deserves. This paper explores whether the framework of 'crisis architecture' can help explain the evidence of destruction and reconstruction at the Megaron complex in the Cult Centre at Mycenae.

CRISIS ARCHITECTURE

The underlying rationale for developing the concept of 'crisis architecture' was to use architectural remains to identify short-term economic, social, or political stresses in a past society.⁴ To be classed as 'crisis architecture', the archaeological record must ideally meet three criteria: 1) a decrease in energy input for production and maintenance; 2) a change away from the original function; 3) a change in the original plan.⁵

Driessen envisaged that the majority of 'crisis architecture' would be visible in minor adaptations to existing buildings rather than new constructions, with the exception of so-called 'warchitecture' (structures such

1 I would like to thank the organisers for kindly inviting me to present at their conference and contribute to this volume. The research underlying this paper stemmed from the analysis carried out in order to produce the final publication of the excavation of the Megaron complex and its ancillary rooms as part of the Well Built Mycenae series. I would like to thank Dr Elizabeth French for her unstinting support during this period and for her comments on an earlier draft of this paper. Thanks are also due to Dr Yannis Galanakis for his insightful comments and suggestions. All remaining errors and omissions should be attributed to the author.

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2 DRIESSEN 1995, 65.

3 BACHHUBER, GARETH ROBERTS 2009; MIDDLETON 2010; van der WILT, MARTÍNEZ JIMÉNEZ 2013; CLINE 2014.

4 DRIESSEN 1995, 65.

5 DRIESSEN 1995, 67.

as fortifications and refugee camps), and the occasions where settlement remains from more than a single period have been preserved for comparison.⁶ Driessen also sought to distinguish between an immediate response and gradual change⁷ as, for example, occurs in disaster relief efforts, which are understood to have an emergency phase, involving the immediate effects and recovery, and a rehabilitation phase, when the intention is to restore a community back to its previous level of existence.⁸

THE CULT CENTRE

The area of Mycenae known as the Cult Centre lies in the south-west part of the citadel. It consisted of five complexes: the Temple, the Room with the Fresco Complex, Tsountas House, Tsountas House Shrine, and the Megaron (Fig. 1). The Megaron is perhaps the least well known of these five. All of these structures show some links to ritual practice, although the exact characteristics of this ritual expression differ between each complex.⁹ The profusion of shrines and altars concentrated into this part of the acropolis led Mylonas to describe it as a “cult centre”,¹⁰ although this does not necessarily mean that every part of this area was dedicated to a religious function.

The Cult Centre was hit by two destruction episodes. The first of these occurred in mid LH IIIB and was probably caused by an earthquake.¹¹ The acropolis of Mycenae lies directly above a network of fault lines, and there are faults present close to the Lion Gate and underneath the north-east section of the Cyclopean fortification wall; the surrounding geomorphology indicates that the latter was last active during the Mycenaean period.¹² The earthquake caused damage that was widespread but variable in its effects. Two skeletons were found covered by fallen stones, one in Panagia House I and the other in the Plakes House, from the same earthquake horizon.¹³ The group of buildings known as the ‘Ivory Houses’ was destroyed by fire at a similar point in time and never rebuilt.¹⁴ Damage was caused to the South House Annex, and, within the Cult Centre itself, a programme of alterations took place in response to this event.¹⁵ The latter are discussed in more detail below.

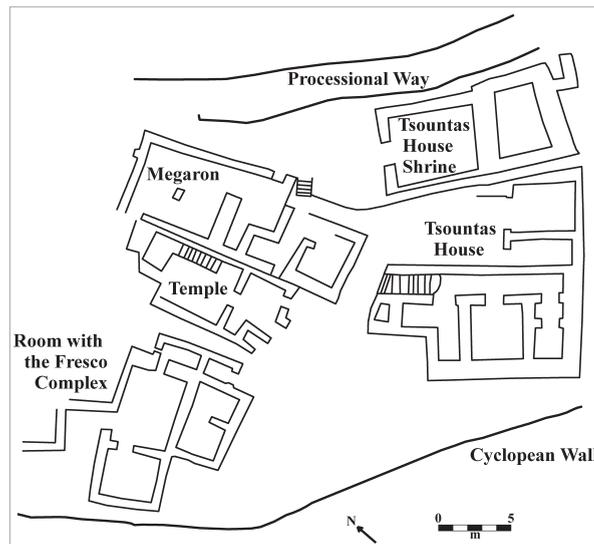


Fig. 1 Simplified plan showing the five main areas of the Cult Centre at Mycenae. Drawing by the author, based upon the 1981 plan of the Citadel House Excavations.

The second and final disaster was much more destructive. Its cause remains unknown, although it is clear this event involved a significant conflagration.¹⁶ The entire Cult Centre was effectively levelled, and many of its structures were buried beneath a thick layer of debris.¹⁷ A few walls were well enough preserved to remain visible above this destruction stratum and were later reused during the partial reoccupation of this area in LH IIIC as walls again or as wall foundations.¹⁸

As mentioned above, the study of the architectural remains of the Cult Centre has demonstrated that repairs and adaptations were carried out during the period between the two destruction episodes. This period of time, the second half of LH IIIB, forms the focus of this paper.

THE MEGARON COMPLEX

The following description of the architecture of the Megaron complex and its associated finds is taken from the forthcoming publication of the Megaron and its ancillary rooms, and further details which support the interpretations presented in this paper can be found in that volume.¹⁹ The Megaron complex was excavated from

6 DRIESSEN 1995, 67.

7 DRIESSEN 1995, 68.

8 DRIESSEN 2002, 255.

9 FRENCH 1981.

10 MYLONAS 1973, 222; WARDLE 2015, 577.

11 FRENCH 1996, 51; WARDLE 2015, 590–591.

12 MAROUKIAN *et al.* 1996, 191–192; NUR 1998, 145.

13 FRENCH 1996, 51.

14 TOURNAVITOU 1995, 298.

15 WARDLE 2015, 589–591.

16 FRENCH 2002, 135.

17 FRENCH 2002, 135.

18 FRENCH 2011, 1; AULSEBROOK forthcoming.

19 AULSEBROOK forthcoming.

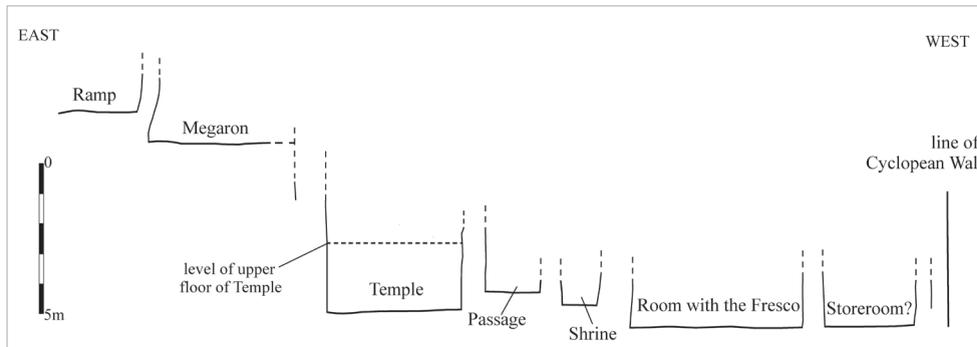


Fig. 2 Simplified composite section through the Cult Centre from east to west. It clearly illustrates the significant difference in height between the terraces upon which the Cult Centre was constructed. Drawing by the author, based upon TAYLOUR 1981, 115, Section 1.

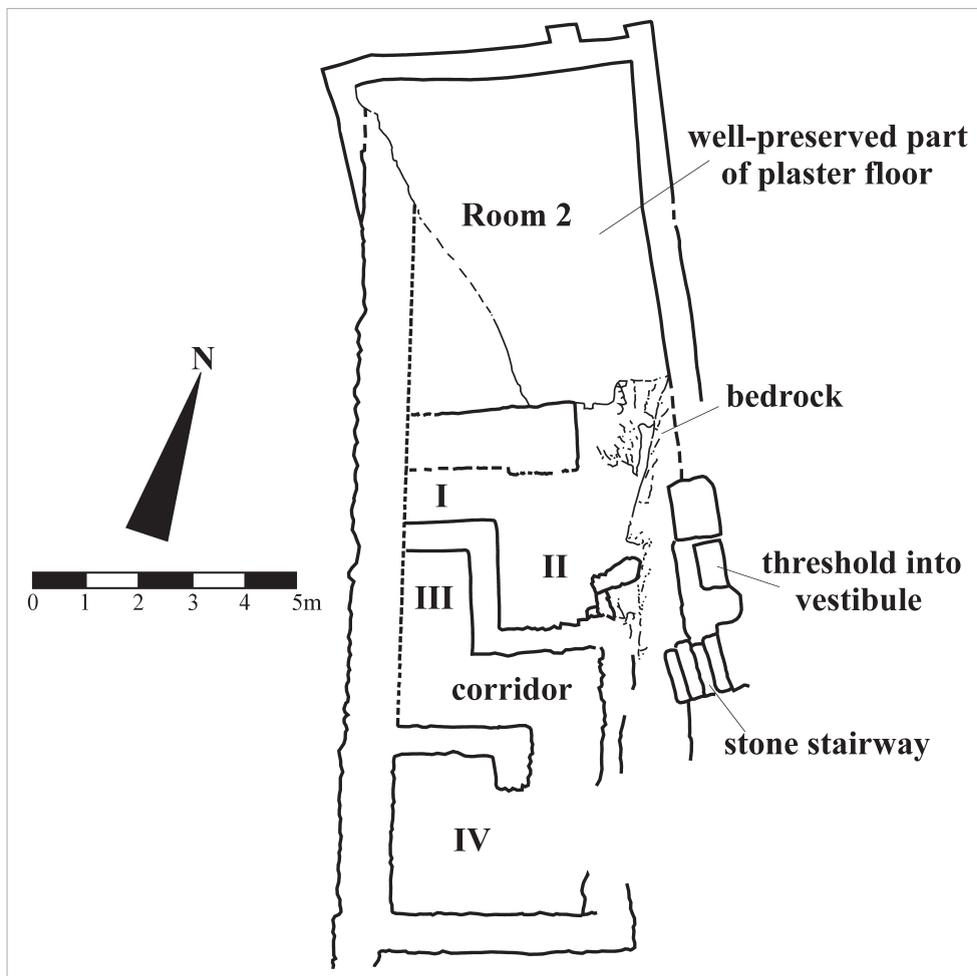


Fig. 3 Internal layout of the Megaron building at the Cult Centre. Drawing by the author.

1959–1962 and again in 1968.²⁰ The recent restudy of this building has revealed previously unknown details of its lifecycle, particularly for its basement level.

The Megaron complex was positioned on the top terrace of the Cult Centre area and was constructed during LH IIIB1 (Fig. 2).²¹ When excavated, it was found to have been very poorly preserved; a significant quantity of the deposits covering its architectural remains consisted of rubble and debris washed down from higher up the slope of the citadel rather than the remains of the Megaron complex itself. The upper storeys of the Megaron had instead toppled westwards during the final destruction of the Cult Centre and buried the adjacent Temple on the terrace below. The general lack of *in situ* finds has made it difficult to ascribe specific functions to each room. This problem, from the point of view of archaeological interpretation, is in fact quite typical of this destruction level at Mycenae.

Elements of the principal ground floor room of the Megaron, Room 2, had survived. This room, approached from a vestibule to the south, had a white plaster floor with a central rectangular plastered hearth. This hearth was covered by a thin layer of carbon and ash upon which several burnt stone slabs had been laid horizontally. A small collection of bones and shells to its east may have been associated with its use. Part of the vestibule of Room 2 was also intact, but any other rooms on this level did not survive. High-status architectural elements, such as the poros blocks re-used in Hellenistic buildings in the vicinity of the Megaron and the fresco fragments and poros blocks found in rubble above the Temple, may have originally belonged to the Megaron complex²² and, if so, emphasise the effort invested in its construction. This is in strong contrast to the adjacent Temple, which had no fine masonry.²³

The basements of the Megaron complex had a relatively better level of preservation. There was no basement directly below Room 2 itself, as it was built upon a heavy stone fill. Four basement rooms and a corridor were preserved to the south; these had partially lain beneath the plaster floor of the vestibule to Room 2 (Fig. 3).

Limited modifications took place prior to the mid LH IIIB earthquake. This included the laying of a second plaster floor in Room 2 and its vestibule,²⁴ and the reorganisation of Basement Room IV to install a corridor between the Megaron complex and the forecourt of Tsountas House to its south.²⁵

THE MEGARON COMPLEX'S BASEMENTS AND THE MID LH IIIB DESTRUCTION

As is apparent from Fig. 3, the four basement rooms were organised into two discrete sections. To the north were Basement Rooms I and II; the former acted as the gateway to the latter and may have communicated with the roof level of the Temple immediately to the west and/or with the vestibule to Room 2 via a ladder. To the south were Basement Rooms III and IV, which were joined together by a corridor. This corridor probably linked these two basement rooms to the Middle Ramp of the entry system into the Cult Centre via a stair of five poros steps directly to its east and also provided access westwards, further into the Cult Centre, to the terrace upon which the Temple was built again at the level of the roof. No evidence regarding the impact of the mid IIIB event and the response to it was preserved in Basement Room IV.²⁶ The excavation strategy employed during the clearance of debris from Basement Room I has also prevented the recovery of evidence that would have enabled the reconstruction of the impact of the mid LH IIIB earthquake and the response to it within this room.²⁷ However, it seems likely that Basement Room I continued to act as the point of entry into Basement Room II even after the mid LH IIIB earthquake took place.

