

# Textile tools from the East Gate at Mycenaean Midea, Argolis, Greece

## Abstract\*

This contribution presents in the first place an analysis and interpretation of all implements and tools possibly related to textile production that were recovered in the East Gate area at Midea during the Greek-Swedish excavation campaigns between 2000 and 2009. Secondly, with the help of comparative evidence from other zones on the citadel of Midea and also from other Mycenaean sites, it is argued that at least one multifunctional unit, where textile manufacture was also carried out, might have existed in the East Gate area. It is also suggested that this textile production comprised fine quality products to a significant extent. Finally, referring to signalling theory it is proposed that the fabrics possibly manufactured in the citadel served as means for the local community or élite to partake in the socio-cultural and political competition which seems to characterize Mycenaean society in general.

*Keywords:* Spindle whorls, spinning, weaving, multifunctional units, workshops, fine garments, conspicuous consumption, costly signalling

## Introduction

Bronze Age (BA) textile production in the Mediterranean has in recent years been the subject of a growing scientific interest variously analysing its economic and socio-cultural importance.<sup>1</sup> Written evidence, such as Linear A and B tablets

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in palace archives from the Aegean and Assyrian texts from Anatolia dating back to the end of the 3rd and continuing well into the 2nd millennium BC, provides important insights that textile production was indeed to a significant extent a surplus-oriented activity for trade and exchange.<sup>2</sup> In contrast to the plentiful information provided by the written sources, organized textile manufacture and trade are hardly recognizable in the archaeological record of the widely studied Aegean world;<sup>3</sup> it is this archaeological record that is the scope of this study. Our understanding of Mycenaean textile production is hampered in the first place by the limited amount of preserved textile fragments,<sup>4</sup> and secondly by the limited understanding of what could have constituted a textile workshop or an allocated working environment within single households.<sup>5</sup> In the

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<sup>1</sup> E.g. Andersson Strand & Nosch 2015; Barber 1991; Breniquet & Michel 2014; Burke 2010a and 2010b; Gillis & Nosch 2007; Gleba 2008 and 2014; Gleba & Mannering 2012; McCorrison 1997; Nosch & Laffineur 2012; Michel & Nosch 2013

<sup>2</sup> Burke 2010b; Del Freo *et al.* 2013; Killen 2007; Michel & Veenhof 2013; Nosch 2011; Waetzoldt 1972; Wisti Lassen 2014.

<sup>3</sup> Alberti 2008; Alberti *et al.* 2012; Andersson Strand & Nosch 2015; Brysbaert 2014; Tournavitou 1988 and 1997; Laffineur 1995; Smith 2002.

<sup>4</sup> Nosch 2014, 5; Skals *et al.* 2015.

<sup>5</sup> In defining specifically allocated working spaces for textile production one might take into account that such production requires a complex sequence of operations and that many of them (such as for example fibre production and post-weaving treatments) could have been carried out in open areas or outside settlements, while others (such as for example spinning and cloth manufacture) are relatively “mobile” and could have been carried out in different places and at different times. About textile production complex *chaîne opératoires* see e.g. Andersson Strand 2012; Andersson Strand *et al.* 2006; Andersson Strand & Nosch 2015; Barber 1991; Gleba 2008; Gillis & Nosch 2007.

case of the citadel of Midea, the presence of textile production has already been proposed mainly on the basis of the numerous spindle whorls found at the site.<sup>6</sup> Yet, little attention has been directed at the study of the textile-related implements from the recent excavations at the East Gate area which are largely unpublished. This paper aims at filling the gap, and also discussing the possible organization and socio-economic significance of the supposed textile production on the site with reference to comparative evidence from the wider Mycenaean world.

Midea is an impressive site situated on the top of a hill dominating the entire Argive Plain.<sup>7</sup> Argolid is indeed a relatively small region, which sees during the Late Bronze Age (LBA) an important concentration of major Mycenaean centres, including the citadel of Mycenae. The political organization of the region is a matter of debate.<sup>8</sup> While it is generally acknowledged that Mycenae must have had a dominant role of at least a cultural and political nature, the centres of Tiryns and Midea have also been highlighted as possibly retaining a major status in the area.<sup>9</sup> Mycenaean society is generally considered as strongly dominated by élite groups which made use of various strategies to exercise ideological and political power. It has been discussed how palaces for example played a focal role as arenas which enabled and framed such power presentations.<sup>10</sup> In addition, access to and/or production of prestige commodities must have played a major competitive role in the exhibition of political power.<sup>11</sup> Jewellery and ornaments from Midea have recently been discussed in an attempt to associate local élite identity with the necessity to acquire and display precious commodities;<sup>12</sup> hence demonstrating a local need/wish to be part of the higher levels of the Mycenaean society.

An established field of study in anthropology is concerned with signalling theory and the interaction between symbolic communication and social capital/benefits.<sup>13</sup> A fundamental purpose of prestige signalling is the acquisition of social benefits which can be achieved through a range of performances, including conspicuous consumption.<sup>14</sup> The latter seems to apply very well to Mycenaean élites in general.<sup>15</sup> One of the aims of this paper is to discuss whether the analysis of the textile tools from the East Gate area at Midea could support the

application of such a theoretical approach for a better understanding of the site organization and its community during Mycenaean time. Characteristics and distribution patterns of the textile tools analysed in this study provide indications as to the possible existence of textile production within multi-functional units, which might have been oriented towards supporting the local attempt to display conspicuous consumption.

## The textile-related tools from the East Gate at Midea

Several excavation campaigns have been conducted at Midea since the 1930s.<sup>16</sup> Modern Greek-Swedish excavations have taken place almost continuously from the beginning of the 1980s, providing a large number of finds and information about the characteristics of the site.<sup>17</sup> The material published and analysed in this work includes all finds possibly related to textile manufacture from the Swedish part of the joint Greek-Swedish excavations carried out between 2000 and 2009 in the area of the East Gate and in Trench 1 north-west of the East Gate (*Fig. 1*).<sup>18</sup>

The finds examined in this study include numerous spindle whorls and a selection of clay, metal, and bone tools which might have been used in textile and cloth manufacture. They have been divided in three main categories:

- spinning-related tools
- weaving-related tools
- multipurpose tools (or not necessarily exclusively textile-related)

The items in each category are divided in types on the basis of first their functional characteristics and secondly, when necessary, their taxonomic characteristics. The latter supposedly provide data to establish the way certain tools might have been used and for which purpose, such as in the case of spindle whorls, the quality and characteristics of the spun thread.

<sup>6</sup> Demakopoulou *et al.* 2015.

<sup>7</sup> Demakopoulou 2007; Walberg 1998, 15.

<sup>8</sup> Maran 2009, 79; Pullen 2013, 117; Schofield 2007, 89; Walberg 2007; Wright 2006.

<sup>9</sup> Demakopoulou 2007; Maran 2001, 117; 2009, 79; Pullen 2013; Voutsaki 2010; Walberg 1998, 15–17.

<sup>10</sup> Bennet 2008; Maran 2009.

<sup>11</sup> Gorzato 2012; Pullen 2013; Schallin 2016; Voutsaki 2001; 2010.

<sup>12</sup> Schallin 2012; 2016.

<sup>13</sup> E.g. Bliege Bird & Smith 2005; Boone 2000.

<sup>14</sup> E.g. Neilissen & Meijers 2011; Veblen 1994 (1899).

<sup>15</sup> Schallin 2012; 2016; Whittaker 2012; Wright 2004.

<sup>16</sup> Cf. Åström 1983; Persson 1942; Walberg 1998, 16–17.

<sup>17</sup> Åström 1983; Åström & Demakopoulou 1986; Åström *et al.* 1988; Demakopoulou *et al.* 1999; 2002; 2003; 2004; 2005; 2008a; 2008b; 2009; 2010; Walberg 1998; 2007.

<sup>18</sup> For the preliminary reports of the excavations at the East Gate see the specific contributions by H.A. Alisoy, G. Ekroth, L. Klintberg, A. Lindblom, M. Lowe Fri, M. Miller, L. Sjögren, K. Uray, E. Weiberg, and in particular by M. Nilsson and A.L. Schallin in Demakopoulou *et al.* 2002; 2003; 2004; 2005; 2008a and 2008b; 2009 and 2010; page indications refer to those contributions. A complete catalogue of the items examined in this study is provided in the appendix.

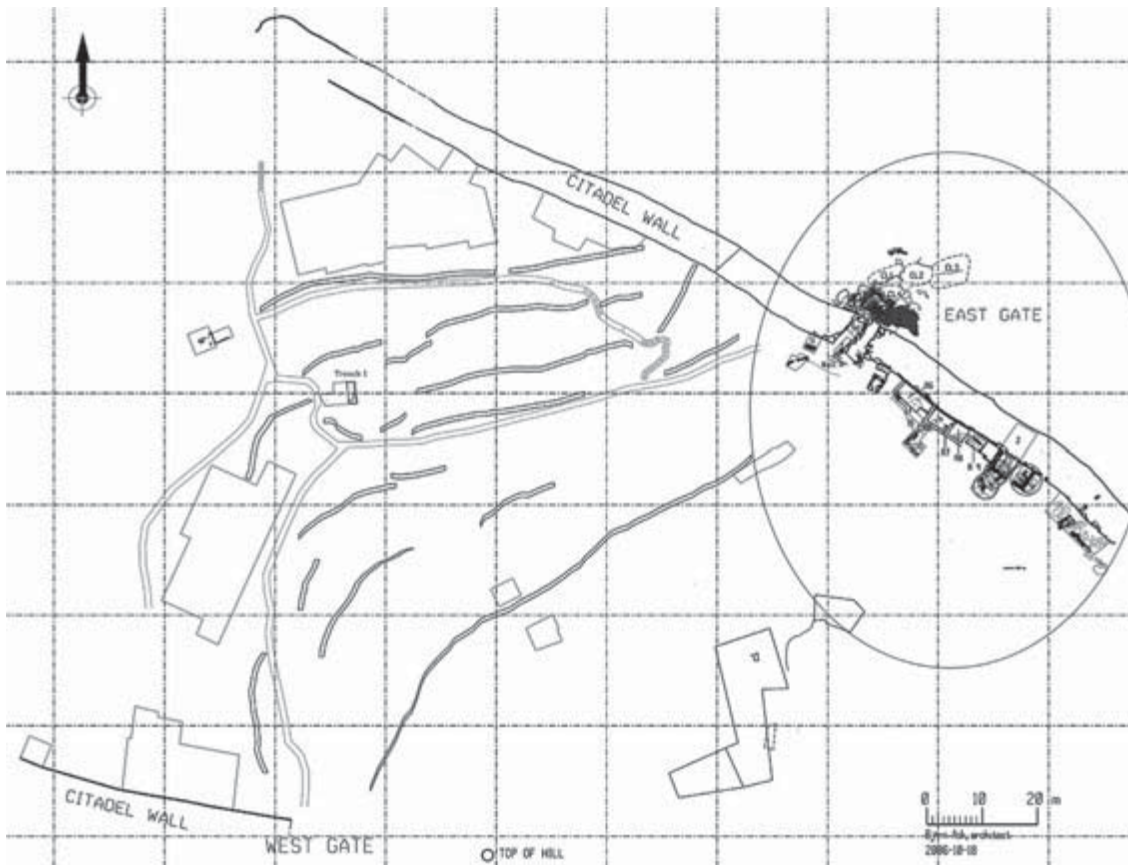


Fig. 1. Plan of the citadel of Midea with the East Gate excavation area and Trench 1. Courtesy of Ann-Louise Schallin and Björn Ask.

Additionally, the distribution patterns of the finds have been carefully studied in order to determine the possible existence of spaces specifically allocated for textile production. Finally, characteristics, chronology, and distribution of the objects have been compared to archaeological evidence from other excavated sectors at Midea and also from other Mycenaean sites in order to underpin the overarching interpretation of the material.

### SPINNING-RELATED TOOLS

Spinning is an activity that can be carried out in a variety of ways and does not always require tools, since it can be done just by using fingers or other parts of the body.<sup>19</sup> Because spindle whorls are a very common class of artefact in Europe and the Mediterranean during the LBA it is quite likely that spinning with spindles and spindle whorls was the most common

technique in this area.<sup>20</sup> In practice a spindle whorl works as a sort of flywheel attached to a spindle, which has been inserted in its perforation. The work performed by spindle whorls can be achieved by other items with similar taxonomic characteristics, such as for example perforated pottery sherds, which are also well-known in the Mycenaean world.<sup>21</sup> Indeed shape, size, weight, and use-wear of such sherds from the East Gate at Midea strongly suggest that they too were used as spindle whorls. As far as spinning-related tools are concerned it ought to be considered that while spindle whorls are generally made of clay or stone, spindles are often made of perishable material (straight pieces of wood would work well for the purpose) and are therefore rarely found in the archaeological record. However, preserved examples in bronze and ivory from various LBA Mediterranean sites show their existence and also suggest that they could be prestige items.<sup>22</sup> The spinning-related

<sup>19</sup> Barber 1991, 39–51.

<sup>20</sup> Barber 1991, 51–68; Gleba 2008, 100–109.

<sup>21</sup> Rahmstorf 2008; Andersson Strand & Nosch 2015.

<sup>22</sup> Barber 1991, 62–65; Borgna 2003.

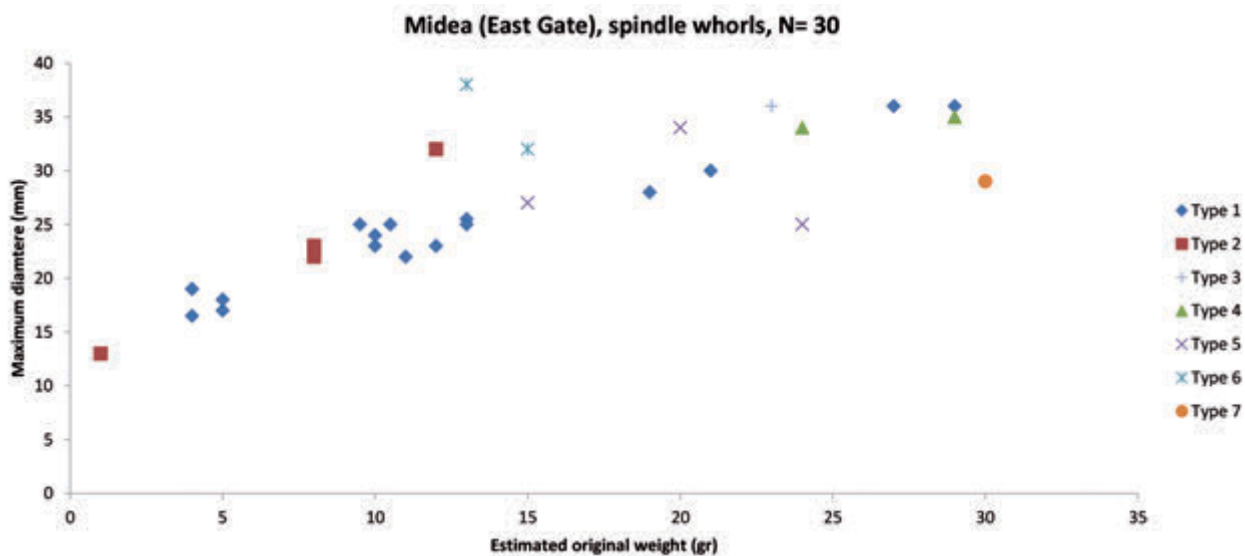


Fig. 2. Spindle whorls from the East Gate area and Trench 1 at Midea: type and weight/maximum diameter. The items for which it was not possible to estimate the original weight (see Table 1) are not present in the diagram.

tools from the East Gate area at Midea include spindle whorls, perforated pottery sherds, and possible spindles.

### Spindle whorls

The corpus of the spindle whorls from the East Gate includes 34 items, 24 made of stone and ten made of terracotta or coarse ware (see Table 1). As often it is not possible to make a sharp division between whorls made for spinning, to function as beads/conuli, or to function as both, in this section all those items with taxonomic characteristics suitable for spinning are included.<sup>23</sup> A total of 19 of the stone whorls are made of an almost black-coloured talc or soapstone, which is normally called steatite in the archaeological literature about Midea;<sup>24</sup> this same definition will be used in this work too. Four spindle whorls are made of a green variety of serpentine also called chlorite; since previous publications of the site of Midea called such green stone objects green steatite, this designation will be used in this work too. The whorls have been divided in eight types on the basis of their shape (see Plate 1).

#### Type 1: Conical (Pl. 1A)

The type includes 19 conical spindle whorls (SW3–5, SW7–9, SW11–14, SW17–19, SW24–28, and SW33).<sup>25</sup> They have an overall conical shape with a smooth-edged upper part and a generally flat round base. They weigh between 4 and 29 g, which means that they are not only the most numerous category, but also the type with the greatest variation of weights. One whorl is made of terracotta (SW27), three are made of green steatite (SW9, SW14, and SW19), while the remaining 15 are of steatite.

