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PRODUCTION AND CONSUMPTION OF OBSIDIAN IN THE SITEIA BAY AREA: FINAL NEOLITHIC THROUGH LATE MINOAN

This paper will present a diachronic perspective on the production and consumption of obsidian in the Siteia Bay area of East Crete. The sites which will serve as the basis for this presentation include the Final Neolithic site of Kephala Petra, the MMIA site of Aghia Photia, and the site of Petras, which of course consists of a number of components beginning with EMII. Metaxia Tsipopoulou, to whom I wish to express my appreciation for allowing me to study the material, has investigated all of these sites (1989; 1990). The assemblages from the various components of the Siteia Bay sites offer a local insight on the evolution of the obsidian industry in Crete. Although the focus is regional, the changing socio-economic role and value of obsidian exhibited here have ramifications for the island as a whole.

One of the dilemmas of obsidian and chipped stone studies in Crete has been the lack of comparative published data and, more importantly, detailed studies of this material. Compounding the difficulty is the incomplete nature of some of the reports from major sites. Lately, however, this vacuum is being remedied, notably by Tristan Carter's work on the Mochlos, Poros-Katsambas, Archanes and Mallia material. Moreover, some sites with published data, such as Pseira (Dierckx 1995), Kommos (Blitzer 1995), Myrtos (Jarman 1972), Debla (Warren and Tzedhakis 1974), to mention a few, lack the frequency of finds from which to draw valid conclusions. However, this lack of finds is a reflection of the preferential distribution of obsidian within Minoan society. A case which

finds corroboration in the fact that obsidian is found in large quantities only at major centres in the Minoan world. Clearly eminent amongst these is Poros-Katsambas, as the port of Knossos (Dimopoulou 1997), Archanes (Carter per.com.), Chania Kastelli, and Mochlos described by Carter as the gateway community for the importation of obsidian in Eastern Crete. Where do the Sitea Bay area sites figure in this model? Although not premiere in importance compared with these previous sites, the number of finds, consisting of 753 from Aghia Photia and over 1,300 from Petras, represent one of the more significant obsidian concentrations in Crete. Particularly conspicuous is the enigmatic fortified site of Aghia Photia. The frequency of obsidian from this small site alone certainly warrants attention. More importantly it offers a rare insight into the obsidian industry at a key transition point in the evolution of palatial society.

In Crete, obsidian is obviously regarded as an exotic or non-local commodity, emanating primarily from the Cycladic island of Melos and, to a lesser extent, from the Dodecanese island of Ghyali. Although Ghyali obsidian is present in the assemblages from the local sites in the Siteia Bay area, its frequency is extremely low. The widespread distribution of obsidian in the Aegean Bronze Age is centered on the Melos source.

In terms of acquisition, distance is not a determining factor. Both obsidian sources are nearly equidistant from Eastern Crete. The distance factor model is, therefore, irrelevant to the procurement of obsidian. Choice was dictated by cultural preferences. The assemblage from the Final Neolithic site of Kephala Petra suggests that the preference for Ghyali obsidian is a Neolithic tradition. At this site, it accounts for 6% of the obsidian recovered. This is no doubt an indication for a shift in the orientation of influences and intensity in exchange networks from the Neolithic to those of Minoan Crete. The northeast could be considered peripheral compared to the preferred traffic through the Cyclades.

The scarcity of Ghyali obsidian during Minoan times is reflected in the low frequency of finds from Petras, where only 18 specimens were recovered. Even fewer, only 4 specimens, are present at Aghia Photia. Altogether, they represent less than 1% of the obsidian total. The regional paucity of Ghyali obsidian during the Bronze Age suggests that its procurement was indeed sporadic. By this time its consumption was no longer considered appropriate for systematic blade manufacture. This role was clearly dominated by Melian obsidian.

Despite being no rival to Melian obsidian for the production of blades, obsidian from Ghyali nevertheless retained its value as a viable commodity for the manufacture of prestigious ground objects. Its versatility, as Betancourt (1997) has pointed out, is well demonstrated by the variety of carved finds from many Minoan sites. One ground fragment was recovered from the site of Petras, which substantiates this diversity of function in the Siteia Bay area also.

