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MATERIALITY AND SCRIPT: CONSTRUCTING A NARRATIVE ON THE MINOAN INSCRIBED AXE FROM THE ARKALOCHORI CAVE

Georgia Flouda

Summary

This paper aims to deduce episodes of the cultural biography of the inscribed bronze double axe from the sacred cave at Arkalochori in central Crete by focusing on its materiality and by examining the context of both its production and the reception of its undeciphered inscription. A discussion of the technicalities involved in the making of its fifteen signs and new evidence stemming from the recent restoration of the axe helps to review its inscription. It is also suggested that the symbolic reception of the double axe may be decoded through examining its performative capacities and considering the possibility of its final use in display and deposition rites taking place in the cave. It is argued that metalsmiths were definitely among the social agents participating in the deposition, possibly because of an obligation to return to the earth a portion of the objects produced from the raw materials generated by it. Part of the prestige metal votives deposited in the cave may also be the result of the competition of local elites or a social class with military associations, manifesting in ostentatious display and distinction.

“Objects need symbolic framings, storylines and human spokespersons in order to acquire social lives; social relationships and practices in turn need to be materially grounded in order to gain temporal and spatial endurance.”

Pels, Hetherington, Vandenberghe 2002, 11.

The double axe has been established in the archaeological literature as one of the most enduring symbols of Minoan religion and ritual, mostly due to its alleged link to bull sacrifice (Nilsson 1950, 227).¹ Not only is it reproduced in many forms and materials, such as metal artefacts, clay figurines, jewellery, pottery vessels and stone objects (MacGillivray 2012, 118-119), but it also appears as a sign in the earliest of all Aegean scripts, the ‘Archanes Script’ (Olivier, Godart 1996, cf. sign 042; Sakellarakis, Sapouna-Sakellarakis 1997, 326-330; Flouda 2013, 155), and forms part of the Cretan Hieroglyphic, Linear A and Linear B syllabaries. Interpretations of the double axe focus mainly on its function as a religious emblem and vary considerably: it was allegedly employed in burial rites (Nilsson 1950, 426-443; Rethemiotakis 1984, 248) and signified the sun emerging from the horizon (Marinatos 2010, 129; MacGillivray 2012, 118), the sky god (Cook 1925, 533-534) or the duality of the chthonic goddess and her male satellite (Evans 1921, 447). Nevertheless, due to the manifold manifestations of the double axe in Minoan art and the variety of archaeological contexts in which it appears, it can be argued that it was a polysemic symbol (Womack 2005, 3) conveying multiple layers of meaning.² It is, thus, conceivable that it also functioned as an attribute of a group or class within Minoan society, depending on its contextual associations (Haysom 2010, 50).³

Double axes in various sizes and pendants in the shape of a double axe, which appear for the first time as burial gifts in Prepalatial tombs (from EM IIA to MM IA) in the Mesara and at Mochlos, show that aspects of its

1 This view was contradicted by Buchholz 1959, 16, who disassociated double axes and bucrania by pointing out that the double axe was always depicted hanging from a rope or ribbon; also cf. Marinatos 2010, 116.

2 Karetsou and Koehl (2013, 140-141) adopt a similar approach by arguing for the possible multivalent meaning of the bull in Minoan Crete.

3 Whittaker (2014, 75-76) argues that the double axe, which also occurs sporadically on the mainland from the Early Helladic period onwards, was mostly an attribute of social status rather than a religious symbol there. On the importance of the double axe as a symbol in continental Europe, Harding 2007, 46-47.



Fig. 1a-b. Front- and back-side of the bronze Arkalochori axe HM inv. no. X2416. Photo by Chronis Papanikolopoulos, courtesy of the Heraklion Museum.

cultural meaning were already introduced at this early stage (Branigan 1968, 30; 1970, 114; 1974, 21, 164-165; MacGillivray 2012, 118).⁴ They were also commonly included among the offerings at Minoan cave sanctuaries and mountain peak sanctuaries of the Protopalatial and Neopalatial period (Hogarth 1899-1900, 109). Interestingly, a cache of 36 Protopalatial votive bronze axes recovered from a pit along with a stone kernos may have been the foundation deposit of the largest peak sanctuary on Mount Juktas.⁵ The recent excavation of an open-air sanctuary at Gournos Kroussonas on Mount Psiloritis supplements this evidence (Rethemiotakis 2009, 190-191, fig. 16, 6, and 194-195, fig. 16, 12) and indicates that depositing a few small bronze sheet double axes in the crevices of the rocky outcrops may also have been a standard practice. However, solid full-size double axes also had valuable functions as tools. They were probably used for felling trees, ship construction and woodworking of all sorts, but also for

4 Double axes have been excavated in the following Mesara tholos tombs: Platanos Tholos A, Apesokari Tholos B, Aghia Triada Tholos B and Kamilari Tholos II, cf. Long 1974, 40 and Branigan 1974, 21, pl. 10 no. 521, 164-165: nos. 521, 552, 528 and 523 respectively.

5 The pit was cut in the area south of the stepped altar, Karetsou 2012, 89, figs. 10, 13-14; 1981, fig. 14.

cutting soft stone (Evely 1993, 51; Northover, Evely 1995, 89-90; Shaw 2009, 39). They could also have served for chopping animal carcasses, as a recent experimental archaeology project has demonstrated (Lowe Fri 2007; 2011).