#### Type 2: Concave conical (Pl. 1B)

Four pieces have a slightly conical shape with a pronounced concave outline in profile. One is made of coarse ware (SW1) and three of steatite (SW15, SW30–31). Their weight ranges between 1 and approximately 12 g. The smallest piece (SW15) is the lightest of all the documented whorls/conuli from the East Gate area and the possibility should not be ruled out that it might have been a bead or a pendant rather than a spindle whorl.<sup>26</sup>

<sup>23</sup> For a discussion about weights and sizes of spindle whorls see: Andersson Strand *et al.* 2006; Liu 1978; Mårtensson *et al.* 2006b; Olofsson *et al.* 2015.

<sup>24</sup> Ostenso 1998, 165.

<sup>25</sup> All analysed material has been given an identification acronym which is internal to this paper. Information about each single find including their inventory number, as it is classified in the Archaeological Museum in Nafplion, is to be found in the appendix.

<sup>26</sup> The possibility that such very light whorls were used as beads or pendants has been discussed through the years, see e.g. Carington Smith 1992; Konstantinidi-Syvidi 2014, 145–148; Ostenso 1998, 165–166. It has been demonstrated that even very light spindle whorls can be used to produce very fine threads (Liu 1978; Mårtensson *et al.* 2006a; Olofsson *et al.* 2015).

Table 1. Synoptic table with data on all the possible spindle whorls from East Gate area at Midea in order of weight.

| Object no. | Trench | Layer    | Est. weight (g) | Max. Ø (cm) | Hole Ø (cm) | Material       | Type | Actual weight (g) |
|------------|--------|----------|-----------------|-------------|-------------|----------------|------|-------------------|
| SW15       | T12    | 1        | 1               | 1.3         | 0,2         | Steatite       | 2    | 1                 |
| SW7        | T3     | 3        | 4               | 1.9         | 0.3         | Steatite       | 1    | 4                 |
| SW19       | T12    | 3B       | 4               | 1.65        | 0.3         | Green steatite | 1    | 4                 |
| SW28       | T3/R9  | 4        | 4               | 1.9         | 0.2         | Steatite       | 1    | 4                 |
| SW5        | T3     | 3        | 5               | 1.8         | 0.35        | Steatite       | 1    | 5                 |
| SW14       | T11    | 2        | 5               | 1.7         | 0.3         | Green steatite | 1    | 5                 |
| SW30       | T3/R9  | 2        | 8               | 2.2         | ?           | Green steatite | 2    | 4                 |
| SW26       | T15    | 4        | 9.5             | 2.5         | 0.25        | Steatite       | 1    | 8                 |
| SW13       | T11    | 2        | 10              | 2.3         | 0.4         | Steatite       | 1    | 10                |
| SW3        |        | Cleaning | 10              | 2.7         | 0.45        | Steatite       | 1    | 9                 |
| SW9        | T3     | 3        | 10              | 2.4         | 0.4         | Green Steatite | 1    | 10                |
| SW11       | T9     | 1        | 11              | 2.2         | 0.4         | Steatite       | 1    | 11                |
| SW4        | T3     | 2        | 12              | 2.3         | 0.35        | Steatite       | 1    | 9                 |
| SW1        | T1     | 7        | 12              | 3.2         | ?           | Coarse ware    | 2    | 4                 |
| SW2        | T1     | 7        | 13              | 3.8         | 0.8         | Coarse ware    | 6    | 7                 |
| SW24       | T14    | 4        | 13              | 2.5         | 0.4         | Steatite       | 1    | 13                |
| SW25       | T14    | 3        | 13              | 2.5         | 0.5         | Steatite       | 1    | 12                |
| SW6        | T3     | 3        | 15              | 3.2         | 0.85        | Coarse ware    | 6    | 5                 |
| SW20       | T12    | 5B       | 15              | 2.7         | 0.59        | Steatite       | 5    | 15                |
| SW8        | T3     | 3        | 19              | 2.8         | 0.5         | Steatite       | 1    | 18                |
| SW31       | TE/TF  | 2        | 19              | 2.3         | 0.36        | Steatite       | 2    | 18                |
| SW21       | T12    | 2        | 20              | 3.4         | 0.58        | Coarse ware    | 5    | 20                |
| SW18       | T12    | 3B       | 21              | 3.0         | 0.45        | Steatite       | 1    | 20                |
| SW29       | T3/R9  | 4        | 23              | 3.6         | 0.49        | Green steatite | 3    | 18                |
| SW22       | T12    | 3        | 24              | 2.5         | 0.45        | Terracotta     | 5    | 6                 |
| SW32       | ?      | Topsoil  | 24              | 3.4         | 0.7         | Coarse ware    | 4    | 12                |
| SW27       | T3/R9  | 4        | 27              | 3.6         | 0.6         | Terracotta     | 1    | 27                |
| SW33       | TF     | 2        | 29              | 3.6         | 0.5         | Steatite       | 1    | 28                |
| SW16       | T12    | 4B       | 30              | 2.9         | 0.2         | Stone          | 8    | 30                |
| SW23       | T13    | 3        | 30              | 3.5         | 0.6         | Terracotta     | 4    | 14                |
| SW10       | T3     | 3        | ?               | ?           | ?           | Steatite       | 3    | 5                 |
| SW12       | T9     | 3        | ?               | 1.5         | 0.2         | Steatite       | 1    | 2                 |
| SW17       | T12    | 4A       | ?               | 3.1         | 0.4         | Steatite       | 1    | 23                |
| SW34       | 12     | 2        | ?               | 3.8         | 0.7         | Terracotta     | 7    | 48                |

**Type 3: Truncated conical (Pl. 1C)**

One item (SW29) has a sharp truncated conical shape. It weighs 23 g and is made of green steatite. Another fragmentary whorl (SW10) made of steatite is tentatively considered as belonging to this type.

**Type 4: Convex truncated conical (Pl. 1D)**

Two items made of terracotta (SW23 and SW32) have a roughly truncated conical shape with differently pronounced convex sides. They are both fragmentary and have an estimated weight of 30 g and 24 g respectively.

**Type 5: Biconical (Pl. 1E)**

Three items have a biconical shape. The only one made of steatite (SW20) has a regular shape with a protruding edge at the maximum diameter. The other two items are terracotta whorls (SW21–22) with an irregular and smooth-edged outline. Their weight ranges between 15 g and 24 g.

**Type 6: Flattened biconical (Pl. 1F)**

Two items have a roughly biconical and significantly flattened shape. They (SW2 and SW6) are both made of terracotta and are quite similar to each other having an estimated original diameter between respectively 32 and 38 mm and a weight between 13 g and 15 g.

**Type 7: Spherical (Pl. 1H)**

One item (SW16) is most likely a spherical whorl made of stone. It has a diameter of 29 mm and a weight of 30 g. The very narrow diameter of its hole (2 mm) suggests the possibility that the piece could have been a weight or a pendant of some sort rather than a spindle whorl.

**Type 8: Concave cylindrical (Pl. 1G)**

One relatively large whorl (SW34) is a cylindrical terracotta item with a pronounced concave outline and a vertical hole in the middle.<sup>27</sup>

**Perforated and trimmed sherds (Pl. 3A, 3E)**

Four items (PS1–4) consist of more or less discoid sherds from various types of Mycenaean vases (made of coarse, medium coarse, and fine ware) with a hole perforated approximately in the middle. The diameter of these objects varies between 25 mm and 32 mm and their weight is between 3 g and 11 g. One sherd (PS1) had been cut out from the base of a pot and therefore has an indented profile which might have allowed the piece also to be used as a sort of spool to wind threads.

<sup>27</sup> Concave cylindrical whorls are not particularly common, but a similar item has been found in LBA Lerna (Wiencke 1998, fig. 23) and Tiryns (Rahmstorf 2008, pl. 5, 2105 and 1519).

Four other sherds (TS1–4) which are not perforated resemble the above so closely that it is argued they were prepared to be perforated. These sherds are worked into a roughly round shape with diameters between 33 mm and 44 mm and weight between 8 g and 21 g.<sup>28</sup>

**Spindles (Pl. 3C, 3E)**

There is no clear evidence for spindles among the material with the possible exception of two small and fragmentary bone objects. The first piece is the pointed edge of a tool (S1). Most likely the rest of the tool was thinner than the point, alternatively there must have been a notch between the preserved pointed end and the rest of the object which is now missing. Two hypotheses are considered here: on the one hand it could be the enlarged end of a spindle, so manufactured in order to prevent the whorls from sliding off.<sup>29</sup> The second hypothesis is that this is half of a belt clasp similar to those known in burial contexts from Asine and Mycenae.<sup>30</sup> In both cases the item would be connected to textiles either as a tool to produce yarn or as an accessory.

The second piece (S2) is just a 15 mm long tapering bone rod. The two ends of the rod have different diameters. This supports the possibility that it could have been a spindle, since the diameter of such tools generally widens from one end to the other in order to prevent the whorls from sliding off.<sup>31</sup>

**Spinning at the East Gate**

The spinning-related tools recovered suggest that not only spinning took place in the East Gate area, but also that a variety of threads could be spun there. The diagram showing the relation between weight and maximum diameter of the studied whorls (Fig. 2) hints at a possible correlation between specific whorl shapes and the desired quality of the spun thread. While the numerous conical whorls span the whole diagram, the other types cluster in specific parts of it suggesting that they were used for restricted purposes. It might be therefore that their shape would have helped the spinners to quickly decide which item to use to obtain the desired results. The perforated pottery sherds are rather uniform in weight and would

<sup>28</sup> Trimmed pottery sherds from Midea have been so far generally interpreted as possible lids (e.g. Demakopoulou *et al.* 2010, 17) rather than items awaiting to be perforated. Similarly worked sherds are known from several sites in the Aegean and the Eastern Mediterranean (e.g. Alberti *et al.* 2012; Rahmstorf 2008; Siennicka 2014; Peyronel 2004, 117–119). It is interesting that in the neighbouring site of Tiryns, their presence consistently increases through the LH IIIC (Rahmstorf 2008, 296).

<sup>29</sup> A wooden spindle with a shape that recalls this item from Midea was found in the Alpine lake settlement of Fiafè (Marzatico 2003, 138).

<sup>30</sup> Mycenaean belt clasps have been recently discussed e.g. in Konstantinidi-Syvridi 2014, 153–154.

<sup>31</sup> Barber 1991, 62–75; Borgna 2003; Sauvage 2014.

be suitable for the spinning of light and fine threads. In general, there is an emphasis on light items. A total of 23 out of 38 suitable items (including both whorls and perforated pottery sherds) weigh below 15 g; it seems therefore that the spinning of fine yarn retained a considerable significance in the area.

### WEAVING-RELATED TOOLS

Weaving is a less mobile activity than spinning, as it generally requires a working space where the loom can be set up and kept until the weave is over. Although several different types of looms might be used, the widespread presence of loom weights throughout the Mediterranean BA suggests that vertical warp-weighted looms were widely used.<sup>32</sup> Loom weights provide tension to the warp threads tied to them. Depending on their number and weight and on the amount of threads attached to each of them the tension varies and as a consequence so do the final characteristics of the weave.<sup>33</sup> Another weaving-related tool is the pin beater. Pin beaters are used to lift warp threads and facilitate the passage of the weft through them; they are particularly useful in close, fine, and complex weaves.<sup>34</sup> There is relatively little written on pin beaters in the archaeological literature, and this is in all probability due to their ambiguous nature as they can resemble other types of pins or awls. Nonetheless their presence is a significant indicator of the undertaking of weaving, as pin beaters can be used with various types of looms, including those which might not leave behind any archaeological evidence.<sup>35</sup> The weaving-related tools from the East Gate possibly include both categories of tools: loom weights and pin beaters.

#### Loom weights (Pl. 3B, 3E)

Only one item (LW1) is here tentatively interpreted as a possible loom weight. It is a perforated potsherd from a Mycenaean coarse ware vessel. It weighs 100 g, has a hole with a diameter of 95 mm, and thickness that varies between *c.* 100 and 150 mm. The use wear observable on the hole supports the idea that the item was hanging and thus possibly used as a loom weight. It was made from the base of a vessel, thus it has an indented profile which would also have allowed using this tool as a sort of spool to wind threads or cords.

<sup>32</sup> Andersson Strand & Nosch 2015.

<sup>33</sup> Andersson Strand *et al.* 2006; Barber 1991, 79–125; Gleba 2008, 122–138; Mårtensson *et al.* 2006a; Olofsson *et al.* 2015.

<sup>34</sup> Hoffmann 1974, 320–321; Barber 1991, 273–274.

<sup>35</sup> Warp-weighted vertical looms are most often identified thanks to the archaeological presence of loom weights, while other types of looms such as horizontal ones (Barber 1991, 79–91) for example do not generally leave any trace in the archaeological record.

#### Pin beaters (Pl. 3D, 3E)

Three worked bone tools (see Pl. 3) have been here tentatively interpreted as pin beaters. Among these is a finely shaped, but fragmentary, bone (maybe ivory?) flat pin (PB1) with a sinuous profile. The pin has a circular section at its narrower incomplete end.<sup>36</sup> Also another possible pin beater (PB2) is fragmentary and has a roughly circular section at its incomplete narrower end. Finally an undecorated, but intact bone pin (PB3) 84 mm long could also have been used as a pin beater.

#### Weaving at the East Gate

Evidence of weaving and looms at the East Gate area is uncertain. Since just one item might have been a loom weight it seems unlikely that vertical warp-weighted looms were used there. On the other hand three tools could have been used as pin beaters, thus hinting at the possible presence of weaving. It could be tentatively hypothesized that, if any, types of looms other than the vertical warp-weighted one were probably used.

### MULTIPURPOSE TOOLS (OR NOT NECESSARILY EXCLUSIVELY TEXTILE-RELATED)

The tools discussed in this section are tools which might have been used in a variety of activities, including textile work. Some of them could, for example, have been used to cut or perforate various types of material and thus also cloth, threads, or adornments that could be applied to textiles and garments.

#### Bronze blades (Pl. 4A)

One of the bronze fragments (BB1) appears as the pointed edge of a thin blade. From the same context also comes a folded bronze fragment (BB2), interpreted here as the likely other end of the same blade, which is therefore identified as a small tanged knife or dagger. A third bronze fragment (BB3) might have been a very thin blade; however, it is difficult to reconstruct its original shape and use since the piece is incomplete and worn out.

#### Chisels and piercing tools (Pl. 4B)

Three items (C1–3) have a rectangular section. Such tools appear to have been suitable for cutting and piercing and might have been secondarily involved in textile manufacture or in the production of accessories directly linked to cloth and garments.

<sup>36</sup> In the preliminary publication of the excavation campaign during which the item was found, the piece had been interpreted as a possible writing tool (Demakopoulou *et al.* 2005, 33).

### Needles/pins (Pl. 4C)

There are four bronze needles/pins from the area of the East Gate. Their preservation state does not allow appreciating their specific features and/or full understanding whether they could have been used for sewing purposes. One find (N1) could be a needle with a blunt head (originally perforated?); given its state of preservation the possibility that the piece might have instead been a small arrowhead similar to another specimen also found in the citadel of Midea should not be ruled out.<sup>37</sup> None of the other three bronze items (N2–4) has a preserved end. While N2 is a straight pin, N3 appears worn-out and with an irregular profile. N4 has an embossed squared section in the middle.

## Distribution patterns

The tools analysed in this work (see Appendix) come from almost all the layers uncovered by the 2000–2009 excavations in the East Gate area and in Trench 1 (Fig. 1). Nonetheless the study of their distribution patterns revealed concentrations in specific areas. The parameter used to define a concentration of tools is the presence of more than two textile-related tools in an area of the excavation with neighbouring and/or communicating rooms/spaces. Such concentrations are attested in three locations,<sup>38</sup> from north to south:

- The neighbouring Trenches 13NE, 14, 15 and Room 6 (henceforth Concentration area A).
- The neighbouring Trenches 3 and 9 and the baulk between them, the baulk between Room 9 and Trench 3 and Trench 12 (henceforth Concentration area B)
- The neighbouring Trenches E and F and the baulk between them (henceforth Concentration area C)

<sup>37</sup> A bronze arrowhead of a relatively similar shape was found in Room IX of the West Gate area (Demakopoulou *et al.* 2004, fig. 17).

<sup>38</sup> Indeed a concentration of textile-related tools (two spindle whorls [SW1–2], one perforated sherd [PS2], and one multifunctional tool [C3]) was also found in Trench 1, situated on one of the middle terraces of the citadel north-west of the East Gate (see Fig. 1). The area was probably levelled in Byzantine times for agricultural purposes as suggested by the mixture of diagnostic material from various periods and the characteristics of the layers (Demakopoulou *et al.* 2002, 54–55). Since it does not seem possible to propose any clear understanding as to the function of this space, this concentration is not taken in for further considerations.