We start, therefore, in the basement corridor directly north of Basement Room IV. It was 3.85 m long and 1.35 m wide, with a good-quality white plaster floor that was shared with both of its adjoining basement rooms (Fig. 4). However, neither its southern nor northern walls were plastered. A *pithos* stood in the corridor along its northern edge just to the west of, and opposite to, the entrance to Basement Room IV. The only damage

20 TAYLOUR 1981, 24, 27, 29, 32–33, 46.

21 It is possible that its construction may have begun at the end of LH IIIA2.

22 FRENCH 1981, 44; MOORE 1989, 37.

23 MOORE, TAYLOUR 1999, 82.

24 *Contra* TAYLOUR 1981, 13; the re-laying of the floor was previously believed to have taken place after the mid LH IIIB earthquake.

25 SHELTON forthcoming.

26 Part of Basement Room IV was briefly excavated by Tsountas in 1886 to find wall lines as part of the excavation of Tsountas House. This area was then subsequently used as a dump for material

generated from his continued excavation in the vicinity. Although he left some of the destruction deposit intact, the presence of this dump damaged the surrounding archaeology. Unfortunately, as this area lay beyond the confines of Tsountas House, very few details were published. Therefore, it is no longer possible to reconstruct the original sequence of deposition related to the destruction events in Basement Room IV.

27 Although five clearly differentiated strata were identified in the debris, the material was removed collectively. This has made it impossible to date the individual layers and, therefore, separate out evidence regarding the mid LH IIIB destruction event.



Fig. 4 Photograph from the 1962 excavation season showing the basement corridor with Basement Room IV in near foreground and Basement Rooms II (right) and III (left) beyond the corridor. Reproduction courtesy of the Mycenae Excavations Archive.

sustained within the area of the corridor during the earthquake was the partial collapse of the western end of the stone wall dividing the corridor from Basement Room II; this may have been instigated by or worsened by the toppling of the corridor's *pithos* northwards and through the breach in the wall.

Before the earthquake, the irregularly-shaped Basement Room II, which was roughly 3.05 m by 2.82 m in size, contained a large cooking pot located in its southwest corner, and there were signs of fire damage caused by repeated heat events on the floor in the centre of the room, indicating a hearth-like feature. A drain ran along the bedrock that formed the eastern boundary of the room. This meagre evidence points towards some form of cooking activity, which may have been related to food preparation or industrial practices. As discussed above, the toppling of the *pithos* in the corridor caused or exacerbated the partial collapse of the wall that divided Basement Room II from the corridor. It also damaged the upper courses of the mudbrick western wall of Basement Room II, the wall which divided it from Basement Room III. There was no evidence for any other damage caused by the mid LH IIIB earthquake in Basement Room II.

Basement Room III was approximately 1.93 m by 1.24 m and had a white plaster floor that ran directly into the adjoining corridor. Along its northern and eastern walls was a low platform. It may have served as a reception room on a route between the approach ramps to the Cult Centre and the Temple. It appears that Basement Room III was the worst affected of the Megaron complex's basement rooms. As well as the damage sustained to its eastern wall, which divided it from Basement Room II, the ceiling of Basement Room III collapsed allowing a limited quantity of debris to enter from above and spill into the adjoining corridor. Basement Room III also suffered intensive fire damage as indicated by the extensive remains of carbonised beams and other wood lying directly upon its floor. It is probable that the ceiling collapse was caused by a combination of damage to one of its supporting walls and the effect of the fire.

THE RESPONSE TO THE MID LH IIIB EARTHQUAKE IN THE MEGARON COMPLEX'S BASEMENTS

The mid LH IIIB earthquake had damaged the structure of the Megaron complex's basements and left a significant quantity of debris. Action was carried out in the immediate aftermath to remedy these two problems.

The two damaged walls were repaired. The stone wall that divided Basement Room II from the basement corridor was most badly damaged at its westernmost extent and this section had to be completely rebuilt from the base upwards. The debris in the vicinity was not cleared before this took place, meaning that this reconstructed section stood upon a layer of burnt material. Two thin strips of wood were inserted into the wall, and the stones used to rebuild it included a small column drum. Repairs to the mudbrick wall dividing Basement Rooms II and III were carried out using the *pisé* technique; mud and/or clay was pressed or poured like concrete into a wooden frame, which was later removed when the material had dried.²⁸ This technique enabled repairs to be carried out to partially standing walls.²⁹ It was a much quicker method than rebuilding using mudbrick.³⁰ Therefore, the effort expended on effecting the repairs for both of these walls did not match that expended during the original construction of the Megaron complex.

A significant quantity of debris was left inside Basement Room III. To prevent further debris entering the corridor, a blocking wall was constructed across the open entrance between the corridor and Basement

28 MYLONAS-SHEAR 1968, 433; FRENCH 1996, 54.

29 FRENCH 1996, 54.

30 FRENCH 2009, 108.

Room III. This wall was very poorly constructed. It consisted of a drystone wall that was left unplastered, and it did not follow the alignment of the existing walls. No effort was made to clear away the debris that lay beneath the intended position of this wall, or even to level it, prior to its construction. Therefore, the lowest course of this blocking wall was uneven. The wall protruded out into the corridor, which would have impeded passage through this access route between the entrance to the Cult Centre and the Temple. This blocking wall remained in place until the second destruction event overtook the Cult Centre at the end of LH IIIB2. There was no evidence to suggest that the ceiling of Basement Room III, which formed the floor of the vestibule into Room 2, was ever repaired.

Within the corridor itself, the base of the *pithos* and a small quantity of debris surrounding it, which probably originated from the collapse of the wall immediately to its north, was also left in place. This, again, would have impeded passage through the corridor, potentially closing off or downgrading an important route into the Cult Centre.

Although the damaged walls of Basement Room II were repaired, the room ceased to be used for its original function after the mid LH IIIB earthquake. Instead, it was repurposed as a debris dump. This dump only included a limited quantity of rubble and mainly consisted of artefacts, some of which appeared to be rejected material from workshops. This included pieces of unworked, partially worked, and finished pieces of ivory, fragments from lead vessels, a group of *kylix* bases, several boar tusks, fragments of painted plaster, and a significant quantity of broken pottery. A temporary *plesia* clay floor was laid, into which many of the scattered objects became embedded (Fig. 5). It is possible that this floor may have been necessary to allow access to the damaged wall if those repairs were not undertaken immediately. Another possibility is that the floor represented a preparatory step for the eventual refurbishment of Basement Room II. However, there is no indication that Basement Room II was used for any other purpose after the installation of the temporary *plesia* floor, nor were any further modifications to this room carried out before it was destroyed at the end of LH IIIB2.

AN EXAMPLE OF CRISIS ARCHITECTURE?

The purpose of defining ‘crisis architecture’ as a special case was to highlight the architectural changes that take



Fig. 5 Photograph from the 1962 excavation season showing objects embedded in the *plesia* floor laid in Basement Room II after the mid LH IIIB earthquake. Reproduction courtesy of the Mycenae Excavations Archive.

place under some form of emergency. Basic structural stabilisation and the abandonment of rooms are not enough, in Driessen’s opinion, to warrant the label of ‘crisis architecture’ as both are responses that could also be carried out as part of the normal processes of life. For the term ‘crisis architecture’ to be justified, they must be understood as short-term responses whilst the society was under some form of internal or external pressure. Therefore, at first glance, the changes to the Megaron complex discussed above could be understood as part of the usual reaction to an earthquake in the Mycenaean period. However, when examined within its wider context, I consider that using the framework of ‘crisis architecture’ in this situation may be justified. First, however, it is necessary to check how closely the evidence from the Megaron complex’s basements matches the three criteria established by Driessen.³¹

1) A decrease in energy expenditure.

It is clear that the repairs carried out to the two partially collapsed walls required less energy expenditure than the original construction. The mudbrick wall was repaired using the quicker *pisé* technique, rather than rebuilding it with mudbrick. The stone wall was reconstructed without removing the layer of debris that had accumulated, thin strips of wood were inserted into its fabric, and there was at least one certain example of the

31 DRIESSEN 1995, 67.

use of *spolia*. Although Driessen is correct to argue that the use of *spolia* is not enough to indicate the presence of ‘crisis architecture’,³² its incorporation into a wall that was rebuilt to a lower standard of quality than that of its original construction does support the hypothesis that, in this case, the use of *spolia* was intended to lower the energy expenditure for the repair of this wall. The construction quality of the blocking wall across the entrance of Basement Room III also supports the same conclusion. This decrease in energy expenditure may have been a direct consequence of the need to secure the stability of the building quickly after the earthquake took place. Therefore, either these initial repairs and the debris in the basement corridor were then left in place for several decades over the course of LH IIIB2, or the process of repairing the Megaron complex’s basements was interrupted by the second destruction event. The latter scenario would mean that this process of repair was painfully slow, suggesting limited resources were provided for the work, or that this area of the building remained in a state of severe disrepair until close to the end of LH IIIB2.

2) Change of original function.

This is most evident in Basement Room II, where previous activities related to the cooking pot and hearth area were stopped and the room was repurposed as a dump to house debris from elsewhere. It is also possible, given the apparent lack of interest paid to keeping the basement corridor clear of obstacles, that the corridor changed its original function as well. If access through the corridor was maintained, it seems that its status may have been downgraded, and this may have affected when the corridor was used and by whom.

3) Change of original plan.

There was one major alteration to the plan of the Megaron complex’s basements during this response phase, which was enacted by raising the blocking wall across the entrance into Basement Room III. The fact that this wall and untouched debris would have impeded passage through the basement corridor may also indicate a conceptual change from the original plan of the building that was not physically materialised in the architecture.

Therefore, the evidence from the Megaron complex’s basements does incorporate all three elements that would be expected of ‘crisis architecture’. However, it is their effect on the functioning of the Megaron complex as a whole that I believe is fundamental to distinguishing these changes from a typical earthquake response.

To study this, we must turn to Room 2, the principal ground floor room of the Megaron. Although Room 2 had been buried beneath a thick layer of destruction debris, there was no evidence that any of this material was the result of the mid LH IIIB event; instead, it originated with the second and final destruction at the end of LH IIIB2. Furthermore, study of Room 2 did not reveal any damage that could be associated with the mid LH IIIB earthquake. Given that this room was constructed upon a strong stone foundation fill, had well-built walls, and that the damage in the basement area was probably caused or exacerbated by the very specific circumstance of the toppling of a *pithos*, it seems plausible that Room 2 survived unscathed or with only minor damage.

Despite this, there was no *in situ* deposit that could be related to the use of Room 2 after the mid LH IIIB earthquake took place. The room was almost completely devoid of objects, with two very small clusters found beneath the destruction debris. The remains associated with the hearth most likely pre-dated the mid LH IIIB earthquake. A small group of objects found in the north-east corner of Room 2, which included a fragment of an alabaster vessel, a piece of a fish *askos*, and fragments of obsidian, metal, and painted plaster, probably fell from an upper storey. The curation of broken objects with ritual significance echoes the finds from the adjacent Temple in the sealed-off Room 19 and Room 18 alcove.³³ This may imply that the upper storeys of the Megaron were accessed at least once after the mid LH IIIB earthquake, although the objects cannot be considered as evidence to support the case that the upper storeys were in regular use during this period. The general absence of artefacts that can be associated with these upper storeys may be due to the fact that the majority of the material fell westwards over the Temple.

Another piece of evidence that supports the hypothesis that Room 2 went out of regular use after the mid LH IIIB earthquake is the treatment of Basement Room III. During the earthquake its ceiling collapsed. The ceiling of this room formed the floor of the vestibule into Room 2. Large fragments of the plaster from this floor are clearly distinguishable in the rubble generated by the mid LH IIIB earthquake. However, there are no such plaster pieces in the debris from the second destruction at the end of LH IIIB2. This would indicate that the floor of the vestibule was never repaired, at least not with matching white plaster, although some form of perishable material may have been used to cover the hole.

32 DRIESSEN 1995, 70.

33 MOORE, TAYLOUR 1999, 22; WARDLE 2015, 590.

This evidence would seem to indicate that this section of the Megaron was no longer in regular use during LH IIIB2. However, there are no clear signs of mothballing as found elsewhere in the Cult Centre. As mentioned above, areas of the Temple were sealed off after cultic objects had been deposited in them.³⁴ In addition, the main part of the Room with the Fresco Complex was mothballed, probably around the same time; the famous fresco was whitewashed and fine soil then large stone slabs laid over the cult items and dedications.³⁵

Furthermore, there is no evidence to demonstrate that this part of the Megaron was repurposed for a more practical function. Such actions have been interpreted as a sign of crisis. This type of change is seen in certain central court buildings during LM IB, where particular high-status rooms were reused as areas for food preparation or storage.³⁶ Instead, Room 2 seems to have been devoid of any archaeologically visible activity during LH IIIB2.

Yet, although the Megaron may have no longer been in regular use during LH IIIB2, it was not pulled down in preparation for the reuse of the site. Driessen argued that razing and rebuilding indicates a wealthier community because it is a more costly solution than carrying out repairs.³⁷ Instead, the structure was stabilised. This would imply that there was an intention to continue using the Megaron, perhaps after more effective repairs had taken place. The blocking wall at the entrance to Basement Room III may have been a temporary measure to prevent the further spillage of debris into the corridor so that repairs could have been carried out more efficiently. This means that it cannot be assumed that the wall repairs or the erection of the blocking wall were intended to be permanent changes to the fabric of the Megaron complex.