In order to place the Siteia Bay sites in context with what is known of the obsidian industry in Crete, we will begin with a general overview of some the morphological characteristics associated with the industry. A review of documented obsidian technology for the Aegean area demonstrates consistent methodology in its reduction process. The industry was organized around two main processes, which involved the preparation of blade cores, and the subsequent manufacture of blades (Van Horn 1980; Cherry and Torrence 1984). Perhaps the most drastic change from Neolithic to Bronze Age obsidian technology is the switchover from conical to tabular cores. The consequence of this shift is exemplified by more standardised blade morphology. From the Early Minoan period onwards, the industry specialised exclusively in the production of parallel-sided prismatic blades. Although flake production is present, it is purely a by-product of this process and assumes only a minor role. At a few sites in the Aegean, flake production seems to be a separate industry, such as Period V Ayia Irini on Keos (Torrence 1986). In the Siteia Bay area, the scarcity of utilized flakes attests to the secondary role of these items and to their sporadic utilization.

Metric analysis of blades has revealed a very limited set of parameters. The lack of any great deviation in blade attributes suggests a formally organised industry. This of course creates a diagnostic problem when trying to identify affiliation when dealing with multi-component sites with a number of reconstruction episodes. For example, obsidian found in EMII contexts presents little difference in morphology compared to later periods. This suggests that sometime during the EM period, the obsidian industry had already reached its greatest level of efficiency in production methodology.

The sequence of events during the shaping of cores and the final products manufactured produces blanks, be they flakes or blades, with distinctive morphological attributes. Basically, frequency of these blanks

serves to identify the level of intensity of production versus consumption. In addition, the number of cores is a basic and obvious indicator of on-site production. At Aghia Photia the remnants of 46 cores exceeds the total of 42 from all of Petras. Evidence for the preparation of obsidian cores at Aghia Photia is atypical of most assemblages in Crete. Aside from Poros-Katsambas and Mochlos, few other sites display such orientation in the industry. Compared to blades, the rest of the obsidian assemblage consisting of primary, secondary, and tertiary flakes represents 65% of the total at Aghia Photia. Other local site components display the opposite proportions. At Petras, the debitage from any of the major phases of occupation constitutes the lowest proportion of the assemblage, ranging from between 30 to 40 %. These proportional differences are a clear indication of the magnitude of production occurring at Aghia Photia, as opposed to blade consumption.

These observations suggest that blades were destined to be marketed elsewhere. Interestingly enough, this aspect is also a distinctive feature of the EMII sector at Aghia Photia. This link between the two phases of the site is indicative of a common functional directive established along with Aghia Photia's beginnings. Clearly, this site lives up to its enigmatic nature by presenting anachronistic trends in obsidian consumption.

Other indicators of production are the splintered products of bipolar reduction (fig. 1). These characterize the final use of obsidian cores. Indeed, all cores, save two, have been subjected to this method of reduction. Decreasing frequency of splintered items is noticeable from the Final Neolithic onwards. At Kephala Petra these constitute 57% of the assemblage, whereas at Aghia Photia during the EMII it drops to 25%, and by the MMIA it is 19%. At Petras this type of artifact represents only 5% of the assemblage. Since these splintered artifacts are found in association with core preparation debitage, this phenomenon is directly connected with the presence of obsidian workshops. It is evident that for the EMII and MMIA periods at Aghia Photia these have been excavated, whereas at Petras, only the EMII house yielded some evidence for such a workshop.

The Minoan obsidian industry focused on one product objective: the prismatic blade (fig. 2). Blade production begins with a series of preparatory blade types. Simplest is the cortical blade, where a natural ridge from an unworked obsidian nodule is simply struck off. Another is the crested blade, where an artificial ridge is created by flaking a series of small

flakes and then striking it off. However the most common type is the initial blade, typically characterized by having remnants of preparation flakes.

One of the main differences between Bronze Age prismatic blades and earlier types is their parallel sides. Neolithic blades present a greater range of standard deviation, whereas Bronze Age varieties are distinguished by their rigid formal characteristics. The use of some kind of holding device has been postulated by some researchers as being responsible for this (Van Horn 1980; Torrence 1986).

These then are the classic formal blade types found in Minoan contexts. Their characteristic trapezoidal shape and parallel sides distinguish these blades. Although technically referred to as trapezoidal, blades for the most part have a distinct triangular appearance. The middle facet is usually much narrower than the two lateral facets. This feature may be indicative of later stage blade production whereby blades have a tendency to become much narrower as the core diminishes in size. Indeed, the only occurrence of a larger or more proportional middle facet is found on wider blades, most likely produced on newly prepared cores.

