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The prehistoric finds from Mine 3 and their relationship to the Thorikos mining community

ABSTRACT: *This chapter discusses the earliest prehistoric pottery excavated from Mine 3 at Thorikos, the most ancient mine gallery in the Laurion so far known. The mine was discovered in 1975 and was excavated from 1976 to 1981 by a team led by H.F. Mussche and P. Spitaels; a preliminary report by P. Spitaels appeared in 1984. This study of the Mine 3 assemblage presents the macroscopic fabrics, shapes and surface treatments/decorations of the Neolithic and Early Bronze Age diagnostics. A preliminary distinction between local and imported pottery was possible through macroscopic fabric group analysis. The typological study refers to parallels from other prehistoric sites in the southern Aegean. In the conclusions, the controversial issue of the chronology of the earliest exploitation of the Thorikos ores is reviewed. The excavation data is not sufficient for a systematic investigation of taphonomic processes of the finds, which could have been associated with phases in mining activities. Yet the recovery of Late Neolithic, Final Neolithic and Early Bronze Age I pottery from the excavated area of the mine could be used as evidence for opencast mining in these periods (the 4th and early 3rd millennia BC), before the gallery was dug into the Velatouri hill in the Early Bronze Age II period. In conclusion, the Mine 3 prehistoric pottery offers insights into ceramic production and consumption in the Laurion and helps us unravel the history of a prehistoric mining community.*

KEYWORDS: AEGEAN NEOLITHIC/EARLY BRONZE AGE POTTERY, MACROSCOPIC FABRIC GROUP ANALYSIS, PREHISTORIC MINING

Introduction

Thorikos benefits from its crucial geographical position in the eastern Mediterranean, in the centre of the Aegean and on the coast of south-eastern Attica and the Laurion. The site is a double hill, called the Velatouri, next to a double port. The Adami and the Potami valleys offered arable land in prehistoric times, but it was most likely the rich metal ores that attracted settlement since the Neolithic period.

With about 700 minerals recorded so far, the Laurion is ranked amongst the mineral-richest areas of our planet. Many of these minerals occur at Thorikos; the most important are galena and ceroussite, exploited for lead and silver. Gale, et al. (2009) have suggested that copper ores were most likely mined in the Laurion in prehistory, perhaps also at Thorikos, while there is yet no evidence for the mining of iron.

The first excavations of prehistoric finds at Thorikos were conducted by the Greek archaeologist V. Staïs in the late 19th century; Staïs investigated the tholos tombs 3 and 4, a construction that he named the 'bothros' and the prehistoric settlement at the top of the acropolis (Staïs, 1890; 1893; 1895). The pottery from Staïs' explorations at Thorikos, now located at the National Archaeological Museum in Athens, has been studied in detail and was recently published (Papadimitriou, 2020; Nazou, 2020).

Since the 1960s, the site's rich archaeology is under investigation by international teams led by archaeologists affiliated with Belgian Universities[1]. The prehistoric remains on the acropolis were investigated by Servais in the 1960s and 1970s (Servais, 1967; 1968; Servais and Servais-Soyez, 1984). Servais re-investigated the tholos tombs excavated by Staïs and also three more tombs. In terms of settlement, the floor of a Middle Bronze Age house was excavated in square I 53 (Fig. 1), where also a fragment of litharge was recovered and interpreted as the earliest evidence for cupellation at Thorikos (Servais, 1967, pp.20–24). Below the foundations of this house an assemblage of Final Neolithic pottery was recovered and published by Spitaels (1982).

Until the early 1970s, the concentrations of prehistoric remains were mostly on the Thorikos acropolis, with settlement as well as burial remains dated to different periods in prehistory, providing a patchy, yet important picture of prehistoric activities. This picture changed in 1975, with the discovery of Mine Gallery 3 that was dug into the Velatouri (Spitaels, 1984); it is located only 30 m west of the Classical theatre (Fig. 2).

The author's involvement in archaeological research at Thorikos started in 2007, with the study of the Neolithic pottery recovered at the acropolis in the context of a PhD thesis (Nazou, 2014). In 2008 with the kind permission

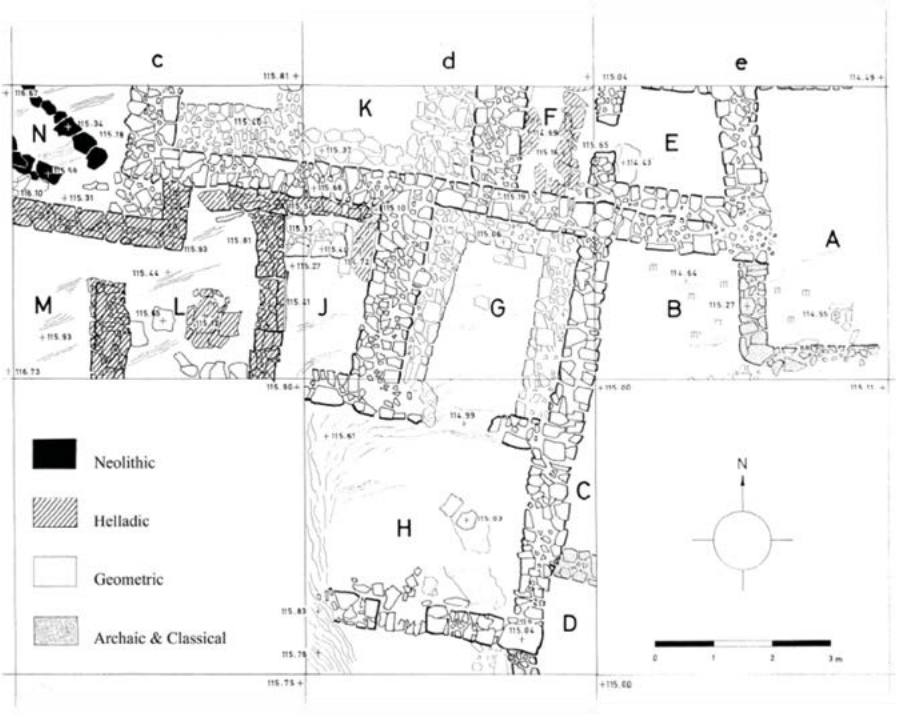

Fig. 1: The central trench on square I 53 on the acropolis (after Van Gelder, 2013, p.17, fig.2).