Thus, we should instead regard the Megaron complex as being destroyed during a period of transition. The most basic and immediate structural needs had been dealt with, and the basement was temporarily changed into a storage zone for debris whilst repairs and alterations took place around the rest of the Cult Centre. The inhabitants of Mycenae did intend to bring the Megaron back into use, but this project was of a lower priority in comparison to other construction and refurbishment programs that were taking place around the citadel.

One of these projects was the extension of the Cyclopean wall to complete the encirclement of the citadel, which would have absorbed much time and labour. Particularly if the extension of the wall was intended to counteract a perceived threat, then perhaps this major building project was not only ranked as the highest priority, but it was also considered foolhardy to invest resources in the complete refurbishment of the Cult Centre until the full defensive wall was in place.³⁸ At roughly the same time, systems to ensure the safety of the water supply were put in place at Athens, Tiryns, and Mycenae which, as French notes,³⁹ may have been due to fashion or necessity. It is also possible that the investment in the fortification of the acropolis and associated strategic measures reflected the continuously shifting nature of elite identity during the process of establishing the core tenets of Mycenaean rulership.⁴⁰

Another important project was the monumentalisation of the Processional Way, the route by which the Cult Centre could be directly accessed from the Palace.⁴¹ This was despite the abandonment of much of the Cult Centre and may indicate that the area of the Tsountas House Shrine formed the main focal point during LH IIIB2.⁴² Modifications were made to the Palace as well, including the construction of the Grand Staircase in its final form to provide a second entrance to the Palace orientated towards the south-west;⁴³ this would have improved accessibility between the Palace and the Cult Centre. Yet, notwithstanding the grandeur of these construction projects, there are other signs of a decline in the quality of and energy expenditure invested in architectural work undertaken during LH IIIB2. The floor of the Palace court was re-laid with plaster rather than the waterproof materials that were previously used.⁴⁴ The walls of the South House Annex were repaired using the *pisé* technique.⁴⁵

Therefore, the changes to the Megaron complex's basements, although initially following the path of a typical response to an earthquake, can be understood as effectively becoming 'crisis architecture' through inertia. A once highly significant building, standing at the foot of the newly-monumentalised Processional Way, apparently fell into disuse despite action, perhaps taken in the immediate aftermath, to stabilise its structure. Previous activities were suspended, and the debris was

34 MOORE, TAYLOUR 1999, 22; WARDLE 2015, 590.

35 FRENCH 2002, 92; WARDLE 2015, 589.

36 DRIESSEN 2002, 258.

37 DRIESSEN 1995, 69.

38 See WARDLE 2015, 588–589, 591–592 for a summary of much of the evidence regarding the date of the western extension of the Cyclopean Wall, which he believes strongly indicates that this section post-dates the mid LH IIIB earthquake.

39 FRENCH 2002, 101.

40 MARAN 2009, 248.

41 MYLONAS 1983, 128–130; WARDLE 2015, 592.

42 WARDLE 2015, 592; SHELTON forthcoming.

43 WACE 1964, 90; IAKOVIDIS, FRENCH 2003, 15.

44 FRENCH 2009, 108.

45 WARDLE 2015, 589.

left to block rooms and access routes. Yet the space was not reused, in spite of the history of constant changes within the Cult Centre and its vicinity,⁴⁶ and the principal ground floor room, and also probably its upper storeys, remained accessible. Taken together, the evidence signals a significant change in priorities. This is especially evident within the Megaron complex because it underwent several alterations prior to the mid LH IIIB earthquake that sought to maintain its high-status appearance.

Of course, such a shift in priorities in this area may not necessarily indicate an economic or political change; it could imply a religious change of some sort. Modifications to ritual practice, such as the increased importance of urban community shrines and domestic cults, decreased grandeur of major rural shrines, and loss of lustral basins, occurred in the wake of the volcanic eruption at Santorini that destroyed the settlement of Akrotiri.⁴⁷ Late Bronze Age Mycenae was of course no stranger to earthquakes; another apparently struck at the end of LH IIIA2, causing damage such as the destruction of Petsas House.⁴⁸ Yet the extensive damage caused to an area of religious importance may have fundamentally shaken the beliefs underpinning the significance of the Cult Centre and possibly have changed attitudes as to its role within the settlement. There are a number of indications in support of this hypothesis, some of which, such as the abandonment of the Room with the Fresco Complex and the special deposition of cult artefacts in the Temple, have been mentioned above. In addition, the bench behind the altar of the Tsountas House Shrine was apparently deliberately smashed.⁴⁹ The access into Shrine Γ was blocked up, and changes were made to an adjacent room, with a poros stone feature set up just outside the shrine that may have become the new focus of ritual activity.⁵⁰ Moreover, the debris from the earthquake and subsequent reconstruction efforts was allowed to accumulate in the courtyard outside the Temple to such a degree that the altar in this area was eventually smothered.⁵¹

In general, many of the responses within the Cult Centre could be considered to suggest fear or awe.⁵² In addition, these changes may have been instigated or encouraged by elements within the upper echelons of the social hierarchy at Mycenae, who saw an opportunity to bring the activities of the Cult Centre more

firmly into the remit of the palatial sphere.⁵³ However, it is not necessary to view all the changes to the Cult Centre in this light. The decision to mothball a specific part of the Room with the Fresco Complex may instead have been influenced by the decreased accessibility of this area after the westwards extension of the Cyclopean wall.⁵⁴ It is important to note, though, that the accessibility of the Megaron was less affected by the extension of this circuit wall. Its position within the Cult Centre meant that the Megaron was not immediately approachable from the west once the Temple and Room with the Fresco Complex had been constructed. In fact, it could be argued that the construction of new access routes within the citadel and the monumentalisation of the Processional Way increased the accessibility of the Megaron from the east during LH IIIB2, which makes the treatment of the Megaron during this period seem even more peculiar.

CONCLUSIONS

Through using the framework of 'crisis architecture', we can see that the changes wrought to the basements of the Megaron complex due to the effects of the earthquake were a short-term response to a critical event, intended to stabilise the structure and prepare the way for renovation or even a programme of full reconstruction. However, these temporary repairs and adaptations became accidentally immortalised in the archaeological record as the second destruction event overtook Mycenae before any future plans for the Megaron could be implemented. It has been suggested that a similar chain of events can be observed in the adjacent Temple, where a corresponding flurry of activity directly after the earthquake that may have been intended to ready the building for restoration was apparently followed by its use for casual domestic purposes.⁵⁵

It is difficult to be certain as to why there was a significant delay in proceeding beyond or putting into action this initial response; unfortunately, the available evidence does not allow us to pinpoint exactly at which point during LH IIIB2 the architectural changes to the Megaron complex were carried out. It is reasonable to assume that the renovation of various parts of the Cult Centre may have been placed on hold if the western extension to the Cyclopean wall was being constructed

46 FRENCH 1981, 43.

47 DRIESSEN 2002, 258.

48 SHELTON 2015, 27.

49 FRENCH 1981, 47.

50 WARDLE 2015, 591–592; SHELTON forthcoming.

51 WARDLE 2015, 593.

52 FRENCH 1996, 54.

53 See WARDLE 2015, 592 n. 126; Wardle suggests several possibilities as to why the palatial elites at Mycenae may have been interested in bringing this area within the circuit of the Cyclopean wall, not all of which are predicated on their desire to more closely control the activities of the Cult Centre itself.

54 FRENCH 2002, 92.

55 WARDLE 2015, 593.

at this time. The Megaron may also have been considered a lower priority in comparison to other construction projects underway during LH IIIB2, although this would seem to contradict the high status accorded to this building when first planned and constructed. The delay seems to indicate a shift in the importance of the Megaron, which may not have occurred in the immediate aftermath of the earthquake but a little later, once the temporary repairs and adaptations had been made. This could perhaps be linked to a wider change in attitude towards the Cult Centre and its place within the community. Whether the term 'crisis' can be considered an accurate description of this shift is difficult to say. The treatment of the Megaron in LH IIIB2

should certainly not be used as an indication that a crisis enveloped the whole of Mycenae during this period. However, some form of crisis seems to have taken place in terms of the identity of the Megaron with regard to the direction of its renovation, which may have encompassed its future appearance, future purpose, and even perhaps its necessity. It is possible that the same observation can be applied to the Cult Centre more broadly and underlines the important point made by Wardle that the Cult Centre at Mycenae must not be interpreted as a fully-functioning religious centre during LH IIIB2.⁵⁶ This 'identity crisis' was not resolved before the second destructive event took place at Mycenae, which ultimately rendered the debate redundant.

BIBLIOGRAPHY

- Aulsebrook S. (forthcoming) *The Megaron: Well Built Mycenae. The Helleno-British Excavations within the Citadel at Mycenae, 1959–1969. Fascicule 12*, Oxford.
- Bachhuber C., R. Gareth Roberts (eds.) (2009) *Forces of Transformation: the End of the Bronze Age in the Mediterranean. Proceedings of an International Symposium Held at St. John's College, University of Oxford, 25–26th March 2006*, Oxford.
- Cline E. H. (2014) *1177 B.C.: The Year Civilization Collapsed*, Princeton, Oxford.
- Driessen J. (1995) 'Crisis Architecture'? Some observations on architectural adaptations as immediate responses to changing socio-cultural conditions, *Topoi* 5, pp. 63–88.
- Driessen J. (2002) Towards an archaeology of crisis: defining the long-term impact of the Bronze Age Santorini eruption, in: R. Torrence, J. Grattan (eds.), *Natural Disasters and Cultural Change*, London, New York, pp. 250–263.
- French E. B. (1981) Cult places at Mycenae, in: R. Hägg, N. Marinatos (eds.), *Sanctuaries and Cults in the Aegean Bronze Age. Proceedings of the First International Symposium at the Swedish Institute in Athens, 12–13 May 1980*, Skrifter utgivna av Svenska institutet i Athen 28, Stockholm, pp. 41–48.
- French E. B. (1996) Evidence for an earthquake at Mycenae, in: S. Stiros, R. E. Jones (eds.), *Archaeoseismology. Fitch Laboratory Occasional Paper*, 7, Athens, pp. 51–54.
- French E. B. (2002) *Mycenae: Agamemnon's Capital. The Site in its Setting*, Stroud, Charleston.
- French E. B. (2009) The significance of changes in spatial usage at Mycenae, in: C. Bachhuber, R. G. Roberts (eds.), *Forces of Transformation: The End of the Bronze Age in the Mediterranean. Proceedings of an International Symposium Held at St. John's College, University of Oxford, 25–6th March 2006*, Oxford, pp. 108–110.
- French E. B. (2011) *The Post-Palatial Levels: Well Built Mycenae. The Helleno-British Excavations within the Citadel at Mycenae, 1959–1969. Fascicule 16/17*, Oxford.
- Iakovidis S. E., E. B. French (2003) The excavated areas, in: S. E. Iakovidis, E. B. French *et al.* (eds.), *Archaeological Atlas of Mycenae*, Athens, pp. 10–18.
- Maran J. (2009) The crisis years? Reflections on signs of instability in the last decades of the Mycenaean palaces, *ScAnt* 15, pp. 241–262.
- Maroukian H., K. Gaki-Papanastassiou, D. Papanastassiou (1996) Geomorphologic-seismotectonic observations in relation to the catastrophes at Mycenae, in: S. Stiros, R. E. Jones (eds.), *Archaeoseismology. Fitch Laboratory Occasional Paper*, 7, Athens, pp. 189–194.
- Middleton G. D. (2010) *The Collapse of Palatial Society in LBA Greece and the Postpalatial Period*, Oxford.
- Moore A. (1989) *A Study of Religious Practice in Bronze Age Greece with Particular Reference to the Various Cult Rooms at Mycenae*, unpublished PhD thesis, Manchester University.
- Moore A., W. D. Taylour (1999) *The Temple Complex: Well Built Mycenae. The Helleno-British Excavations within the Citadel at Mycenae, 1959–1969. Fascicule 10*, Oxford.

⁵⁶ WARDLE 2015, 578.

- Mylonas G. E. (1973) The 1972 excavations of the west slope of the acropolis of Mycenae, *AJA* 77, p. 222.
- Mylonas G. E. (1983) *Mycenae Rich in Gold*, Athens.
- Mylonas-Shear I. (1968) *Mycenaean Domestic Architecture*, unpublished PhD thesis, Bryn Mawr College.
- Nur A. (1998) The collapse of ancient societies by great earthquakes, in: B. J. Peiser, T. Palmer, M. Bailey (eds.), *Natural Catastrophes during Bronze Age Civilisations: Archaeological, Geological, Astronomical, and Cultural Perspectives*, Oxford, pp. 140–147.
- Shelton K. (2015) Pottery and Petsas House: recent research on LH IIIA2 Mycenae, in: A.-L. Schallin, I. Tournavitou (eds.), *Mycenaeans up to Date: The Archaeology of the North-Eastern Peloponnese – Current Concepts and New Directions*, Skrifter utgivna av Svenska institutet i Athen 56, Stockholm, pp. 27–36.
- Shelton K. (forthcoming) *Tsountas House Area: Well Built Mycenae. The Helleno-British Excavations within the Citadel at Mycenae, 1959–1969. Fascicule 14*, Oxford.
- Taylor W. D. (1981) *The Excavations: Well Built Mycenae. The Helleno-British Excavations within the Citadel at Mycenae, 1959–1969. Fascicule 1*, Warminster.
- Tournavitou I. (1995) *The ‘Ivory Houses’ at Mycenae*, London.
- Wace A. J. B. (1964) *Mycenae. An Archaeological History and Guide*, New York.
- Wardle K. A. (2015) Reshaping the past: where was the ‘Cult Centre’ at Mycenae?, in: A.-L. Schallin, I. Tournavitou (eds.), *Mycenaeans up to Date: The Archaeology of the North-Eastern Peloponnese – Current Concepts and New Directions*, Skrifter utgivna av Svenska institutet i Athen 56, Stockholm, pp. 577–596.
- van der Wilt E. M., J. Martínez Jiménez (eds.) (2013) *Tough Times: The Archaeology of Crisis and Recovery. Proceedings of the Graduate Archaeology at Oxford conferences in 2010 and 2011*, Oxford.