This has repercussions in identifying some economics of the obsidian industry, especially relevant for EMII and MMIA Aghia Photia. Here, it has been shown that obsidian reduction is the major aspect of the industry as opposed to consumption. The blades recovered from the site represent the final phases of core reduction. The earlier or wider blades have already been exported from the site. Another revealing aspect of the blade assemblage at Aghia Photia further emphasizes the lack of final blade products on site. The classic trapezoidal blade constitutes just over half, 53%, of the total number of blades. Save for the slight evidence of a middle facet, these are triangular in appearance. The fact that nearly equal amounts are blade products from the preparatory stage and final blade core reduction sequences clearly points to export of blades from the site.

It is interesting to note that at the nearby EMI-II cemetery of Aghia Photia, hundreds of these larger obsidian blades were recovered (Davaras 1971). It is possible that this was one of the destinations for blades produced at Aghia Photia for the EMII period at least. Based on current cemetery data, it is apparent that obsidian blades formed an integral part of burial customs. Perhaps the most revealing dichotomy of obsidian blade production between cemetery and domestic sites comes from Phourni at Archanes (Sakellarakis and Sakellarakis 1997). The evidence from Phourni

points to a separate cemetery workshop for blade production. There is a definite emphasis on large blade production destined for funerary activities, suggesting that the obsidian industry was split into a separate craft for domestic/utilitarian needs versus ceremonial, rituals or public displays. Of course, the possibility exists that these larger blades were also produced at most sites. However, their eventual destination or purpose accounts for their low frequency at most domestic sites. This discussion is not to suggest that Aghia Photia served as a preparatory building for funerary activities, although that would make for an intriguing hypothesis. One thing is certain, Aghia Photia was a supplier of blades. The site of Petras would make for an obvious choice for this demand during the MMIA period. However, their eventual destination during the EMII period could be closer than we think, since at Petras the EMII house was clearly producing blades, although at reduced level compared to Aghia Photia during this period.

Turning now to the association and use of obsidian with craft or domestic activities, I would like to focus on one aspect of blade modification that highlights this connection. One of the most noteworthy occurrences from Petras and Aghia Photia is the presence of some 20 microlithic tools (fig. 3). They are otherwise known as trapezes and lunates, based on their most common forms, although a number of amorphous shapes occur as well. These are the rarest tool types manufactured on blade segments. The size and form point to their use as drill bits or engraving points. With the exception of a few specimens, the majority derive from pre-palatial contexts. These offer a connection for obsidian with lapidary and other artistic workshops.

Microlithic tools are a group of artifacts rarely documented in Minoan contexts. Of the few sites where these have been found, all have produced single examples. LM Coast Mochlos (Carter per. com.); EM Myrtos Phournou Koriphi (Jarman 1972); EM Archanes Tholos Tomb C and Platanos Tholos B (Carter per. com). However, at Petras microlithic tools are conspicuously abundant with a present total of 16, overwhelmingly surpassing all documented microlithic finds in Crete.

The small size of these microlithic tools would suggest utilization as hafted or complex composite implements. Their use as drill bits or engraving points for the working of other materials such as stones, bone, and ivory appears likely. Some researchers have proposed obsidian as just

such a tool used to pierce suspension holes for beads and engraving seals. At Mallia, Poursat (1996) has made this connection with the lapidary workshops up to the end of the MM period. Younger (1989) goes further to suggest that this practice corresponds to the use of softer materials, such as steatite, serpentinite, and chlorites, for seals and beads prevalent in EM and early phases of the MM. Towards the end of the MM period harder semi-precious stones become the dominant choice. Because of their hardness, they exclude the use of obsidian to carve or engrave them.

Therefore, it is not mere coincidence that we begin to notice a gradual decline in obsidian consumption during the MM. The likely cause for the decrease in the volume of obsidian was its restriction in the range of utilitarian uses, possibly due in part to the increase in metal tools. In earlier periods, obsidian workshops were easily identified, either alone or in association with other industries, by their sheer magnitude of finds. For example, the EMII house area at Petras, measuring 25x10m and representing only a very small section of the site, produced some 250 pieces or 26% of the obsidian from the whole of the Petras hill. Similarly, the EMII sectors at Aghia Photia, which are restricted to the SW and SE corners of the site, yielded 34% of the total obsidian. However, as the evidence from Petras shows, by the LMI obsidian finds become severely restricted and less concentrated.