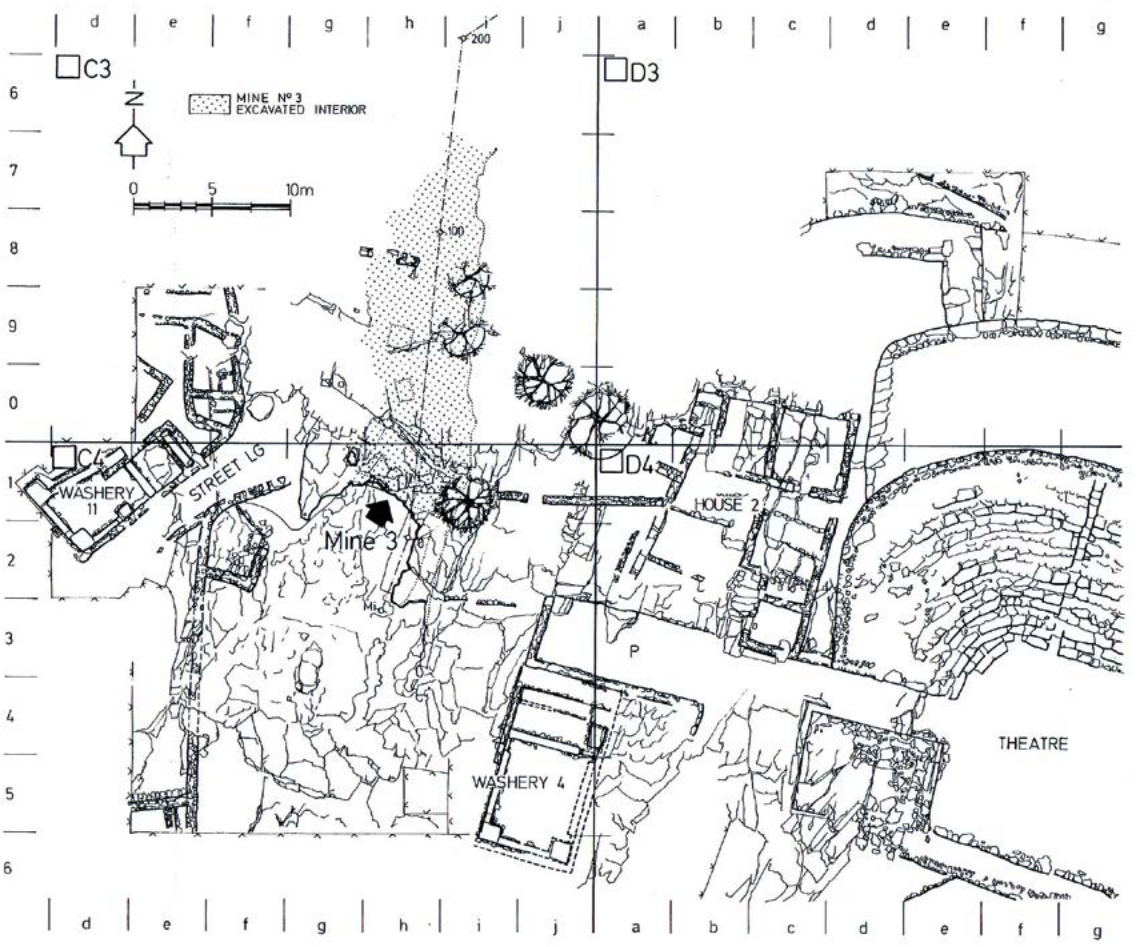

Fig. 2: Plan of Thorikos grid squares C3, C4, D3 and D4, indicating the location of Mine 3 (after Spitaels, 1984, p.155, fig.97).

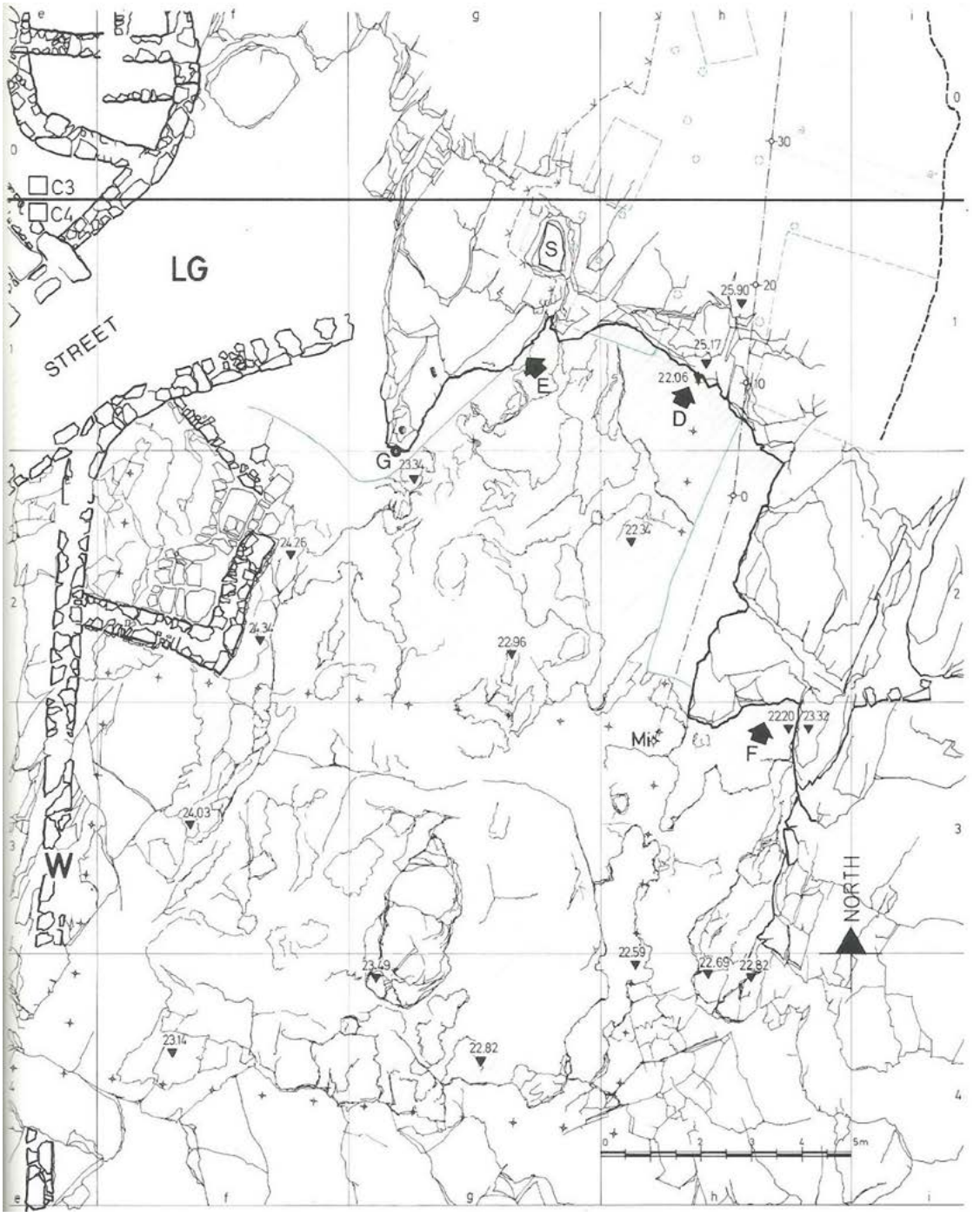

Fig. 3: Plan of the exterior of the mine (after Spitaels, 1984, p.157, fig.98).

of the site director R. Docter the author undertook the study and final publication of the Mine 3 prehistoric pottery. This chapter discusses the Neolithic and EBA pottery from Mine 3 and its relationship to the Thorikos mining community. The preliminary results of the study of the EBA III, MBA and LBA pottery from the mine, still in progress, will also be briefly discussed.

The earliest prehistoric pottery is important for two main reasons: first, it is a very large assemblage that has been studied in detail and can offer unique insights into ceramic production, consumption and exchange at Thorikos. Second, the context of the pottery is unusual, since it was excavated from a prehistoric mine; therefore, the new evidence could contribute to the investigation of prehistoric mining activities in the Laurion.

In order to contextualize the study some essential excavation information will be provided and the history of previous research will be presented. The methodology of this study will be explained. The main part of the chapter is a discussion of the material. Finally, the intriguing issue of

the relationship of the pottery with the Thorikos community and prehistoric mining in the Laurion will be considered.