This paper aims to reassess the evidence relating to a full-size bronze double axe from central Crete which deviates from the norm (Heraklion Museum inv. no. X2416). Although functional from a typological standpoint, it is rendered exceptional by the undeciphered inscription of fifteen symbols it carries and the affinities of the latter to the Phaistos Disk inscription (Figs. 1 a-b). The double axe forms part of a fairly homogeneous cultural deposit recovered in the early twentieth century in the sacred cave at Arkalochori, which holds a special position among excavated Minoan caves and is considered as a cult centre functioning throughout most of the Cretan Bronze Age (Evely 2007).

So far research has centered upon the difficulty of classifying and interpreting the controversial inscription of the double axe without considering its context (Vermeule 1959, 8-9; Duhoux 1998; Owens 2000, 238). I hereby aim to deduce episodes of the cultural biography of the object by focusing on its materiality and its contextual associations. The method employed is two-fold. First, I shall try to situate the double axe in the context of both its production and the reception of its inscription. The technicalities involved in the making of the inscription will be discussed and by using new evidence stemming from the recent restoration of the axe I will review its inscription. The symbolic reception of the double axe may be decoded through examining its performative capacities and considering the possibility of its use in display and deposition rites. By approaching the artefact through these two levels of meaning, namely technological-functional aspects and social life, I shall lead up to the hypothesis that this particular axe may have acquired some form of agency through its inscription.

THE CONTEXT OF THE ARKALOCHORI CAVE ASSEMBLAGE

The difficulty in reconstructing the cultural biography⁶ of the Arkalochori axe mainly lies in the lack of clear contextual evidence for the moment it ended its social life. Reconstructing the intermediate stage between its life-production and its death is also hampered by the lack of insufficient evidence (Joy 2009, 543). Its depositional context has been damaged by the looting and the destruction of the greater part of the cave with dynamite before the excavation. Associated with a prominent natural landmark, namely the top of a rocky hill to the south-west of the modern village of Arkalochori – ca. 3 km south of the Minoan palace at Galatas and 33 km south-east of modern Heraklion –, the cave was formed by a horizontal shallow rock fissure nearly 40 meters long and measuring two meters at its widest point (Hazzidakis 1912-1913, 36-17, fig. 2; Marinatos 1935b, 214). A thick but clumsy wall built right at the entrance forms a room and a long corridor, but it is hard to assess this architectural layout (Evely 2007), since the roof collapsed most probably after the Late Minoan IA period. The earliest pottery finds from the cave belong to the EM I and II phases (Hazzidakis 1912-1913, 38-39, fig. 4). Potential evidence for ritual use of the cave in the Prepalatial (EM I – EM II) and Protopalatial (MM IB – MM II) periods consists only of pottery, which hints at offerings of agricultural products as well as ceremonial drinking activities (Marinatos 1962, 89; Faro 2008, 78). The presence of an obsidian core and of obsidian blades suggests some sort of limited tool-working activity in the cave, while the absence of votive and other symbolic objects differentiates the cave from Protopalatial cult assemblages. The assemblage of metal artefacts that dates from the MM III to the LM IA period according to a few unpublished fragments of pottery (Marinatos 1935b, 218; Marinatos 1962, 89), suggests that ritual practice during the early Neopalatial period did not follow the established network of set ritual activities or performances deduced from the distribution of specific item types in other cave or open-air sanctuaries (Kyriakidis 2005, 24-26, tables 1.1-1, 3). Typical votive objects, such as inscribed stone vessels and ‘libation tables’, anthropomorphic and zoomorphic figurines and drinking vessels in large numbers, are totally absent. After the collapse of the roof activity was interrupted and later on restricted to the outer chambers, as inferred from

6 Gosden and Marshall (1999, 174) have elaborated on the notion of ‘cultural biography’ introduced by Kopytoff (1986), by stressing that “objects can be understood only by looking at the cultural contexts which originally produced them and the new circumstances into which they later moved. The histories of many objects are composed of shifts of context and perspective”.



Fig. 2. Miniature silver double axe HM inv. no. X-A626 from the Arkalochori cave, after Godart, Olivier 1982, 143.

deposits including LM IIIA and IIIB pottery and part of a potter's wheel (Kanta 1980, 80, fig. 32, 1).⁷

With regard to the Neopalatial period assemblage, the finds were dispersed all over the cave, but they mainly formed two concentrations. At the far north end of the cave masses of bronze votive weapons and double axes were recovered in 1912 by the first excavator, Josef Hazzidakis (1912-1913, 37). The latter estimated that approximately 18 'okkades', namely 23076 grams in total,⁸ of scrap bronze had been sold and smelted in Heraklion prior to the excavation (Hazzidakis 1912-1913, 37).⁹ The concentration at the centre of the cave covered a surface of two square meters. Although it had already been looted, it produced a number of bronze blades of swords and daggers, bronze miniature double axes, as well as a silver miniature double axe (Hazzidakis 1912-1913, 37, 43-46, figs. 7-9; Marinatos 1935b, 214-215).¹⁰ In 1935, the excavation of this central deposit by Spyridon Marinatos and Nikolaos Platon also produced a few votives in precious metals and led to the inference that an altar probably existed at the centre of the cave (Marinatos 1935b, 215). Moreover, at the north end of the cave an excess number of piled-up metal artefacts, most probably dating from Middle Minoan III to Late Minoan IA period was also excavated (Marinatos 1935b, 215, fig. 15; 1934, col. 252, fig. 3; 1935a, coll. 244-256). It included raw material in the form of copper bun ingots, a bronze cosmetic scraper¹¹, dozens of sword blades, tiny elongated triangular sheets of gold, hundreds of weapon simulacra and votive double axes of various sizes. Marinatos accordingly suggested that this assemblage was formed by the long-term deposition of

votive offerings produced locally by a metalsmiths' guild specializing in the production of metal votives and using the cave for storage (Marinatos 1935b, 218; 1962, 92). The offerings may have been dedicated to a war goddess, allegedly worshiped in the cave (Marinatos 1935b, 220; Vermeule 1959, 6; Kaczyńska 2002, 139-140).