Although there is a trend during the Late Bronze Age towards shrinking distribution of obsidian on sites, it appears that the level of consumption remains constant in ritual areas. The LMIA House 1at Petras offers clear evidence for this pattern. The house yielded only 87 pieces of obsidian. Except for one area, obsidian was evenly distributed throughout. Here, a household shrine was located in the NW corner of the house's backyard. In direct association with this was a discrete assemblage of 34 pieces of obsidian, accounting for 40% of the assemblage. In addition 14 of the items were utilized. No other area within House 1 approaches this level of consumption and concentration. An example from further afield is the LC West Shrine at Phylakopi, where an increasing obsidian frequency as opposed to a decrease in the secular sector of the site is also documented (Torrence 1985). With its demise as a domestic utilitarian object, the underlying importance of obsidian becomes clear in its association with ritual activities, ceremonies and public displays.

In conclusion, the obsidian industry could not maintain its integrity

unchanged over the course of the Bronze Age without a strict production regimen. Standardization is a key element that distinguishes an industry's adherence to formalized production processes. The use of a core holding device ensured a highly successful rate of standardized blade production (Van Horn 1980; Torrence 1986). Consequently, it is unlikely that the possession of these devices was available to all, but was rather restricted in its accessibility, much in the same way as obsidian was restricted in its distribution. If obsidian were available to be worked by all, aberrant, varying, and eventually degenerating practices would be evident. Indeed, if the general populace were dependent upon it, there would also be more evidence for local chipped stone technology relying on locally available chert and other materials to supplement household needs. However, the opposite is true. The other chipped tool stones are extremely limited in their use and distribution. The reduction of obsidian was in the hands of artisans and its consumption controlled by elites who dictated the products and created the demand for products obsidian helped to manufacture.

These specialized manufacturing techniques serve to further disassociate elite groups from the populace by creating a buffer zone in the production system. Prestige goods are produced by a craft that is specialized in itself but not in widespread distribution, rather, limited to major centers in Minoan society. Obsidian is wholly dependent upon the products it is meant to produce and the ideologies it serves to maintain – complex system of production that is further reinforced by ceremonial value.

Obsidian serves a dual role as a craft that is directly connected with the manufacture of status symbols and as an object of traditional and cult significance. What makes obsidian a virtual necessity is the corporate memory and value it carries from its onset as a commodity initiated during the Neolithic. With its removal from unlimited use, sometime during the MM, its role as ceremonial object becomes more apparent, making all those connected with its utilization and consumption socially segregated. As a ritual implement in ceremonies, obsidian is removed from mundane domestic tasks. It ceases to be an ordinary tool stone. Its extensive use in mortuary contexts associates its products, specifically blades, with ritual importance. These discussions reveal that the obsidian industry was not necessarily dependent on technological criteria to maintain its integrity over such a long period of time, but was supported by socioeconomic demands directly related to the support of ideologies.

REFERENCES

Betancourt, Philip P., 1997. The Trade Route for Ghyali Obsidian, in R.L. Laffineur and P.P. Betancourt (eds), *TEXNH. Craftsmen, Craftswomen, and Craftsmanship in the Aegean Bronze Age*, Aegaeum 16, 171-175, Liege.

Blitzer, H., 1995. Minoan Implements and Industries, in J. W. Shaw and M.C. Shaw (eds), *Kommos I: The Kommos Region and Houses of the Minoan Town*, 403-535, Princeton University Press, Princeton N.J.

Cherry, J. F. and R. Torrence, 1984. The Typology and Chronology of Chipped Stone Assemblages in the Prehistoric Cyclades, in J. A. MacGillivray and R. L. N. Barber (eds), *The Prehistoric Cyclades: Contributions to a Workshop on Cycladic Chronology*, 12-25, Edinburgh.

Davaras, Costis, 1971. An Early Minoan Cemetery at Aghia Photia, *Athens Annals of Archaeology* 4, 392-397.