Excavation information on Mine 3

According to the excavation's diaries, Mine 3 was initially thought to be a cave but soon it was realised that the cavity was in fact a mine gallery that had escaped re-working during the modern resumption of mining in the Laurion (Spitaels, 1984, p.153). Mine 3 was further excavated in the late 1970s and early 1980s (Mussche, 1998, p.36).

In her preliminary report, Spitaels provides information on the excavation methods and stratigraphy of the mine[2]. The excavations established that in antiquity the entrance of the gallery was probably 5m further south of the current entrance and it evidently collapsed (Fig. 3). Therefore, the reference to the exterior and the interior of the mine refers to the state of the mine at the time of its excavation and not its ancient state.

The excavation investigated the exterior of the mine and defined the limits of opencast working to the south and to the east of the present entrance. In this area, the marble bedrock is penetrated by a rich rust-coloured zone of haematite and limonite mineralisation, about 15m long and up to 13 m wide (Fig. 4). Worked-out veins of the ore and toolmarks are scattered all over this area but cease abruptly beyond it. Spitaels therefore suggested that there must have been an outcrop of the ore on the hillside, which would have attracted the attention of the first miners. In the rest of the exterior area there were later constructions, but the possibility that the ore outcrop extended further west should not be excluded. This area is now covered by 4th century BC remains of a guard room and a peribolos (Mussche, 1998, pp.37, 124, fig.63). The deposits of the exterior of the mine were very thick, and they increased progressively from south to north, reaching more than 2 m at the present entrance. They consisted mainly of the refuse of extraction and collapse, from both outside and inside the mine. This observation was confirmed by the many sherd joins from the exterior and the interior of the mine. Spitaels suggested that the disturbances, which resulted in the recovery of archaeological materials from different periods at the exterior of the mine, occurred mainly from four activities: continuous extraction of the ore during the prehistoric and later periods, collapse of the entrance, later levelling and modern agricultural operations.

The investigation of the interior of the mine required different excavation techniques. A geological examination proved that the cavity was completely man-made. Potential hazards were erosion, danger of roof collapse and especially flooding in case of heavy rain. It is likely that continuous flooding would also have occurred in antiquity. This could also explain the stratigraphic disturbances in the interior of the mine. The first few metres of the interior were cleared in 1976 and the roof was supported by wooden props and by stone pillars. Due to practical reasons, the method of excavation did not follow the grid system of excavation and recording used outside the mine. Instead, a base-line, established by theodolite, was marked on the roof. A point of reference at the exterior was used to mark a line approximately north-south, which extended into the interior of the mine. Points on this line were used to record the finds and to draw the plan of the interior. The gallery was found to be at least 120 m long, even though

Fig. 4: Photo of the area on the exterior of Mine 3, indicating the rust-coloured zone of haematite and limonite mineralisation (photo: M. Nazou).

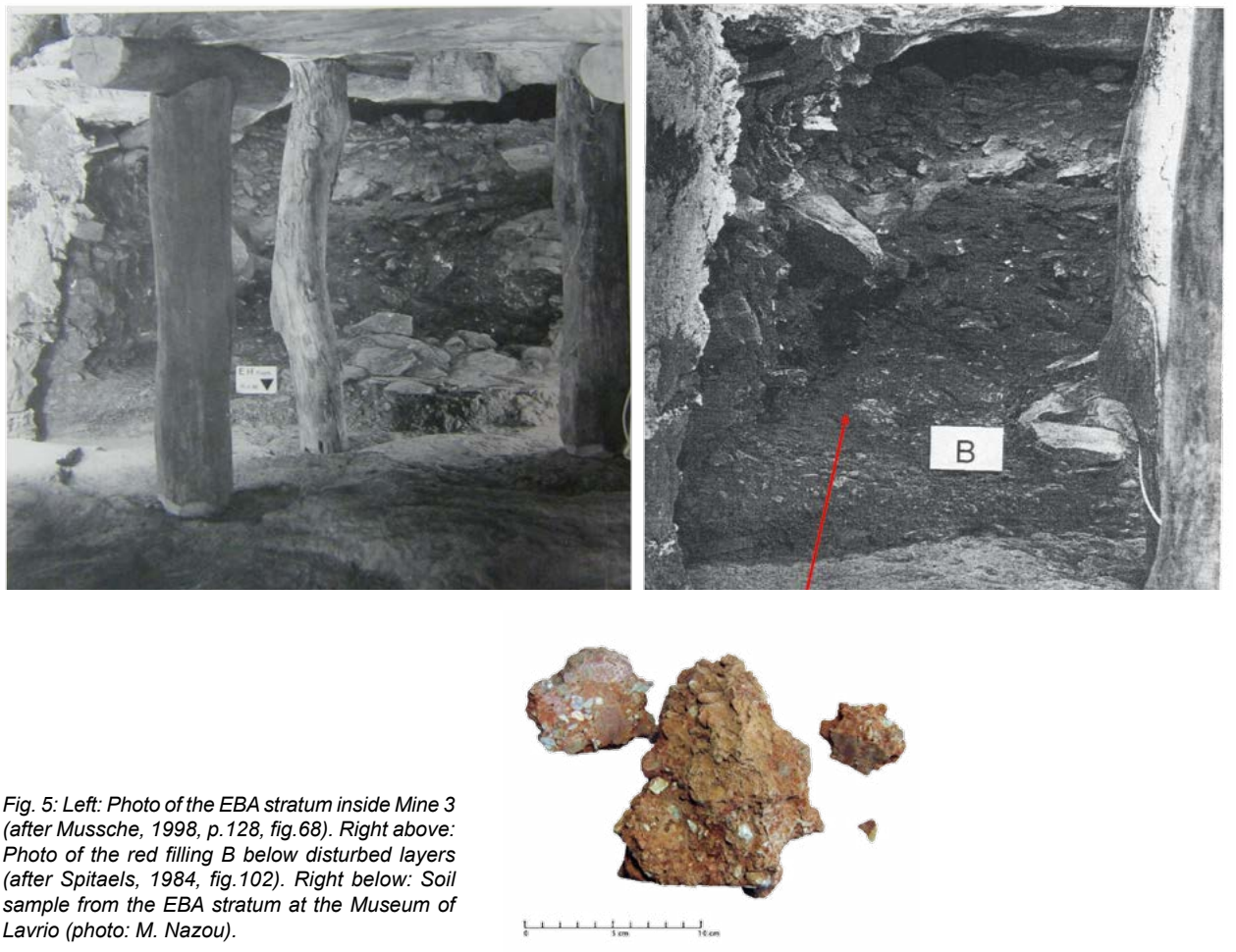

Fig. 5: Left: Photo of the EBA stratum inside Mine 3 (after Mussche, 1998, p.128, fig.68). Right above: Photo of the red filling B below disturbed layers (after Spitaels, 1984, fig.102). Right below: Soil sample from the EBA stratum at the Museum of Lavrio (photo: M. Nazou).

its furthest part is most probably post-Bronze Age. It was suggested that the Bronze Age gallery probably did not exceed 20 m. The height of the gallery varied from 0.5 to 1.5 m, decreasing towards the interior.

The initial hope that the interior of the mine would provide better stratigraphy than the exterior proved to be false. Inside the gallery, severe disturbances were identified. These were probably created by subsequent mining, during prehistoric and historical periods (Waelkens, 1990, pp.136, 138). Moreover, during the Archaic and Classical periods, shafts were dug to haul out the ore. Post-Early Bronze Age miners had moved the Early Bronze Age material in the interior from the west to the east during the re-working of certain veins with metal tools. The Bronze Age material was moved for a short distance, in the first 7 m of the interior, and beyond this area a large quantity of Mycenaean pottery was excavated.