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POTTERY AS AN INDICATOR
OF INTERREGIONAL CONTACTS
PLACE OF VARDAR AND STRUMA RIVER VALLEYS IN THE CULTURAL
NETWORK OF CENTRAL MACEDONIA IN THE LATE BRONZE AGE —
STATE OF RESEARCH AND FURTHER PERSPECTIVES¹



ABSTRACT: The Late Bronze Age in Europe was a time of increased population mobility and the inception of social stratification that laid the foundations of the European civilisation. During this period, Central Macedonia, located within northern modern Greece, functioned between two dynamically developing and significantly different centres: the Aegean and the Balkans. The primary goal of this article is to present the current state and future perspectives of research on the character and intensity of contact between prehistoric communities living in the Axios/Vardar and Struma River Valleys, located within modern Greece, Bulgaria, and Macedonia (FYROM). Archaeologists have highlighted the crucial importance of these watercourses — they probably functioned as the main thoroughfares linking past human populations. The goal of this research is achieved through the analysis of archaeological pottery remains. First, the current ambiguous opinion of specialists about the origins of ceramic production in the region is discussed. They note separate traditions apparent in the pottery assemblages, specifically the northern character of specific wares and the importance of southern influences in others. Moreover, archaeologists point to the unique character of the Central Macedonian pottery craft, as well as its syncretic character that incorporates stylistic features from the neighbouring areas.

KEYWORDS: Late Bronze Age; Aegean; Vardar River Valley; Struma River Valley; Central Macedonia; Balkans; Pottery; Interregional contacts.

INTRODUCTION

Macedonia is the largest geographical region in modern Greece. It is divided into three morphological units: Western, Central, and Eastern. The first embraces the Hellenides Mountains in the west and numerous plateaus in the east. The second unit comprises an extensive plain forming the mouth of the Axios/Vardar, Loudiamos, and Aliakmon rivers. This area is known as the largest cultivated land in Greece.² The last zone, Eastern Macedonia, borders Greek Thrace, and it is composed of fertile basins (with one of the largest rivers in the northern part of the country — the Struma) separated by hills. Macedonia itself is somewhat isolated due to the geography of the neighbouring mountain

ranges: the Rhodope and Pangaion Mountains to the east and north, the Voras Mountains to the north-west, and the Pindos and Olympus Ranges to the south. Despite these obstacles, several paths of communication can be distinguished, and moving along the north-south axis was presumably easier due to accessible river valleys.³ Such possible prehistoric routes are most prominently evident in Central Macedonia, where a distinct connection between the Thessaloniki Plain and the adjacent mountain ranges through large river valleys such as those of the Axios/Vardar and Struma is discernible. Thus, these geographical circumstances delimit the study area of this research.

¹ This article is a result of a project funded by the National Science Centre of Poland (2016/21/N/HS3/00900). The author received a scholarship from the Adam Mickiewicz University Foundation for academic year 2018/2019.

² GHILARDI *et al.* 2008, 112.

³ STEFANI 2015A, 121.

During the Bronze Age (3100–1050 BC),⁴ Central Macedonia functioned between two dynamically developing and significantly different centres, namely the Aegean and the Balkans. In the scope of theory of the ‘Bronze Age world’, it has been defined as a peripheral (the Early and Middle Bronze Ages) or marginal zone (the Late Bronze Age).⁵ In the Late Bronze Age (1650–1050 BC),⁶ it did not belong to the so-called ‘Mycenaean *koiné*’ — the area heavily influenced by the Mycenaean civilisation.⁷ Presently, due to an increasing number of studies, such concepts require revision. Recent archaeological data that certify the existence of inter-regional networks of cultural influences must be incorporated into cognitive models. Especially exceptional sites, such as Kamenska Čuka, evidence of Aegean pottery wares (Fig. 1), characteristic metal artefacts, and architectural features (Fig. 2) identified in the south-eastern Balkans should also be taken into consideration.⁸

The highest number of sites in Central Macedonia were occupied during the Late Bronze Age.⁹ New sites were placed in less hospitable areas that offered protection and control over the surrounding terrain.¹⁰ Nevertheless, old settlements continued to be occupied in the lowlands, such as in the Langadas Basin region.¹¹ Habitation forms included mainly tell settlements (*toumba*), which were sometimes surrounded by stone, mud-brick walls, or clay banks.¹²

Archaeological research has revealed reliable information about the planning and spatial organisation within the tells. In the cases of Assiros and Thessaloniki, the settlement plans were replicated over time in more or less immutable form. Researchers identified a regular network of parallel streets within the tells, which created boundaries between large, rectangular blocks consisting of room-spaces.¹³

On the tells, researchers have uncovered evidence for the ability to possess and store agricultural products in amounts greatly exceeding the needs of the community.¹⁴ Similar observations were based on the data from Thessaloniki and Assiros, where large concentrations of *pithoi* and other containers were discovered.¹⁵

Nevertheless, there is no unequivocal evidence for the presence of institutionalised political centres that managed communal storage rooms and agricultural products in Central Macedonia, as is found in contemporary southern and central Greek palatial administrative units.¹⁶

In the study region, research indicates the existence of influences from both the Balkan and Mycenaean cultural circles. This raises the question as to whether Central Macedonia was a ‘buffer zone’ allowing individual Aegean and Balkan elements to penetrate the northern area and beyond the Danube.¹⁷ An alternative hypothesis assumes the more active role of Macedonian communities in interregional contacts as ‘mediators’, through whom ideas, achievements, and artefacts were freely exchanged.¹⁸

The primary goal of the study is to present the current state of research and future perspectives for the recognition of the character, frequency, and methods of contacts between communities living in the valleys of two watercourses — the Axios/Vardar and Struma Rivers — based on the pottery evidence. Presently, these two rivers flow within the national borders of modern Greece, Bulgaria, and the southern Republic of Macedonia (FYROM) and are indirectly connected with the Danube — an important feature for prehistoric communities in Central Europe. Archaeologists have highlighted the crucial importance of these rivers, as they were probably the main thoroughfares linking past human populations.¹⁹

THEORETICAL APPROACH

The theoretical approach employed herein is based on the concept that ceramic styles are mediums of cultural information and through their original contexts it is possible to identify evidence of interregional contact during the Late Bronze Age. Pottery, as the most abundant artefactual material from past societies, is a comprehensive bearer of information regarding cultural origins, zones of influence, religious practices, contextual function, ethnic association, and so forth.²⁰

4 After ANDREOU 2010, 644–649.

5 SHERATT 1993, 44.

6 After ANDREOU 2010, 649.

7 CAMBITOGLU, PAPADOPOULOS 1993, 289.

8 For important artefacts and influences of the Aegean culture circle in the region, see among others: STEFANOVICH, BANKOFF 1998; MITREVSKI 2003, 44, 48–51; TODOROVA 2003, 301; VIDESKI 2005, 102; 2007; ALEXANDROV *et al.* 2007; STEFANOVICH, KULOV 2007; PERNICHEVA-PERETS *et al.* 2011.

9 ANDREOU 2010, 649.

10 ANDREOU *et al.* 1996.

11 ANDREOU *et al.* 1996, 578.

12 In the case of Thessaloniki Toumba site, see ANDREOU, PSARAKI 2007, 402; Assiros WARDLE 1980, 236–239; Angelochori STEFANI, MEROUSSIS 1997, 354.

13 ANDREOU 2010, 649–650.

14 In the case of Assiros site, see JONES *et al.* 1986; Thessaloniki Toumba ANDREOU *et al.* 1996, 579.

15 ANDREOU 2001, 167.

16 ANDREOU 2001, 171; 2010, 653.

17 HOREJS 2007.

18 HOREJS 2007, 295.

19 MITREVSKI 2003, 13; PERNICHEVA-PERETS *et al.* 2011, 3–7.

20 HOREJS 2010, 16.



Fig. 1 Aegean wares of pottery from sites within Axios/Vardar and Struma valleys: a. Matt-painted juglet (Kilindir/Kalindria); b. Matt-painted basin-shaped vessel (Kilindir/Kalindria); c. Mycenaean imported kantharos (Ulanci); d, f, g, h. Matt-painted bowls and kantharoi (Ulanci); e. Mycenaean vessel (Ulanci); i, j. Matt-painted sherds (Kamenska Čuka); k, l. Fragments of Mycenaean vessels (Limnotopos); m. Mycenaean sherd (Ulanci). After STEFANOVICH, BANKOFF 1998, 270; MITREVSKI 2013, 207–208, pls. 62, 63; ASLAKSEN 2015, 162; STEFANI 2015B, 41–42, 136–38.

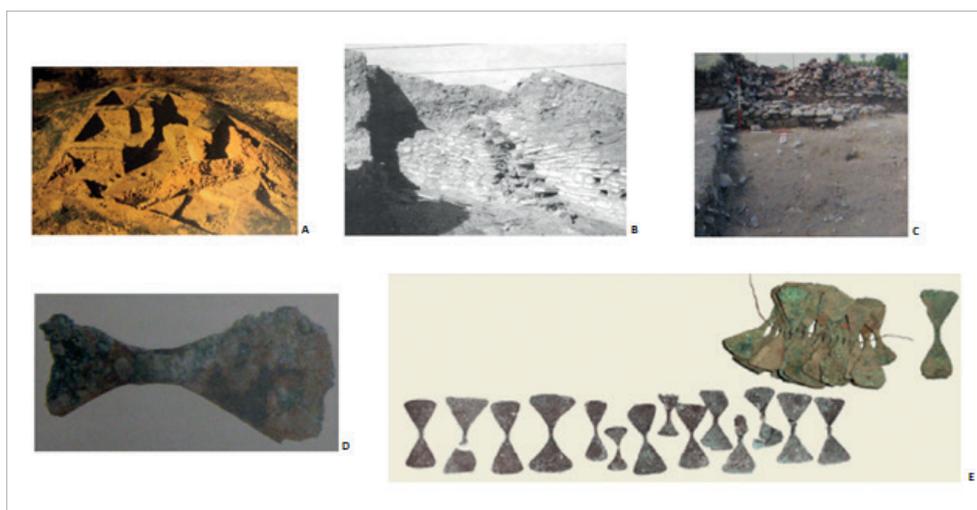


Fig. 2 a–c. Outstanding stone architecture features: Kamenska Čuka (a, b), Krsto Pokrovnik (c); d. Bronze labrys (Sandanski); e. Belt made of bronze labryses (Dimov Grob — Ulanci); After STEFANOVICH, BANKOFF 1998, 265, 274; ALEXANDROV et al. 2007, 375; STEFANOVICH, KULOV 2007, 392; VIDESKI 2007, pl. LV.

After almost a century of research, the opinion of specialists regarding the character of ceramic production in Central Macedonia remains inconsistent. Researchers continue to argue for the partially northern ('otherness of Macedonia') character of pottery vessels in the region²¹ or the importance of southern influences, which are visible in the ceramic repertoire.²² Moreover, archaeologists point to the unique and syncretic character of Central Macedonian pottery that combines the stylistic features of the neighbouring areas.²³ Therefore, these hypotheses require verification through the analysis of pottery from Central Macedonia and the neighbouring areas to better understand the regional network of cultural connections. Here, special attention will be focused on ceramics from the so-called 'incised' and 'encrusted' wares, for which archaeologists suggest a Balkan origin.²⁴ An additional aim of this paper is to recognize Aegean features within ceramic repertoires discovered in the middle and upper courses of the Struma and Axios/Vardar Rivers. Although widely debated,²⁵ this issue has never been the subject of detailed and systematic research.

HISTORY OF RESEARCH

1) Central Macedonia.

The current state of knowledge about Central Macedonian pottery production in the Late Bronze Age and its inter-regional relations is the result of more than a century of archaeological activities in this area. A pioneering survey was conducted by Berlin researchers Paul Träger and Hubert Schmidt, who conducted their *Reiseberichte* in Central Macedonia.²⁶ This was the first description of characteristic multi-layered Late Bronze Age settlement sites, or *toumbas*, in northern Greece, as well as the first systematic collection of prehistoric pottery samples.

This work was continued by surveys conducted by British archaeologists Alan J. B. Wace and M. S. Thompson,²⁷ followed by The Archaeological Service of the French Army under the leadership of Leon Rey,

who carried out the first scientific excavations in the region at the Sedes and Gona *toumbas*.²⁸ In the 1920s, a series of excavations were conducted at multiple sites, including Tsaoutsitsa/Chauchitsa (1921–1922),²⁹ Vardino,³⁰ Kilindir/Kalindria (1925),³¹ Vardaroftsa (Vardarophtsa)/Axiochori (1925, 1926),³² Olynthus (1928),³³ and Saratse/Perivolaki (1928).³⁴ In 1939, the state of archaeological knowledge was summarised in a publication by Walter Heurtley, which remains an essential compendium on the prehistory of the Central Macedonia region.³⁵ In this book, the author attempted to explain the prehistoric interregional networks of the area based on the pottery remains.

In the 1960s, David French conducted an archaeological landscape survey that upgraded the archaeological data in the discussed area.³⁶ In his PhD dissertation, French verified the location of archaeological sites and collected surface pottery, creating an index of prehistoric sites in Central Macedonia.