## CONCENTRATION AREA A

### The archaeological context

Concentration area A (Fig. 3) includes at least one room (6) and an outdoor (?) space to the west and south-west of it. The area has not been entirely excavated and the relation between the various structures is not definitively understood.

Room 6 was excavated in the early 1980s,<sup>39</sup> but not completely. The south-western scarp which had not been investigated was removed in 2005 and revealed under the dark brown topsoil layer (1) the fine textured Mycenaean destruction layer (2) with a high content of ashes.<sup>40</sup> Diagnostic material from the room dates to the LH III period, with one cup dating to LH IIIB2. Two stone steps leading down into the room were also uncovered.<sup>41</sup> In Layer 2 from the south-western scarp of Room 6, one stone hand tool was also recovered.<sup>42</sup>

Trench 14 is a long trench parallel to the long side of Room 6.<sup>43</sup> Excavations in its south end revealed under a loose dark soil (Layer 2) the fine ashes of the Mycenaean destruction layer (3). Underneath this destruction layer a pavement (Layer 4) could be associated with the neighbouring Rooms 6 and 7.<sup>44</sup> It rests on reddish soil (Layer 5) that continues down to the bedrock. An exceptional find was discovered in Layer 3. It is a plaque covered with gold foil, decorated with Argonauts and dots and executed in granulation technique, which suggested either the presence on the site of elite artisans, or alternatively of individuals with high status.<sup>45</sup>

Trench 13NE is an extension of Trench 13 which was excavated with the aim to better understand the situation west of Rooms 6 and 7, but no structures from the Mycenaean times emerged.<sup>46</sup> In the Mycenaean debris from the trench there were several fragments of heavy vessels, the base of a pithos, and a miniature female figurine.<sup>47</sup>

Trench 15 is a triangular trench which connects Trenches 13NE and 14. Like the other two it was rich in pottery dating to different periods. As far as architectural features are concerned, it contains traces of the same stone packing which started in Trench 14 and either ends in Trench 13 or continues under the platform.<sup>48</sup>

<sup>39</sup> Åström 1983.

<sup>40</sup> Demakopoulou *et al.* 2008a, 26–27.

<sup>41</sup> Demakopoulou *et al.* 2008a, 27.

<sup>42</sup> Demakopoulou *et al.* 2008a, 26.

<sup>43</sup> Demakopoulou *et al.* 2008a, 27–28.

<sup>44</sup> Demakopoulou *et al.* 2009, 29–30.

<sup>45</sup> Schallin, 2016, fig. 11.

<sup>46</sup> Demakopoulou *et al.* 2008b, 29.

<sup>47</sup> Demakopoulou *et al.* 2008b, 29.

<sup>48</sup> Demakopoulou *et al.* 2008b, 29.



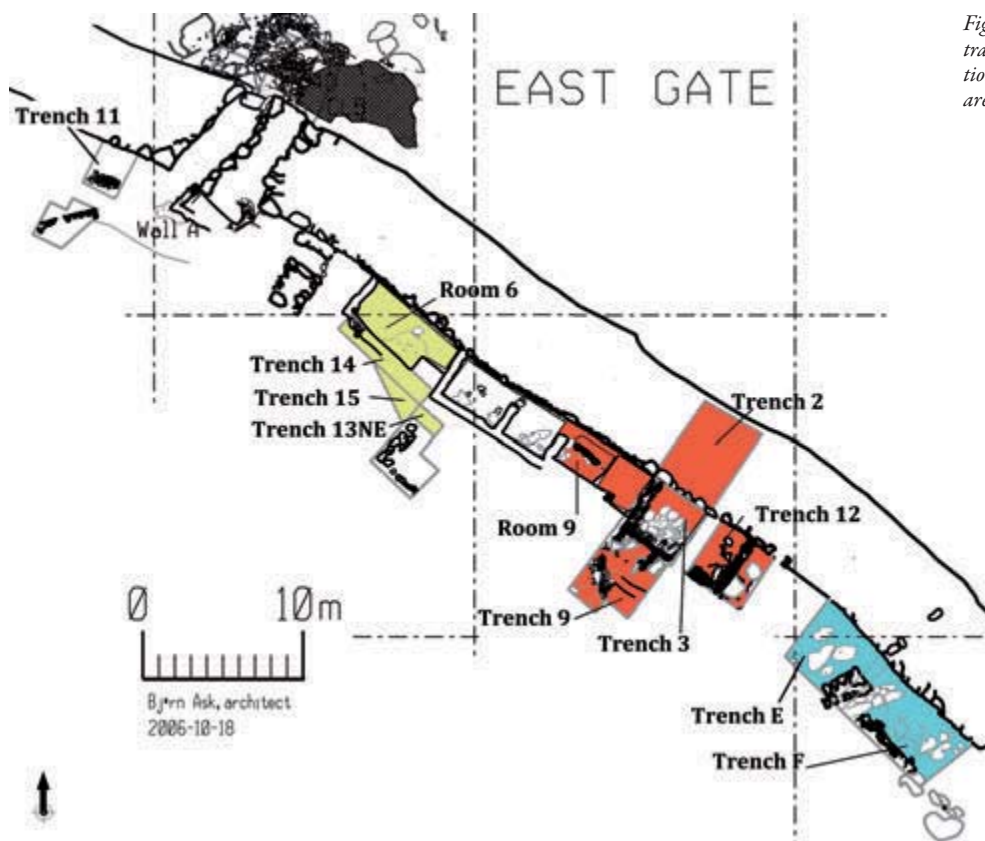


Fig. 3. The East Gate area with Concentration area A (in yellow), Concentration area B (in red) and Concentration area C (in light blue).

Table 2. Distribution of the textile-related finds from Concentration area A (item marked with \* is from disturbed layers).

| Room 6 SW-scarp | Trench 14      | Trench 13NE    | Trench 15      |
|-----------------|----------------|----------------|----------------|
| LW 1 (Layer 2)  | SW24 (Layer 4) | C2 (Layer 2)   | S2* (Layer 1)  |
| PS3 (Layer 2)   | SW23 (Layer 3) | SW23 (Layer 3) | SW26 (Layer 4) |
|                 |                | N2 (Layer 3)   |                |

### The textile-related tools

Ten textile-related tools come from Concentration area A (Table 2). They hint at weaving practices (the possible loom weight [LW1]), spinning (a perforated sherd [PS3], four spindle whorls [SW23–26] and one possible spindle [S2]) as well as at other activities (C2 and N2).

### CONCENTRATION AREA B

#### The archaeological context

None of the trenches included in Concentration area B (Fig. 3) has yet been entirely excavated. Therefore the relationship between the unexcavated walls still needs to be completely established.

Room 9 was partly excavated in the 1980s,<sup>49</sup> but never published in any detail. The baulk between Room 9 and Trench 3 was removed in order to complete previous excavations in the area. Under the baulk, the evidence of a possible opening/entrance to Room 9 at the conjunction between Walls A and B appeared; however, the presence of a few lower courses of stones might signify that it rather was just an indentation in the wall or that an earlier structure was situated there.<sup>50</sup> The textile-related finds come from Layer 4 which contained destruction ashes and is rich in pottery, animal bones, and other

<sup>49</sup> Åström 1983.

<sup>50</sup> Demakopoulou *et al.* 2009, 27.

Table 3. Distribution of textile-related tools from Concentration area B (items marked with \* are those from disturbed layers).

| Baulk R 9/ T 3   | Trench 3         | Trench 9         | Baulk T9/T3    | Trench 12              |
|------------------|------------------|------------------|----------------|------------------------|
| F27–29 (Layer 4) | SW4* (Layer 2)   | SW11* (Layer 1N) | SW30 (Layer 2) | SW15* (Layer 1)        |
| TS4 (Layer 4)    | SW5–10 (Layer 3) | BB3* (Layer 1N)  | PB1 (Layer 2)  | SW21* (Layer 2)        |
| N1 (Layer 5)     | PS4 (Layer 3)    | SW12 (Layer 3)   |                | SW34* (Layer 2)        |
|                  | C1 (Layer 3)     |                  |                | SW18–19, 22* (Layer 3) |
|                  |                  |                  |                | N3* (Layer 3)          |
|                  |                  |                  |                | S1* (Layer 3)          |
|                  |                  |                  |                | SW16–17 (Layer 4)      |
|                  |                  |                  |                | TS1–3 (Layer 4)        |
|                  |                  |                  |                | BB1–2 (Layer 4)        |
|                  |                  |                  |                | SW20 (Layer 5)         |

finds such as charred seeds and figs. The diagnostic material dates Layer 4 to LH IIIB2 at the latest.<sup>51</sup>

Trench 3 includes part of a room parallel to the citadel fortification and is surrounded by walls to the west (Wall 1) and south (Wall 2). A third wall (Wall 3) lies parallel to Wall 2, and its function is not yet clear. The excavation seems to have reached the floor of the room, which was probably uneven and partly constituted by the bedrock.<sup>52</sup> Three layers were distinguished: Layer 1 consisting of dump material from previous excavations; Layer 2 consisting of dark topsoil layer with disturbances from various periods; and Layer 3 which is the ashy layer with destruction material dating the stratum to LH IIIB2 at the latest.<sup>53</sup>

Trench 9 and the baulk between Trenches 9 and 3 are situated immediately to the east of Trench 3. The presence of walls here revealed one of the most interesting features of the whole area, which is the possible presence of structures parallel to those which are attached to the fortification.<sup>54</sup> Layer 1N in Trench 9 contained material from earlier excavations that had been dumped,<sup>55</sup> while Layer 3 contained the LH destruction material. Layer 2 from the baulk between Trench 3 and 9 contained large pottery fragments and diagnostic ceramics;<sup>56</sup> there were also as many as four Mycenaean stirrup jars dated to the LH IIIB2 horizon.<sup>57</sup> No structures were revealed when the baulk was removed.

Trench 12 lies immediately to the south of Trench 3 and a 1 m wide baulk was left between them.<sup>58</sup> Trench 12 includes a wall which seems the continuation of Wall 1 in Trench 3. Despite the baulk between them, it seems clear that Trench 12 and Trench 3 contain the same large room.<sup>59</sup> Five layers have been identified in this trench:<sup>60</sup>

- the upper layer (1) which contained dumped soil from previous excavations,
- Layer 2, which is topsoil with mostly LH III diagnostic material, but also one Byzantine ceramic fragment,
- 3 layers containing the ashy soil of the LH IIIB2 destruction, which have been interpreted as including material from higher up on the hill (Layer 3), from the upper floor (Layer 4), and from the ground floor of the room (Layer 5).<sup>61</sup> Layers 3–5 all contained diagnostic material dating to the LH IIIB2 at the latest.

#### The textile-related tools

As many as 36 tools that may have been used in the production of textiles come from this area (Table 3). Most of them come from the large room which has been uncovered under Trenches 3 and 12 (Fig. 3). They hint at both weaving practices (the possible pin beater [PB1]), and spinning (21 spindle whorls [SW4–12, 15, 18–22, 27–30, and 34], a perforated sherd [PS4], four sherds which were possibly intended to be

<sup>51</sup> Demakopoulou *et al.* 2009, 27.

<sup>52</sup> Demakopoulou *et al.* 2002, 56–58; 2004, 26.

<sup>53</sup> Demakopoulou *et al.* 2002, 57–58; 2004, 26–28.

<sup>54</sup> Demakopoulou *et al.* 2009, 27–28; 2010, 24–25.

<sup>55</sup> Demakopoulou *et al.* 2009, 23.

<sup>56</sup> Demakopoulou *et al.* 2005, 33.

<sup>57</sup> Demakopoulou *et al.* 2009, 28.

<sup>58</sup> Demakopoulou *et al.* 2005, 34.

<sup>59</sup> Demakopoulou *et al.* 2010, 29.

<sup>60</sup> Demakopoulou *et al.* 2010, 25–31.

<sup>61</sup> Demakopoulou *et al.* 2010, 31.

Table 4. Distribution of other finds from Concentration area B (the items marked with \* are those from disturbed layers).

| <i>Baulk R9/T3</i>             | <i>Trench 3</i>             | <i>Baulk T9/T3</i>         | <i>Trench 12</i>                          |
|--------------------------------|-----------------------------|----------------------------|---|
| 1 faience bead (Layer 4)       | 7 faience bead (Layer 3)    | 1 cylinder seal* (Layer 2) | 1 spool shaped weight* (Layer 2)          |
| 1 bone relief plaque (Layer 4) | 2 faience plaques (Layer 3) |                            | 1 grinding stone* (Layer 3)               |
|                                | 1 antler handle (Layer 3)   |                            | 5 blue faience beads (Layer 4)            |
|                                | 1 pounder (Layer 3)         |                            | 1 mould shaped glass plaque (Layer 4)     |
|                                | 1 quern (Layer 3)           |                            | 1 quern (Layer 4)                         |
|                                |                             |                            | Several unspecified stone tools (Layer 4) |

perforated [TS1–4] and a possible spindle [S1]). The presence of other activities performed in the area might be hypothesized on the base of a number of multifunctional tools (such as needles [N1 and 4], piercing devices [C1], and bronze blades [BB1–2 and BB3]).

#### Other relevant small finds

During the excavations in this area a significant number of the so called “small finds” were recovered (Table 4), including faience beads and decorative plaques which could have been made, stored, or used in the area. All these items could have various decorative purposes including that of adorning fine garments. A fine spool-shaped stone object (probably a weight) was also recovered from Layer 2 in Trench 12 (see also *Pl. 4D*). Indeed the area was generally rich in other types of finds; at least seven Mycenaean female figurines have also been found: three from Layer 4 in the baulk between Room 9 and Trench 3 and four from Layer 2 in Trench 3. In the latter also vessels made of lead, pithoi, and one bovine figurine were found.

### CONCENTRATION AREA C

#### The archaeological context

Concentration area C (*Fig. 3*) includes Trenches E and F which were both partly excavated during the 1980s.<sup>62</sup> As in Concentration areas A and B, this area also most probably includes rooms which were immediately adjacent the citadel wall south of the East Gate; however the relation between the visible walls is difficult to interpret. The area is hard to interpret also because it contains mixed layers.<sup>63</sup> Pottery was nonetheless abundant. Other relevant finds from the area are three

figurine fragments, one hemispherical plaster object, one bone lid, and one round stone of uncertain function.

#### The textile-related tools

Of the four textile-related tools from the area, two (SW3 and PB2) come from surface cleaning, while two (SW31 and 33) come from Layer 2 in the baulk between Trenches E and F and Trench F respectively.<sup>64</sup>

### Concentration area B: further observations

The analysis of the archaeological contexts in which textile-related tools from the East Gate were found shows that, despite those tools being widely spread, some more consistent concentrations of them could be identified. Due to the relatively abundant material in combination with distinct chronological, contextual, and stratigraphical data it has been considered profitable to examine more in detail Concentration area B.

Concentration area B (see *Fig. 3*) includes Room 9 (although the excavation data used in this study come only from the southernmost part of it), the adjacent room which emerged in the excavation of Trenches 3 and 12 and the outdoor (?) area between them and the possible structure that might have existed in front of them.<sup>65</sup> Both rooms were built against the fortification wall of the citadel, which also represents their eastern wall.

Following the preliminary report of the excavation, it seems that the rooms were part of a several-storey building.<sup>66</sup> The numerous lime pellets and traces of plaster from some of

<sup>62</sup> Åström & Demakopoulou 1986, 19–20; Åström *et al.* 1988, 7.

<sup>63</sup> Demakopoulou *et al.* 2005, 31–33.

<sup>64</sup> Demakopoulou *et al.* 2005, 32–33.

<sup>65</sup> Demakopoulou *et al.* 2009, 24–25.

<sup>66</sup> Demakopoulou *et al.* 2010, 31.

the layers have been interpreted as evidence for upper floors.<sup>67</sup> The ground floor of these structures is not flat but rather respects the morphology of the hill, visibly incorporating the bedrock.<sup>68</sup> Accordingly it is likely that such rooms with uneven bedrock floors were more suitable for storage or eventually as working spaces of some sort rather than for proper living.

It has been suggested that due to the morphology of the hill some of the finds (in particular from Layer 3 in Trench 12) and construction material could have rolled down toward the fortifications that stopped them, from buildings that once possibly existed higher up on the hill.<sup>69</sup> However, even excluding all the finds from the layer (3) with possibly intrusive material, Concentration area B contained a significant number of finds in general (*Tables 3 and 4*), and of textile-related tools in particular (*Table 3*), all datable to LH IIIB2 at the latest. Unless these objects were just stored there, the characteristics of the material suggest that a multifunctional unit might have been situated in the area and that textile manufacture was also one of the performed activities. It is however difficult to postulate the scale and/or organization of any such activities.