Dierckx, Heidi M. C., 1995. The Ground and Chipped Stone Tools, in P. P. Betancourt and C. Davaras (eds), *Pseira I: The Minoan Buildings on the West Side of Area A*, 21-22, 41, 55-56, 64-65, 124-126, 142, University of Pennsylvania.

Dimopoulou, Nota, 1997. Workshops and Craftsmen at Poros-Katsambas, in R.L. Laffineur and P.P. Betancourt (eds), *TEXNH. Craftsmen, Craftswomen, and Craftsmanship in the Aegean Bronze Age*, Aegaeum 16, 433-437, Liege.

Jarman, M. R., 1972. The Obsidian, in P.M. Warren (ed.), *Myrtos: An Early Bronze Age Settlement in Crete*, British School of Archaeology at Athens, 326-328, Thames and Hudson, London.

Poursat, J-C., 1996. Artisans Minoens: Les Maisons-Ateliers du Quartier MU, *Etudes Cretoises* 32, Ecole Francaise d'Athenes.

Sakellarakis, Y. and E. Sakellaraki, 1997. *Archanes: Mia Nea Matia sti Minoiki Kriti*, Ammos, Athens.

Torrence, Robin, 1985. The Chipped Stone, in C. Renfrew (ed.), *The Archaeology of Cult: The Sanctuary at Phylakopi*, British School at Athens, Suppl. 18, 469-478.

---- 1986. Chipped Stone, in J.L. Davis (ed.), *Keos 5, Ayia Irini: Period V*, Verlag, Philip Von Zabern, pp. 90-96, Mainzon Rhine.

Tsipopoulou, Metaxia, 1989. Archaeological Survey at Aghia Photia, Siteia, *SIMA* 82, Partille, Sweden.

—— 1990. Nea Stoicheia gia ti Minoiki Katsikissi stin Periochi tou Kolpou tis Siteias, *Acts of the 6th International Cretalogical Congress*, 305-321, Chania 1986.

Van Horn, David M., 1980. Observations Relating to Bronze Age Blade Production in the Argolid of Greece, *JFA* 7, 487-492.

Warren, P. M. and J. Tzedhakis, 1974. Debla. An Early Minoan Settlement in Western Crete, *BSA* 69, 299-342.

Younger, J.G., 1989.Bronze Age Aegean Seals in the Middle Period, in R. Laffineur (ed.), *Transition: Le Monde Egeen du Bronze Moyen au Bronze Recent*, Aegaeum, pp. 53-64, Universite de l'Etat a Liege.

Fig. 1. Splintered pieces from core fragments: Kephala Petra Final Neolithic assemblage.