Twenty years later, a period of intensive excavations on the major Late Bronze Age sites in Central Macedonia began at the Thessaloniki,³⁷ Kastanas,³⁸ and Assiros³⁹ *toumbas*. In the late 1990s, an updated index of prehistoric sites in this region was published.⁴⁰

In terms of Late Bronze Age research, Central Macedonia is the best studied area when compared to the two other regions discussed in this chapter. This is due to the activities of foreign and Greek archaeologists over a long period of time.

2) South-western Bulgaria.

Prehistoric sites were not well known in the 'Bulgarian' part of the Struma Valley until 1978, excluding several that were accidentally discovered (Bălgărčevo, Drenkovo-Gărleški Nivi, Strumsko, Pokrovnik-Pobit, and Kamak Pokrovnik). Two of them, Bălgărčevo and Strumsko, were systematically excavated in the late 1970s.⁴¹ Later surface surveys significantly increased the amount of archaeological data concerning the Late Bronze Age. For example, the international Bulgarian-Polish expedition "Struma" (1978–1982) identified 20 sites dating from the 4th to the 1st millennium BC.⁴²

21 SCHMIDT 1905, 110–113; for the discussion, see ANDREOU *et al.* 1996, 561.

22 HEURTLEY 1939, xvii.

23 WARDLE 1993, 117; ASLAKSEN 2013, 10.

24 HEURTLEY 1939, 120–123; HÄNSEL 1982, 14–16; HOREJS 2007, 297–298.

25 E.g. ANDREOU 2003; WARDLE K., WARDLE D. 2007, 459.

26 SCHMIDT 1905.

27 WACE 1914.

28 REY 1917.

29 CASSON 1925.

30 HEURTLEY 1925.

31 CASSON 1926.

32 HEURTLEY, DAVIES 1927.

33 HEURTLEY 1939, xxi.

34 HEURTLEY, RALEGH RADFORD 1930.

35 HEURTLEY 1939.

36 FRENCH 1967.

37 ANDREOU, PSARAKI 2007; ANDREOU 2009; JUNG *et al.* 2009.

38 HÄNSEL 1989; JUNG 2002.

39 WARDLE 1989.

40 GRAMMENOS *et al.* 1997.

41 GRĘBSKA-KULOWA, KULOV 2007, 280; PERNICHEVA-PERETS *et al.* 2011, 2.

42 GODŁOWSKI 1983.

The results of another project, “Skaptopara” (1994–2001), have revealed an additional 26 archaeological sites dating to the same period. Today, archaeologists estimate there are 33 identified Late Bronze Age sites in the middle course of the Struma River.⁴³ However, only a few have been systematically investigated through excavations. The most important archaeological sites for the current study are Kamenska Čuka, Krsto Pokrovnik, Sandanski, and Bălgărčevo.

3) Republic of Macedonia (FYROM).

In this area, archaeologists conducted research during a series of projects carried out in the lower Vardar Valley throughout the 20th century.⁴⁴ In the middle of the river course, researchers identified a distinctive archaeological group named ‘U lanci’ that is characterised by the important necropolis of Dimov Grob and a settlement site of Stolot-U lanci. Other important sites, located on higher parts of the land, include Gradiste-Vodovrati, Bezanija-Krivi Dol, Vardarski Rid, and Gradiste-Dolno Sonje.⁴⁵ As in south-western Bulgaria, only a few of these settlements have been excavated, including Stolot-U lanci (1992–1994), part of Bezanija-Krivi Dol (1995, 2000), and Vardarski Rid (1998–1999). A distinctive aspect of the U lanci group is noticeable in the similarities of the material culture to artefacts from the Aegean world. According to local researchers, the closest pottery analogies appear in the settlements of the lower Vardar Valley in modern Greece, at Vardino, Limnotopos, Vardaroftsa (Vardarophtsa)/Axiochori, Kastanas, but also in the valley of the Struma (ceramics from Kamenska Čuka).⁴⁶

THE SIGNIFICANCE OF POTTERY IN INTERREGIONAL CONTACTS

The study of the remains of pottery vessels collected during various research programs for over a century has provided data concerning ceramic styles produced and consumed by the Late Bronze Age communities.⁴⁷ The source material has been classified and divided into several groups. The most important in this study are examples grouped in the tableware class: incised and encrusted, matt-painted, and Mycenaean. This wide

variety of pottery styles clearly demonstrates the complexity of the material culture in this region. Some of these wares are relatively well-studied, and it is possible to place them within the context of the Late Bronze Age world. In addition to the utilitarian character of the pots, their ‘social’ role within the Central Macedonian communities and our interpretations of their distribution are also important.

1) Southern wares.

In Central Macedonia, the matt-painted pottery class is visible in the ceramic repertoire until the Late Bronze Age. However, it has a longer history and is better known through scientific work conducted in the more southern regions of Mainland Greece.

Since its initial study, this ware has raised controversy and inconsistencies, especially regarding its genesis. Some archaeologists speculate whether matt-painted Middle Helladic ware was a continuation of Early Helladic tradition or had even earlier, Neolithic, origins.⁴⁸ Others suggest this group came from the Cyclades or that it indicates the migration of people from Asia Minor.⁴⁹ When potters began to use matt paint to decorate their vessels remains unknown, but the earliest examples come from the transitional phase between the Early Helladic III and Middle Helladic periods.⁵⁰

This ware may be monochrome or bichrome or even trichrome. The paints used are probably the same with differences in colours being a result of different quality of firing.⁵¹ The paint colour on ceramic fragments from Macedonian sites ranges from purple (the most common), through brown and black, to even red. The base colour of the slip was yellow-buff or orange (but a whitish slip also occurs), smooth, and with a ‘soapy’ feel (Heurtley compared them to yellow Minyan ware).⁵² The closest stylistic affinities to Central Macedonian examples are the transitional Middle to Late Bronze Age painted ceramics of Thessaly and Central Greece.⁵³

In Central Macedonia, vessel forms included shallow bowls with angular or sagging bodies and ‘thumb-grip’ handles,⁵⁴ small s-profile bowls with raised vertical handles,⁵⁵ closed jars,⁵⁶ open-mouthed mugs with raised handles, and *pithoi* with vertical, strap-like handles. The repertoire of shapes also included bowls and

43 GREBSKA-KULOWA, KULOV 2007, 291.

44 Mainly from the sites of Vardino, Vardaroftsa (Vardarophtsa)/Axiochori, Kastanas, Kilindir/Kalindria: MITREVSKI 2005, 12–13; VIDESKI 2005, 91.

45 MITREVSKI 2003, 46–47.

46 MITREVSKI 2003, 46–49.

47 For a summary of archival research, see ANDREOU *et al.* 1996, 560–562; PAPPAS, BAHYRYCZ 2016.

48 BUCK 1964, 231.

49 DICKINSON 1994, 108–109.

50 ZERNER 1978, 151.

51 RUTTER 1976, 9.

52 HEURTLEY 1939, 94–95.

53 http://www.aegeobalkanprehistory.net/index.php?p=article&id_art=8, accessed: 20.04.2018.

54 HEURTLEY 1939, 218–219, 220, 224–225.

55 ANDREOU, PSARAKI 2007, 408.

56 ANDREOU, PSARAKI 2007, 408.

amphoras with ‘wish-bone’ handles,⁵⁷ jugs with cut-away necks,⁵⁸ jars with broken profiles,⁵⁹ small jugs with high loop-handles,⁶⁰ and bowls with flaring rims and tubular handles.⁶¹ Vessel decoration comprises mainly geometric patterns, triangles (hatched, latticed, with pot-hook spirals attached), toothed and wavy lines, bands, multiple zigzags, running spirals, and chevrons.⁶² On morphological grounds, the majority of vessel shapes can be associated with the consumption of liquids, while the appearance of the matt-painted class may also indicate “a new drinking etiquette performed at some special festive occasions”.⁶³

There are several explanations for the origins and meaning of ceramics in relation to social complexity in the Late Bronze Age societies of Central Macedonia. They have been interpreted as a local imitation of the Mycenaean prototypes⁶⁴ (based on functional similarities) on the one hand, and as originating from the Middle Helladic ceramic tradition⁶⁵ on the other. Radiocarbon dates from Western Macedonia show that the latter explanation is more probable because matt-painted pots appeared in the region in the 15th century BC — earlier than the first Mycenaean imports.⁶⁶ The latest hypothesis is that this handmade painted ware may be the result of a long, extant, and continued interaction between the Macedonian communities and the inhabitants of Central and Southern Greece.⁶⁷ The spatial extent of matt-painted pottery demonstrates that rivers played an important role in the distribution of this ware and, therefore, in the mobility of and interactions between Late Bronze Age communities of the south-eastern Balkans.

This brief history of research in Central Macedonia demonstrates the complexity and continuous growth of archaeological data concerning Mycenaean pottery. Beginning with the pioneering research of Berlin archaeologists,⁶⁸ each successive investigation or excavation has provided new examples of Mycenaean pottery sherds. At the turn of the 19th and 20th centuries, this ware was recognised at only three sites, but by 1914 this number had risen to seven,⁶⁹ and after 1917 two

more sites with this type of pottery were identified.⁷⁰ In 1939, of the 57 Late Bronze Age sites identified in Central Macedonia, ten (18%) contained Mycenaean ceramics.⁷¹ In 1967, due to substantial progress in archaeological research, this pottery class was identified in the collections of 31 of the 101 Late Bronze Age sites identified to that time (33%).⁷² The last complete archaeological reconnaissance in Central Macedonia increased the number of known Late Bronze Age settlements with identified Mycenaean pottery fragments to 58 (24% of all sites from this period),⁷³ many of which are located in the valleys of rivers.

Most information regarding the production, repertoire of shapes, decoration, and chronology of the Mycenaean vessels in Central Macedonia comes from multi-season excavation projects conducted at three archaeological sites in the region: Kastanas, Assiros, and Toumba Thessaloniki. Initial research found that Mycenaean pottery appeared in the area in the Late Helladic III period.⁷⁴ Excavations at Assiros tell confirmed this and refined the chronology to Late Helladic III A–B⁷⁵ (14th century BC). However, in 1967, David French identified sherds that dated to the Late Helladic I and II periods,⁷⁶ which was partially confirmed by later researchers.⁷⁷ The earliest example of a Mycenaean vessel to date — part of a Vapheio cup dating to the Late Helladic I period⁷⁸ — was discovered during the Toroni excavation project, conducted at one of the southernmost archaeological sites in Central Macedonia, on the Chalkidiki Peninsula.

During the Late Bronze Age, the percentage of Mycenaean wares in Central Macedonia increased but never exceeded more than a few percent.⁷⁹ Mycenaean pots were initially introduced in Northern Aegean contexts as uncommon imports from the south and were then imitated locally.⁸⁰

The production technology of Mycenaean pots in Central Macedonia reflects that of southern Aegean potters. These ceramics were turned on pottery wheels, have a lustrous glaze, and were fired in kilns heated to high temperatures.⁸¹ Detailed studies of the ceramic

57 HEURTLEY 1939, 218, 219, 220, 224, 225; STEFANI, MEROUSIS 1997, 356.

58 HEURTLEY 1939, 218, 219, 220, 224, 225.

59 HEURTLEY 1939, 218, 219, 220, 224, 225.

60 HEURTLEY 1939, 218, 219, 220, 224, 225.

61 HEURTLEY 1939, 94.

62 HEURTLEY 1939, 218, 219, 224; STEFANI, MEROUSIS 1997, 356.

63 ANDREOU, PSARAKI 2007, 408.

64 HÄNSEL 1979.

65 VOKOTOPOULOU 1986, 255; WARDLE 1993, 124.

66 STEFANI, MEROUSIS 1997, 357.

67 http://www.aegeobalkanprehistory.net/index.php?p=article&id_art=8, accessed: 20.04.2018.

68 SCHMIDT 1905.

69 WACE 1914.

70 REY 1917.

71 HEURTLEY 1939.

72 FRENCH 1967.

73 GRAMMENOS *et al.* 1997.

74 HEURTLEY 1939, 96.

75 WARDLE 1988, 40.

76 FRENCH 1967.

77 For evidence of Late Helladic II B sherds at Thessaloniki Toumba, see ANDREOU 2009, 18.

78 CAMBITOGLU, PAPADOPOULOS 1993, 292.

79 5.5% at Thessaloniki Toumba, see ANDREOU *et al.* 1996, 582.