### SPINNING

The likelihood that spinning took place in the area is suggested by the presence of numerous spindle whorls and a perforated sherd (*Table 3*). The whorls belong to type 1 (SW5, 7–9, 12, 17, 27–28), 2 (SW30), 3 (SW10 and 29), 5 (SW20), and 6 (SW6) of this study. An estimate of their original weight is available for ten of these items and shows a considerable variation between 4 g and 27 g. Five whorls weigh 10 g or less, three are between 15 and 19 g, and two between 23 and 27 g. It can be argued that threads of various kinds could be spun in the area, including very fine ones.<sup>70</sup>

### WEAVING

That weaving took place in the area might be hypothesized due to the presence of a possible pin beater (PB1) and by the consideration that weaving might not necessarily have been done with warp-weighted looms.<sup>71</sup>

<sup>67</sup> Demakopoulou *et al.* 2010, 30.

<sup>68</sup> Demakopoulou *et al.* 2003, 26–27.

<sup>69</sup> Demakopoulou *et al.* 2010, 31.

<sup>70</sup> About weight and size of spindle whorls and related thickness of the spun threads see Andersson Strand *et al.* 2006; Mårtensson *et al.* 2006b; Olofsson *et al.* 2015.

<sup>71</sup> Barber 1991, 79–91.

### OTHER ACTIVITIES

If we acknowledge that textile production might have taken place in the area, the tanged knife (BB1–2) and a likely piercing tool (C1) found there might have been used to cut threads during the manufacture of yarn and cloth or to pierce both clothing and other objects possibly used to decorate or furnish garments. Both the knife and the piercing tool can of course be used in other activities. At least four grinding stone devices (see *Table 4*) should also be taken into account when attempting to reconstruct the other possible pursuits that were performed in the area, although no further interpretation as to their function is yet available. The presence of faience beads, a bone plaque with a relief design, and two glass plaques with sideways perforations allowing them to be, for example, sewn onto a cloth suggest that precious accessories may have been stored, used, or even produced in the area.

Two more finds deserve further attention suggesting the presence of some form of control/management activity. The first is a cylinder seal which comes from Layer 2 in the baulk between Trenches 9 and 3. Cylinder seals are generally considered as belonging to individuals and used to mark possession and/or to guarantee the quality of specific goods. They are therefore generally believed to constitute evidence for production and/or trade. The first examples are known in the Near East during the 4th millennium BC, but they remain relatively common, at least in the Aegean and eastern Mediterranean, during the whole Bronze Age.<sup>72</sup> The second noteworthy find is a spool-shaped stone object from Layer 2 in Trench 12 (*Pl. 4D*). The context is unfortunately disturbed and it is therefore not possible to securely associate this find to the others discussed so far. However, its presence at Midea is interesting *per se*. The stone object has a close parallel to similar items which have been convincingly interpreted as balance weights and which were in use in the whole eastern Mediterranean during the 3rd millennium BC.<sup>73</sup> This spool-shaped stone item is partly damaged and weighs 103 g; its original weight is estimated to have been c. 110 g, which suggests a link with a typologically similar find from the Early Bronze Age (EBA) layers of the neighbouring town of Tiryns. The latter weighs 55.1 g, hence approximately half as much. The EBA spool-shaped objects from Tiryns are interpreted as balance weights that conformed to a weight unit slightly above 9 g.<sup>74</sup> Another similar spool-shaped stone item also from Midea raised the issue of whether it had been collected as a curiosity or was still used as a weight so far into the 2nd millennium.<sup>75</sup> This item from a possible multifunctional unit in the East Gate area would rather support the second hypothesis.

<sup>72</sup> Collon 1987.

<sup>73</sup> Rahmstorf 2010.

<sup>74</sup> Rahmstorf 2010, 89.

<sup>75</sup> Demakopoulou *et al.* 1999, 57–58; Rahmstorf 2010, 98.

## Multifunctional units and textile production at the East Gate?

The archaeological evidence which could be connected to possible textile production from the East Gate area at Midea is not unproblematic. It should be also recalled that most of the structures under examination are known through preliminary reports and have not been completely excavated, thus limiting our understanding of their function and of the material uncovered within them. Despite all the limitations, the analysis of all the finds possibly related to textile production suggests that there might have been at least one multifunctional unit (Concentration area B) along the inner wall of the citadel immediately south of the East Gate, at least until the end of LH IIIB2. The characteristic of the archaeological evidence, severely affected by the LH IIIB2 destruction and the later use of the site, does not provide exact information on the context of provenance (e.g. position) of the finds and there are therefore no unequivocal indications about scale and economic significance of this potential working and/or storage area; however the characteristics of the textile tools suggest that among other things the manufacture of fine yarn might have taken place there. Evidence for weaving practices is scanty and suggests indeed that weaving was either not a relevant activity or that it was performed with types of looms other than the vertical warp-weighted one. Such possibility is actually supported by the likely presence of pin beaters, which, as discussed, are weaving tools that can be used in various types of looms. That fine yarn and/or garments could have been produced, alternatively stored or consumed in the East Gate area might be indirectly inferred due to the presence of precious finds such as faience beads, and glass, bone and ivory plaques,<sup>76</sup> all of which could have been used to decorate or complement fine garments.

## Comparative evidence for multifunctional units including textile tools

The hypothesis put forward in this work of at least one multifunctional unit in the East Gate area, where the production of textiles could have taken place, appears corroborated by the recurrent presence of similar archaeological evidence in other excavated sectors on the same citadel of Midea as well as in other Mycenaean sites.

<sup>76</sup> Indeed an ivory object with a palm motif (Schallin 2016, fig. 12), possibly an inlay of some sort, was found in Trench 11 immediately northwest of the East Gate (Demakopoulou *et al.* 2005, 30) in what has been interpreted as a large stone paved area (Demakopoulou *et al.* 2004, 26) most likely created in LH IIIB when the East Gate was built.

## MULTIFUNCTIONAL UNITS AT MIDEA

Concentrations of textile-related finds similar to those from the East Gate area can be found in three other sectors also from the citadel of Midea: in the West Gate area, in the Lower Terrace, and in the Megaron complex.

Along the citadel wall, to the west of the West Gate, one large room (VI) divided in two (VIa and VIb) by a short cross wall provided strong indications of storage and workshop activities including textile production.<sup>77</sup> Textile production has been inferred on the basis of the presence of 25 spindle whorls. Given the generally light weight of the whorls from this room it has been also postulated that very fine threads were spun there. The room contained also a large number of pestles and grinding stones.<sup>78</sup> A Linear B inscribed stirrup jar and a clay nodule with the “wheat” ideogram were also found, suggesting that some form of recording/administrative activity was taking place in the space. Next to Room VI, Room VII was also excavated and interpreted as a sort of production space containing vessels of various types and 15 spindle whorls. The whorls from Room VII are generally heavier than those from Room VI, thus suitable for the spinning of coarser yarn than that produced in the neighbouring room.<sup>79</sup> In a very similar fashion to that seen at the East Gate the row of basement rooms along the citadel fortification continues after Room VII with Room VIII divided in a similar fashion to Room VI in two parts (VIIIa and VIIIb). Vessels, pestles, and grinding devices together with as many as eight spindle whorls were recovered in Room VIII. The whorls from this space, as those from Room VI, suggest spinning of relatively light threads. Similarly to Concentration area B from the East Gate bone, glass, and ivory items were also found in Room VIII.<sup>80</sup>

Another possible multifunctional unit was identified in Rooms II and IX of the Lower Terrace excavation at Midea.<sup>81</sup> Like Concentration area B in this study and the above-mentioned rooms from the West Gate area, Rooms II and IX were also located along the citadel fortification. Due to the significant concentration of small finds and stone tools the excavators suggested that processing of some sort (food, dye, and/or various materials) was taking place in these rooms.<sup>82</sup> The possibility that textile production also took place in these rooms was postulated due to the presence of 14 spindle whorls.

Numerous spindle whorls have been also found in different layers within the various rooms of Midea’s so called Mega-

<sup>77</sup> Demakopoulou *et al.* 2015.

<sup>78</sup> Demakopoulou *et al.* 1999; Demakopoulou 1998; 1999; Demakopoulou *et al.* 2015, 248.

<sup>79</sup> Demakopoulou *et al.* 2015, 250.

<sup>80</sup> Demakopoulou *et al.* 2015, 251.

<sup>81</sup> Ostenson 1998, 166.

<sup>82</sup> Ostenson 1998, 166.

ron complex.<sup>83</sup> If such whorls were not just stored there, their widespread occurrence suggests that spinning was taking place in the Megaron, and across time periods as well. An interesting concentration of textile-related implements was found in an area consisting of two adjacent rooms (VII and XVI) immediately to the north of the Megaron complex. They probably constituted the lower floor of a building which was separated from the Megaron by an open space or passage/street.<sup>84</sup> Both rooms were built during the first phase of the LH IIIB period and were also affected by the reconstruction of the area dated to the second LH IIIB phase.<sup>85</sup> Of great interest is the presence of three nodules under and above the LH IIIB floor in Room VII suggesting that recording and/or administrative activities might have taken place there.<sup>86</sup>

As far as finds are concerned, five spindle whorls have been found in the LH IIIB layers from Room VII.<sup>87</sup> Found together with the whorls and also datable to LH IIIB were four millstones,<sup>88</sup> two bones awls,<sup>89</sup> three glass beads,<sup>90</sup> one possible bracelet, one bronze sheet fragment, one lead ring, a strip with a lead rivet, and a lump of lead.<sup>91</sup> Two spindle whorls, four perforated sherds, large fragments of pithoi, three small beads, one rectangular bone plaque, and a large number of animal bones dating to the LH IIIB period were retrieved from the neighbouring Room XVI. Close to the entrance of the same room there was a bone awl, and a number of small lumps of yellow ochre.<sup>92</sup> The finds from the area suggest that the building might have contained a multifunctional unit. In this respect it is interesting to mention that in Room XXVI, one of the closest structures to the east of the building formed by Rooms VII and XVI and apparently partly connected to it by Wall 59A,<sup>93</sup> two spindle whorls, a blade, red ochre, and an ivory offcut all dating to the LH IIIB period were found. Another ivory offcut, unfortunately from a disturbed context, was found in the nearby Room XX of the Megaron area; both finds have been used to suggest that ivory articles might have been manufactured at Midea.<sup>94</sup>

In conclusion, it seems that significant concentrations of textile-related tools were to be found at different locations along the inner side of the citadel wall, in the Lower Terrace,

and in the Megaron complex. As with Concentration area B at the East Gate, all these concentrations are characterized by a relatively limited number of textile-related tools, mostly spindle whorls and the contemporary presence of other small finds and/or tools of various natures including pestles and grinding stones. In addition, some form of administrative activity seems to have taken place in at least three of the discussed locations: Room VII in the Megaron complex (three nodules), Room VI in the West Gate area (a Linear B inscribed stirrup jar and a clay nodule), and in Concentration area B of this study (a balance weight and cylinder seal). Hence, if any textile production took place at Midea it most likely occurred in several parts of the citadel and was carried out parallel to other (productive?) activities including administrative practices.

#### MULTIFUNCTIONAL UNITS IN OTHER MYCENAEAN SITES

One of the first and most comprehensive overviews of Mycenaean textile manufacture is to be found in the unpublished PhD thesis by Carington Smith from 1975. The work spans several periods, but regarding the LH phases it has the merit to present not only the widespread presence of textile tools on mainland Greece, but also a critical discussion of the archaeological contexts in which they were found. The work also discusses the apparent lack of specifically allocated areas for textile manufacture and how, judging from the available archaeological evidence, the latter seemed to have coexisted with other activities.<sup>95</sup> As to the evidence for multifunctional units in which textile production could have also been carried out, important parallels to the situation discussed for the East Gate at Midea can be found in particular at the mainland Mycenaean sites of Tiryns in Argolis, and Thebes in Boeotia.

At Tiryns, which is generally considered one of the most important Mycenaean centres of the Argive Plain after Mycenae itself,<sup>96</sup> studies on the distribution of small finds and textile-related implements show a situation somewhat close to that discussed so far for Midea.<sup>97</sup> The archaeological evidence from the Lower Citadel shows not only the existence of textile manufacture during the Palatial period prior to the LH IIIB destruction,<sup>98</sup> but also that this was most likely widespread throughout those contexts that have been excavated. The most common textile-related implements appear to be spindle whorls/conuli, which were found in most rooms and

<sup>83</sup> Walberg 2007, 188, 196–198, 334–338.

<sup>84</sup> Walberg 2007, 69 and pl. A.

<sup>85</sup> According to the excavator, in the second LH IIIB phase Room VII got a new floor, while Room XVI was enlarged; see Walberg 2007, 197.

<sup>86</sup> Walberg 2007, 179, 197.

<sup>87</sup> Walberg 2007, 30–33.

<sup>88</sup> L72, L111–113 in Walberg 2007, 309–312.

<sup>89</sup> B19–20 in Walberg 2007, 294.

<sup>90</sup> G31–33 in Walberg 2007, 305.

<sup>91</sup> M100, 146, 162, 165, 214 in Walberg 2007, 320.

<sup>92</sup> Walberg 2007, 58–59.

<sup>93</sup> Walberg 2007, pl. A.

<sup>94</sup> Reese 2007, 399.

<sup>95</sup> An interesting case for multifunctional activities was detected in the so called “House of the Oil Merchant” (Carington Smith 1975, 487–488) where a considerable number of textile-related tools were also found.

<sup>96</sup> Maran 2001; 2009; Pullen 2013; Voutsaki 2010.

<sup>97</sup> Rahmstorf 2008; Rahmstorf *et al.* 2015; Siennicka 2014.

<sup>98</sup> Rahmstorf *et al.* 2015.

layers of the Lower Town, and often associated, as at Midea, with a variety of other small finds.<sup>99</sup> Again as at Midea, the coexistence of spindle whorls and beads, pendants and decorative items is also widely documented.<sup>100</sup> Yet there are no major concentrations of textile-related finds. No more than *c.* ten spindle whorls or conuli were retrieved from any of the excavated contexts, clearly suggesting the lack of specialized workshops.<sup>101</sup> As to the kinds of textile-related activities that were possibly carried out, at Tiryns, as at Midea, the lack of loom weights during the LH III B period has been used to suggest the local predominance of spinning practices. The taxonomic characteristics of the analysed spindle whorls suggest that if several different kinds of threads could be spun, a clear emphasis was apparently put on the manufacture of fine and very fine fabrics. It has therefore been pointed out that LH III B textile production at Tiryns most probably required skilled textile workers and was a considerably time-consuming activity.<sup>102</sup>

A recent analysis of the textile-related archaeological evidence from Thebes in Boeotia also shows an interesting parallel to the situation discussed for the material at Midea. Despite difficulties due to the very partial understanding of the Mycenaean town of Thebes, which lies right under the homonymous modern Greek town, the finds from the excavated plots suggested the presence of small-scale and decentralized multifarious production units widespread within the citadel fortifications.<sup>103</sup> It seems also clear that during the Late Palatial period (LH III B2) there was in each of the numerous investigated units a consistent emphasis on high-quality and specialized crafts being carried out side by side in the same spaces. Every one of the investigated units also contained a number of textile-related tools and thus, if they were not just stored there for further distribution, probably encompassed textile production as well.<sup>104</sup> As at LH III B Tiryns and Midea among the investigated textile-related tools from Thebes there is a preponderance of spindle whorls/conuli, suggesting an emphasis on spinning activities. The taxonomic characteristics of the whorls also suggest that various types of threads could

have been spun in the town, although a significant attention was given to the production of thin threads/yarn.<sup>105</sup>

Indeed there is an ongoing debate as to how to identify workshops and distinguish them from storage rooms and/or administrative units in Mycenaean citadels, to which the present material from the East Gate area at Midea can only add fuel for further discussions.<sup>106</sup> The examined evidence from Midea, Tiryns in Argolis, and Thebes in Boeotia suggests that multifunctional units, characterized among other things by the presence of a limited number of textile-related tools, might have been rather widespread within Mycenaean citadels until the LH III B period. The general emphasis on relatively light spindle whorls in most of those units suggests also that fine threads might have been preferably<sup>107</sup> spun within the fortification wall, indirectly hinting at the presence of *intra mura* specialized and skilled labour forces.<sup>108</sup> One major problem regarding textile production in the Mycenaean world still stands though: there is a vivid contrast between abundant written evidence for large-scale textile production, and the apparent lack of storehouses for textiles and raw materials and of the to-be-expected large-scale workshop or industrial areas on the LBA Greek mainland.<sup>109</sup> Such discrepancy has been recently interpreted as an indication for textile manufacture probably carried out extensively in many different places and ways and maybe having been undertaken in small settlements rather than in major centres.<sup>110</sup> The widespread presence of spindle whorls in the hinterland site of Nichoria, in Messenia, demonstrates that spinning was definitely undertaken outside citadels.<sup>111</sup> Additionally, the whorls from Nichoria also include light items suggesting that the production of fine yarn was not necessarily restricted to citadel workshops. Different from spinning, the archaeological evidence for weaving does not appear very consistent in any of the discussed sites. The apparent lack of loom weights during in particular the Palatial period has been interpreted in the case of Tiryns as a possible indicator of weaving taking place outside the citadel.<sup>112</sup> The very same absence of loom weights is also attested at Mycenae.<sup>113</sup> More evidence is needed to fully understand the issue, though if

<sup>99</sup> Slightly over 150 spindle whorls and almost 300 stone conuli have been recorded at Tiryns in the layers corresponding to LH III B and C, thus not all of them contemporary to the evidence discussed in this paper. The number of securely dated items does seem to be around 80 pieces.