The notable variety of the artefacts and the fact that some of them were found carefully piled (Marinatos 1962, 92), make it plausible that this hoard of metal objects resulted from intentional and structured deposition (Rethemiotakis 1999, 95; Adams 2006, 14). Despite its fragmentation as a result of several looting episodes, the hoard is a multiple-type one characterized by a remarkable volume of hoarded metal. Apart from the five copper ingots (HM inv. no. X2407-2411, cf. Mangou, Ioannou 2000, 208), it comprises several medium-sized bronze double axes and many large bronze double axes ranging from 0.28 to 0.67 m in length.¹² Some of these large examples have been decorated by chasing and a few (e.g. X2420)¹³ are made of non-utilitarian sheet metal. In addition, many artefacts of a votive character were recovered, namely dozens of the very long Type A swords – most of them actually bronze unhilted blades

7 Occasional finds of Archaic and Hellenistic pottery were also recovered, cf. Marinatos 1935b, 218.

8 One Ottoman unit of weight "okka" corresponds to 1282 grams, cf. Ágoston, Masters 2009, 597.

9 It is impossible to estimate what proportion of the bronze objects that were recovered this represents, as no systematic publication of the assemblage is available so far.

10 On the long daggers HM inv. nos. X2405 and X2406, see Branigan 1974, 11, 160 (cat. nos. 284-285).

11 The scraper was studied by Branigan 1974, 32, 176 cat. no. 1418, pl. 17, who assigns it to his type III "with concavely curved sides, convex cutting edge and two rivets".

12 HM inv. nos. HM X2413-2414, X2416, X2418-X2425, X2754-X2762, X2770-2771, X2776, X2777, X2782, X2793, X2799, X2801. Use-wear analysis is required in order to establish whether any of them had actually been used as tools.

13 It was probably designed to fit onto a shaft, as suggested by its solid circular shaft-hole (diam 0.025 m).

(e.g. HM inv. no. X2399-X2404, X2817 etc.)¹⁴ —, numerous model blades of knives in bronze, hundreds of unpublished small-sized bronze votive double axes and twenty pieces of elongated triangular gold foil weighing 9.95 gr (Michailidou 2003, 309). The latter can be compared to the votive bronze knives in the form of small cut-out plaques, which were recovered from the sanctuary at Ayios Georgios on Kythera (Sapouna-Sakellarakis *et al.* 2012, 231-234, 237, pl. 3 d-e) and also from a storeroom for cult paraphernalia and votives discovered on Terrace III (Room V) of the open-air sanctuary of Mount Juktas (Ioannidou-Karetsou 1985, fig. 4, pl. 141 a; Karetsou, Koehl 2013, 139, 141). The small-sized bronze votive double axes are mostly fragmentary and may be an accumulation of scrap metal that had been brought together for recycling, so they were possibly associated with metalworkers. In any case, no specialized installations or by-products of metalworking have been recovered (Kilian-Dirlmeier 1993, 13), so these activities would not have taken place in the cave.

In addition, thirty-five gold and ten silver votive double axes represent the miniature version of this diachronic symbol in thin sheet (Hazzidakis 1912-13; Marinatos 1962). The gold examples are of various sizes. The hole in the shaft of the miniature axes suggests that they were meant to hang upside down, like the inverted double axe depicted on the conical rhyton HM inv. no. P3385 from Palaikastro (Marinatos 2010, 125, fig. 9, 17). One of the miniature silver double axes (Fig. 2, HM inv. no. X-A626) bears four incised signs of the still undeciphered Linear A script (AB28-AB01-AB80-AB04, Boofidis 1953-1954, 64-65; Pope 1956, 132, fig. 1 d, 134-135, pl. 37b).¹⁵ The same inscription also appears on the Boston Museum inscribed gold double axe (Fig. 3) and, although the two examples differ palaeographically (Marinatos 1962, 88 n. 3; AR Zf 1-2, cf. Godart, Olivier 1982, 162), it has been plausibly suggested that the Boston example also comes from the Arkalochori cave (Vermeule 1959, 4-5; Young 1959, 17). In any case, the inscription on the two miniatures has been tentatively transliterated as *i-da-ma-te* using the phonetic values of the signs in Linear B, thus offering ground for a connection with the ritual sphere (Boofidis 1953-1954, 64-65).¹⁶ It is noteworthy that the version *da-ma-te*, which appears on a MM III-LM I stone miniature ladle (KY Za 2) from the open-air sanctuary at Ayios Georgios on Kythera, could possibly relate to *i-da-ma-te* (Olivier, Sakellarakis 1994, 344-345, figs. 1-6; Kaczyńska 2002, 139-140 note 11; Sakellarakis 2013, 53, 132-133). Could many of the discussed metal artefacts have been initially involved in rituals and then displayed in the Arkalochori cave? The closest parallel is the Psychro cave, which has also produced many metal offerings dating to the Neopalatial period, including 18 votive double axes, mostly found in situ in the stalactite niches, and votive weapons (Hogarth 1899-1900, 108-109, figs. 4c, 40.2; Tyree 2001, 41).¹⁷ Due to the limited documentation of the excavation, it is impossible to reconstruct the



Fig. 3. Boston Museum gold double axe (accession no. 58.1009) with Linear A inscription, after Godart, Olivier 1982, 162.