It becomes evident that, even though the excavators of Mine 3 provide some stratigraphic information, the formation processes of the debris from the mine were not fully investigated. The stratigraphic details were not analysed systematically, and the precise stratigraphic context of the pottery from Mine 3, except for few sherds, was not recorded. Therefore, most of the pottery cannot be linked with specific locations inside or outside the gallery. This is very unfortunate, as a detailed study of the mine's topography along with the excavated finds could have established whether the debris was the result of disturbance and collapse, or it was intentionally and carefully placed as filling, also known as 'deads' in mining terminology. Deads are frequently used in mining to channel air to the working face or to direct the exit of the fumes from fire setting (Craddock, 1995, p.8). Occasional suggestions on this matter are made by the excavators, but a detailed study was not published. Therefore, the pottery from Mine 3 must be considered out of context, in the sense that most of it cannot be related to detailed excavation and contextual information.

The only exceptions to the lack of stratigraphic information from the mine are two retained excavation units. These constitute the only undisturbed deposits identified in the interior of the gallery. The deposits, patches of red soil covering an area of 1 m, were located on the rock floor, at the western part of the interior and within the first 2 m from the entrance (Fig. 5). They proved to be fillings of the depressions left by the working of two ore-bearing veins. Toolmarks from stone tools were identified at the base of these veins, preserved under the red fillings. The fillings, which varied in thickness between 5 and 12 cm, consisted of reddish clay, greyish towards the base, compact and very hard, mixed with very small fragments of schist and marble.

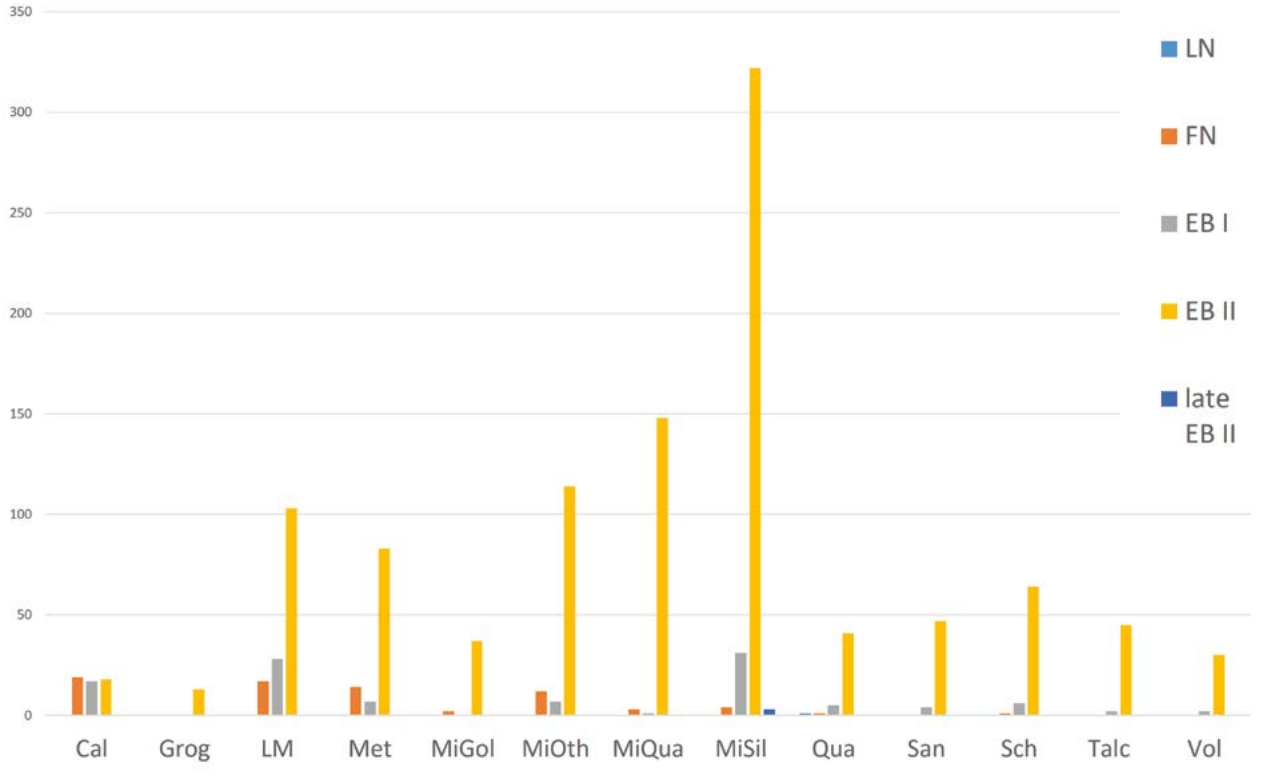

Fig. 6: The distribution of coarse and medium macroscopic fabrics by period (photo: M. Nazou).

The archaeological materials recovered in these excavation units were few: an obsidian flake, a few fragments of shell and bone and 35 small EBA II sherds. This pottery will be further discussed towards the end of the chapter.

The prehistoric pottery

The study of prehistoric pottery offers great potential for exploring a variety of research questions: chronology, function and activities, local production, consumption and imports, ancient exchange and networks, settlement size and nature, technological choices and last but not least, the most intriguing issues of culture and identity (Orton, et al., 1993, pp.23–35).

At Thorikos, the first systematic study of prehistoric pottery was conducted by Spitaels (1982), in her publication of Final Neolithic pottery from square I 53 on the acropolis. This pottery was dated to the so-called Attica-Kephala phase of the Final Neolithic, with pattern-burnished ware, red burnished bowls with elephant-head lugs, incised scoops and cheese pots. The phase dates to the 4th millennium BC and it is well documented at other Attic sites such as the Agora of Athens, Kiapha Thiti (Kontra Gliate) and the Kitsos Cave as well as neighbouring islands such as Kephala on Kea, Plakari on Euboea and Kolonna on Aegina (Nazou, 2014, pp.299–303).

The pottery from Mine 3 was washed, conserved and preliminary recorded. Spitaels (1984, pp.166–170) presented only a small selection of late EBA II and EBA III sherds, as she intended to publish this material at a later stage, but due to her untimely death she did not complete her study. Mountjoy (1995) published a selection of Mycenaean pottery from the mine.

The author's methodology for studying the Mine 3 pottery is described below. Three key aspects were examined in detail: fabric, form and surface treatment/decoration. For the study of the fabrics the method of macroscopic fabric group analysis was used, a quick and inexpensive technique for designating potentially local and imported fabrics. The ceramic shapes were recorded with a formal and measurement-based classification system. Surface treatment and/or decoration groups were designated. Finally, the pottery was quantified in sherd count and weight.

Spitaels had pre-sorted about 132 kg of pottery from Mine 3, which the author sorted into diagnostic pottery, namely feature and decorated sherds and non-diagnostic body sherds. Most of the pottery is dated to the Neolithic and the Early Bronze Age, but there is also later prehistoric pottery dated to the Middle and Late Bronze Age, and also a few sherds dated to the historical periods.

The identification of macroscopic fabric groups was done following the recording system suggested by Orton, et al. (1993, pp.231–242), with ideas from recent work

Chronological period	Date BC
Late Neolithic	5300–4100
Final Neolithic	4100–3100
Early Bronze Age I	3100–2650
Early Bronze Age II	2650–2200/2150
Early Bronze Age III	2200/2150–2050/2000
Middle Bronze Age	2050/2000–1700/1675

Tab. 1: Absolute chronologies for the periods of pottery studied from Thorikos (source: https://sites.dartmouth.edu/aegean-prehistory/chronology/, with additions by M. Nazou).

on macroscopic classification in the Aegean (Broodbank, 2007; Broodbank and Kiriatzi, 2007; Kiriatzi, 2003; Moody, et al., 2003; Pentedeka, et al., 2010).

