

INDUSTRIAL ACTIVITIES, PERSONAL ADORNMENTS AND BELONGINGS¹

by

Maria Bruun-Lundgren

The small finds treated below are rather evenly scattered all over the site. A good two thirds of them can be attributed to an LM IIIB:1 context, and the remaining part to an LM IIIA:2 context. Most of the specimens were not found in their original contexts, but in secondary ones; accumulated/related deposits, constructions or levelling deposits. It seems probable, however, that even the items found in a secondary context have been fetched, together with soil and stones, from the immediate neighbourhood.

TEXTILE INDUSTRY AND TEXTILE IMPLEMENTS

The textile industry in LM IIIB:1 and LM IIIA:2 Khania is indicated through the finds of textile implements. The large amount of bones from *Ovis*, mainly adult ones, suggests that sheep were not only primarily kept for their milk, but also for their wool, which was probably a common raw material for textiles. The relative frequency of murex shells hints at textiles of better quality that were brightly coloured. The textile implements, rather evenly distributed over the site, are of types well-known from the preceding periods.

Spindle whorls of terracotta

In the LM IIIB:1 layer, there are only two specimens of spindle whorls other than KS whorls (made from reused kylix stems).² One of the whorls, 84-TC 014 (*Pl. 244i:3*, Rubbish Area Southeast, 20-Pit H2) is conical and of Type 4. The other one, 70-TC 021 (*Pls. 226, 253b:5*, deposit north of Space G), a cylindrical one, is of type 5. The clay of spindle whorls is of a fine to a semi-fine quality. In LM IIIA:2 there is, actually, not one single example.

When it comes to KS whorls we are in a better position, counting 14 examples altogether in the LM IIIB:1 layer.³ Since there are no KS-whorls recorded from pre-LM IIIA:2 layers in Khania, and since the only LM IIIA:2 KS-whorl derives from a disturbed part of a floor (see above p. 202), it seems plausible that the fabrication of KS whorls started during the LM IIIB:1 period. In the LM IIIB:2 period the amount of KS whorls is 16 items.⁴ During the LM IIIC period

they are represented by 19 items. From Post-Minoan strata no less than 42 survive,⁵ suggesting that there were originally more KS whorls preserved from the LM IIIB-C period. There are, furthermore, other possible functions of the KS whorls than as spindle whorls. It has been suggested that they also had a function as beads or – less probably – as buttons, or maybe even as gaming markers.⁶

However, just as in the LM IIIC and LM IIIB:2 layers, it can be stated that the scarcity of spindle whorls treated here speaks in favour of the KS whorls at least sometimes being used as spindle whorls. When they have been found in original contexts (on floors or in pits) in the LM IIIB:1 period, they are identified both without and with textile implements (confined to loom weights), but in each case there is also evidence of tools and materials belonging to other kinds of productions in the same contexts. The same goes for the LM IIIB:2 period (where the textile implements, found together with the KS whorls, are instead confined to spindle whorls).⁷ Contrary to this, during the LM IIIC period, the KS whorls always occur together with textile implements (spindle whorls, an occasional bead/button/spindle whorl, an occasional loom weight and loom weights/bobbins). How-

¹ I am very grateful to Professor Robin Hägg and Dr Ann-Louise Schallin for their generous support, for fruitful discussions and for providing me with references.

² For a presentation of the standard categories of whorls, see *GSE* II, 27-28.

³ The KS whorls in the LM IIIB:1 strata are distributed as follows: 77-TC 047 (*Pls. 221, 233b:4*), 77-TC 054 (*Pl. 233b:3*), 77-TC 055 (*Pl. 233b:1*), 77-TC 064 (*Pls. 226, 233b:2*, all four in Layer with stones), 80-TC 030 (*Pl. 234b:5*, Room A, inside shaft), 84-TC 010 (*Pl. 234c:1*), 87-TC 012 (*Pl. 234c:2*, both Room C, on floor), 78-TC 010 (*Pl. 237b:1*, Room D, filled-in door), 77-TC 068 (*Pl. 237e:4*, Corridor/Space I, on floor), 77-TC 044 (*Pl. 240a:3*, Space G, dump below upper floor), 73-TC 028 (*Pl. 241c:2*, Room E, in upper floor), 73-TC 011 (*Pl. 242a:2*, Room E, pits in floor), 71-TC 032 (*Pl. 244b*, Room U, upper floor), 82-TC 019 (*Pl. 247a:1*, Courtyard, 19-Pit Q). There is one more KS-whorl, 84-TC 042 (*Pls. 229, 255c:2*), recorded in a disturbed LM IIIA:2 layer, which possibly derives from a Venetian foundation pit.