14 Some of them exceed the length of 90 cm and have a very short tang, sword HM inv. no. X2399 with a length of 111 cm being the longest. The tang would normally be attached to hilt plates through one or two rivet holes and the hilt plates would also be riveted to the shoulders, but these swords from the cave are unfinished, cf. Kilian-Dirlmeier 1993, 17-18, Taf. 4. 22-23; 5. 24-25.

15 Only about half the double axe is preserved (width 0.034 m); it would initially have been the same size as the silver double axes HM inv. nos. X-A623 or X-A624.

16 Duhoux (1998, 21) has argued that LA > LB *i-* could be a syntactic marker denoting the case (dative or genitive) or preposition.

17 Other bronze offerings recovered from the Lower Cave at Psychro include swords, daggers, knives, chisels, a saw, a toothed sickle as well as spear- and arrow-heads, cf. Rutkowski, Nowicki 1996, 17. A notable difference of the Psychro cave is that it has also produced a complex assemblage of the Protopalatial period.

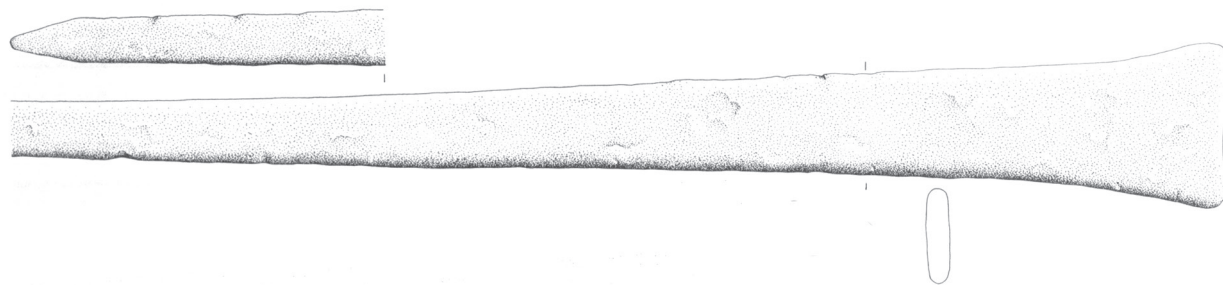


Fig. 4. Bronze sword HM inv. no. X2404 from the Arkalochori cave, after Kilian-Dirlmeier 1993, Taf. 3.15.

affective involvement of the Arkalochori finds in social interactions or the depositional practices which might have influenced their piling up in the cave. The assemblage certainly unites different types of objects, which are regularly found in other Neopalatial sanctuaries, *e.g.* Juktas, Kophinas, and Aghios Georgios on Kythera, or in the Idaean, Phaneromeni, Skoteino and Psychro caves to name just a few (Jones 1999, 47-50, 69-70, 72; Kyriakidis 2005, 91-96, 144-146, 165; Sakellarakis 2013, 63-64, fig. 26, 75). Nevertheless, it is also distinguished by the absence of unequivocal cult objects and the exceptional wealth of full-size double axes, weapon simulacra and double axe models, which has led to the notion that it must be “the base of a special cult” (Dickinson 1994, 278). The absolute typological uniformity that characterizes the specific categories of objects – double axes, sword blanks, model blades of knives and triangular foils of gold – suggests a unique source of production for the assemblage or at least for the individual sets involved. When it comes to the Arkalochori swords, their role as a prestige or status symbol has been overemphasized (Whittaker 2014, 140). But since only a few of them have been published (Kilian-Dirlmeier 1993, 17-18) there can be no statistical analysis that could determine their symbolic or practical use. The unfinished and unusually thick bronze sword HM inv. no. X2404¹⁸ (Fig. 4), which weighs 1800 gr, could be considered as merely representing value or as premonetary exchange means (Marinatos 1935b, 252; 1962, 90-91, fig. 1; Kilian-Dirlmeier 1993, 12, Taf. 3, 15), and the same hypothesis might apply to the small votive double axes (Michailidou 2003, 302-305, 308-309, 312-314).¹⁹ From this evidence we can also deduce that the cave assemblage remains unique in demonstrating the ability of whatever social entities were involved in the possible performances of rituals in the cave – a guild of metalsmiths, the nearby palace of Galatas, a social group with military associations or priesthood – to withdraw from circulation, accumulate, and, thus, control wealth.

THE INSCRIBED ARKALOCHORI DOUBLE AXE: PRODUCTION AND INTENTIONALITY

How does the cast double axe HM inv. no. X2416 under study stand up against this depositional context that forms the social setting of its ‘death’, namely its last appearance in the archaeological context? No clear stratigraphic indications for dating its deposition are available, but this should have taken place in the MM III-LM IA period that is specified by the excavator as the temporal framework for the assemblage (Marinatos 1962, 89). Inferences on its biographical trajectory can be drawn from its affordant properties.²⁰ It is significantly smaller in size than the rest of the full-size Arkalochori examples.²¹ The Arkalochori double axe is not rectangular in out-

18 Kilian-Dirlmeier 1993, Taf. 3, 15. There are six more of this type of sword with almost square shoulders of the blade and no rivet-holes for the attachment of a hilt, cf. Kilian-Dirlmeier 1993, 11-12, Taf. 2: 9, 11-12, Taf. 3: 14-14B.