80 ANDREOU, PSARAKI 2007, 416.

81 WARDLE 1993, 133.

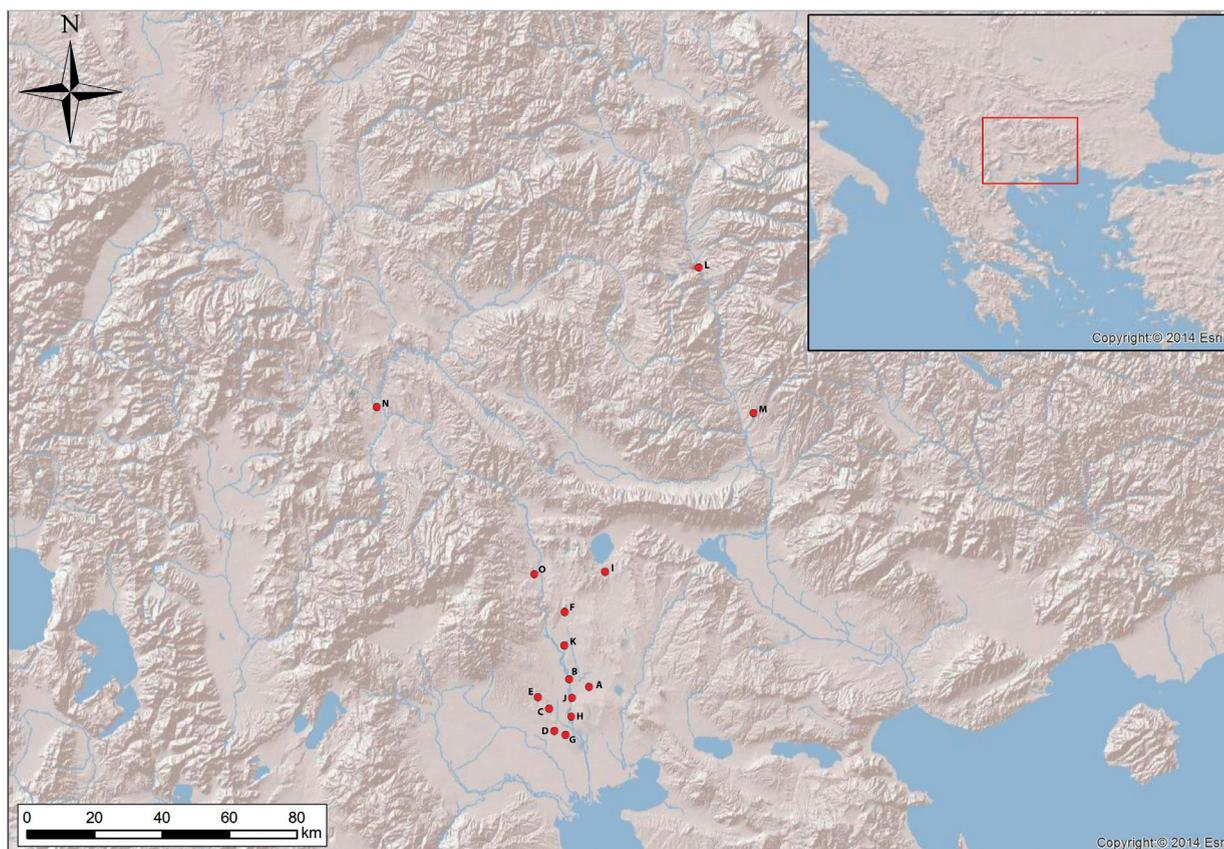


Fig. 3 Sites with finds of matt-painted and Mycenaean pottery: a. Anthophytos A and B; b. Vardaroftsa (Vardarophitsa)/Axiochori; c. Toumba Kouphalia and Kouphalia A; d. Toumba Livadhi; e. Toumba Rakhona; f. Tsaoutsitsa/Chauchitsa; g. Valtokhori; h. Dourmousli; i. Kilindir/Kalindria; j. Kastanas; k. Limnotopos; l. Kamenska Čuka; m. Sandanski; n. Dimov Grob; o. Vardarski Rid and Kofilak.

repertoire have revealed that this ware was more technologically diverse, as potters used different types of clay, finishing techniques, firing conditions, and paints.⁸²

The most common vessel shapes favoured by the inhabitants of Central Macedonia during the Late Bronze Age were small pots, including loop-handled bowls, cups, kylikes, jugs, stirrup jars, squat jars, jugs with cut-away necks, and *amphoriskoi*.⁸³ Larger vessels were not popular, although some fragments have been recognised.⁸⁴ Archaeologists have also identified several 'special' pots, including spouted jugs and bridge-spouted bowls.⁸⁵

Painted decoration consisted of different wide bands, spirals, waves, dots, floral motifs, nets, meanders, reversed horns, tassels, and so forth, typical of Mycenaean styles.⁸⁶ During the early and middle Late Helladic III C period, motifs such as simple bands or monochrome

decoration⁸⁷ also appeared on the interior surface of vessels.

The appearance of Mycenaean pottery wares in Central Macedonia after the 14th century BC was a major innovation in the material culture of the Late Bronze Age communities, despite the continued use of older and local classes of pots. Soon after the introduction of the first imports (presumably brought by the organisers of feasts and other social events),⁸⁸ this class of vessels started to be imitated locally, although it constituted only a small part of the whole tableware pottery assemblage. The repertoire of vessel shapes is restricted (with some variability) to those used in the south for wine consumption (*e.g.* kylikes, jugs, *etc.*) or as containers for aromatics (*e.g.* *amphoriskoi*). Therefore, it is possible that Mycenaean wares were used in ceremonial contexts, during feasts, or for fulfilling libation offerings

82 ANDREOU 2009, 20–21.

83 HEURTLEY 1939, 96–97; JUNG 2002; ANDREOU 2009, 20–21; JUNG *et al.* 2009, 189–191.

84 WARDLE 1993, 133.

85 HEURTLEY 1939, 96–97.

86 HEURTLEY 1939, 96–97.

87 ANDREOU 2009, 20–24.

88 ANDREOU, PSARAKI 2007, 216.

(as evidenced by vessels with special shapes, such as bridge-spouted bowls). Unfortunately, there is no evidence for ritual activity within the Late Bronze Age contexts in Central Macedonia to date.

Mycenaean pots were probably considered luxurious and exotic items because of their foreign provenance and technological superiority over the contemporaneous handmade examples. In Western Macedonia, Mycenaean vessels were more prestigious, and their use was restricted to the highest-level members of the society, whereas the rest of the community used matt-painted equivalents.⁸⁹

In contrast, the adoption of the Mycenaean wares in Central Macedonia was more socially widespread due to the geographical conditions of the region — trade along the coast was easily accessed and not regulated by an ‘elite’. Rivers penetrated deep into the mainland in the north, directly connecting inland sites with the Thermaikos Gulf and, more broadly, the Aegean Sea. The circulation of pottery was unrestricted; therefore, lower-strata members of the social hierarchy could copy behaviours of the local ‘elites’ using wheel-made, foreign, exotic, and luxurious sets of pots. This mimicry has been identified in the “subversive quality of the Mycenaean pottery”.⁹⁰

Both matt-painted and Mycenaean pottery have Aegean origins⁹¹ and indicate contacts with the southern circle of the civilisation. However, the entire spatial extent of these wares in the northern Aegean has not yet been the subject of complex study.⁹² Examples of sites where these types of pottery have been identified are located along the lower Axios/Vardar Valley (Figs. 3 and 1), including Valtokhori,⁹³ Kilindir/Kalindria,⁹⁴ Anthophytos A and B,⁹⁵ Aspros Toumba,⁹⁶ Axiochori/Vardaroftsa,⁹⁷ Kastanas,⁹⁸ Kouphalia A,⁹⁹ Dourmousli,¹⁰⁰ Toumba Kouphalia,¹⁰¹ Toumba Livadhi,¹⁰² Toumba Rakhona,¹⁰³ Limnotopos,¹⁰⁴ and Tsautsitsa/Chauchitsa.¹⁰⁵ Beyond the border of the northern

Aegean, these classes are also visible in the pottery assemblage of sites in the Struma and Vardar/Axios River Valleys, for example at Kamenska Čuka,¹⁰⁶ Sandanski,¹⁰⁷ Vardarski Rid¹⁰⁸ and Kofilak,¹⁰⁹ and Dimov Grob¹¹⁰ (Figs. 3 and 1).

2) Northern class.

In terms of northern influences in Central Macedonia during the Late Bronze Age, handmade vessels decorated by incisions and encrustations seem to be most important. These pots were produced using relatively high quality clay, and, prior to firing, the potter incised decorative motifs on the surface of the vessels using a variety of tools (e.g. sharp flints, metal sheets, circular tools, etc.).¹¹¹ Incisions primarily included rectilinear motifs, triangles, and parallel, oblique, and irregular lines, sometimes with traces of frame-like designs as well as spirals and circles,¹¹² and were then filled with calcareous white or pink powder.¹¹³ Surface colours occurred in many variants, ranging from orange/bright brown to almost black, due to uneven firing conditions and differences in the degree of oxidisation.

The most common vessel shapes included *kantharoi*, wishbone-handled bowls, four-handled amphoras, cups, cut-away neck jugs, and juglets.¹¹⁴ One special function pot, a tripod stand, was also identified.¹¹⁵ The repertory of shapes clearly demonstrates that incised and encrusted vessels were used during different activities; for instance for storing products (e.g. amphoras and *kantharoi*, the latter for aromatic substances)¹¹⁶ but also in consumption (e.g. bowls and jugs).

This pottery class is easily recognizable within other tableware ceramics in the northern Aegean contexts because of its unique decoration, characteristic of more northern regions in the Balkans. Archaeologists have looked for analogies over a vast area, comparing Central Macedonian examples to the products of Bronze Age archaeological cultures in Bulgaria and Romania

89 KARAMITROU-MENTESIDI 1999; 2003.

90 ANDREOU, PSARAKI 2007, 416–417.

91 Among others: BUCK 1964; DICKINSON 1977; ZERNER 1978; HOCHSTETTER 1982, 79–90; MOUNTJOY 1993.

92 For the distribution map of Mycenaean ware in Central Macedonia, see HOREJS 2007, map LXXVII b; for the Mycenaean influences to the north, see WARDLE 1993.

93 FRENCH 1967, 68.

94 ASLAKSEN 2013, 171–172.

95 FRENCH 1967, 57.

96 FRENCH 1967, 57.

97 ASLAKSEN 2013, 163.

98 FRENCH 1967, 60; JUNG 2002, 65–191.

99 FRENCH 1967, 60.

100 FRENCH 1967, 58.

101 FRENCH 1967, 67.

102 FRENCH 1967, 67; ASLAKSEN 2013, 179.

103 FRENCH 1967, 67.

104 ASLAKSEN 2013, 162, 168.

105 ASLAKSEN 2013, 173.

106 STEFANOVICH, BANKOFF 1998, 274–275, 278.

107 ALEXANDROV *et al.* 2007, 377.

108 VIDESKI 2005, 98.

109 VIDESKI 2005, 94–95.

110 VIDESKI 2007, 212.

111 STEFANI, MEROUSIS 1997, 354–355.

112 STEFANI, MEROUSIS 1997, 356; ANDREOU, PSARAKI 2007, 408, 412.

113 STEFANI, MEROUSIS 1997, 355; ASLAKSEN 2013, 136.

114 ASLAKSEN 2013, 132.

115 STEFANI, MEROUSIS 1997, 355.

116 ROUMBOU *et al.* 2008; after ANDREOU 2010, 652.

(Coslogeni, Cerkovna, Verbicioara, Tei, Wietenberg)¹¹⁷ and slightly later cultures from the Iron Age (Cepina, Catalka, Psenicevo, Babadag, Rabisa, Ostrov).¹¹⁸

Incised and encrusted pottery is repeatedly recovered along rivers in the central Balkans,¹¹⁹ although it never reached the regions south of Macedonia, nor was it part of the Aegean repertory.¹²⁰ Interestingly, these pots are routinely found in the same contexts with matt-painted and Mycenaean examples. This indicates that they may have been accessible to the majority of community members rather than being restricted to the elite.¹²¹

Samples taken for radiocarbon dating from the site of Archondiko (Western Macedonia) provide the chronological framework for the incised and encrusted pottery in the region. These date to the first half of the 2nd millennium BC, prior to the emergence of matt-painted vessels.¹²²

The diversification of shapes, and therefore their functions, permits the use of incised and encrusted pottery in the investigation of interregional contacts in the south-eastern Balkans. The spatial distribution of these wares shows that the main rivers in the region may have been essential routes, through which technology was transferred and finished products were exchanged. Another hypothesis asserts that incised and encrusted ceramics moved with people, perhaps via marriage.¹²³ Functional and distributional analysis of the main vessel shapes has revealed another hypothesis, suggesting that *kantharoi* with aromatic substances may have been important trade items between the Late Bronze Age communities in the south-eastern Balkans.

Examples of this ware have been identified from sites in the lower Axios/Vardar River Valley, including Dourmouslij,¹²⁴ Toumba Paionias,¹²⁵ Toumba Livadhi,¹²⁶ Kastanas,¹²⁷ Kilindir/Kalindria,¹²⁸ Axiochori/Vardaroftsa,¹²⁹ Tsautsitzza/Chauchitsa,¹³⁰ and Limnotopos¹³¹ (Figs. 4 and 5). In the southern Balkans, similar pots have been identified from settlement sites as well as necropolises located along the middle and upper courses of the Vardar/Axios and Struma Rivers, including the sites of Kofilak,¹³² Kamenska

Čuka,¹³³ Krsto Pokrovnik,¹³⁴ Bălgărčevo,¹³⁵ and Sandanski¹³⁶ (Figs. 4 and 5). However, determining the origin of incised and encrusted ware from these sites requires research based on museum and university collections that have never been sufficiently studied.