⁴ See *GSE* III, 73-TC 019 (p. 28), 71-TC 033 (p. 28), 73-TC 022 (p. 33), 77-TC 053 (p. 38), 73-TC 009 (p. 44), 73-TC 010 (p. 44-45), 71-TC 031 (p. 70), 82-TC 014 (p. 88), 77-TC 025 (p. 108), 77-TC 014 (p. 113), 84-TC 006 (p. 122), 84-TC 013 (p. 122), 82-TC 006 (p. 124), 84-TC 031 (p. 145), 80-TC 018 (p. 166), 80-TC 020 (p. 170).

⁵ See *GSE* II, 176, where these amounts are stated.

⁶ For a discussion of the function of these objects, see Evelyn 1984, 250 and n. 197-199; *GSE* II, 175; *GSE* III, 266-267.

⁷ *GSE* III, 70, 122, 124, 145.

ever, just as in the preceding cases, these textile implements are always mixed with tools and materials belonging to other branches of production.⁸ Since the KS whorls are cut out from kylix stems, their clay is of good quality and some of them are made from kylikes fabricated in the Kydonian Workshop.

Loom weights

Among the terracotta loom weights of standard categories⁹ there are at most three loom weights (one of them fragmentarily preserved) of the same type; the discoid one, Type 2, that emerge from the same spot, an LM IIIA:2 pit in Space E (74-TC 005, 74-TC 007 and 74-TC 008), all of them treated in more detail below. Since they were found in a pit, and since their measurements are only approximate¹⁰ it is, however, not likely that they actually derive from the same loom. The clay of all of the categories of loom weights belonging to the standard types, found in the LM IIIB:1 and LM IIIA:2 levels, is, as a rule, coarse and gritty.

Type 1, a spherical loom weight, is represented by only two specimens, both from contexts that were partly mixed with LM I and MM pottery.¹¹ With the exception of these two loom weights (and of two more fragmentarily preserved loom weights of Type 1 found in a post-Minoan layer), loom weights of Type 1 are restricted to the LM I period, when they appear at the site and are richly represented, and to the LM II/LMIIIA:1 periods, when they occur more sporadically.¹² Furthermore, one item from the LM IIIB:1 period, 73-TC 023 (*Pl. 243a:2*, Room E, levelling deposits), (although with unusually flattened sides), is probably either an extremely small and light loom weight of Type 1, or a very large and heavy spindle whorl, similar to Type 6. It emanates from the levelling deposits (partly containing material from LM IB) in Room E in Building 1. It has been put forward that loom weights of different sizes and weights were used in different combinations, a flexible and practical system.¹³ In the same way there was presumably a flexibility of spindle whorls of different weights.¹⁴

The most frequent type of loom weight is the discoid one: Type 2, which is represented by 14 pieces in the LM IIIB:1 and LM IIIA:2 periods.¹⁵ Type 2 is often almost pear-shaped because there is a grooved or a flat erased edge at its upper end. It is either provided with one hole (Type 2a) or with two holes (Type 2b), placed at its upper part. Type 2a is the most common in the LM IIIB:1-LM IIIA:2 periods, represented by 10 pieces, while Type 2b is represented by one single piece.¹⁶ Only the lower part of the discoid Type 2 loom weight is preserved on a further three specimens. It can thus not be stated whether they belong to the subgroup a or b.¹⁷

Type 5, the spool-shaped type of loom weights/bobbins, is represented by one single specimen, 84-TC 043 (*Pls. 232, 255c:3*), found in a floor packing, in LM IIIA:2 Space A-D. This is the oldest sample of loom weights/bobbins in Khania. This type of implement is presently lacking in the LM IIIB:1 period, only to emerge again in the LM IIIB:2 period, when it is represented by four specimens. In LM IIIC the loom weights/bobbins increase to 18 pieces, and in Post-Minoan

layers there are five pieces from this category recorded altogether.¹⁸ These spool-shaped objects are classified here as loom weights/bobbins since their primary use in a textile context, presumably as loom weights, has been convincingly argued.¹⁹ A textile use for them fits well with the general picture in Khania, where they are often found together with textile implements.²⁰ Furthermore, even though the loom weights/bobbins differ slightly among themselves, different series that are almost identical can be detected,²¹ and in the cases where the objects are not fragmentarily preserved, a consistent weight within a series can be stated. There are also occasional string-impressions, suggesting a use in a textile context.²² Furthermore, recent experimental research where copies of some examples of these loom weights/bobbins have been used, has shown that with the exception of the lightest ones (the weight varying between 0.015-0.308), they are very functional as loom weights in a warp weighted loom. The

⁸ Cf. *GSE II*, 36, 42-43, 69, 82.