19 For a similar hypothesis on the basis of sickles and axes represented many times in European hoards, see Bradley 2013.

20 The affordant properties stem from the term ‘affordances’, introduced by the ecological psychologist James Gibson, in order to denote the “potentialities held by an object for a particular set of actions”, see Knappett 2005, 45.

21 The sheet metal double-axe inv. no. X2420 bears a spiraliform decoration pattern made by tracing; dimensions: length 40 cm, width at the shaft 9.5 cm, max. width 21 cm. Cf. Zervos 1956, 301, fig. 431; Evelyn 1999, 199, no. 27. The diameter of its elliptical shaft-hole is 19.17-21.75 mm and the average thickness of the sheet metal is 4.19 mm. The solid axe inv. no. X2425 has a length of 35 cm, a width of

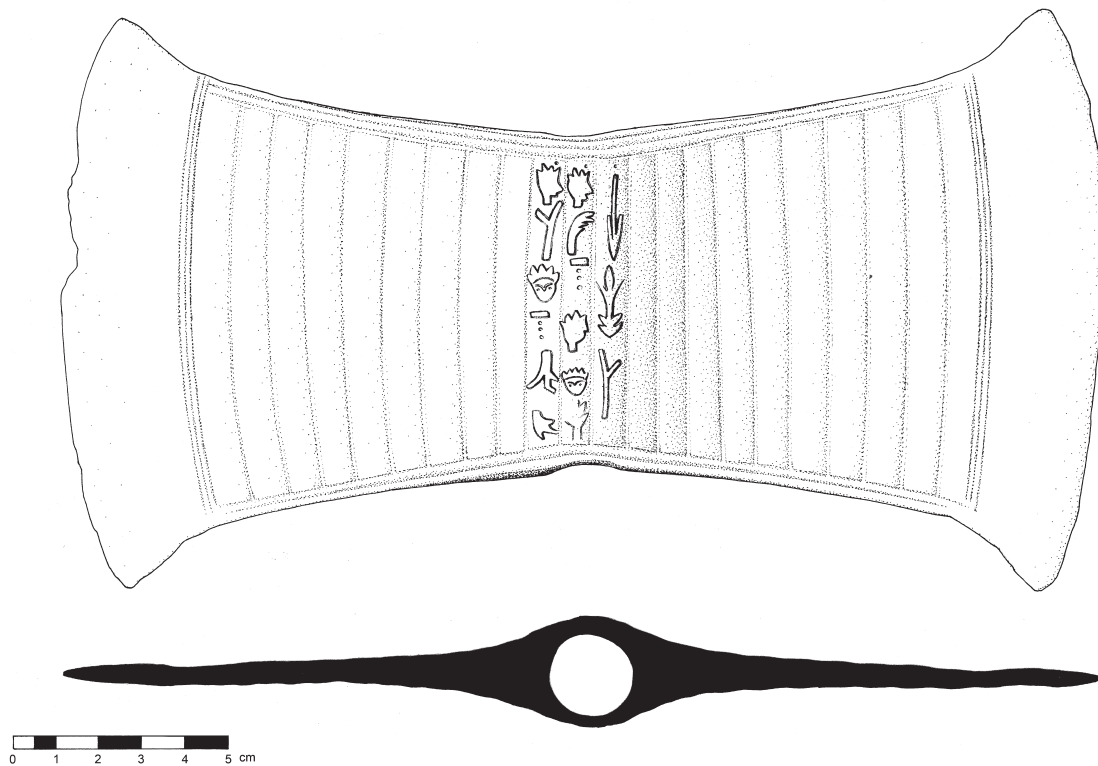


Fig. 5. Drawing of the Arkalochori axe and its inscription (by Giuliano Merlatti).

line.²² It belongs to Branigan's Type II (Branigan 1974, 21, 164, pl. 10 no. 522) or Evely's Type 4 (Evely 1993, 48, fig. 20) and is solid with a circular shaft-hole and two broad curved and flaring cutting edges, which must initially have been sharp. The length of the axe is 24.1 cm and its width at the point of the shaft-hole is 74 mm. The thickness of the long sides ranges from 4.55 mm to 2.40 mm at the edges and the shaft-hole has a diameter of 19.24-19.32 mm. Regrettably no use-wear analysis has been made and the corrosion of the axe makes it hard to determine whether the cutting edges were worn through usage. It could have been fixed on a wooden handle for holding through the solid central circular shaft-hole. On the whole, the axe is distinctive among the deposited objects not only because of its fully functional character, which can be inferred from its form and manufacture, but also because of its elaborate decoration and its inscription, as will be demonstrated.

The high quality craftsmanship involved in the manufacture of the monumental inscription and of the intricate decoration of the axe implies that this was an object meant for display. The inscription signs are not characterized by a micrographic character, as is usually the case with most of the metal artefacts with Linear A inscriptions, which had to be held close to the eyes in order to be read (Flouda 2013, 162-163). The signs on the axe are rather large and arranged in three parallel vertical zones covering the centre of one of the long sides above the shaft-hole (Fig. 5). The circumference of the axe is outlined by fine parallel grooves, which also continue to the curved cutting edges. This provides a notable parallel with the miniature gold inscribed double axe in the Boston Museum of Fine Arts (Vermeule 1959, 5) and indicates that they may have been products of the same workshop. On both sides of

6.9 cm on the shaft-hole and a maximum width of 7.1 cm at the middle of the sheet, while the solid axe inv. no. X2422 has a length of 46 cm and a width of 10 cm on the shaft-hole.