<sup>100</sup> Rahmstorf 2008, pls 125, 127, 133, 134.

<sup>101</sup> Rahmstorf 2008; Siennicka 2014.

<sup>102</sup> Rahmstorf *et al.* 2015, 276.

<sup>103</sup> Alberti *et al.* 2012.

<sup>104</sup> As at Tiryns and Midea, the number of spindle whorls/conuli and other possible textile-related finds is relatively low in each unit, from a very few items as in the Loukou plot up to the 23 whorls from the Kofini plot (Alberti *et al.* 2012), hence suggesting once again specific and limited production, if any.

<sup>105</sup> Alberti *et al.* 2012; forthcoming.

<sup>106</sup> Bendall 2003; Brysbaert 2014; Tournavitou 1988; 1997.

<sup>107</sup> Heavier spindle whorls are less plentiful in the discussed context, but they do exist and so coarser threads might have been also produced.

<sup>108</sup> As it has been demonstrated by experiments done at The Centre for Textile Research of Copenhagen spinning fine yarn with light whorls requires a skilled spinner, see Andersson Strand *et al.* 2006; Mårtensson *et al.* 2006a; Olofsson *et al.* 2015.

<sup>109</sup> Tournavitou *et al.* 2015, 262.

<sup>110</sup> Burke 2010b; Siennicka 2014.

<sup>111</sup> Aprile 2013; Burke 2010b, 437; Carington Smith 1975; 1992.

<sup>112</sup> Brysbaert 2014; Rahmstorf 2008; Siennicka 2014.

<sup>113</sup> Tournavitou *et al.* 2015.

one considers the possibility of a controlled skilled production of fine yarn within citadel walls, the possibility that different looms than the vertical warp-weighted ones might have been in use should not be ruled out, since it would have allowed control to be maintained on this phase of the textile production also.<sup>114</sup>

## Local productions, costly signalling, and Mycenaean political economy: Concluding thoughts

It is widely accepted that the élite in the Mycenaean society made extensive use of prestige commodities as identity markers to distinguish itself from the non-palatial population.<sup>115</sup> It has been argued that pictorial evidence from Mycenaean wall paintings hint at a great use of colourful and precious clothing as means for palatial élite to achieve what appears to be a standardized beauty ideal with deep “ideological and legitimizing connotations”.<sup>116</sup> Indeed the importance of prestige goods in relation to the performance of social and political authority has occupied a great number of archaeological studies in particular when dealing with the complex relation between core and peripheries in terms of difference in access/control of prestige commodities.<sup>117</sup> In signalling theory the use of conspicuous consumption is considered one of the possible forms of symbolic communication aiming to provide social benefits for those who are able to perform it.<sup>118</sup> Costly signalling is traditionally interpreted as a sign of social status, but as it has been pointed out social status is something that is obtained by the perception that one manages to provoke amid a chosen public/audience rather than something that is displayed.<sup>119</sup> Costly signalling is therefore an attempt to communicate access to power and can be profitably seen in terms of striving for the acquisition of social and political benefits, including a high degree of social ranking and possibly access to leadership.<sup>120</sup>

It is argued that the material analysed in this work provides renewed food for thought to the ongoing debate on Mycenaean society and economy. Referring to signalling theory, it is tentatively proposed to interpret eventual textile productions within Mycenaean citadels in general,<sup>121</sup> and as to the scope of the present study in the East Gate area at Midea in particular, as an integrated part of the conspicuous consumption practices aiming at directly controlling the manufacture of what was to be displayed (in this case fine or precious garments). In other words if one sees the display of costly symbolic capital as part of a strategy performed by ruling élites to acquire social and political benefits, the existence of *intra muros* production of prestige items, including textiles, would usefully respond to a twofold strategy of control. On the one hand it would guarantee the presence *in loco* of skilled workers able to manufacture the sought garments and on the other hand it would also guarantee the direct management of the very final products which ultimately enabled conspicuous consumption practices.

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<sup>114</sup> The fact that both at Tiryns and at Thebes, during the later LH IIIC phase, there is a conspicuous presence of spool-shaped loom weights suggests that weaving of fine fabrics took place in the citadels after the LH IIIB. This might either be indicative of a turning point in textile manufacture or an indirect sign of resilience for an activity that was possibly performed with different techniques in earlier times.

<sup>115</sup> Bennet 2008; Davis & Bennet 1999; Gorzato 2012; Pullen 2013; Schallin 2012; 2016; Voutsaki 2001; 2010; Whittaker 2012; Wright 2004.

<sup>116</sup> Whittaker 2012, 195.

<sup>117</sup> E.g. Frankenstein & Rowland 1978, 80–81; Papadimitriou & Kriga 2013; Peregrine 2000; Sherratt & Sherratt 1991.

<sup>118</sup> Bliege Bird & Smith 2005; Veblen 1994 (1899).

<sup>119</sup> Boone 2000.

<sup>120</sup> See the discussion in Aprile 2013; Neilissen & Meijers 2011.

<sup>121</sup> Alberti, forthcoming; Alberti *et al.* 2012; Brysbaert 2014; Rahmstorf 2008; Siennicka 2014; Tournavitou 1988; 1997; Voutsaki 2001; 2010.



## Appendix: Catalogue of the textile- related finds from the East Gate excavations 2000–2009

### LOOM WEIGHTS

#### LW1 (*Pl. 3B, 3E*)

Inv. no.: 2005:T1.

Excavation date: 2005/07/04.

Provenance: Room 6, West scarp, Layer 2.

Material: Mycenaean coarse ware.

Preservation: Possibly complete.

Max. diam.: 80 mm. Hole diam.: 95 mm. Th.: 10–15 mm.

Weight: 100 g.

Shape: Discoid with indented profile.

Comments: Crafted out of the foot of a vessel.

### PIN BEATERS

#### PB 1 (*Pl. 3D, 3E*)

Inv. no.: 2004:B2.

Excavation date: 2004/07/08.

Provenance: Bulk between Trenches 3 and Room 9, Layer 2.

Material: Bone (possibly burnt ivory?).

Preservation: Incomplete, one end is missing; it is not possible to estimate the original length.

Max. length: 61 mm. Section: Squared in the expanded part, circular (diam. 1.90 mm) at the broken end.

Weight: 2 g.

Comments: Has a dark brown colour and a surface which suggests it is probably a burnt ivory find.

#### PB 2 (*Pl. 3D, 3E*)

Inv. no.: 2004:B5.

Excavation date: 2004/06/17.

Provenance: South Fischer trench, cleaning top of rubble next to West wall (apparently not excavated).

Material: Bone, Cervus elaphus antler (D. Reese, pers. comm. 2015/09/09).

Preservation: Incomplete, it is not possible to estimate its original length.

Max. length: 74 mm. Section: Irregular in the expanded part, circular (diam. 1.70 mm) at the broken end.

Weight: 2 g.

#### PB 3 (*Pl. 3D, 3E*)

Inv. no.: 2006:B2.

Excavation date: 2006/06/30.

Provenance: Trench 15, Layer 4.

Material: Bone.

Preservation: Complete.

Max. length: 82 mm. Section: Squared with smoothed edges at the blunt end, oval towards the narrower end.

### SPINDLE WHORLS

#### SW1 (*Pl. 1B*)

Inv. no.: T2001:4.

Excavation date: 2001/06/29.

Provenance: Trench 1, Layer 7, quadrant 8.

Material: Coarse ware.

Preservation: Approximately  $\frac{1}{3}$  is preserved.

Est. original max. diam.: 32 mm. Hole diam.: Not estimable.

Actual weight: 4 g. Est. original weight: 12 g.

Type: 2.

#### SW2 (*Pl. 1F*)

Inv. no.: 2001:T1.

Excavation date: 2001/06/27.

Provenance: Trench 1, Layer 7, quadrant 7.

Material: Coarse ware.

Preservation: Approximately  $\frac{1}{2}$  is preserved.

Max. diam.: 38 mm. Hole diam.: 8 mm.

Actual weight: 7 g. Est. original weight: 13 g.

Type: 6.

#### SW3 (*Pl. 1A*)

Inv. no.: 2004:W1.

Excavation date: 2004/06/21.

Provenance: North Fischer Trench, cleaning.

Material: Steatite.

Preservation: All edges are slightly chipped away.

Est. original max. diam.: 27 mm. Hole diam.: 4.5 mm.

Actual weight: 9 g. Est. original weight: 10 g.

Type: 1.

#### SW4 (*Pl. 1A*)

Inv. no.: L2002:33.

Excavation date: 2002/07/05.

Provenance: Trench 3, Layer 2 South + North.

Material: Steatite.

Preservation: *c.*  $\frac{1}{4}$  is missing.

Max. diam.: 23 mm. Hole diam.: 3.50 mm.

Actual weight: 9 g. Est. original weight: 12 g.

Type: 1.

**SW5 (PL 1A)**

Inv. no.: L2002:22.  
 Excavation date: 2002/07/03.  
 Provenance: Trench 3, Layer 3 South.  
 Material: Steatite.  
 Preservation: The widest face is slightly damaged.  
 Max. diam.: 18 mm. Hole diam.: 3.50 mm.  
 Weight: 5 g.  
 Type: 1.

**SW6 (PL 1F)**

Inv. no.: 2001:T2.  
 Excavation date: 2001/06/28.  
 Provenance: Trench 3, Layer 3.  
 Material: Coarse ware.  
 Preservation: c. 1/3 is missing.  
 Est. max. diam.: 32 mm. Est. original hole diam.: 8.50 mm.  
 Actual weight: 5 g. Est. original weight: 15 g.  
 Type: 6.

**SW7 (PL 1A)**

Inv. no.: L2002:34.  
 Excavation date: 2002/07/03.  
 Provenance: Trench 3, Layer 3 South (1.20 south scarp–2.10 fort).  
 Material: Steatite.  
 Preservation: Small splinters are chipped away.  
 Max. diam.: 19 mm. Hole diam.: 3 mm.  
 Weight: 4 g.  
 Type: 1.

**SW8 (PL 1A)**

Inv. no.: L 2001:13.  
 Excavation date: 2001/07/09.  
 Provenance: Trench 3, Layer 3 North.  
 Material: Steatite.  
 Preservation: The tip of the cone is missing and the surface is partly damaged.  
 Max. diam.: 28 mm. Hole diam.: 5 mm.  
 Actual weight: 18 g. Est. original weight: 19 g.  
 Type: 1.

**SW9 (PL 1A)**

Inv. no.: L2002:31.  
 Excavation date: 2001/07/01.  
 Provenance: Trench 3, Layer 3 South.  
 Material: Green steatite.  
 Preservation: One small splinter is chipped away at the bottom of the cone.  
 Max. diam.: 24 mm. Hole diam.: 4 mm.  
 Weight: 10 g.  
 Type: 1.

**SW10 (PL 1C)**

Inv. no.: L2002:17.  
 Excavation date: 2002/07/04.  
 Provenance: Trench 3, Layer 3 South.  
 Material: Steatite.  
 Preservation: Only a very small fragment of what supposedly was a rather large spindle whorl is preserved.  
 Max. diam.: Not estimable. Hole diam.: Not estimable.  
 Actual weight: 5 g. Est. original weight: Not estimable.  
 Type: 3.

**SW11 (PL 1A)**

Inv. no.: L 2002:23.  
 Excavation date: 2002/06/27.  
 Provenance: Trench 9, Layer 1 North.  
 Material: Steatite, burnt, with a whitish patina all over.  
 Preservation: Part of the max. diam. is chipped away.  
 Max. diam.: 22 mm. Hole diam.: 4 mm.  
 Weight: 11 g.  
 Type: 1.

**SW12 (PL 1A)**

Inv. no.: L 2002:12.  
 Excavation date: 2002/07/05.  
 Provenance: Trench 9, Layer 3 North East.  
 Material: Steatite.  
 Preservation: Only part of the base of the cone is preserved.  
 Max. diam.: 15 mm. Hole diam.: 2 mm.  
 Actual weight: 2 g. Est. original weight: Not estimable.  
 Type: 1.

**SW13 (PL 1A)**

Inv. no.: 2004:W6.  
 Excavation date: 2004/07/15.  
 Provenance: Trench 11 South, South West extension, Layer 2 surface.  
 Material: Steatite.  
 Preservation: The bottom of the cone is partly missing.  
 Max. diam.: 23 mm. Hole diam.: 4 mm.  
 Actual weight: 9 g. Est. original weight: 10 g.  
 Type: 1.

**SW14 (PL 1A)**

Inv. no.: 2004:W3.  
 Excavation date: 2004/07/08.  
 Provenance: Trench 11 South, South West extension, Layer 2.  
 Material: Green steatite.  
 Preservation: Very small splinters are chipped away.  
 Max. diam.: 17 mm. Hole diam.: 3 mm.  
 Weight: 5 g.  
 Type: 1.

**SW15 (Pl. 1B)**

Inv. no.: 2004:W2.  
 Excavation date: 2004/07/07.  
 Provenance: Trench 12, Layer 1.  
 Material: Steatite.  
 Preservation: Complete.  
 Max. diam.: 13 mm. Hole diam.: 2 mm.  
 Weight: 1 g.  
 Type: 2.

**SW16 (Pl. 1H)**

Inv. no.: 2009:L7.  
 Excavation date: 2009/06/29.  
 Provenance: Trench 12, Layer 4b, South West corner.  
 Material: Stone.  
 Preservation: Complete.  
 Max. diam.: 29 mm. Hole diam.: 2 mm.  
 Weight: 30 g.  
 Type: 8.  
 Comments: Hole diam. is very small in relation to the weight, thus its use as a spindle whorl is uncertain; it could also have been a weight or pendant.

**SW17 (Pl. 1A)**

Inv. no.: 2009:L6.  
 Excavation date: 2009/06/29.  
 Provenance: Trench 12, Layer 4a.  
 Material: Steatite, burnt and therefore with a whitish patina.  
 Preservation: The bottom of the cone is missing.  
 Max. diam.: 31 mm. Hole diam.: 4–6 mm at the widest.  
 Actual weight: 23 g. Est. original weight: Not estimable.  
 Type: 1.

**SW18 (Pl. 1A)**

Inv. no.: 2009:L4.  
 Excavation date: 2009/06/26.  
 Provenance: Trench 12, Layer 3B.  
 Material: Steatite.  
 Preservation: The bottom of the cone is partly damaged.  
 Max. diam.: 30 mm. Hole diam.: 4.50 mm.  
 Actual weight: 20 g. Est. original weight: 21 g.  
 Type: 1.

**SW19 (Pl. 1A)**

Inv. no.: 2009:L2.  
 Excavation date: 2009/06/24.  
 Provenance: Trench 12, Layer 3B.  
 Material: Green steatite.  
 Preservation: Complete.  
 Max. diam.: 16.50 mm. Hole diam.: 3 mm.  
 Weight: 4 g.  
 Type: 1.

**SW20 (Pl. 1E)**

Inv. no.: 2009:L15.  
 Excavation date: 2004/07/09.  
 Provenance: Trench 12, Layer 5B.  
 Material: Steatite.  
 Preservation: Complete.  
 Max. diam.: 27 mm. Hole diam.: 5.90 mm.  
 Weight: 15 g.  
 Type: 5.

**SW21 (Pl. 1E)**

Inv. no.: 2008:W2.  
 Excavation date: 2008/07/01.  
 Provenance: Trench 12, Layer 2.  
 Material: Coarse ware.  
 Preservation: The surface is slightly damaged.  
 Max. diam.: 34 mm. Hole diam.: 5.80 mm.  
 Weight: 20 g.  
 Type: 5.  
 Chronology: LH III.

**SW22 (Pl. 1E)**

Inv. no.: 2008:W3.  
 Excavation date: 2008/07/03.  
 Provenance: Trench 12, Layer 3.  
 Material: Terracotta.  
 Preservation: *c.* ¾ of the find is missing.  
 Est. max. diam.: 25 mm. Est. hole diameter: *c.* 4.50 mm.  
 Actual weight: 6 g. Est. original weight: 24 g.  
 Type: 5.  
 Chronology: Latest LH IIIB2.