For the designation of local and imported fabrics, the information from the macroscopic fabrics and the geological maps was combined. To be more specific, the geology around the Velatouri comprises mainly various types of schist and marble (Marinos and Petrascheck, 1956; Scheffer, et al., 2007). The schist, limestone/marble and micaceous silver fabrics identified at Mine 3 are compatible with local geology (Fig. 6). However, these rocks are very widely distributed not only through the entire Laurion, but also on the neighbouring islands of Southern Euboea and Kea. In fact, they have a wide distribution within the Attic-Cycladic massif. Therefore, these fabrics could have been produced locally or elsewhere within Attica and the Cyclades. This was first noted by P. De Paepe (1982), who thin-sectioned the Final Neolithic pottery from the acropolis. Further technological analyses could provide more answers on provenance.

At Mine 3 the fabrics, which are compatible with local geology, such as for example the limestone/marble, the calcite-tempered, the micaceous quartz and the micaceous silver are encountered throughout the Neolithic and the EBA; they are the most likely candidates for local fabric recipes, since they occur in relatively large quantities. On the contrary, the fabrics that are incompatible with the geology of Thorikos, such as the volcanic and the talc, are most likely imports.

Dating the pottery was possible through a detailed typological study and comparisons with Neolithic and EBA ceramics from other sites in Attica and the Aegean. Several chronological phases are represented in the assemblage (Tab. 1).

The earliest sherd from Mine 3 dates to the Late Neolithic. It is an incised scoop handle in the medium quartz fabric (Fig. 7). The type has parallels at the Kitsos Cave (Lambert, 1981, pp.290–291, 306).

The Final Neolithic assemblage associated with the Attica-Kephala phase comprises mostly convex bowls (Fig. 8), with parallels from the Thorikos acropolis (Spitaels,

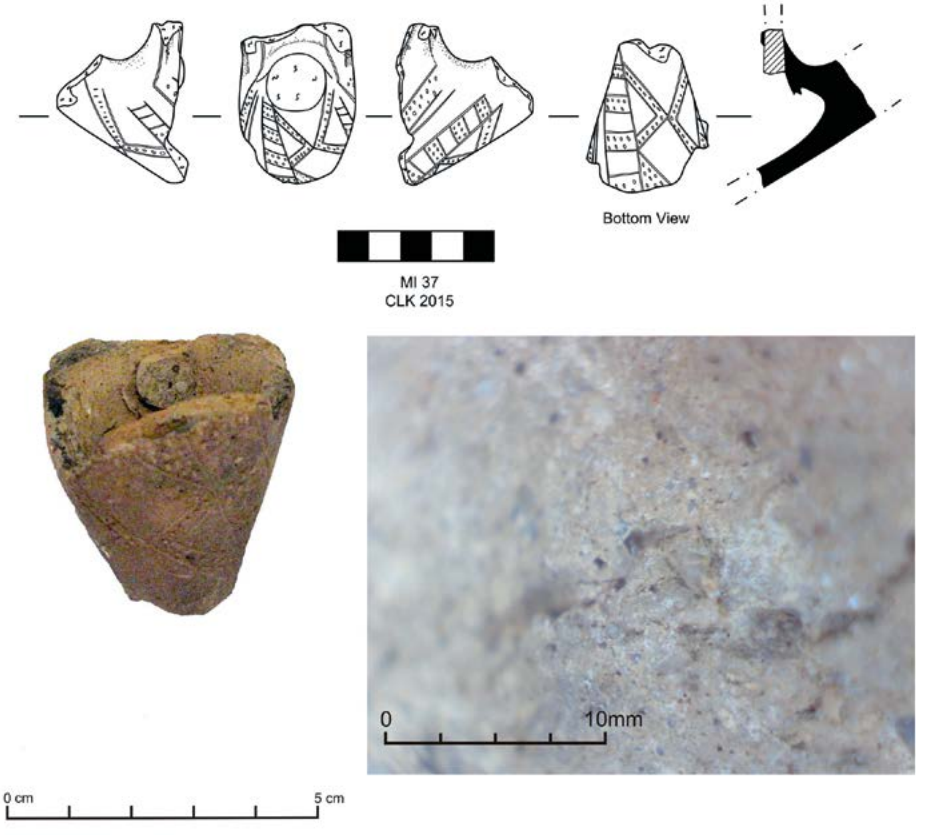

Fig. 7: A LN handle, the earliest sherd from Mine 3 (drawing by C. Kolb, photo and microscope photo by Emilio Rodriguez-Alvarez).

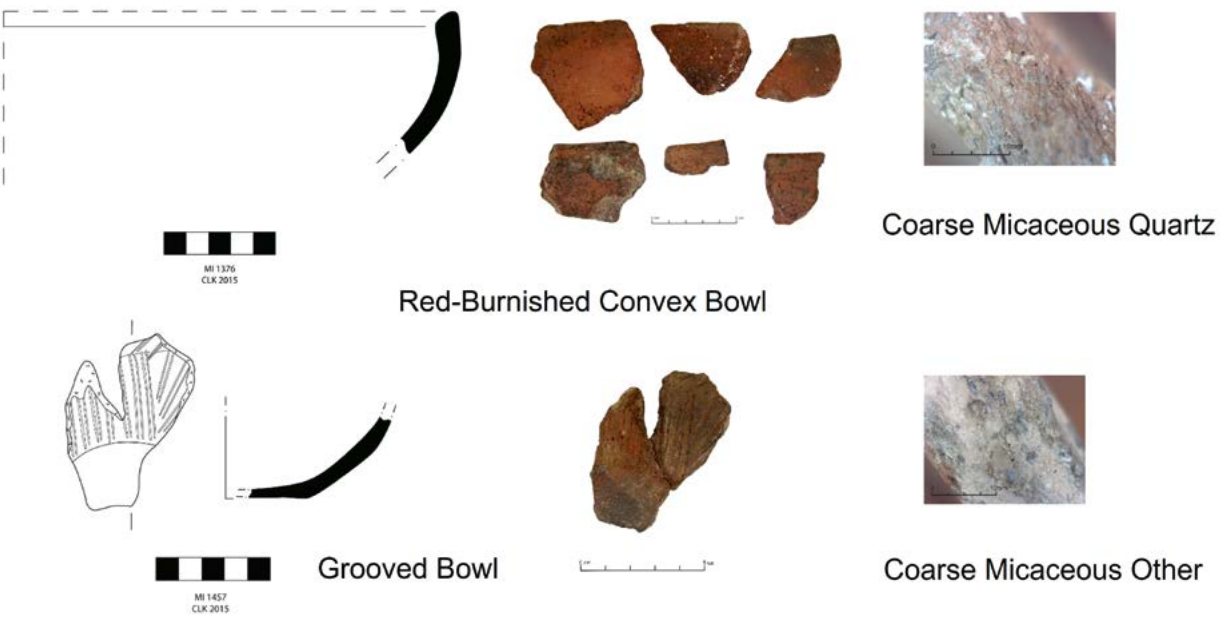

Fig. 8: Examples of FN bowls (drawings by C. Kolb, photos and microscope photos by Emilio Rodriguez-Alvarez).