Given the current state of knowledge of the Late Bronze Age pottery from the Struma and Axios/Vardar River Valleys discussed above, there is a reasonable basis to discuss the interregional connections between Central Macedonia, the Aegean, and the south-eastern Balkans. This statement is also supported by evidence of architectural remains in these areas. As an example, consider the outstanding fortified outposts along the middle course of the Struma River (Kamenska Čuka, Krsto Pokrovnik; Fig. 2a–c). The upland character of these sites, the lack of signs of permanent occupation, and their location permitting a wide view of the Struma River Valley indicate they were most likely fortresses or defensive sites and were part of a fortification chain protecting the north-south route along the river. They were probably built to protect the transport and communication routes connecting the coasts of the Aegean Sea with Central Europe.¹³⁷

In the middle of the Axios/Vardar River Valley, there are other important archaeological data that connect the described regions. Archaeologists have discovered a rich artefact assemblage in the Dimov Grob necropolis that originated from the Aegean circle of the civilisation. In addition to matt-painted ceramics, Mycenaean pottery wares, including imported vessels, were identified at this site. Furthermore, burials contained other evidence of contact, such as jewellery made of ivory, amber, and glass paste, as well as tools, including ivory-handled knives with flat backs and pointed tips decorated with cross-hatched triangles forming a *labryses* and bronze double-axes (Fig. 2d). The items that indicate the strongest Aegean influences and cult functions are belts made of bronze double axes (*labryses*) associated with female burials (Fig. 2e). Thus, in addition to the similarities in the material culture, shared funerary activities and possibly belief systems between the described regions are also visible.¹³⁸

117 HOCHSTETTER 1982, 108.

118 HOCHSTETTER 1982, 116.

119 HOREJS 2007b, 58–65.

120 HOREJS 2007a, 298.

121 ASLAKSEN 2013, 154.

122 STEFANI, MEROUSIS 1997, 355.

123 ANDREOU 2001, 170.

124 FRENCH 1967, 58.

125 FRENCH 1967, 67.

126 FRENCH 1967, 67.

127 HOCHSTETTER 1982; 1984; ASLAKSEN 2013, 139, 151.

128 ASLAKSEN 2013, 135, 137, 138, 142–143, 156.

129 ASLAKSEN 2013, 141, 157.

130 ASLAKSEN 2013, 153–154.

131 ASLAKSEN 2013, 159, 182.

132 VIDESKI 2005, 95.

133 STEFANOVICH, BANKOFF 1998, 277, 307.

134 STEFANOVICH, KULOV 2007, 393.

135 PERNICHEVA-PERETS *et al.* 2011, 2, 206–207, 476.

136 ALEXANDROV *et al.* 2007, 377.

137 GRĘBSKA-KULOWA, KULOV 2007, 291; STEFANOVICH, KULOV 2007, 391; PERNICHEVA-PERETS *et al.* 2011, 19.

138 VIDESKI 2007, 212–213.

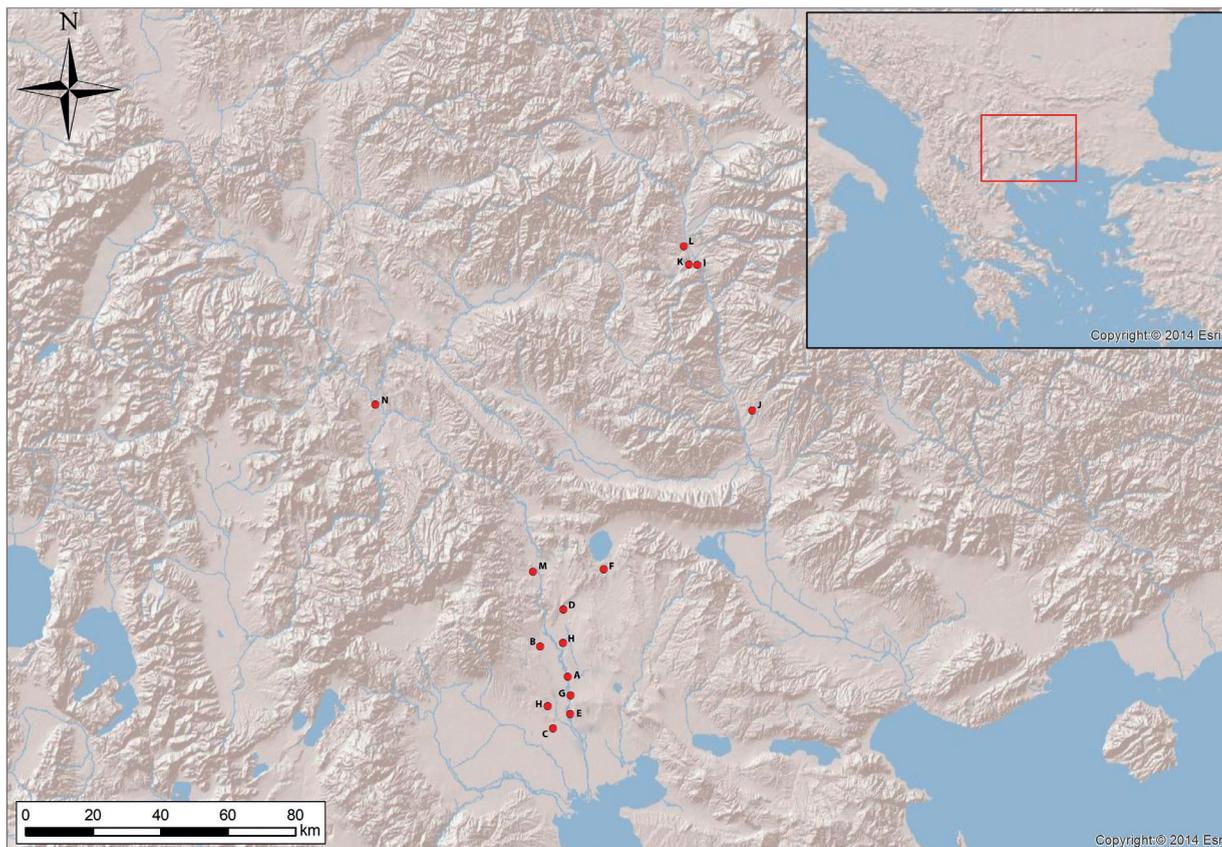


Fig. 4 Sites with finds of incised and encrusted pottery: a. Vardaroftsa (Vardarophitsa)/Axiochori; b. Toumba Paionias; c. Toumba Livadhi; d. Tsaoutsitsa/Chauchitsa; e. Dourmousli; f. Kilindir/Kalindria; g. Kastanas; h. Limnotopos; i. Kamenska Čuka; j. Sandanski; k. Krsto Pokrovnik; l. Bălgarčevo; m. Koflak; n. Dimov Grob.



Fig. 5 Incised and encrusted ware of pottery from the valleys of Axios/Vardar and Struma: a. Kantharos (Vardaroftsa/Vardarophitsa/Axiochori); b. Kantharos (Kastanas); c. Sherd (Krsto Pokrovnik); d–g. Sherds (Kamenska Čuka); h. Sherd (Balgarchevo). After STEFANOVICH, BANKOFF 1998, 307; STEFANOVICH, KULOV 2007, 392; PERNICHEVA-PERETS et al. 2011, 476 pl. XX; STEFANI 2015B, 146–147, 151–152.

The evidence presented herein demonstrates the solid basis for further research into the pottery from Central Macedonia. The results of the comparative analysis of these artefacts with those from the neighbouring regions can provide many interesting interpretations that will have a significant impact on the current state of knowledge concerning interregional contact between the Central Macedonian communities and surrounding cultural circles.

CONCLUSIONS

Three classes of foreign pottery identified from Central Macedonian archaeological sites were the subject of this review article, which summarises the current hypotheses regarding interregional contacts in the south-eastern Balkans during the Late Bronze Age as evidenced in ceramic assemblages. The opinions and hypotheses present in the literature summarised herein do not exhaust the complexity of this matter and require further development in specific areas.

All the pottery groups described in this review are classed as tableware. Those with southern origins — matt-painted and Mycenaean wares — are usually linked with social events, like feasting, resembling activities identified in the Mycenaean civilisation. Nevertheless, it is notable that the matt-painted examples precede the Mycenaean pots in Central Macedonia. The shape repertoire of both classes (and some incised and encrusted examples) clearly indicates that most vessels were probably used for the consumption of liquids. Despite the lack of hard evidence for social events performed at the settlements in this region, there exist some indications that may shed a light on this issue, such as evidence for vinification at the tells of Assiros and Thessaloniki, the presence of large cooking vessels and extensive cooking facilities, and the occurrence of luxurious, exotic, and foreign sets of drinking vessels (outstanding in the local repertoire). This evidence suggests the hosting of feasts, which may have served as a factor that strengthened ties within the community.¹³⁹

As discussed in the introduction, there is no convincing evidence of the presence of an institutionalised hierarchy within the Central Macedonian communities or regional settlement patterns. Nevertheless, some observations have been made based on excavations at Assiros and Thessaloniki Toumba. At these sites, storage rooms were identified that had the capacity to hold collected agricultural products greatly exceeding the

needs of the local communities. Perhaps these sites were regional centres that took part in the interregional exchange of products, ideas, technology, and people. The most convincing data comes from the ceramics, the origins of which could indicate far-reaching contacts and influences not only with the contemporary core of the Mycenaean civilisation but also with the northern regions. Importantly, it should be recognised that these influences were probably not simply one-sided. Data from Central Macedonia indicate that vinification,¹⁴⁰ the murex shells purple dye industry,¹⁴¹ and gold processing¹⁴² were developed during the Late Bronze Age, allowing the production of trade goods in this area that accelerated interregional contact.

Research, conducted by the author of this article, into these issues using more advanced analysis of the three tableware pottery classes discussed herein, including comparative and statistics methods, is currently underway and will contribute to identifying differences in ceramic assemblages from various sites within Greece, the Republic of Macedonia (FYROM), and Bulgaria. These analyses will contribute to the classification of ceramic material and identification of trends in the region during particular stages of prehistory. This will allow the verification of the hypotheses raised by earlier archaeologists studying the region of Central Macedonia.

Presentation and definition of similarities in the pottery repertoire on the sites located in the valleys of the Axios/Vardar and Struma Rivers, without concern for modern national territories and boundaries, will be helpful during the creation of a comprehensive compendium of ceramic vessels from the described region. Obviously, the state of research is significantly different in Greece, Bulgaria, and the Republic of Macedonia (FYROM), but conclusions drawn from the archaeological record permit a general overview of interregional communication networks in the prehistory to be established. Future research will clarify the contributions of the northern and southern cultural components to the formation processes of the Central Macedonian Late Bronze Age material culture. Finally, genetic, chronological, and functional analyses of the aforementioned ceramics will contribute to our knowledge of pottery production and consumption in Central Macedonia during the Late Bronze Age, providing important indications of local and foreign ceramics traditions that will be useful in the interpretation of interregional interaction and exchange in this area.

139 ANDREOU 2010, 651.

140 ANDREOU 2010, 651–652.

141 ANDREOU 2010, 651–652.

142 VAVELIDIS, ANDREOU 2008.

BIBLIOGRAPHY

- Alexandrov S., V. Petkov, G. Ivanov (2007) The Late Bronze Age necropolis in the town of Sandanski, Southwest Bulgaria, in: H. Todorova, M. Stefanovich, G. Ivanov (eds.), *The Struma/Strymon River Valley in Prehistory. In the Steps of James Harvey Gaul. Proceedings of the International Symposium „Strymon Praehistoricus”, Kjustendil–Blagoevgrad–Serres–Amphipolis, 27.09–01.10.2004*, Sofia, pp. 373–387.
- Andreou S. (2001) Exploring the patterns of power in the Bronze Age settlements of Northern Greece, in: K. Branigan (ed.), *Urbanism in the Aegean Bronze Age*, Sheffield, pp. 160–173.
- Andreou S. (2003) I Mykinaïkí keramikí kai oi makedonikés koinonías katá tin ýsteri epochí tou chalkoú (H Mykinaïkí keramikí kai oi makedonikés koinonías katá tin ýsteri epochí tou chalkoú), in: N. Kyprissi-Apostolika, M. Papakonstantinou (eds.), *The Periphery of the Mycenaean World*, Athens, pp. 191–210.
- Andreou S. (2009) Stratified wheel made pottery deposits and absolute chronology of the LBA to the EIA transition at Thessaloniki Toumba, in: S. Deger-Jalkotzy, A. Bächle (eds.), *LH IIIC Chronology and Synchronisms III: LH IIIC Late and the Transition to Early Iron Age. Proceedings of the International Workshop at the Austrian Academy of Sciences at Vienna, 23–24 February 2007*, Wien, pp. 15–40.
- Andreou S. (2010) Northern Aegean, in: E. H. Cline (ed.), *The Oxford Handbook of the Bronze Age Aegean*, Oxford, pp. 643–659.
- Andreou S., M. Fotiadis, K. Kotsakis (1996) Review of Aegean Prehistory V: The Neolithic and Bronze Age of Northern Greece, *AJA* 100, pp. 537–597.
- Andreou S., K. Psaraki (2007) Tradition and innovation in the Bronze Age pottery of Thessaloniki Toumba. Food and drink consumption and “tableware” ceramics, in: H. Todorova, M. Stefanovich (eds.), *The Struma/Strymon River Valley in Prehistory. In the Steps of James Harvey Gaul. Proceedings of the International Symposium „Strymon Praehistoricus”, Kjustendil–Blagoevgrad–Serres–Amphipolis, 27.09–01.10.2004*, Sofia, pp. 397–420.
- Andreou S., J. Czebreszuk, M. Pappa (2016) *The Anthemous Valley Archaeological Project. A Preliminary Report*, Poznań.
- Aslaksen O. C. (2013) *Global and Local in Late Bronze Age Central Macedonia. Economy, Mobility and Identity*, unpublished PhD thesis, University of Gothenburg.
- Athanassov B., R. Krauss (2015) Der Ostbalkanraum zwischen mediterranen Hochkulturen und dem südöstlichen Europa in der Spätbronzezeit, in: G. Von Bülow (ed.), *Kontaktzone Balkan Beiträge des internationalen Kolloquiums „Die Donau-Balkan-Region als Kontaktzone zwischen Ost-West und Nord-Süd”*, Bonn, pp. 63–79.
- Buck R. J. (1964) Middle Helladic matt-painted pottery, *Hesperia* 33, pp. 231–313.
- Bulatović A. (2011) Karakteristične keramičke forme na centralnom balkanu i u severnoj egeji u pozno bronzano doba, *Starinar* 61, pp. 121–140.
- Cambitoglou A., J. K. Papadopoulos (1993) The earliest Mycenaean in Macedonia, in: C. Zerner (ed.), *Wace and Blegen. Pottery as Evidence for Trade in the Aegean Bronze Age 1939–1989: Proceedings of the International Conference Held at the American School of Classical Studies at Athens, Athens, December 2–3, 1989*, Athens, Amsterdam, pp. 289–302.
- Casson S. (1925) Excavations in Macedonia II, *BSA* 26, pp. 1–29.
- Casson S. (1926) Excavations in Macedonia, *AntJ* 6, pp. 59–73.
- Dickinson O. T. P. K. (1977) *The Origins of Mycenaean Civilisation*, SIMA 49, Göteborg.
- Dickinson O. T. P. K. (1994) *The Aegean Bronze Age*, Cambridge.
- Eder B. (2007) The power of seals: palaces, peripheries and territorial control in the Mycenaean world, in: I. Galanaki, H. Tomas, Y. Galanakis, R. Laffineur (eds.), *Between the Aegean and Baltic Seas: Prehistory across Borders. Proceedings of the International Conference Bronze and Early Iron Age Interconnections and Contemporary Developments Between the Aegean and the Regions of the Balkan Peninsula, Central and Northern Europe, University of Zagreb, 11–14 April 2005*, Aegaeum 27, Liège, Austin, pp. 35–45.
- French D. H. (1967) *Index of Prehistoric Sites in Central Macedonia and Catalogue of Sherd Material in The University of Thessaloniki*, unpublished manuscript, Thessaloniki.
- Ghilardi M., E. Fouachea, F. Queyrelb, G. Syrides, K. Vouvalidisc, S. Kuneschd, M. Styllasc, S. Stiros (2008) Human occupation and geomorphological evolution of the Thessaloniki Plain (Greece) since mid-Holocene, *JAS* 35, pp. 111–125.
- Godłowski K. (1983) *The Lower Strumesnica Valley in Prehistoric, Ancient and Early Medieval Times*, Kraków.
- Grammenos D. V., M. Besios, S. Kotsos (1997) *Apó tous proïstorikous oikismous tis Kentrikis Makedonias (Apó tous proïstorikous oikismous tis Kentrikis Makedonias)*, Thessaloniki.