22 Minoan double axes were mostly rectangular in shape, as they were cast in moulds of that shape, see Evely 1993, 51-54. Their cutting edges were mainly formed through hammering their long sides from the centre of the axe body, Lowe Fri 2007, 62-63.

the Arkalochori axe, the space inside the outline double grooves is covered by vertical grooves arranged at distances of 6.85-10.5 mm. The vertical grooves are denser at the centre than at the circumference of the axe.

The artefact was probably cast through the process of “cupellation” in a two-part carved stone mould (Lowe Fri 2007, 62-63), resembling the Protopalatial schist moulds from Malia, for example (Poursat 1996, 116).²³ The latter, though, were presumably reused several times for reproducing standardized types of double-axe (Poursat, Oberweiler 2011, 128-130, fig. 13, 6), whereas the mould employed for the manufacture of the Arkalochori axe would have been carved or re-carved exclusively for producing its inscription. The script signs and the decorative lines were obviously carved in one of the two pieces of the mould in negative, so that after the casting procedure they would emerge in the round. This is in contrast with the usual practice of engraving or chasing inscription signs on double axes with bronze chisels (Evely 1993, 54; cf. KA ZF 1/1954 10-20 1, Godart, Olivier 1982, 149). Whether the carving was done by the bronzesmith who produced the mould will remain an open question, as both tasks demanded specialized experience.²⁴

The result was a prestige object, which can be paralleled to an Egyptian bronze axe-head (Ashmolean Museum inv. no. 1927.4623) that bears a royal inscription and possibly comes from the grave of a courtier or official, although it was originally used as a functional tool (Davies 1974, 118). It should be emphasized that the Arkalochori axe was obviously intended for display and/or for ceremonial deposition, as technological ability and literacy were invested in it in a way reminiscent of the intentionally baked clay Phaistos Disk. Indeed, some of the symbols of the Arkalochori axe may be identified as Linear A signs, while others typologically resemble those found in the impressed inscription of the Phaistos Disk (Duhoux 1998, 14-16; 2000, 597, 599).²⁵ In particular, the ‘head in profile with distinctive hair-style’ sign, which is the most frequent one in initial position on the Phaistos Disk, also appears on the Arkalochori axe three times and probably introduces three sign-sequences/words (Owens 2000, 243-244). The last sign on the third column of the Arkalochori axe (from the top), which also appears on the Phaistos Disk (cf. Duhoux 1983, 34, n. 2), is remarkably similar to the Linear A syllabogram LA > B *da*. Interestingly, the latter is the second sign of the word *i-da-ma-te* on the two inscribed miniature double axes from the cave with the possible ritual connotations.

The axe surface where the inscription is placed has the following dimensions: length 65.83-66.55 mm and width 22.55 mm. Careful observation has shown that the carvings which produced the fifteen inscription signs on the three central zones were carved in one of the two pieces of the mould after the decorative vertical grooves. This is most obvious in the way the fourth sign of the central column, from the top, covers the vertical groove. This *chaîne opératoire* suggests that the mould may have initially been used for producing axes decorated with vertical grooves on both sides. The possibility that the carved inscription signs were a later addition reveals the intentions of the maker. Moreover, due to the vertical arrangement of the signs we are dealing with an artefact so far unique in the corpus of Minoan inscribed objects. Although the similarity with the vertical directionality of the Egyptian Hieroglyphic inscriptions should be noted, the central arrangement of the inscription was possibly a means to accentuate the central part of the axe for display purposes.

Nevertheless, the recent restoration of the Arkalochori double axe in the laboratory of the Heraklion Archaeological Museum²⁶ allows us to review the inscription. Before its treatment the object was fairly oxidized and heavily corroded. Past restoration techniques employed, like treatment with acid, had destroyed the natural patina of the metal alloy, thus making it impossible to see any initial grinding and polishing marks. The addition of wax had given a false reddish-golden colour to the axe. For this reason, the artefact was carefully examined with non-invasive and non-destructive methods before its restoration was carried out in 2010. It was analysed with a portable X-Ray

23 The lost-wax process must also have been employed in certain cases, cf. Hickman 2008, 103.

24 See Poursat, Oberweiler 2011, 130 who note that one had to know “the right capacity and the suitable shape required for the crucibles according to the type and amount of metal objects to produce”.

25 Two of the fifteen signs of the Arkalochori inscription appear to be unique.

26 The restoration was undertaken by the Heraklion Museum conservator Konstantina Klematsaki, to whom I should like to offer my acknowledgements for information on the conservation methodology.

Fluorescence (XRF) device (INNOV-X Portable XRF System Analyzer), in order to determine its organic compounds. The observed spectral signatures can now be compared with known relevant literature databases (Mangou, Ioannou 2000). The double axe was also studied using an Ecleris electronic microscope, which produced high-resolution images of the surface. Examination under the microscope showed the spots where the metal had deteriorated and should be treated. The mechanical cleaning was undertaken with continuous use of the microscope and has allowed the reading of the inscription to be standardized by confirming the three instances of a dot, namely a diacritical mark without phonetic value also encountered on the Phaistos Disk (Duhoux 1977, 16; 1998, 15).²⁷

After the restoration was completed, the following observations on the inscription were made and incorporated in the new drawing of the axe (Fig. 5): 1) One dot has clearly emerged above each of the first two signs (heads in profile) of the first and second column (from left to right). The one above the first sign of the third row is visible only when the axe is illuminated from a specific angle, but it appears clearly in the 1975 photo published by Duhoux (1977, 1, fig. 26). It is possible that these ‘overdots’, placed above each column, denoted the direction in which the inscription was to be read, namely from the top downwards.²⁸ 2)