**SW23 (Pl. 1D)**

Inv. no.: 2006:W1.  
 Excavation date: 2006/07/18.  
 Provenance: Trench 13 North East, Layer 3.  
 Material: Terracotta.  
 Preservation: *c.* ½ of the piece is missing.  
 Est. max. diam.: 35 mm. Est. original hole diam.: *c.* 6 mm.  
 Actual weight: 14 g. Est. original weight: 30 g.  
 Type: 4.

**SW24 (Pl. 1A)**

Inv. no.: 2007:W4.  
 Excavation date: 2007/07/05.  
 Provenance: Trench 14 South end, Layer 4.  
 Material: Steatite.  
 Preservation: The bottom of the cone is partly damaged.  
 Max. diam.: 25 mm. Hole diam.: 4 mm.  
 Weight: 13 g.  
 Type: 1.

**SW25 (Pl. 1A)**

Inv. no.: 2007:W3.  
 Excavation date: 2007/07/04.  
 Provenance: Trench 14, Layer 3.  
 Material: Steatite.  
 Preservation: The upper part of the cone is partly missing.  
 Max. diam.: 25 mm. Hole diam.: 5 mm.  
 Actual weight: 12 g. Est. original weight: 13 g.  
 Type: 1.

**SW26 (Pl. 1A)**

Inv. no.: 2006:W2.  
 Excavation date: 2006/07/03.  
 Provenance: Trench 15, Layer 4.  
 Material: Steatite.  
 Preservation: Part of the edge at the max. diam. is missing.  
 Est. original max. diam.: 25 mm. Hole diam.: c. 2.50 mm.  
 Actual weight: 8 g. Est. original weight: 9.50 g.  
 Type: 1.

**SW27 (Pl. 1A)**

Inv. no.: 2007:W1.  
 Excavation date: 2007/07/03.  
 Provenance: Baulk between Trench 3 and Room 9, Layer 5.  
 Material: Terracotta.  
 Preservation: Slightly irregular conical shape, probably complete.  
 Max. diam.: 36 mm. Hole diam.: 6 mm.  
 Weight: 27 g.  
 Type: 1.

**SW28 (Pl. 1A)**

Inv. no.: 2006:W4.  
 Excavation date: 2006/07/19.  
 Provenance: Baulk between Trench 3 and Room 9, Layer 4.  
 Material: Steatite.  
 Preservation: Some small splinters are chipped away.  
 Max. diam.: 19 mm. Hole diam.: 3 mm.  
 Weight: 4 g.  
 Type: 1.  
 Chronology: Latest LH IIIB2.

**SW29 (Pl. 1C)**

Inv. no.: 2006:W3.  
 Excavation date: 2006/07/19.  
 Provenance: Baulk between Trench 3 and Room 9, Layer 4.  
 Material: Green steatite.  
 Preservation: c. 1/3 of the piece is missing.  
 Est. original max. diam.: 36 mm. Hole diam.: 4.90 mm.  
 Actual weight: 18 g. Est. original weight: 23 g.  
 Type: 3.  
 Chronology: Latest LH IIIB2.

**SW30 (Pl. 1B)**

Inv. no.: 2007:W2.  
 Excavation date: 2007/07/04.  
 Provenance: Baulk between Trench 3 and Room 9, Layer 2.  
 Material: Green steatite.  
 Preservation: c. 1/2 of the piece is missing.  
 Est. original max. diam.: 22 mm. Hole diam.: Not estimable.  
 Actual weight: 4 g. Est. original weight: 8 g.  
 Type: 2.  
 Chronology: Latest LH IIIB (associated with stirrup jars from LH IIIB2).

**SW31 (Pl. 1B)**

Inv. no.: 2004:W5.  
 Excavation date: 2004/07/15.  
 Provenance: Baulk between E and F, Layer 2 below level of cross wall.  
 Material: Steatite.  
 Preservation: Partly damaged at the top of the cone.  
 Max. diam.: 23 mm. Hole diam.: 3.60 mm.  
 Actual weight: 18 g. Est. original weight: 19 g.  
 Type: 2.

**SW32 (Pl. 1D)**

Inv. no.: 2001:T3.  
 Excavation date: 2001/07/04.  
 Provenance: East Gate, Trench 5, topsoil.  
 Material: Coarse ware.  
 Preservation: c. 1/2 of the piece is missing.  
 Estimate max. diam.: 34 mm. Est. original hole diam.: 7 mm.  
 Actual weight: 12 g. Est. original weight: 24 g.  
 Type: 4.

**SW33 (Pl. 1A)**

Inv. no.: 2004:W4.  
 Excavation date: 2004/07/14.  
 Provenance: Trench F, Layer 2 (disturbed).  
 Material: Steatite.  
 Preservation: The bottom of the cone is partly damaged.  
 Max. diam.: 36 mm. Hole diam.: 5 mm.  
 Actual weight: 28 g. Est. original weight: 29 g.  
 Type: 1.

**SW34 (Pl. 1G)**

Inv. no.: 2008:W1.  
 Excavation date: 2008/06/30.  
 Provenance: Trench 12, Layer 2.  
 Material: Terracotta.  
 Max. diam.: 38 mm. Max. length: 42 mm. Hole diam.: 7 mm.  
 Actual weight: 48 g. Original weight: Not estimable.  
 Type: 7.  
 Comments: One large fragment is missing.

## PERFORATED SHERDS

PS1 (*Pl. 3A, 3E*)

Inv. no.: 2000:T2/TC2000:8,23.

Excavation date: Missing.

Provenance: Trench 2, Layer 1.

Material: Medium coarse ware.

Preservation: Probably complete.

Max. diam.: 31 mm. Hole diam.: 5.50 mm.

Actual weight: 11 g.

Comments: Given its indented profile it could also have functioned as a spool for winding thread.

PS2 (*Pl. 3A, 3E*)

Inv. no.: T2001:7.

Excavation date: Missing.

Provenance: Trench 1?, Layer ?.

Material: Mycenaean fine ware.

Preservation: Probably complete.

Max. diam.: 25 mm. Hole diam.: 4.30 mm.

Actual weight: 7 g.

PS3 (*Pl. 3A, 3E*)

Inv. no.: 2005:T2.

Excavation date: 2005/07/04.

Provenance: Room 6, West scarp, Layer 2.

Material: Mycenaean fine ware.

Preservation: Probably complete.

Max. diam.: 32 mm.

Hole diam.: 2.50 cm.

Actual weight: 3 g.

PS4 (*Pl. 3A, 3E*)

Inv. no.: T2001.

Excavation date: 2001/06/28.

Provenance: Trench 3, Layer 3.

Material: Mycenaean fine ware.

Preservation: Probably complete.

Max. diam.: 32 mm.

Hole diam.: 2 mm.

Actual weight: 4 g.

## TRIMMED SHERDS

TS1 (*Pl. 3A, 3E*)

Inv. no.: 2009:TC2.

Excavation date: 2009/07/03.

Provenance: Trench 12, Layer 4b.

Material: Terracotta. Max. diam.: 38 mm.

Actual weight: 11 g.

Comments: The item has no hole in the middle, possibly unfinished waiting to be perforated.

TS2 (*Pl. 3A, 3E*)

Inv. no.: 2009:TC1.

Excavation date: 2009/07/01.

Provenance: Trench 12, Layer 4a.

Material: Terracotta. Max. diam.: 4 mm.

Actual weight: 16 g.

Comments: The item has no hole in the middle, possibly unfinished waiting to be perforated.

TS3 (*Pl. 3A, 3E*)

Inv. no.: 2009:TC3.

Excavation date: 2009/07/06.

Provenance: Trench 12, Layer 4b.

Material: Terracotta.

Max. diameter: 44 mm. Actual weight: 21 g.

Comments: The item has no central hole; possibly unfinished.

TS4 (*Pl. 3A, 3E*)

Inv. no.: 2006:T1.

Excavation date: 2006/07/11.

Provenance: Baulk between Trench 3 and Room 9, Layer 4.

Material: Terracotta.

Max. diameter: 33 mm.

Actual weight: 8 g.

Comments: The item has no central hole; possibly unfinished.

## SPINDLES

S1 (*Pl. 3C, 3E*)

Inv. no.: 2009:B1.

Excavation date: 2009/06/23.

Provenance: Trench 12, Layer 3A.

Material: Bone.

Max. length: 32 mm. Actual weight: 2 g.

Comments: Incomplete. The item might be the embossed end of a spindle, alternatively it could be part of a belt clasp of a type found also at Mycenae and Asine, though in grave contexts.<sup>122</sup>

S2 (*Pl. 3C, 3E*)

Inv. no.: 2006:B1.

Excavation date: 2006/06/22.

Provenance: Trench 15, Layer 1.

Material: Bone.

Max. length: 15.50 mm.

Actual weight: Not estimable.

Comments: There seem to be traces of pigmentation on the surface, but no analyses have been yet carried out to investigate their nature.

<sup>122</sup> Konstantinidi-Syvridi 2014, 153–154.

## NEEDLES/PINS

### N1 (*Pl. 4C*)

Inv. no.: M2007:2.  
Excavation date: 2006/06/22.  
Provenance: Baulk between Trench 3 and Room 9, Layer 5.  
Material: Bronze.  
Max. length: 70 mm.  
Comments: The item seems complete, but it is not clear if there was an eye in the blunt end; alternatively it might have been a bronze arrowhead similar to the item found in Room IX of the West Gate.<sup>123</sup>

### N2 (*Pl. 4C*)

Inv. no.: M2006:9.  
Excavation date: 2006/07/17.  
Provenance: Trench 13 North East, Layer 3.  
Material: Bronze.  
Max. length: 43 mm.  
Comments: Fragmentary.

### N3 (*Pl. 4C*)

Inv. no.: M2009:7.  
Excavation date: 2009/06/24.  
Provenance: Surface find.  
Material: Bronze.  
Max. length: 22 mm.  
Comments: Fragmentary, worn out or maybe manufactured to be thinner at one end.

### N4 (*Pl. 4C*)

Inv. no.: M2008:1.  
Excavation date: 2008/07/01.  
Provenance: Trench 12, Layer 3.  
Material: Bronze.  
Max. length: 50 mm.  
Comments: It is broken in two pieces. The item has not been restored, and has an apparently embossed squared section in the middle.

## CHISELS AND PIERCING TOOLS

### C1 (*Pl. 4B*)

Inv. no.: M2002:8.  
Excavation date: 2002/07/25.  
Provenance: Trench 3, Layer 3 quadrant 2.  
Material: Bronze.  
Max. length: 50 mm.

### C2 (*Pl. 4B*)

Inv. no.: M2006:10.  
Excavation date: 2006/07/10.  
Provenance: Trench 13 North East, Layer 2.  
Material: Bronze?/Iron?  
Max. length: 38 mm.

### C3 (*Pl. 4B*)

Inv. no.: M2000:1.  
Excavation date: 2000/06/27.  
Provenance: Trench 1 East, Layer 4.  
Material: Bronze.  
Max. length: 48 mm.

## BRONZE BLADES

### BB1 (*Pl. 4A*)

Inv. no.: M2009:9.  
Excavation date: 2009/07/03.  
Provenance: Trench 12, Layer 4A.  
Material: Bronze.  
Max. length: 34 mm.  
Comments: Considered to be the pointed end of the tanged blade BB2 (see below).

### BB2 (*Pl. 4A*)

Inv. no.: M2009:8.  
Excavation date: 2009/07/03.  
Provenance: Trench 12, Layer 4A.  
Material: Bronze.  
Max. length: 32 mm.  
Comments: Probably the tanged end of the blade BB1.

### BB3 (*Pl. 4A*)

Inv. no.: M2002:5.  
Excavation date: 2002/06/27.  
Provenance: Trench 9, Layer 1 North.  
Material: Bronze (?).  
Max. length: 42 mm.  
Comments: The piece is incomplete and it is difficult to suggest its original shape and use.

<sup>123</sup> Demakopoulou *et al.* 2004, fig. 17.

## Bibliography

- Alberti, M.E. 2008. 'Murex shells as raw material: The purple-dye industry and its by-products. Interpreting the archaeological record', *Kaskal* 5, 73–90.
- Alberti, M.E. forthcoming. 'Mycenaean textile tools in context: Production, storage/distribution and use at Mycenae and Thebes (1400 – 1200 BCE)', in *Weaving the patterns. Textile production and specialisation in Europe and the Mediterranean during the Bronze Age*, eds. S. Sabatini & S. Bergerbrant, Oxford.
- Alberti, M.E., V.L. Aravantinos, M. Del Freo, I. Fappas, A. Papadaki & F. Rougemont 2012. 'Textile production at Mycenaean Thebes. A first overview', in *Kosmos. Jewellery, adornment and textiles in the Aegean Bronze Age. Proceedings of the 13th International Aegean Conference, Copenhagen 21–26 April 2010* (Aegaeum, 33), eds. M.L. Nosch & R. Laffineur, Liège, 87–106.
- Andersson Strand, E. 2012. 'From spindle whorls and loom weights to fabrics in the Bronze Age Aegean and Eastern Mediterranean', in *Kosmos. Jewellery, adornment and textiles in the Aegean Bronze Age. Proceedings of the 13th International Aegean Conference, Copenhagen 21–26 April 2010* (Aegaeum, 33), eds. M.L. Nosch & R. Laffineur, Liège, 207–213.
- Andersson Strand, E., L. Mårtensson, M.L. Nosch & L. Rahmstorf 2006. 'New research on Bronze Age textile production', *Bulletin of the Institute of Classical Studies* 51, 171–174.
- Andersson Strand, E. & M.L. Nosch, eds. 2015. *Tools, textiles and contexts: Textile production in the Aegean and Eastern Mediterranean Bronze Age*, Oxford.
- Aprile, J.D. 2013. 'Crafts, specialists, and markets in Mycenaean Greece. The new political economy of Nichoria: Using intrasite distributional data to investigate regional institutions', *AJA* 117:4, 429–436.
- Åström, P. 1983. *The cuinass tomb and other finds at Dendra 2. Excavations in the cemeteries, the lower town and the citadel* (SIMA, 4), Göteborg.
- Åström, P. & K. Demakopoulou 1986. 'New excavations in the citadel of Midea 1983–1984', *OpAth* 16, 19–25.
- Åström, P., K. Demakopoulou & G. Walberg 1988. 'Excavations in Midea 1985', *OpAth* 17, 7–11.
- Barber, E.J.W. 1991. *Prehistoric textiles: The development of cloth in the Neolithic and Bronze Ages with special reference to the Aegean*, Princeton.
- Bendall, L.M. 2003. 'A reconsideration of the northeastern building at Pylos: Evidence for a Mycenaean redistributive center', *AJA* 107:2, 181–231.
- Bennet, J. 2008. 'Palace™: Speculations on palatial production in Mycenaean Greece with (some) reference to glass', in *Vitreous materials in the Late Bronze Age Aegean* (Sheffield Studies in Archaeology, 9), eds. C.M. Jackson & E.C. Wager, Oxford, 151–172.
- Bliege Bird, R. & E.A. Smith 2005. 'Signaling theory, strategic interaction, and symbolic capital', *CurrAnthr* 46:2, 221–248.
- Boone, J.L. 2000. 'Status signaling, social power and lineage survival', in *Hierarchies in action: Cui bono?* (Center for Archaeological Investigation, Occasional Papers, 27), ed. M.J. Diehl, Carbondale, Illinois, 84–110.
- Borgna, E. 2003. 'Attrezzi per filare nella tarda età del Bronzo italiana: Connessioni con l'Egeo e con Cipro', *Rivista Scienze Preistoriche* 63, 519–548.
- Breniquet, C. & C. Michel, eds. 2014. *Wool economy in the ancient Near East and the Aegean: From the beginnings of sheep husbandry to institutional textile industry*, Oxford.
- Brysaert, A. 2014. 'Talking shop. Multicraft workshop materials and architecture in prehistoric Tiryns, Greece', in *Material crossovers: Knowledge networks and the movement of technological knowledge between craft traditions*, eds. K. Rebay-Salisbury, A. Brysaert & L. Foxhall, London, 37–61.
- Burke, B. 2010a. *From Minos to Midas: The organization of cloth production in the Eastern Mediterranean*, Oxford.
- Burke, B. 2010b. 'Textiles', in *The Oxford handbook of the Aegean Bronze Age*, ed. E.H. Cline, Oxford, 430–442.
- Carington Smith, J. 1975. *Spinning, weaving and textile manufacture in prehistoric Greece: From the beginning of the Neolithic to the end of the Mycenaean Ages; with particular reference to the evidence found on archaeological excavations*, Ph.D. thesis, University of Tasmania, Hobart. <http://eprints.utas.edu.au/11442/>
- Carington Smith, J. 1992. 'Spinning and weaving equipment', in *Excavations at Nichoria in southwest Greece 2. The Bronze Age occupation*, eds. W.A. McDonald & N.C. Wilkie, Minneapolis, 674–711.
- Collon, D. 1987. *First impressions: Cylinder seals in the ancient Near East*, London.