- Grębska-Kulowa M., I. Kulov (2007) Prehistorical sites in the middle Struma River valley between the end of the VIIth mill. BC and the beginning of the Ist mill. BC, in: H. Todorova, M. Stefanovich (eds.), *The Struma/Strymon River Valley in Prehistory. In the Steps of James Harvey Gaul. Proceedings of the International Symposium „Strymon Praehistoricus”, Kjustendil–Blagoevgrad–Serres–Amphipolis, 27.09–01.10.2004*, Sofia, pp. 279–297.
- Hänsel B. (1989) *Kastanas – Ausgrabungen in einem Siedlungshügel der Bronze- und Eisenzeit Makedoniens 1975–1979: die Grabung und der Baubefund*, Berlin.
- Hänsel B. (1982) Südosteuropa zwischen 1600 und 1000 v. Chr., in: B. Hänsel (ed.), *Südosteuropa zwischen 1600 und 1000 v. Chr. Prähistorische Archäologie in Südosteuropa 1*, Berlin, pp. 1–39.
- Hänsel B. (1979) Ergebnisse der Grabungen bei Kastanas in Zentralmakedonien, *JRGZM* 26, pp. 177–202.
- Heurtley W. A. (1925) Report on an excavation at the tomba of Vardino, Macedonia, *AnnLiv* 12, Liverpool, pp. 15–36.
- Heurtley W. A. (1939) *Prehistoric Macedonia. An Archaeological Reconnaissance of Greek Macedonia (West of the Struma) in the Neolithic, Bronze and Early Iron Ages*, Cambridge.
- Heurtley W. A., O. Davies (1927) Report on excavations at the tomba and tables of Vardaroftsa, Macedonia, 1925, 1926, *BSA* 28, pp. 195–242.
- Heurtley W. A., C. A. Raleigh Radford (1930) Report on excavations at the tomba of Saratse, Macedonia, 1929, *BSA* 30, pp. 113–150.
- Hochstetter A. (1982) Spätbronzezeitliches und Früheisenzeitliches Formengut in Makedonien und im Balkanraum, in: B. Hänsel (ed.), *Südosteuropa zwischen 1600 und 1000 v. Chr. Prähistorische Archäologie in Südosteuropa 1*, Berlin, pp. 99–118.
- Horejs B. (2007a) Macedonia: mediator or buffer zone between cultural spheres?, in: I. Galanaki, H. Tomas, Y. Galanakis, R. Laffineur (eds.), *Between the Aegean and Baltic Seas: Prehistory across Borders. Proceedings of the International Conference Bronze and Early Iron Age Interconnections and Contemporary Developments Between the Aegean and the Regions of the Balkan Peninsula, Central and Northern Europe, University of Zagreb, 11–14 April 2005*, Aegaeum 27, Liège, Austin, pp. 293–306.
- Horejs B. (2007b) *Das prähistorische Olynth: Ausgrabungen in der Toumba Agios Mamas, 1994–1996, Die Spätbronzezeitliche Handgemachte Keramik der Schichten 13 bis 1*, Prähistorische Archäologie in Südosteuropa 21, Berlin.
- Horejs B. (2010) Possibilities and limitations in analysing ceramic wares, in: B. Horejs, R. Jung, P. Pavúk (eds.), *Analysing Pottery. Processing – Classification – Publication*, Bratislava, pp. 15–29.
- Jones G., P. Halstead, K. Wardle, D. Wardle (1986) Crop storage at Assiros, *Sci.Am.* 254:3, pp. 86–103.
- Jung R. (2002) Kastanas. Ausgrabungen in einem Siedlungshügel der Bronze- und Eisenzeit Makedoniens 1975–1979. Die Drehscheibengeramik der Schichten 19 bis 11, *Prähistorische Archäologie in Südosteuropa* 18, Kiel.
- Jung R., S. Andreou, B. Weninger (2009) Synchronisation of Kastanas and Thessaloniki Toumba at the end of the Bronze and the beginning of the Iron Age, in: S. Deger-Jalkotzy, A. Bächle (eds.), *LH IIIC Chronology and Synchronisms III: LH IIIC Late and the Transition to Early Iron Age. Proceedings of the International Workshop at the Austrian Academy of Sciences at Vienna, February 23rd and 24th, 2007*, Wien, pp. 183–202.
- Karamitrou-Mentesidi G. (1999) *Vóion–Nótia. Orestís. Archaïologikí érevna kai istorikí topografía Thessaloníki (Bóïon–Nótia. Opestitís. Archaïologikí érevna kai istorikí topoğrafía Θεσσαλονίκης)*, Thessaloniki.
- Karamitrou-Mentesidi G. (2003) Mykinaiká Aianís-Elimiótidas kai Άνω Μακεδονίας (Μυκηναϊκά Αιανής-Ελιμιωτίδας και Άνω Μακεδονίας), in: N. Kyparissi-Apostolika, M. Papakonstantinou (eds.), *2nd International Interdisciplinary Colloquium – Periphery of the Mycenaean World, Lamia 1999*, Athens, pp. 167–190.
- Mitrevski D. (2003) Prehistory in Republic of Macedonia F. Y. R. O. M., in: D. Grammenos (ed.), *Recent Research in the Prehistory of the Balkans*, Thessaloniki, pp. 13–52.
- Mitrevski D. (2005) Preface, in: D. Mitrevski (ed.), *Vardarski Rid*, Skopje, pp. 12–14.
- Mitrevski D. (2013) *Praistorija na republika makedonija (Праисторија на република македонија)*, Македонија: милениумски културно-историски факти 2, Skopje, pp. 83–266.
- Mountjoy P. (1993) *Mycenaean Pottery. An Introduction*, Oxford.
- Papazovska A. (2005) The Vardarski Rid burials, in: D. Mitrevski (ed.), *Vardarski Rid*, Skopje, pp. 385–400.
- Pappa M., C. Bahyrycz (2016) Anthemous Valley and the history of research, in: S. Andreou, J. Czebreszuk, M. Pappa (eds.), *The Anthemous Valley Archaeological Project. A Preliminary Report*, Poznań, pp. 17–23.
- Pernicheva-Perets L., M. Grębska-Kulowa, I. Kulov (2011) *Balgarchevo. The Prehistoric Settlement I*, Sofia.

- Rey L. (1917) Observations sur les premières habitations de la Macédoine, *BCH* 41–43, pp. 1–175.
- Schmidt H. (1905) Die Keramik der makedonischen Tumuli, *ZfE* 37, pp. 91–114.
- Sheratt A. (1993) What would a Bronze-Age world system look like? Relations between temperate Europe and the Mediterranean in later prehistory, *EJA* 1:2, pp. 1–57.
- Stefani E. (2015a) The geography, natural environment and climate of Macedonia, in: M. Szmyt (ed.), *Everyday Life in Prehistoric Macedonia*, 1, Poznań, pp. 121–125.
- Stefani E. (2015b) Catalogue of artefacts, in: M. Szmyt (ed.), *Everyday Life in Prehistoric Macedonia*, 2, Poznań, pp. 41–42, 146–147.
- Stefani L., N. Meroussis (1997) Incised and matt-painted pottery from Late Bronze Age settlements in Western Macedonia: technique, shapes and decoration, in: R. Laffineur, Ph. P. Betancourt (eds.), *TEXNH. Craftsmen, Craftswomen and Craftsmanship in the Aegean Bronze Age. Proceedings of the 6th International Aegean Conference, Philadelphia, Temple University, 18–21 April 1996*, Aegaeum 16, Liège, Austin, pp. 353–359.
- Stefanovich M., H. A. Bankoff (1998) Kamenska Čuka 1993–1995. Preliminary report, in: M. Stefanovich, H. Todorova, H. Hauptman (eds.), *James Harvey Gaul – In Memoriam*, Sofia, pp. 255–338.
- Stefanovich M., I. Kulov (2007) Krsto Pokrovnik excavations at a Late Bronze Age site in the middle Struma River Valley, southwest Bulgaria. Preliminary results – 2004 season, in: H. Todorova, M. Stefanovich (eds.), *The Struma/Strymon River Valley in Prehistory. In the Steps of James Harvey Gaul. Proceedings of the International Symposium „Strymon Praehistoricus”, Kjustendil–Blagoevgrad–Serres–Amphipolis, 27.09–01.10.2004*, Sofia, pp. 389–396.
- Todorova H. (2003) Prehistory of Bulgaria, in: D. Grammenos (ed.), *Recent Research in the Prehistory of the Balkans*, Thessaloniki, pp. 257–310.
- Vavelidis M., S. Andreou (2008) Gold and gold working in Late Bronze Age Northern Greece, *Naturwissenschaften* 95, pp. 361–366.
- Videski Z. (2005) The Bronze Age at Vardarski Rid, in: D. Mitrevski (ed.), *Vardarski Rid*, Skopje, pp. 91–104.
- Videski Z. (2007) Mycenaean influences in the FYRO Macedonia identified in the Late Bronze Age cemeteries, in: I. Galanaki, H. Tomas, Y. Galanakis, R. Laffineur (eds.), *Between the Aegean and Baltic Seas: Prehistory across Borders. Proceedings of the International Conference Bronze and Early Iron Age Interconnections and Contemporary Developments Between the Aegean and the Regions of the Balkan Peninsula, Central and Northern Europe, University of Zagreb, 11–14 April 2005*, Aegaeum 27, Liège, Austin, pp. 211–214.
- Vokotopoulou J. (1986) *Vítsa. Ta Nekrotafeía nekrotafeías mías Molossikís molossikís Kómis kómis (Βίτσα. Τα νεκροταφεία μιας μολοσσικής κομής)*, Athens.
- Wace A. J. B. (1914) The mounds of Macedonia, *BSA* 20, pp. 123–132.
- Wardle K. A. (1975) The northern frontier of Mycenaean Greece, *BICS* 22, pp. 206–212.
- Wardle K. A. (1980) Excavations at Assiros Toumba 1975–79. A preliminary report, *BSA* 75, pp. 229–267.
- Wardle K. A. (1988) Excavations at Assiros Toumba 1987. A preliminary report, *BSA* 83, pp. 375–387.
- Wardle K. A. (1989) Excavations at Assiros Toumba 1988. A preliminary report, *BSA* 84, pp. 447–463.
- Wardle K. A. (1993) Mycenaean trade and influence in Northern Greece, in: C. Zerner, P. Zerner, J. Winder (eds.), *Wace and Blegen. Pottery as Evidence for Trade in the Aegean Bronze Age 1939–1989: Proceedings of the International Conference Held at the American School of Classical Studies at Athens, Athens, December 2–3, 1989*, Athens, Amsterdam, pp. 117–141.
- Wardle K. A., D. Wardle (2007) Assiros Toumba. A brief history of the settlement, in: H. Todorova, M. Stefanovich (eds.), *The Struma/Strymon River Valley in Prehistory. In the Steps of James Harvey Gaul. Proceedings of the International Symposium „Strymon Praehistoricus”, Kjustendil–Blagoevgrad–Serres–Amphipolis, 27.09–01.10.2004*, Sofia, pp. 451–481.
- Zerner C. W. (1978) *The Beginning of the Middle Helladic Period at Lerna*, unpublished PhD thesis, University of Cincinnati.

INTERNET SOURCES

http://www.aegeobalkanprehistory.net/index.php?p=article&id_art=8, accessed: 20.04.2018.

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