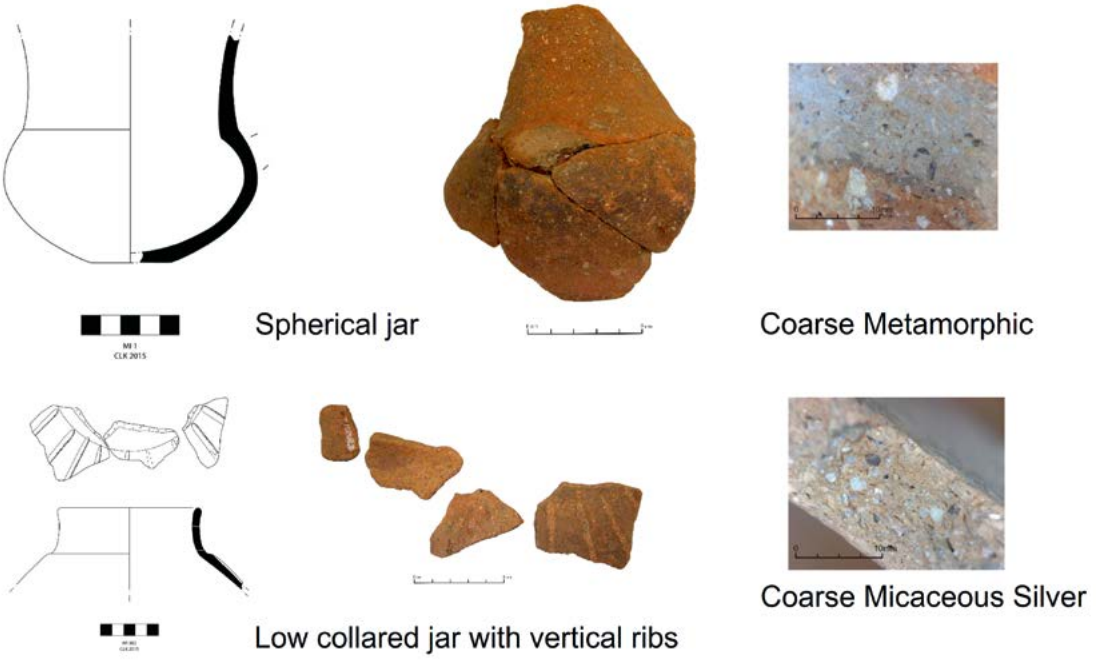

Fig. 9: Shapes of the 'North Slope' phase (drawings by C. Kolb, photos and microscope photos by Emilio Rodriguez-Alvarez).

1982, p.24, fig.1.9 nos 28. 30) and the Kitsos Cave (Karali, 1981, p.354, fig.239.1, CP45). At Mine 3 there is also pottery of the so-called 'North Slope' phase, named from the North Slope of the Athens acropolis. This phase is now better understood in Attica after the recent publication of Deposit 39 from the Tsepi cemetery in Marathon by Pantelidou-Gofa (2016). It comprises two very characteristic closed shapes: the spherical jar and the low collared jar with a decoration of vertical ribs (Fig. 9). In Attica, the North Slope phase is dated to the second half of the 4th millennium BC based on radiocarbon data from Marathon (Facorellis, 2016) and Merenda (Kakavogianni, et al., 2016).

The EBA I repertoire is represented mainly by straight and convex bowls (Fig. 10). The pyxis shape is in local

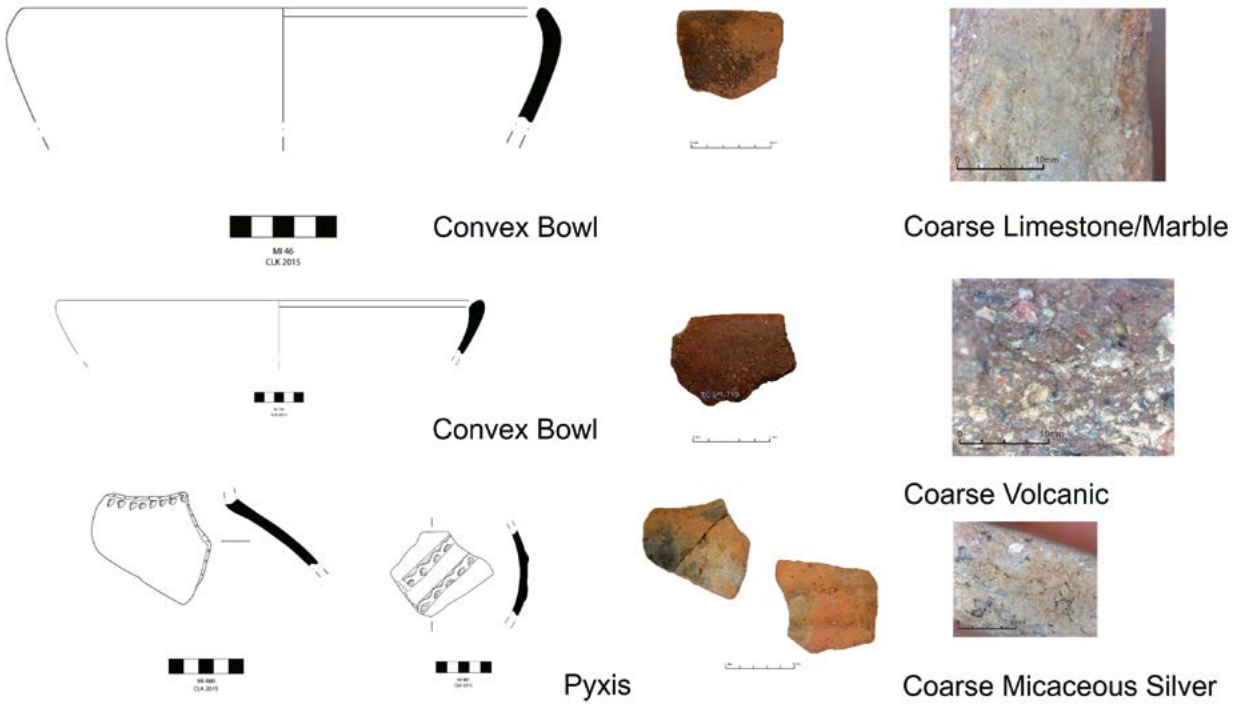

Fig. 10: EBA I pottery (drawings by C. Kolb, photos and microscope photos by Emilio Rodriguez-Alvarez).

and imported examples. Most forms have their closest parallels within Attica, such as Tsepi (Pantelidou-Gofa, 2005, pp.306–307, pl.12, Tomb 11.1) and Palaia Kokkinia (Theocharis, 1951, pp.106, fig.18 α. β).

Turning to the EBA II, it can be argued that the Mine 3 assemblage is one of the richest repertoires documented from Attica so far. Tableware is particularly well represented, and its eclectic range indicates stylistic affinities with different areas (Fig. 10, Tab. 2). Some forms, such as the cups, the sauceboats and the collared bowls, have typological similarities within Attica, at Ayios Kosmas (Mylonas, 1959, pls.116. 17. 19; 117, 1. 3. 4. 6. 7, drawing 54, S-3, 7-9) and Koropi (Ntouni, 2014, pp.305–330). However, the closest parallels for most of the tableware are reported from Ayia Irini II and III on Kea. Several types of handles from askoi or jugs, the jugs with constricted neck and the three shapes of the Lefkandi I / Kastri group, namely the shallow bowl/plate, the neck-handled tankard and the depas cup, are strikingly similar to examples from Ayia Irini (Wilson, 1999, pp.120–121). The stylistic affinities with Ayia Irini are also evident in the case of closed shapes, such as the collared jars, the jar with the exterior flange and the squat pyxis. In terms of absences, no pithoid jars were identified, but the collared jars and the largest bowls or basins could have been used for storage. Finally, the pan and the frying pan occur in small numbers.