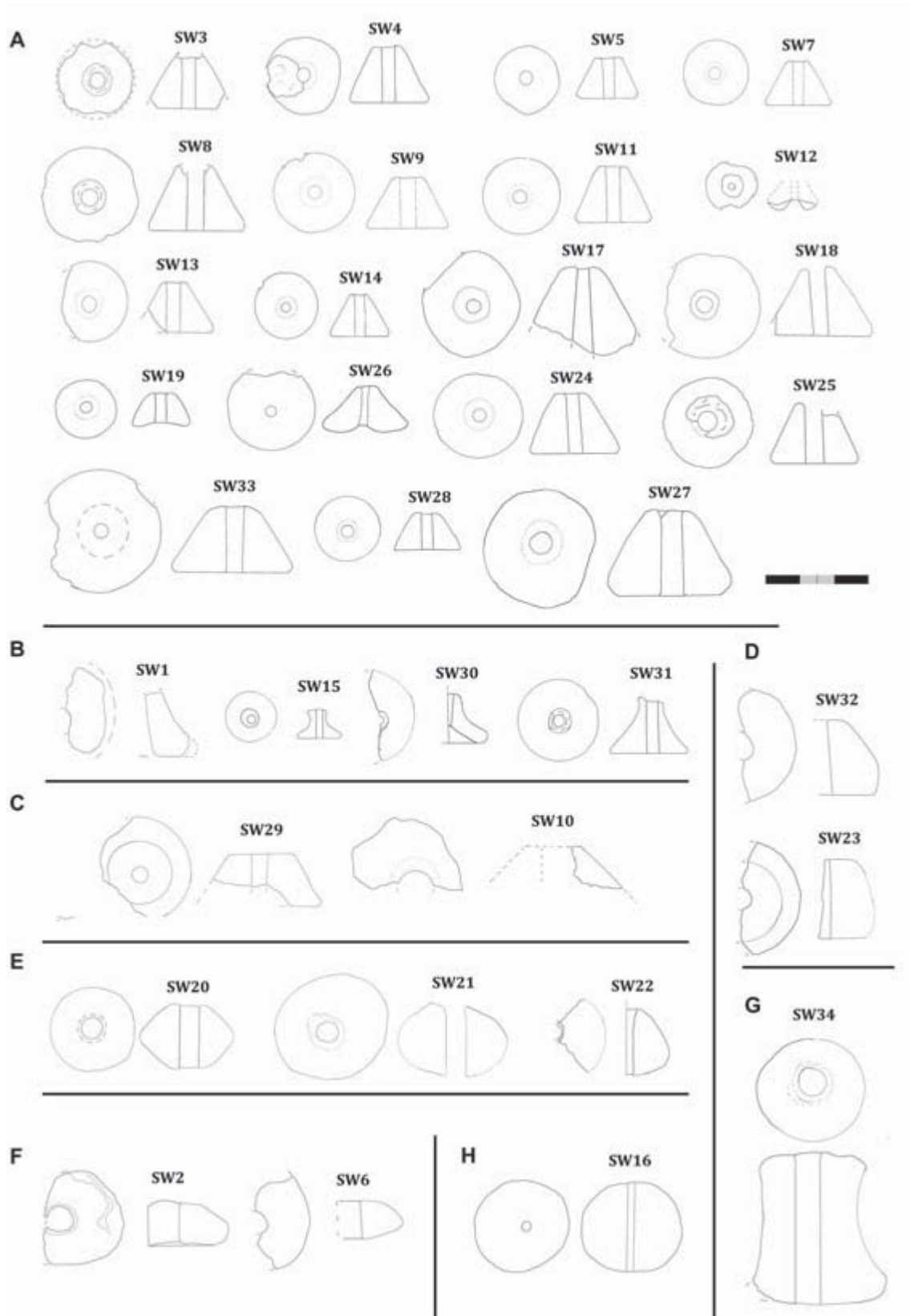
- Davis, J.L. & J. Bennet 1999. 'Making Mycenaeans: Warfare, territorial expansion, and representation of other in the Phylan kingdom', in *Polemos. Le context guerrier en Egée à l'âge du Bronze. Actes de la 7e Rencontre égéenne internationale, Université de Liège 14–17 avril, 1998* (Aegaeum, 19), ed. R. Laffineur, Liège, 105–120.
- Del Frio, M., M.L. Nosch & F. Rougemont 2013. 'The terminology of textiles in the Linear B tablets, including some considerations on Linear A logograms and abbreviations', in *Textile terminologies in the ancient Near East and Mediterranean from the third to the first millennia BC*, eds. C. Michel & M.L. Nosch, Oxford, 338–373.
- Demakopoulou, K. 1998. 'Stone vases from Midea', in *The Aegean and the Orient in the second millennium: Proceedings of the 50th anniversary symposium, University of Cincinnati, 18–20 April 1997* (Aegaeum, 18), eds. E.H. Cline & D. Harris-Cline, Liege, 221–227.
- Demakopoulou, K. 1999. 'A Mycenaean terracotta figure from Midea in the Argolid', in *Meletemata: Studies in Aegean archaeology presented to Malcolm H. Wiener as he enters his 65th year* (Aegaeum, 20), eds. P.P. Betancourt, V. Kazageorghis, R. Laffineur & W.-D. Niemeier, Liège, 197–207.
- Demakopoulou, K. 2007. 'The role of Midea in the network of Mycenaean citadels in the Argolid', *Keimelion. Elitenbildung und elitärer Konsum von der mykenischen Palastzeit bis zur homerischen Epoche. Akten des internationalen Kongresses vom 3. bis 5. Februar 2005 in Salzburg* (DenkschrWien, 350; Veröffentlichungen der Mykenischen Kommission, 27), eds. E. Alram-Stern & G. Nightingale, Vienna, 65–73.
- Demakopoulou, K., N. Divari-Valakou, P. Åström & G. Walberg 1999. 'Excavations in Midea 1995–1996', *OpAth* 22–23, 57–68.
- Demakopoulou, K., N. Divari-Valakou, A.-L. Schallin, G. Ekroth, A. Lindblom, M. Nilsson & L. Sjögren 2002. 'Excavations in Midea 2000 and 2001', *OpAth* 27, 27–58.
- Demakopoulou, K., N. Divari-Valakou & A.-L. Schallin 2003. 'Excavations in Midea 2002', *OpAth* 28, 7–28.
- Demakopoulou, K., N. Divari-Valakou, A.-L. Schallin, E. Weiberg, L. Sjögren & M. Nilsson 2004. 'Excavations in Midea 2003', *OpAth* 29, 9–27.
- Demakopoulou, K., N. Divari-Valakou, A.-L. Schallin, L. Sjögren & M. Nilsson 2005. 'Excavations in Midea 2004', *OpAth* 30, 7–34.
- Demakopoulou, K., N. Divari-Valakou, M. Nilsson & A.-L. Schallin 2008a. 'Excavations in Midea 2005', *OpAth* 31–32, 7–29.
- Demakopoulou, K., N. Divari-Valakou, M. Nilsson & A.-L. Schallin (with an appendix by K. Nikita) 2008b. 'Excavations in Midea 2006', *OpAthRom* 1, 7–30.
- Demakopoulou, K., N. Divari-Valakou, M. Nilsson & A.-L. Schallin 2009. 'Excavations in Midea 2007', *OpAth-Rom* 2, 7–30.
- Demakopoulou, K., N. Divari-Valakou, M. Lowe Fri, M. Miller, M. Nilsson & A.-L. Schallin 2010. 'Excavations in Midea 2008–2009', *OpAthRom* 3, 7–32.
- Demakopoulou, K., I. Fappas, E. Andersson Strand, M.L. Nosch & J. Cutler 2015. 'Textile tools from Midea, Mainland Greece', in *Tools, textiles and contexts: Textile production in the Aegean and Eastern Mediterranean Bronze Age*, eds. E. Andersson Strand & M.L. Nosch, Oxford, 247–252.
- Frankenstein, S. & M. Rowland 1978. 'The internal structure and regional context of Early Iron Age society in south-western Germany', *BIALond* 15, 73–112.
- Gillis, C. & M.L. Nosch 2007. *Ancient textiles, production, craft and society*, Lund.
- Gleba, M. 2008. *Textile Production in Pre-Roman Italy*, Oxford.
- Gleba, M. 2014. 'Italian textiles from prehistory to Late Antique times', in *A stitch in time: Essays in honour of Lise Bender Jørgensen*, eds. S. Bergerbrant & S.H. Fossey, Göteborg, 145–170.
- Gleba, M. & U. Mannering 2012. *Textiles and textile production in Europe: From prehistory to AD 400*, Oxford.
- Gorzato, F. 2012. *Ostentazione di rango e manifestazione del potere agli albori della società micenea* (Praehistorica Mediterranea, 4), Monza.
- Hoffmann, M. 1974. *The warp-weighted loom*, McMinnville, Oregon.
- Killen, J.T. 2007. 'Cloth production in Late Bronze Age Greece: The documentary evidence', in *Ancient textiles: Production, crafts and society. Proceedings of the First International Conference on Ancient textiles, held at Lund, Sweden, and Copenhagen, Denmark, on March 19–23, 2003*, eds. C. Gillis & M.L. Nosch, Oxford, 50–59.
- Konstantinidi-Syvridi, E. 2014. 'Buttons, pins, clips and belts... "Inconspicuous" dress accessories from the



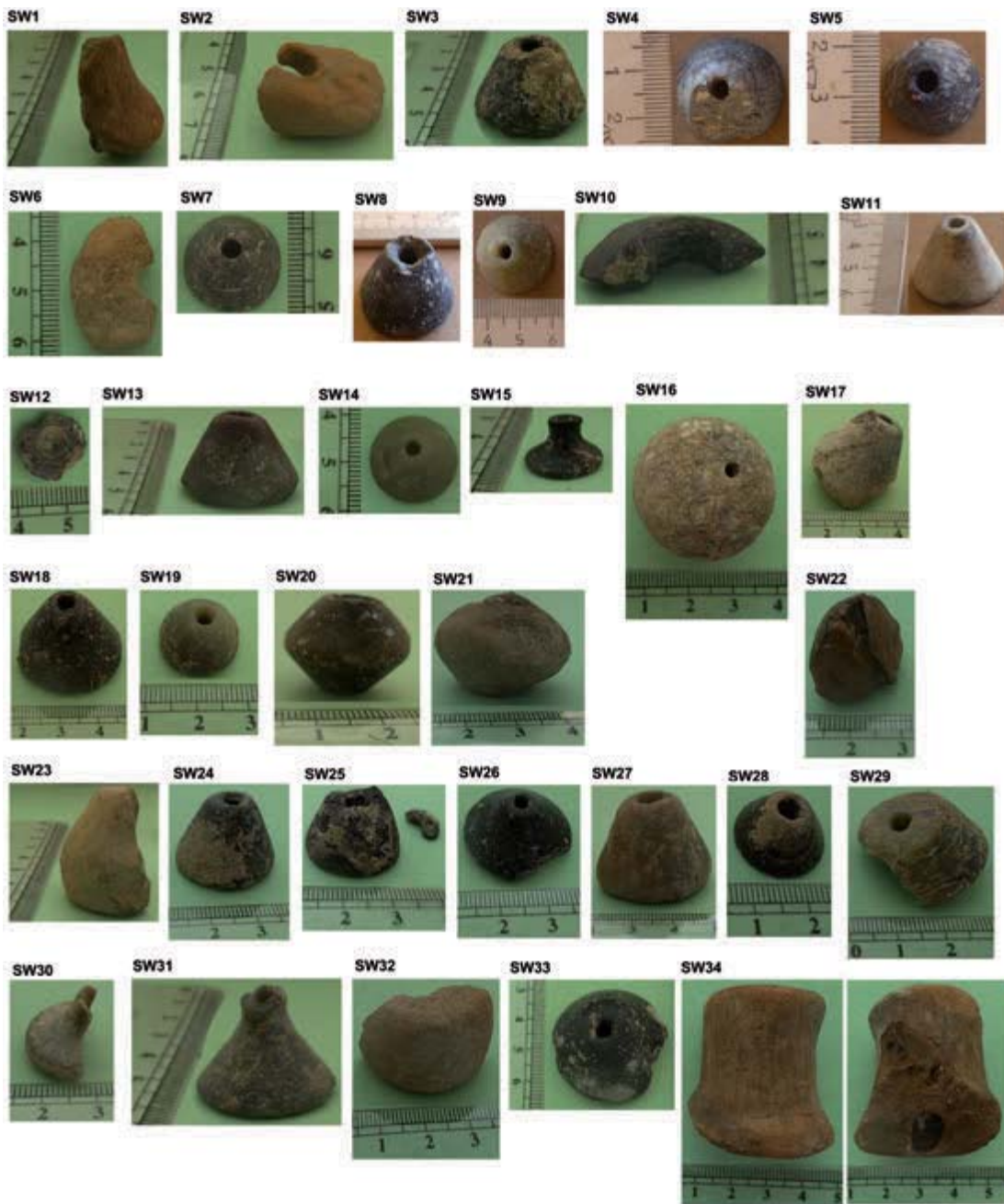
- burial context of the Mycenaean period (16th–12th cent. BC); in *Prehistoric, ancient Near Eastern and Aegean textiles and dress. An interdisciplinary anthology*, eds. M. Harlow, C. Michel & M.L. Nosch, Oxford, 143–157.
- Laffineur, R. 1995. 'Craftsmen and craftsmanship in Mycenaean Greece: For a multimedia approach', in *Politeia. Society and state in the Aegean Bronze Age. Proceedings of the 5th International Aegean Conference Heidelberg, 10–13 April 1994* (Aegaeum, 12), eds. R. Laffineur & W.-D. Niemeier, 189–199.
- Liu, R.K. 1978. 'Spindle whorls: Pt 1. Some comments and speculations', *The Bead Journal* 3, 87–103.
- Maran, J. 2001. 'Political and religious aspects of architectural change on the Upper Citadel of Tiryns. The case of Building T', in *Potnia. Deities and religion in the Aegean Bronze Age. Proceedings of the 8th International Aegean Conference, Göteborg, 12–15 April 2000* (Aegaeum, 22), eds. R. Laffineur & R. Hägg, Liège, 113–122.
- Maran, J. 2009. 'Mycenaean citadels as performative spaces', in *Construction power: Architecture, ideology and social practice*, eds. J. Maran, C. Juwig, H. Schwengel & U. Thaler, Berlin, 75–88.
- Mårtensson, L., E. Andersson, M.L. Nosch & A. Batzer 2006a. *Technical report experimental archaeology part 1 2005–2006*, Copenhagen. [http://ctr.hum.ku.dk/tools/Technical\\_report\\_1\\_experimental\\_archaeology.pdf](http://ctr.hum.ku.dk/tools/Technical_report_1_experimental_archaeology.pdf)
- Mårtensson, L., E. Andersson, M.L. Nosch & A. Batzer 2006b. *Technical report experimental archaeology part 2:2 Whorl or bead?* Copenhagen. [http://ctr.hum.ku.dk/tools/Technical\\_report\\_2-2\\_experimental\\_archaeology.PDF](http://ctr.hum.ku.dk/tools/Technical_report_2-2_experimental_archaeology.PDF)
- Marzatico, F. 2003. 'Torbiera Carera, Fiavè (TN) Italia', in *Textiles. Intercisi e tessuti dalla preistoria europea*, eds. M. Bazzanella, A. Mayr, L. Moser & A. Rast-Eicher, Trento, 138–148.
- McCorriston, J. 1997. 'The fiber revolution. Textile extensification, alienation and social stratification in Ancient Mesopotamia', *Curr.Anthr* 38:4, 517–549.
- Michel, C. & M.L. Nosch, eds. 2013. *Textile terminologies in the ancient Near East and Mediterranean from the third to the first millennia BC*, Oxford.
- Michel, C. & K.R. Veenhof 2013. 'The textile traded by the Assyrians in Anatolia (19th–18th centuries BC)', in *Textile terminologies in the ancient Near East and Mediterranean from the third to the first millennia BC*, eds. C. Michel & M.L. Nosch, Oxford, 210–271.
- Neilissen, R.M.A. & M.H.C. Meijers 2011. 'Social benefits of luxury brands as costly signals of wealth and status', *Evolution and Human Behavior* 32, 343–355.
- Nosch, M.L. 2011. 'The Mycenaean administration of textile production in the Palace of Knossos: Observations on the Lc(1) textile targets', *AJA* 115, 495–505.
- Nosch, M.L. 2014. 'The Aegean wool economies of the Bronze Age', *Textile Society of America Symposium Proceedings (Paper 900)*, 1–13.
- Nosch, M.L. & R. Laffineur eds. 2012. *Kosmos. Jewellery, adornment and textiles in the Aegean Bronze Age. Proceedings of the 13th International Aegean Conference, Copenhagen 21–26 April 2010* (Aegaeum, 33), Liège.
- Olofsson, L., E. Andersson Strand & M.L. Nosch 2015. 'Experimental testing of Bronze Age textile tools', in *Tools, textiles and contexts: Textile production in the Aegean and Eastern Mediterranean Bronze Age*, eds. E. Andersson Strand & M.L. Nosch, Oxford, 75–100.
- Ostenso, A. 1998. 'The small finds', in G. Walberg, *Excavations on the acropolis of Midea. Results of the Greek-Swedish excavations 1. The excavations on the Lower Terraces 1985–1991* (ActaAth-4°, 49:1), Stockholm, 150–167.
- Papadimitriou, N. & D. Kriga 2013. "'Peripheries versus core". The integration of secondary state into the world system of the Eastern Mediterranean and the Near East in the Late Bronze Age (1600–1200 BC)', in *Exchange networks and local transformations: Interaction and local change in Europe and the Mediterranean from the Bronze Age to the Iron Age*, eds. M.E. Alberti & S. Sabatini, Oxford, 9–21.
- Peregrine, P.N. 2000. 'Archaeology and world-system theory', in *A world-system reader: New perspective on gender, urbanism, cultures, indigenous peoples and ecology*, ed. T.D. Hall, Oxford, 59–68.
- Persson, A.W. 1942. *New tombs at Dendra near Midea* (Skrifter utgivna av Kungl. Humanistiska Vetenskaps-samfundet i Lund, 34), Lund.
- Peyronel, L. 2004. *Gli strumenti di tessitura dall'Età del Bronzo all'epoca Persiana* (Materiali e Studi Archeologici di Ebla, IV), Roma.