⁹ For a presentation of the standard categories of loom weights from the Greek-Swedish Excavations at Khania, see *GSE II*, 29-30.

¹⁰ 74-TC 005: 0.147, 74-TC 007: 0.167, 74-TC 008 (fragmentary): 0.050, but with a calculated weight of 0.100. Even though it has been conjectured that weights of different measurements could be combined (see below) there is, however, no particular evidence in favour of these weights belonging to the same loom.

¹¹ 84-TC 054 (*Pl. 247f*, LM IIIB:1, Courtyard, related III) and 84-TC 018 (*Pl. 258f:2*, LM IIIA:2, Rubbish Area Southeast, 20-Pit L/AJ).

¹² For post-Minoan levels, see *GSE II*, 176-177 and n. 19 and 20 with a discussion on the dating of the loom weights of Type 1 and with further references. For LM IIIA:1/LM II and LM I periods, see Vol. V and VI, forthcoming.

¹³ Dabney 1996, 248.

¹⁴ For a discussion of different weights of spindle whorls, see *GSE II*, 175, and n. 2-5 with further references.

¹⁵ It is also the most common type of loom weight in LM IIIB:2 Khania, cf. *GSE III*, 266 and n. 2. In LM IIIC Khania, loom weights of Type 2 are outnumbered only by the loom weights/bobbins, and Type 2 is represented by six pieces, distributed between the different sub-types as follows: Type 2a: two pieces, Type 2b: three pieces, Type 2c: one piece. A further four pieces derive from post-Minoan levels, of which three are of Type 2a and one is of Type 2b. Cf. *GSE II*, 177 and n. 21 (where the two pieces belonging to Type 2a: 77-TC 023 and 77-TC 029 have erroneously been classified as belonging to Type 2b, cf. catalogue descriptions on pp. 81 and 39 respectively.)

¹⁶ Type 2a in LM IIIB:1: 83-TC 004 (*Pl. 233b:14*, Layer with stones), 82-TC 004 (*Pls. 225, 236c:9*, Room D, on floor), 87-TC 007 (*Pls. 225, 240a:6*, Space G, dump below upper floor), 73-TC 031 (*Pls. 226, 243b:12*, Room E, walls), 87-TC 015 (*Pl. 239e:9*, Space G, 23-Floor 11), 87-TC 002 (*Pls. 226, 246a:1*, Building 2, Room A, floor). In LM IIIA:2: 74-TC 005 (*Pls. 231, 257a:4*), 74-TC 007 (*Pls. 232, 257a:5*, both Space E, 9/7-Pit A), 84-TC 025 (*Pl. 259c:3*, Rubbish Area Southeast, 20-Pit K/N), 71-TC 037, (*Pls. 232, 262e:5*, Rubbish Area North, deposit B). Type 2b is represented by 73-TC 027 (*Pl. 242a:7*, LM IIIB:1, Room E, pits in floor).

¹⁷ From LM IIIB:1: 87-TC 011 (*Pl. 240a:5*, found together with above mentioned 87-TC 007 of the 2a type in Space G, dump below upper floor) and 82-TC 018 (*Pl. 247a:7*, Courtyard, 19-Pit Q). From LM IIIA:2: 74-TC 008 (*Pl. 257a:6*, found together with 74-TC 005) and 74-TC 007 of the 2a type, (both from Space E, 9/7-Pit A).

¹⁸ For LM IIIC and Post-Minoan periods, see *GSE II*, 177, for LM IIIB:2, see *GSE III*, 266.

¹⁹ For meticulous study of loom weights/bobbins, see Rahmstorf 2003, 397-415; Rahmstorf 2005, 143-169, pls. 20-22, where it is convincingly argued that loom weights/bobbins were actually used as loom weights. I am very grateful to Dr Lorenz Rahmstorf for generously providing me with information on his research concerning loom weights/bobbins.

²⁰ Cf. e.g. *GSE II*, 43, 69, 78, 82; *GSE III*, 40, 82.

²¹ Cf. Rahmstorf 2003, 402; Rahmstorf 2005, 156.