The presence of talc ware at Mine 3 (Fig. 11) was first reported by Vaughan and Wilson (1993), who argued that its distribution coincided with the major metal sources in the western Cyclades. At Mine 3, the bulk of the talc sherds were out of context, but several sherds, most

EB II shapes	Sherd count
Askos/Jug	21
Bowl, Collared	3
Bowl, Convex	176
Bowl, Pedestalled	3
Bowl, Shallow/Plate	6
Bowl, Straight	84
Cup, Depas	1
Cup, Type a	16
Cup, Type b	14
Jar, Collared	125
Jar, exterior flange	2
Jar, squat (Pyxis)	5
Jug, constricted neck	2
Lid/Frying pan	1
Pan	4
Sauceboat	121
Tankard, neck-handled	2
Tankard, Wavy rim	1
Wheelmade Plate	2
Total	589

Tab. 2: Quantities of EBA II shapes at Mine 3 (author: M. Nazou).

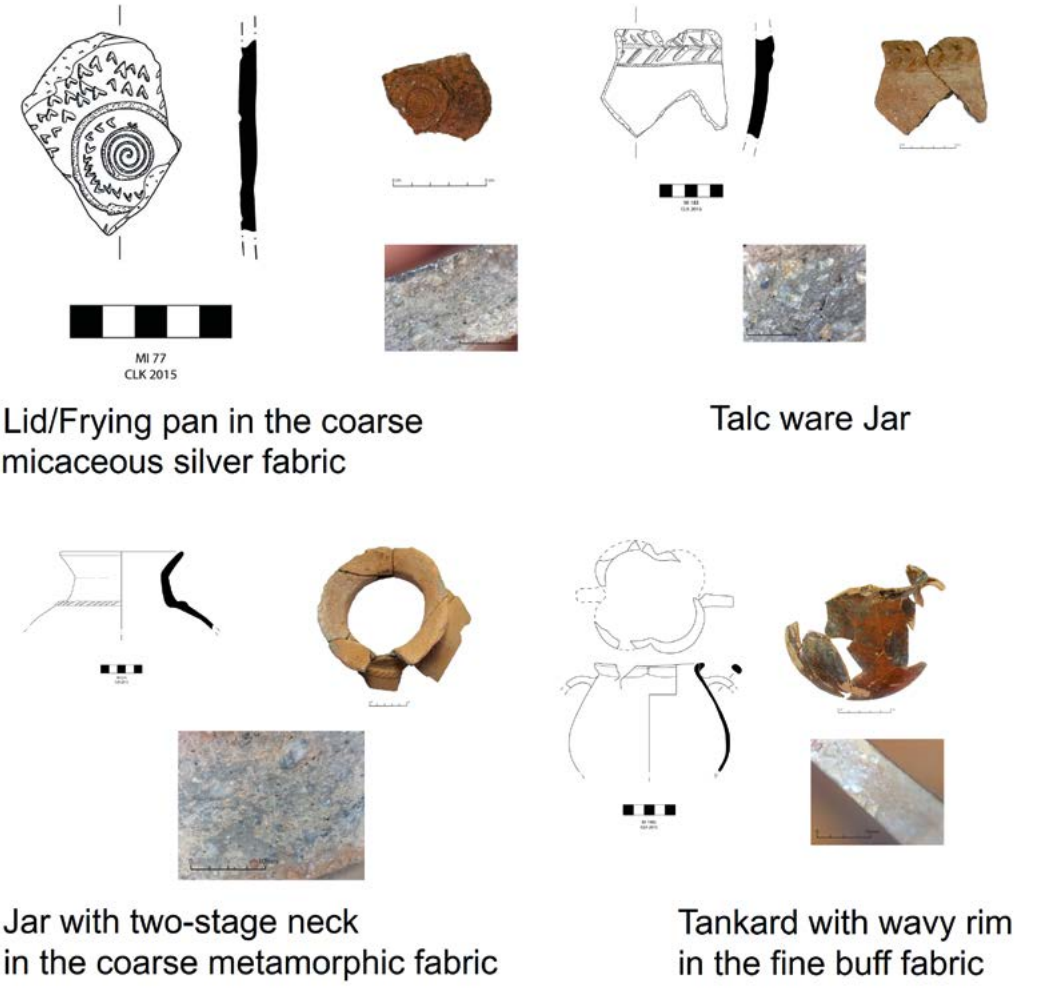

Fig. 11: EBA II pottery (drawings by C. Kolb, photos and microscope photos by Emilio Rodriguez-Alvarez).

likely belonging to the same deep bowl, were excavated together with sauceboat sherds from the red soil deposits at the interior of the gallery, interpreted as undisturbed deposits of mining activity (see above). The imported talc ware vessel recovered in the red soils could be considered evidence strengthening the hypothesis of Vaughan and Wilson, that there is some link of the talc fabric with metallurgy or trade among communities practising metallurgical activities. It is also surprising to encounter sauceboat sherds inside Mine 3, in deposits related to mining activities. The use of this vessel is still controversial. The predominant view considers the sauceboat a tableware shape used for pouring liquids, perhaps wine (Renfrew, 1972, p.284). Theodorou-Mavrommatidi (2007) has refined this interpretation by arguing that sauceboats were used both as ladles and as jugs for pouring wine. It should also be noted that the occurrence of tableware shapes is a long-term phenomenon in Mine 3; Mountjoy (1995, pp.204–205) reports that cups occur in the mine during the Mycenaean period.

The EBA III shapes identified so far are bass bowls, ouzo cups and a wide mouth jar, with close parallels at Lerna IV. Incised pyxis lids are also common, with parallels at the Athenian Agora. The study of the Middle Helladic pottery from Mine 3 is still ongoing, but there are several well-known categories such as grey minyan and incised wares together with coarse wares such as pithoi.

A scheme of ceramic phases for the earliest parts of the Thorikos prehistory can be constructed with all the data available (Tab. 3). The Neolithic has so far three ceramic phases, while the EBA has 3 phases, but the Lefkandi I/Kastri phase of the late EBA II period is also present. Due to the problems in the Mine stratigraphy, we cannot separate an early from a late EBA II phase.

Concluding the discussion of the ceramic data from Mine 3, it is now clear that pottery consumption was restricted during the Neolithic, increased in the EBA I, and reached an impressive peak during the EBA II period. The large EBA II assemblage comprises locally produced and imported shapes, mostly tableware. It is evident that Thorikos was actively participating in an exchange network for pottery, extending as far as Siphnos in the South, indicated by the presence of talc ware, the Saronic Gulf in the West, as suggested by the occurrence of the volcanic fabrics, and the Mesogaia, which is a possible production centre for fine buff yellow mottled sauceboats

Thorikos 1	Late Neolithic
Thorikos 2	Final Neolithic – Attica-Kephala phase
Thorikos 3	Final Neolithic – North Slope phase
Thorikos 4	Early Bronze Age I
Thorikos 5	Early Bronze Age II
Thorikos 6	Early Bronze Age III

Tab. 3: The ceramic phases identified at Thorikos (author: M. Nazou).