Although the surface of the axe is very corroded at this point, side illumination confirms that the third sign of the middle column is the same as the fourth sign of the first column on the left (Fig. 6).²⁹

The repetition of some of the Arkalochori inscription signs and the shared signs with the Linear A syllabary significantly suggest that the inscription probably belongs to a glottographic³⁰ writing system – one whereby the signs represent the spoken word – rather than a semasiographic code without any phonetic value. Nevertheless, we cannot infer whether the signs represent logograms, phonograms or determinatives.³¹ Moreover, the inscription cannot be indisputably assigned to one of the two logosyllabic Cretan scripts used concurrently during the Middle Bronze Age, namely Cretan Hieroglyphic³² and Linear A. From a linguistic point of view it has been remarked that its signs belong to an open syllable syllabary and that comparison with the Phaistos Disk suggests that it represents a votive text (Duhoux 1998, 15). I would like to argue that the directionality of the signs also provides insights in order to approach its undeciphered content. First of all, the vertical arrangement in accurately defined columns has a unique parallel in the agate eight-sided prism AN 1938.1166 of the Ashmolean Museum (Fig. 7), which was acquired by Evans in East Crete (Hughes-Brock 2009, 238-239).³³ This prismatic seal bears 25 Cretan



Fig. 6. Detail of the Arkalochori axe inscription. Photograph by Yiannis Papadakis, courtesy of the Heraklion Museum.

27 The first and the second sign of the first column on the left are also remarkably similar with signs no. 19 and no. 02 of the Phaistos Disk (Duhoux 1977, 16, figs. 27-28). In phonology, diacritic marks or ‘features’ are introduced to account for the exceptional behavior of segments, namely the discrete units that can be identified in the stream of speech, see Crystal 1991, 102, 308.

28 Another possibility is that they altered the value of the signs they accompanied.

29 This was not clear in the 1975 photo by Duhoux (1977, fig. 26).

30 On the distinction between glottographic and semasiographic writing see Sampson 1985, 26.

31 Determinatives, semantic or phonological in nature, were often used in the earliest writing systems in order to designate the appropriate spoken sign, cf. Robertson 2004, 22-23.

32 The Cretan Hieroglyphic script was probably invented in the 2nd half of the 3rd millennium BC, cf. Olivier 2012, 16. Owens (2000, 238) has argued that the Arkalochori axe inscription is related to Cretan Hieroglyphic. Duhoux (2000, 597, 599) has rightly stressed its typological affinities with the script on the Phaistos Disk, while Vermeule (1959, 8) considered it as intermediate between the Hieroglyphic and the Phaistos Disk signs.

33 It allegedly comes from Neapolis, in East Crete, and probably dates to MM II-III, cf. Olivier, Godart 1996, XXX, no. 314; Bendall 2013, 135, figs. 253-254.



Fig. 7. Eight-sided prism AN 1938.1166 of the Ashmolean Museum with Cretan Hieroglyphic inscription, after Bendall 2013, figs. 253-254.

from the top of each column to the bottom, starting from the left column, thus following the less rigid placement of Cretan Hieroglyphic inscriptions in the graphic space (Flouda 2013, 157). Naturally, we cannot tell which sequences of sign-groups corresponded to words or ‘morphemes’.³⁴

DISCUSSION

Summing up, let us try to put the Arkalochori double axe within the context of its creation and deposition. A hoard of bronze axes has also been recovered at Juktas (Karetsou 1981, fig. 14), and the open-air sanctuary at Kophinas has also yielded a number of similar sheet bronzes and ingot fragments (Rethemiotakis 1999, 105-106; Karetsou, Rethemiotakis 1991-1993). The assemblage of the Arkalochori cave notably deviates from the Idaean, Phaneromeni, Psychro, Chosto Nero, Patsos and Skoteino caves, which have produced MM III-LM I assemblages of votive finds, such as bronze figurines, weaponry and personal items, stone vessels and cult symbols made of gold and silver (Faro 2008, 79-82, tab. 3.3). For this reason, Rethemiotakis (1999, 105-107) has suggested that the Arkalochori assemblage was a hoard of metal supplies which belonged to sacred sites. The supplies were presumably meant to be sent to palatial metalworking installations in order to be melted down and re-cast into new artefacts. A destabilization of the circulation of metal votives between the workshops and the sanctuaries, which was allegedly controlled by the palace at Galatas, supposedly led the Galatas officials to hide a part of the hoard into the cave.³⁵ However, the hypothesis that the supplies were to be melted down can apply only to the five copper bun ingots, although no fragments of molten copper ingots have been found here as at the sanctuary of Ayios Georgios on Kythera (Sakellarakis 2013, 75, n. 459).³⁶ Furthermore, the different findspots of the bronze objects and the dating of the assemblage support that the assemblage resulted from episodes of repeated deposition in the cave, namely a patterned social practice with which local social groups or the palace of Galatas engaged. The possibility that it was the outcome of one deposition episode, in response to some perceived risk due to a threat by Knossos (Rethemiotakis 1999, 107), cannot be substantiated because the tradition of depositing metal artefacts in the cave dates from the MM III to the early LM IA period. Neither can it be deduced from the data available to us, due to the lack of detailed documentation of the old excavation. The fact that several of the Type A swords from the cave have unsharpened blades and unperforated tangs and shoulders (Evely 2007) rather argues for their character as offerings and not as metal supplies and against any idea that they had been functional objects. In this respect, it may be relevant that a later

Hieroglyphic signs in total. The fact that three or four signs – depending on their size – are engraved vertically on each of the twelve seal facets reminds us of the arrangement of the Arkalochori axe signs. This fact may point towards a link between the Arkalochori inscription and Cretan Hieroglyphic, despite the fact that the signs of the first look more pictorial; this quality may derive from the fact that the signs were carved in a stone mould. In addition, the signs are horizontally aligned in relation to each other. The inscription probably reads

³⁴ The term ‘morpheme’ denotes the smallest and most basic grammatical unit, cf. Coulmas 2003, 33.