- Pullen, D.J. 2013. 'Crafts, specialists, and markets in Mycenaean Greece: Exchanging the Mycenaean economy', *AJA* 117, 437–445.
- Rahmstorf, L. 2008. *Tiryns: Forschungen und Berichte XVI. Kleinfunde aus Tiryns. Terrakotta, Stein, Bein und Glas/Fayence vornehmlich aus der Spätbronzezeit*, Wiesbaden.
- Rahmstorf, L. 2010. 'The concept of weighing during the Bronze Age in the Aegean, the Near East and Europe', in *The archaeology of measurement*, eds. I. Morley & C. Renfrew, Cambridge, 88–105.
- Rahmstorf, L., M. Siennicka, E. Andersson Strand, M.L. Nosch & J. Cutler 2015. 'Textile tools from Tiryns, mainland Greece', in *Tools, textiles and contexts: Textile production in the Aegean and Eastern Mediterranean Bronze Age*, eds. E. Andersson Strand & M.L. Nosch, Oxford, 267–278.
- Reese, D.S. 2007. 'Appendix A. The faunal remains', in *Midea: The Megaron complex and shrine area. Excavations on the Lower Terraces 1994–1997* (Prehistory Monographs, 20), ed. G. Walberg, Philadelphia, 397–468.
- Sauvage, C. 2014. 'Spindle and distaffs: Late Bronze and Early Iron Age Eastern Mediterranean use of solid and tapered ivory/bone shafts', in *Prehistoric, ancient Near Eastern and Aegean textiles and dress. An interdisciplinary anthology*, eds. M. Harlow, C. Michel & M.L. Nosch, Oxford, 184–226.
- Schallin, A.L. 2012. 'Mycenaean jewellery and adornment at Midea', in *Kosmos. Jewellery, adornment and textiles in the Aegean Bronze Age. Proceedings of the 13th International Aegean Conference, Copenhagen 21–26 April 2010* (Aegaeum, 33), eds. M.L. Nosch & R. Laffineur, Liège, 509–514.
- Schallin, A.L. 2016. 'Identities and "precious" commodities at Midea and Dendra in the Mycenaean Argolid', in *Local and global perspectives on mobility in the Eastern Mediterranean*, ed. O.-C. Aslaksen, Athens, 159–190.
- Schofield, L. 2007. *The Mycenaeans*, Los Angeles.
- Sherratt, A. & S. Sherratt 1991. 'From luxuries to commodities', in *Bronze Age trade in the Mediterranean* (SIMA, 90), ed. N.H. Gale, Göteborg, 351–386.
- Siennicka, M. 2014. 'Changes in textile production in Late Bronze Age Tiryns, Greece', in *Textile trade and distribution in antiquity. Textilhandel und -distribution in der Antike* (Philippika, 73), ed. K. Droß-Krüpe, Wiesbaden, 161–176.
- Skalks, I., S. Möller-Wiering & M.L. Nosch 2015. 'Survey of archaeological textile remains from the Eastern Mediterranean area', in *Tools, textiles and contexts: Textile production in the Aegean and Eastern Mediterranean Bronze Age*, eds. E. Andersson Strand & M.L. Nosch, Oxford, 61–74.
- Smith, J.S. 2002. 'Changes in the workplace: women and textile production on Late Bronze Age Cyprus', in *Engendering Aphrodite: Women and society in Ancient Cyprus* (ASOR Archaeological Reports, 7; CAARI Monographs, 3), eds. D. Bolgerand & N. Serwint, Boston, 281–312.
- Tournavitou, I. 1988. 'Towards an identification of a workshop space', in *Problems in Greek prehistory. Papers presented at the Centenary Conference of the British School of Archaeology at Athens, Manchester April 1986*, eds. E.B. French & K.A. Wardle, Bristol, 447–468.
- Tournavitou, I. 1997. 'Jewellers' moulds and jewellers' workshops in Mycenaean Greece. An archaeological utopia', in *Trade and production in premonetary Greece. Production and the craftsman. Proceedings of the 4th and 5th International Workshops, Athens 1994 and 1995* (SIMA-PB, 134, ), eds. C. Gillis, C. Risberg & B. Sjöberg, Göteborg, 209–256.
- Tournavitou, I., E. Andersson Strand, M.L. Nosch & J. Cutler 2015. 'Textile tools at Mycenae, mainland Greece', in *Tools, textiles and contexts: Textile production in the Aegean and Eastern Mediterranean Bronze Age*, eds. E. Andersson Strand & M.L. Nosch, Oxford, 253–265.
- Veblen, T. 1994 (1899). *The theory of the leisure class*, New York.
- Voutsaki, S. 2001. 'Economic control, power and prestige in the Mycenaean world: The archaeological evidence', in *Economy and politics in the Mycenaean palace states. Proceeding of a conference held on 1–3 July 1999 in the Faculty of Classics, Cambridge*, eds. S. Voutsaki & J. Killen, Cambridge, 195–213.
- Voutsaki, S. 2010. 'From the kinship economy to the palatial economy: The Argolid in the second millennium BC', in *Political economies of the Aegean Bronze Age: Papers from the Langford Conference, Florida State University, Tallahassee, 22–24 February 2007*, ed. D.J. Pullen, Oxford, 86–111.
- Waetzoldt, H. 1972. *Untersuchungen zur neusumerischen Textilindustrie* (Centro per le antichità e la storia

- dell'arte del Vicino Oriente, Studi economici e tecnologici, 1), Roma.
- Walberg, G. 1998. *Excavations on the Acropolis of Midea. Results of the Greek-Swedish excavations 1. The excavations on the Lower Terraces 1985–1991* (ActaAth-4°, 49:1), Stockholm.
- Walberg, G., ed. 2007. *Midea: The Megaron complex and shrine area. Excavations on the Lower Terraces 1994–1997* (Prehistory Monographs, 20), Philadelphia.
- Whittaker, H. 2012. 'Some reflections on the use and meaning of colour in dress and adornment in the Aegean Bronze Age', in *Kosmos. Jewellery, adornment and textiles in the Aegean Bronze Age. Proceedings of the 13th International Aegean Conference, Copenhagen 21–26 April 2010* (Aegaeum, 33), eds. M.L. Nosch & R. Laffineur, Liège, 193–198.
- Wiencke, M.H. 1998. 'Mycenaean Lerna', *Hesperia* 67:2, 125–214.
- Wisti Lassen, A. 2014. 'Wool in Anatolia in the Old Assyrian period', in *Wool economy in the ancient Near East* (Ancient Textiles Series, 17), eds. C. Breniquet & C. Michel, Oxford, 255–263.
- Wright, J.C. 2004. 'The Mycenaean feast: An introduction', *Hesperia* 73:2, 121–132.
- Wright, J.C. 2006. 'The formation of the Mycenaean palace', in *Ancient Greece: From the Mycenaean palaces to the age of Homer* (Edinburgh Leventis Studies, 3) eds. S. Deger-Jalkotzy & I.E. Lemos, Edinburgh, 7–51.

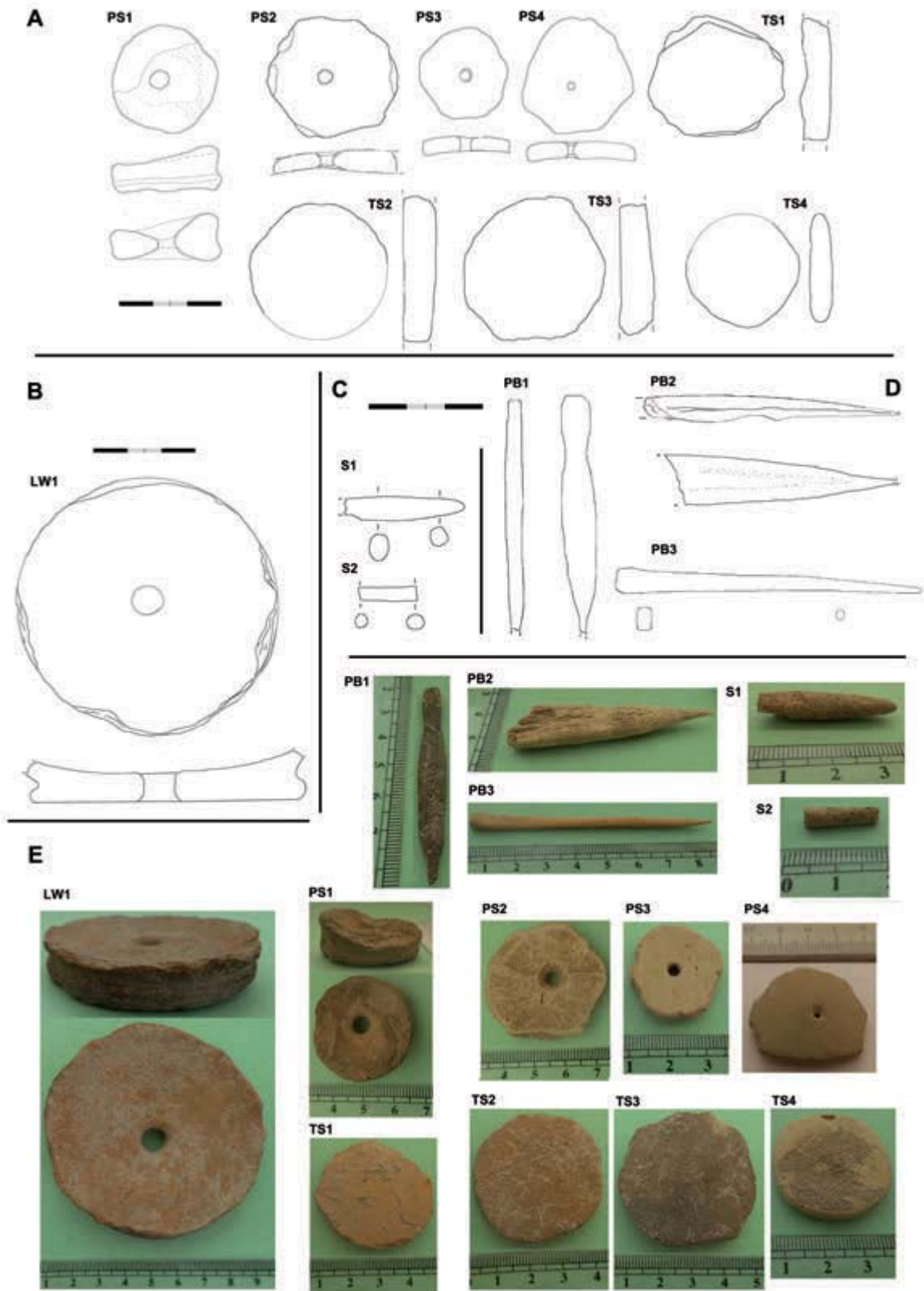


Pl. 2

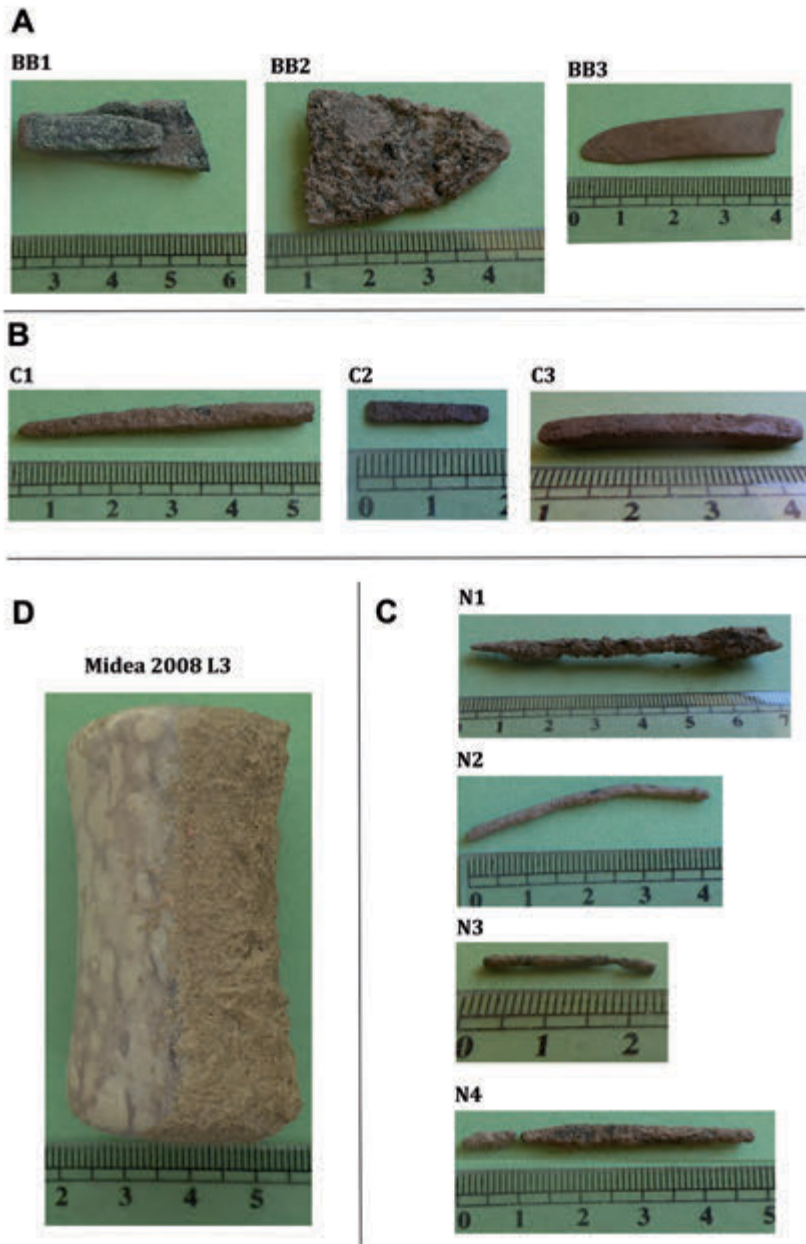


Pl. 1 (previous page). Typological chart of the spindle whorls from the East Gate and Trench 1 at Midea: (A) Type 1, Conical; (B) Type 2, Concave conical; (C) Type 3, Truncated conical; (D) Type 4, Convex truncated conical spindle whorls; (E) Type 5, Biconical; (F) Type 6, Flattened biconical; (G) Type 7, Concave cylindrical; (H) Type 8, Spherical. Drawings: author.

Pl. 2 (above). Spindle whorls from the East Gate Area and Trench 1 at Midea. Photos: author.



Pl. 4



Pl. 3 (previous page). Other textile-related tools from the East Gate and Trench 1 at Midea: (A) perforated and trimmed sherds; (B) loom weights; (C) spindles; (D) pin beaters; (E) photos of the textile tools. Drawings and photos: author.

Pl. 4 (above). Other tools from the East Gate and Trench 1 at Midea: (A) bronze blades; (B) chisels and piercing tools; (C) needles/pins; (D) spool shaped stone tool from Trench 12, layer 2, possibly a balance weight. Photo: author.