(Ntouni, 2014, pp.501–502). Except for the talc ware, which could have been imported due to its superiority in resisting thermal stress in cooking (Wilson, 1999, p.235), the rest of the imported shapes are mostly fine tableware, and only a few jars. The jars could have been exchanged for their contents, but tableware forms would have been selectively imported as additions to the locally produced eating and drinking sets. The overwhelming stylistic similarities with Ayia Irini II and III suggest that Thorikos and Ayia Irini are in close contact. Finally, the presence of the EBA III pottery indicates activities at Thorikos at a period that is not well documented in Attica.

Early mining at Thorikos

There are several difficulties in the interpretation of the Neolithic and the EBA pottery excavated from Mine 3. At least some of the pottery recovered in the mine could be associated with mining activities. Some could argue, however, that Mine 3 was used as a dump for a nearby settlement (Spitaels, 1984, p.173). Final Neolithic pottery was found about 50 m higher than the mine entrance on top of the Velatouri acropolis (Servais, 1967, pp.24–27; Spitaels, 1982). If indeed there was a Final Neolithic settlement on the Velatouri, pottery may have eroded down from the top. That being said, there is a sharp contrast between the very few and sporadic Final Neolithic to EBA finds recognised to date from the entire Velatouri hill and the impressive amount of pottery recovered from the restricted area of Mine 3. Another possibility is that a Final Neolithic to EBA settlement may have been destroyed by later buildings and activities in squares C3, C4, D3 and D4 (fig.4). This area has many later constructions, such as the theatre, a few Classical / Hellenistic houses and the washeries 4 and 11. Bronze Age sherds were indeed recovered in the construction fillings of these buildings (Spitaels, 1984, pp.158, 173).

New evidence on prehistoric settlement on Thorikos, which may be produced by future investigations at the site may shed some light on the history of mining activities. With the existing data, an interpretation of the Mine 3 pottery is inevitably linked to the question of dating the earliest mining activities in the Laurion. The chronology of the first extraction of metal ore from Mine 3 is very controversial. The scenario of Neolithic exploitation would appear reasonable to many researchers, as analyses of Neolithic silver objects have pointed to the Laurion sources (McGeehan-Liritzis, 1996, pp.233–234, tab. 4.5.1.1a). Arguments in favour of mining at Thorikos already from the Late Neolithic suggest that the first miners did not need to dig for the ore: it was readily available as natural surface outcrops (Krysko, 1988; Mussche, 1978, p.70). Krysko's research supports the case for opencast exploitation at the initial stages before the Gallery was dug into the Velatouri. Waelkens' study of the toolmarks also argues for opencast exploitation, since the toolmarks outside the Gallery match the ones associated with the undisturbed EBA II layers of red soil in the interior (Waelkens, 1990, p.118). The recovery of stone hammers is further evidence for mining (Fig. 12), since similar stone hammers are found in many early mines (Craddock, 1995, pp.37–47), but they cannot be dated with precision. Among the excavation data, the interpretation of the large quantity of pottery recovered from the mine is the most problematic; ceramic specialists world-wide know that pottery use can be difficult to infer from excavation data and that secure stratigraphy, contexts and associations are needed to support the use of pottery in specific activities. Perhaps this scepticism led Spitaels to take a 'safe approach' to the matter of the early chronology of activities in Mine 3. She discussed only the late EBA II and EBA III types, leaving the earlier pottery for a later stage of publication.

The possibility that some of the pottery, especially the bowls, could have been used in ore processing, cannot be excluded. Only a limited number of physical manipulations is effective for separating ores, because of the physical properties of components of the ore, and what physical transformation needs to take place, and bowls could have been used in this process. Ethnoarchaeological studies suggest that panning is a technique developed by many cultures world-wide for separating metals from ores. Kakavogiannis (2005, pp.236–238) has suggested that

Fig. 12: Stone hammers excavated from Mine 3 (photo: M. Nazou).

during the Classical period the metallurgical workshops in the Laurion used bowls for the same purpose. The direct comparison of the Mine 3 pottery with contemporary sherds found as strays in the later Classical levels in areas surrounding the mine or in other deposits on the Velatouri, potentially relating to nearby domestic activity, might someday highlight any specialised characteristics of the Mine 3 assemblage.

To conclude, there is circumstantial evidence to associate the EBA II pottery from the red soils with the use of the mine. However, with the existing data, the unstratified Neolithic and EBA pottery assemblage excavated throughout the area of the mine cannot be used with certainty to re-date the earliest mining activities at Thorikos, since the excavation did not clarify whether this material was introduced into the reworked fills in the mine all together at a subsequent date or it was originally deposited in sequence, representing different phases of activities in the mine, and later mixed *in situ*.

Conclusions

Summarising the findings we have from prehistoric pottery so far, we can make the following observations. Mining at Thorikos could have started as early as the Late Neolithic (5th millennium BC) and continued during the Final Neolithic and throughout the Bronze Age. The impressive peak in ceramic consumption at Mine 3 during the EBA II could indicate intense mining activities. The preliminary examination of the survey pottery from the southern slope of the Velatouri, a project conducted under the directorship of R. Docter from 2012–2017, suggests a relative scarcity of EBA II pottery compared to the Final Neolithic and Middle Bronze Age finds. Lacking data from Thorikos itself, we can argue that the EBA II settlement is most likely located on the coast. In support of this hypothesis, rescue excavations by O. Kakavogianni (1985, p.51) yielded EBA II pottery in the DEI power plant building plot. The Middle Bronze Age is an especially flourishing period, associated with settlement remains on the acropolis (Servais, 1967, pp.20–24). There is evidence for the development of a local elite and hierarchies during the late Middle Bronze Age to the early Late Bronze Age, when the monumental tombs are built (Laffineur, 2012). The site seems to decline during the late stages of the Mycenaean period, yet mining at Mine 3 may have continued in the LH IIIC (Mountjoy, 1995, p.197).

Some last observations can also be made on the position of Thorikos in prehistoric metal exchange networks in the Mediterranean. Early seafaring may have been triggered by the search for metal ores in the Aegean and the Mediterranean, and the strategic and easily accessible position of Thorikos cannot be overlooked. The social context of early mining and metallurgy was most likely different than later phases in prehistory, when palatial centres were consuming large amounts of copper, gold and silver.

Kassianidou and Knapp (2005, p.231) have highlighted that early mining and production sites in Cyprus were relatively isolated from the large Bronze Age coastal centres. Thorikos and its place in the Laurion provides a different picture, since it is an important coastal site, which combines evidence of mining, metallurgy and the presence of hierarchies and elites profiting and perhaps controlling its metal sources. There are also other mines in the Laurion that have been preliminary dated to the Final Neolithic and the Early Bronze Age: Vigla Ribari, Kastella-Thymari and Souvlero near Anavyssos (Lohmann, 1993, pp.87–88, 244) and Ovriokastro near Keratea, (Kakavogiannis and Kakavogianni, 2001, pp.56–57). Their systematic investigation could provide some comparative information in order to better understand early mining in the Laurion.

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Notes

1 The Belgian School at Athens was instituted in 1985. Back in the 1960s, Thorikos was being excavated under the directorship of Herman Mussche of Ghent University, who worked through the so-called Committee for Belgian excavations in Greece. For the history of investigations and excavations at Thorikos see Mussche (1998, pp.5–8) and Webster (2018, pp.11–12).

2 The section on the Mine excavation is based on the information provided by Spitaels (1984, pp.151–164), unless otherwise mentioned.

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