²² See e.g. *GSE II*, 177. Cf. also Rahmstorf 2003, 401.

lightest ones might have been used as weights for table weaving, brading or warping.²³ The weight of 84-TC 043 (0.081) was probably heavy enough to have functioned in a warp weighted loom.

It has, however, been suggested that there were other possible uses for them, such as gaming markers or maybe cooking supports or kiln separators.²⁴ Even if the loom weight/bobbins are weaving implements, it does not seem impossible that there were also occasional secondary uses for them. It has been suggested that the reason they are sometimes found near to hearths or kilns is simply that they were to be baked.²⁵ In Khania, loom weights/bobbins have been found near an oven in three cases. In 2005 no less than ten specimens were found beside an oven in a late LM III context.²⁶ Furthermore, one loom weight/bobbin, 80-TC 015, was found near an oven in Room M in the LM IIIC Building 1. There are also finds of some stone tools and obsidian in this room.²⁷ One more loom weight/bobbin, 80-TC 034, was found close to an oven in Courtyard F in the LM IIIB:2 level.²⁸ Among the other finds from this spot is a needle, hinting at a textile use also for the loom weight/bobbin. The most plausible explanation for the presence of loom weights/bobbins and other tools near ovens in Khania, seems to be that different kinds of domestic work, such as cooking, baking, textile production and other kinds of handicrafts took place in the same room, in a similar way that a loom was found beside a hearth in Room M in the LM I, Building I.²⁹

Three terracotta weights found in LM IIIB:1 contexts have a different appearance than the types classified as loom weights in the Khania material. Other uses such as suspensor for looms cannot be excluded. One of them, 82-TC 015 (*Pls.* 225, 238c:5, LM IIIB:1, Corridor/Space I, in floor) is of a unique type, although only half is preserved. It has one flat and one rounded side and has a centrally pierced hole. The other one, 84-TC 033 (*Pl.* 248e:8, LM IIIB:1, Courtyard, floors of 2nd phase), is of a rounded shape and has a proportionally large hole pierced through its middle. The third one, 87-TC 004 (*Pl.* 239e:2, LM IIIB:1, Room G, 23, Floor 11), although fragmentarily preserved, is pear-shaped and has a large hole pierced through its middle. At its upper part the surface is smoothed and there are diagonally running impressions as well.

Other possible textile implements

It is an open question as to what extent the pierced items in stone (here more generally called stone weights) were used as loom weights or had other functions as suspension weights. The idea that stones were also used as loom weights in Khania is substantiated by eleven small stones of almost equal size (\varnothing c. 0.10), found in a deposit in Space G in the LM IIIB:1 Building 1 (*Pl.* 41d). Since the stones were lying in an almost straight row at a length of c. 0.75 rather closely to a wall, it can be surmised that they were weights of a standing loom, which had leaned towards the wall.³⁰

Two needles can be recognized. One of them is from the LM IIIA:2 period, made of bone and has only its lower part

and tip preserved, 74-B 001 (*Pl.* 256d:4, Space E, levelling deposit). The other one is from the LM IIIB:1 period and is made of bronze, 77-M 051 (*Pls.* 221, 235c:3, Room C, between layer of stones and floor). It is almost completely preserved, from pin to eye. Its length (0.106) corresponds well with a needle found in Tomb 2 in Odos Palama in the LM III cemetery at Khania, as well as to a needle found at Kommos and dated to LM IIIA:2 or LM I.³¹ Because of the length of the needle 77-M 051, it would have been functional for rather rough cloth and/or even for fish-net fabrication.³² Furthermore, it is possible that at least some of the fragmentarily preserved bronze objects, classified as pins (see below), are actually parts of needles or maybe awls.

The function of the so-called beads or buttons in stearite has been discussed in the *GSE II* volume.³³ It seems possible that these objects have had different functions, and that their use as beads and/or buttons should not be excluded. However, the general opinion that they are too light to have functioned as spindle whorls must be modified in the light of the recent experimental archaeological research where textile experts have proved that it is possible to spin a very thin woollen thread with reconstructed beads/buttons/spindle whorls.³⁴ Only four beads/buttons/spindle whorls have been found in the LM IIIB:1 level, and only three other samples of them have been found in the LM IIIA:2 level.³⁵ Their presence in these levels, however, might speak in favour of their use as spindle whorls due to the total lack of any other spinning implements in the IIIA:2 level and its presence being limited to only two

²³ I am very grateful to Dr Eva Andersson for generously having shared her expertise on textile tools with me and for showing me the results of this experiment, presented in *Technical Textile Tools Report*, ed. by E.B. Andersson, M. Nosch & A. Wisti Larsen, forthcoming. I am also much obliged to Dr Eva Andersson and Dr Marie-Louise Nosch for having involved me in their project, *Centre for Textile Research*, University of Copenhagen.