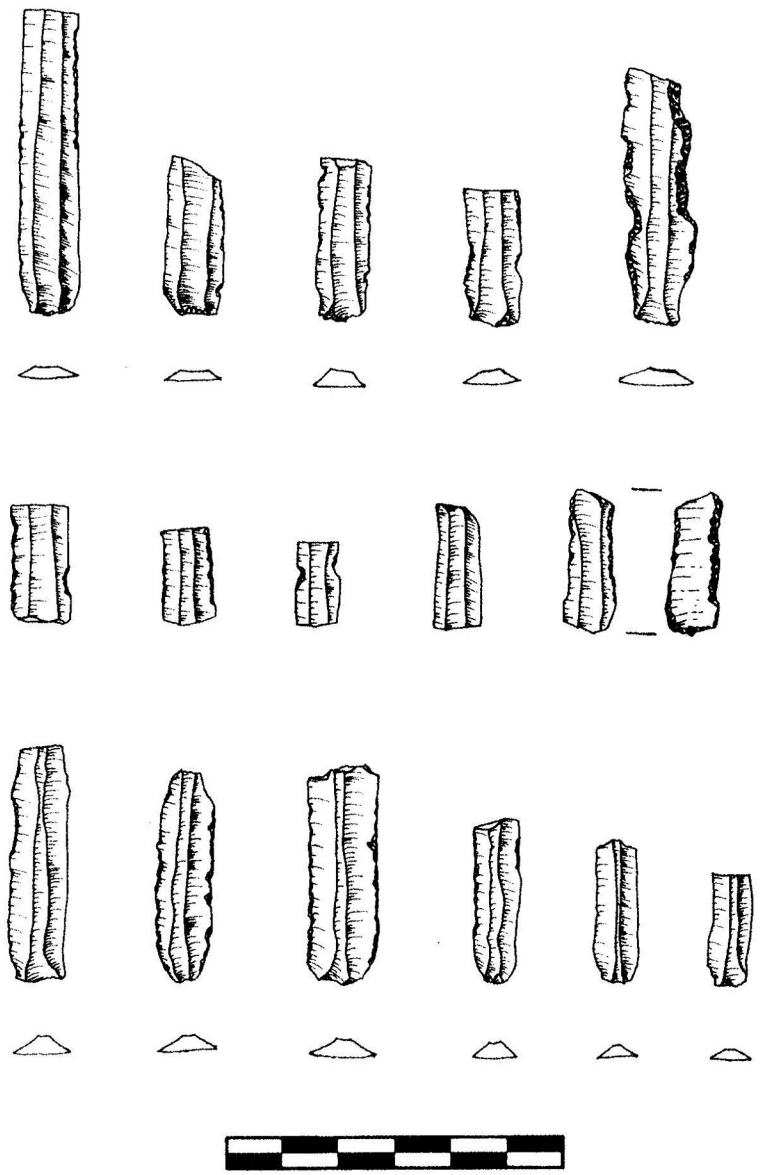

Fig. 2. Trapezoidal Blades from EMII to LMI contexts at Petras.

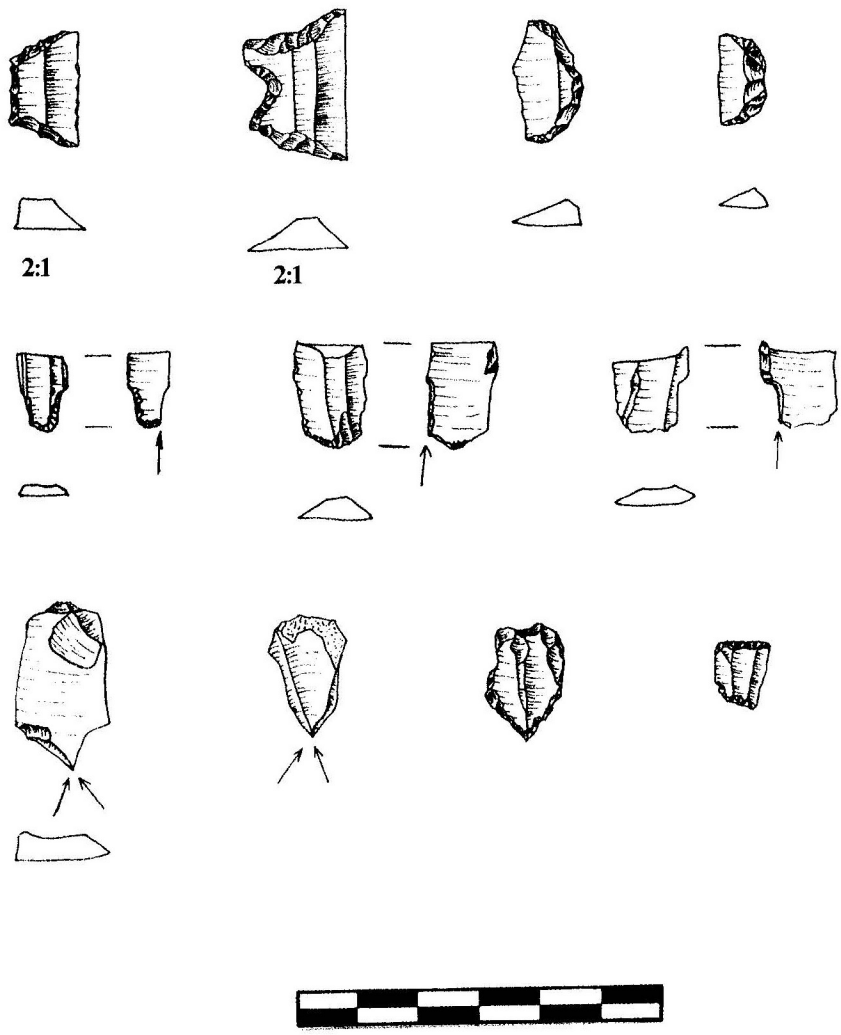

Fig. 3. Microlithic Tools from EMII to LMI contexts at Petras.

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