³⁵ Adams (2006, 14) accepts that the hoard from Arkalochori should be linked to Galatas.

³⁶ The metallographic examination of the Arkalochori bun ingot HM 2407 has revealed that it had been cast from molten metal (copper or bronze) in an open mould, and not shaped from a semi-solid state by beating (Mangou, Ioannou 2000, 213-214).

chamber tomb excavated in the wider area of Arkalochori contained a LM IIIB sarcophagus with a lid decorated by sword-like projections on the central ridge (Kanta 1980, 80).³⁷ The notion that the swords were offerings is in total agreement with the presence of the metal double axes, which were destined for display as votives, as was also the case with the Psychro cave, where the axes were mostly found *in situ* in the stalactite niches. The swords excavated in the Syme Viannos sanctuary notably document the continuation of the practice of offering weapons as votives in the LM II-III A period (Papasavvas, Muhly, Lebessi 1999, 641; Kyriakidis 2005, 145-146).

So, if we accept the hypothesis of structured deposition in the cave as a partial manifestation of ritual as defined by Rappaport (1999, 24), namely “the performance of more or less invariant sequences of formal acts and utterances not entirely encoded by the performers”, engagement in this deposition must have created some sort of affective memories for the participants. The limited size of the cave actually suggests that any performance would take place before a small initiated audience. Small ritual chambers of the Skoteino and Psychro caves as well as the north recess at Melidoni cave may also have been the focus of rituals attended by a small number of participants (Tyree 2001, 42). The state of the Arkalochori cave’s preservation today does not permit inferences on the sensory experience that participation in this ritual may have afforded. Nonetheless, since caves were possibly perceived by the Minoans as liminal places³⁸ (Tomkins 2012, 67) potentially symbolizing points of access to the netherworld, altered states of consciousness (Tyree 2001, 41-43) can be suggested. This possibility is supported by a recent study based on neuroscience, which has shown that “a cave environment creates conditions, like sensory deprivation, which force the human mind to deviate from its normal waking state and to enter altered states of consciousness” (Ustinova 2009).

From a social point of view, the persons who deposited the items of the hoard must have enjoyed differential access to raw materials and craftsmanship. Whether they were members of the Galatas palace elite and/or priesthood or specialized metalworkers remains an open question. In my opinion, a case for the latter can be made, as it has been established through anthropological analogies that the technology of metalworking is universally invested with symbolic qualities as a craft embodying both a regenerative and a destructive power (Budd, Taylor 1995; Gilles 2007, 395). The inscribed bronze double axe and the two inscribed miniature examples from Arkalochori support that the access of Minoan metalsmiths to skilled know-how may have been complemented by the knowledge of writing (Olivier, Godart, Laffineur 1981, 22; Boulotis 2008, 78; Flouda 2013, 163). I would like to suggest that metalsmiths were definitely among the social agents participating in the deposition of metal artefacts in the cave. As shown by ethnographic analogies (Helms 2009, 155) they may have followed an obligation to return to the earth a portion of the objects produced from the raw materials generated by it, so that the continuation of the cycle of decay and regeneration would not be interrupted. At the same time, part of the prestige metal votives deposited in the cave may also be the result of the competition of local elites or a social class with military associations, manifesting in ostentatious display.

The symbolic power of the full-size inscribed double axe also substantiates the assumption that the Arkalochori assemblage consists of a votive deposit *in situ* (Michailidou 2003, 310, note 75). It is possible that during the final episode of its cultural biography the inscribed artefact acquired some form of agency by being the focus of ritual deposition and ceremonial display thanks not only to its material qualities, such as its durability, its size and its shiny effect, but also to its inscription. Stories and memories associated with it because of its original context of production and use may have supplemented its use in ritual performance. Although the inscription remains undeciphered, its signs probably denoted a short ritual message, while at the same time they served as an integral part of the decorative scheme of the object. The diacritical marks accompanying the signs and possibly indicating the direction of reading reinforce this suggestion. On the other hand, the pictorial character and the typological affinities associating the Arkalochori signs with the Phaistos Disk make it plausible that the idiosyncratic inscription on

37 The site is named Tsoulouka Kolympos, cf. Alexiou 1965, 312, pl. 362 b.

38 Hall (1999, cited by Tyree 2001, 40) argues that they were considered the juncture between this world and the netherworld. A similar element could also be envisaged for the open-air sanctuaries on Mount Juktas and on Kophinas, where a chasm may have been the epicenter of cult, cf. Karetsou 1981, 145, fig. 10, and 153.

the axe was probably invested with magical connotations. Understanding the inscription probably did not matter so much to those who were illiterate, because it was perceived to have an esoteric power. As such, the inscription may have given the object a fetishistic importance, which is not incompatible with the possibility that the double axe was generally perceived by the social agents of the time as ‘a summarizing symbol’, namely a symbol “summing up...for the participants in an emotionally powerful and relatively undifferentiated way, what the system means to them” (Ortner 1973, 1139).

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