²⁴ As gaming markers, cf. Hillbom 2005, 299-301. As cooking supports or kiln separators, "... mainly because they were found in some cases near hearths and kilns ..." cf. discussion in Rahmstorf 2003, 403, where the author, however, rejects these theories. Cf. also discussion in *GSE II*, 177-178 and n. 33-36 with further references; *GSE III*, 266.

²⁵ Rahmstorf 2005, 143-169; Rahmstorf 2003, 403. In the Khania material most of these loom weights/bobbins are unbaked, although some of them are baked.

²⁶ *GSE* forthcoming.

²⁷ Cf. *GSE II*, 77.

²⁸ Cf. *GSE III*, 81-82 and fig. 19a, 266.

²⁹ Hallager & Tzedakis 1984, 5; Touchais, 1983, 831, fig. 153.

³⁰ See above p. 88. For the sake of convenience all of the stone weights found in LM IIIB:1 and LM IIIA:2 periods are, however, treated below in the section "Stone Weights".

³¹ Khania: Hallager & McGeorge 1992, 13-14, no. M 519, Pl. 10B; Kommos: Blitzer 1995, 517, no. M 171, pl. 8.83.

³² See further below in the section "Hunting and fishing".

³³ *GSE II*, 178 and n. 44-47 with further references. For beads/buttons found in LM IIIB:2 Khania, see *GSE III*, 267 and n. 15 with further references.

³⁴ Andersson & Nosch 2003, 197-205. For that reason the term bead/button/spindle whorl will henceforth be consistently used.

³⁵ LM IIIB:1: 71-S 001 (*Pls.* 226, 253c:1), 71-S 013 (*Pl.* 253c:2, both from north of Buildings 1 and 2, north of Room H), 72-S 094 (*Pls.* 226, 238a:2, pit in central part of Space I) and 80-S 026 (*Pls.* 226, 233b:5, Layer with stones). LM IIIA:2: 71-S 010 (*Pls.* 228, 261d:3, Rubbish Area North, dump), 73-S 028 (*Pls.* 229, 257c:2, Space H, levelling deposit), 82-S 006 (*Pls.* 229, 257d:4, south of Building 1, deposit 1).

samples in the IIIB:1 level (the doubtful KS-whorls not counted).³⁶

BRONZE INDUSTRY

The many bronzes found at the site are evidence that objects made of this metal were not uncommon in LM IIIB:1 and LM IIIA:2 Khania. Only a few of the bronze objects are well-preserved, a large part of them are very fragmentary, consisting of corroded and small sheets, straps, rods or wires. Since these more or less fragmentarily preserved bronzes are occasionally found together in floor deposits or in pits together with slag and/or implements indicating bronze production, it seems probable that at least a part of them were scrap-bronzes, intended to be remelted. This supposition is further strengthened by the observation that some fragments seem to have been deliberately bent.³⁷ Occasionally they have also been held together by organic fibres, from which there are traces preserved, probably for bunching scrap-bronzes together, like 82-M 004 (*Pl. 244f*, LM IIIB:1, Street, in lower layer).³⁸ The lack of any ingot at all among the LM IIIB:1 and LM IIIA:2 finds might be coincidental, but in any case the scrap-bronzes seem to have played an important part in the bronze production.³⁹ Analyses of the bronzes attest that metals from far off places like Laurion, Siphnos and Sardinia reached the town.⁴⁰

With the exception of a small piece of slag found in the LM IIIA:2 stratum, 74-MISC 004 (*Pl. 257a:1*, Space E, 9/7-Pit A) and of 71-M 022 (*Pl. 262a:2*, Rubbish Area North, 5-Pit) which is either slag or a lump of bronze, all the direct evidence of bronze-melting activities, such as slags, a mould and maybe a crucible, are limited to the LM IIIB:1 stratum. This is no doubt coincidental since the other ingredients – scrap-bronzes and stone tools related to bronze production – have been identified in the LM IIIA:2 context, just as in the LM IIIB:1 one. As well as the pieces of slag⁴¹ there are, furthermore, probable traces of bronze production on two of the above-mentioned small fragments containing metal from Laurion: 70-M 019 (*Pl. 241b:1*) has slag on its surface and the surface of 84-M 050 (*Pl. 248c:2*) is mixed with clay, maybe from a crucible. Other evidence of bronze production is: a fragmentarily preserved terracotta mould in hard, fine-grained clay with part of an angular thin mould-area, 80-TC 038 (*Pls. 221, 233b:15*, Layer with stones). The mould area of 80-TC 038 is indeed fragmentary, although its angled shape would fit well with the shape of a double axe. The depth of the negative of the mould 80-TC 038 is very thin. This might, however, not be original, but the result of wearing. Although a little damaged, the parts around the negative, seem to originally have been plain, indicating that the mould is the rest of a former two part mould, normally made of stone. One more example of such a clay-mould, dated to MM IIIB-LM IA, has been found in Palaikastro. The mould from Palaikastro has a height of 0.095, which gives a hint of the original height of 80-TC 038. Since there seems to be traces of heat and heavy fire on the inside of 80-TC 038, the mould has probably been used for a direct casting.⁴² The fragmentary piece 87-TC 017 (*Pl. 239e:1*, Space G, 23-Floor 11), also in a hard fine-grained clay, is provided

with three thin grooves, where the reddish clay is discoloured dark brown. It is probably a part of a mould for small objects, daggers, knives or some other implements. Since there are imprints of three negatives on 87-TC 017, this fragment might be the rest of a two-part mould for direct casting. The lost-wax casting system normally includes the negative of only one implement, not a group of two or more artefacts.⁴³ Likewise the fragmentary object, 87-TC 020 (*Pl. 240a:2*, Space G, dump below upper floor) with its coarse, gritty clay, relatively thick wall and slightly curved shape, might be part of a crucible.⁴⁴ On the other hand, the absence of any traces of burn-

³⁶ The beads/buttons/spindle whorls will be treated more below in the section “Jewellery, personal adornments, inlay- and appliqué work”.

³⁷ Such as 77-M 054 (*Pl. 247e:3*, LM IIIB:1 Courtyard, related II), 77-M 060 (*Pl. 236c:4*, LM IIIB:1 Room D, on floor) and 84-M 038 (*Pl. 259c:2*, LM IIIA:2 Rubbish Area Southeast, 20-Pit K/N).

³⁸ In a similar way six corroded arrowheads bundled together were found at Mycenae. Since they were placed in a sanctuary, they were in this case placed here for a votive, rather than a remelting purpose, French 1999, 202, no. 199.

³⁹ Fragments of copper, belonging to what seems to be a copper ingot from the Geometric period was found in Khania, see *GSE II*, 125, 82-M 002. In the LM IIIB:2 period, two more fragments of copper ingots were found, see *GSE III*, 268-269. For copper ingots during the LM II/IIIA:1 and LM I periods, see *GSE II*, 207, 209, 211 and *GSE V-VI*, forthcoming.

⁴⁰ Laurion: 70-M 019, a bronze fragment/lump (*Pl. 241b:1*, LM IIIB:1, Room H, levelling deposits), 71-M 008, a bronze fragment/rod with lumps of bronze attached to it (*Pl. 261d:5*, LM IIIA:2, Rubbish Area North, dump), 77-M 058, bronze fragment/chisel? (*Pl. 258a:3*, LM IIIA:2, south of Building 1, deposit 2), 77-M 067, a fragmentary sheet (consisting of two pieces) (*Pl. 238c:3*, LM IIIB:1, Corridor/Space I, in and below floor), 82-M 008, a fragment/lump (*Pl. 248a*, LM IIIB:1, Courtyard, deposits above latest floors), 84-M 050, a fragmentary sheet? (*Pl. 248c:2*, Courtyard, floors of 3rd phase). The following two pieces emanate from Siphnos (77-M 060, a fragmentary strip, *Pl. 236c:4*, LM IIIB:1, Room D, floor) and from Sardinia respectively (77-M 064, a fragmentary nail, *Pl. 244c*, LM IIIB:1, Room U, possible levelling). For an analysis of metals from LM IIIB:1 and LM IIIA:2 Khania, see *GSE II*, 206-214. Furthermore, 77-M 060 has a chemical composition, emanating from copper ores on the island Siphnos, which was in use in Crete during the EM-MM periods. This piece has thus been in use for a long time, unless it is an EB scrap-bronze that has just happened to turn up in LM layers, *GSE II*, 211.

⁴¹ 77-M 057 (*Pl. 236c:5*, Room D, on floor), 82-M 026, *Pl. 249b:1*, Courtyard, pit in 1st phase), and 84-MISC 088 (*Pl. 249b:3*, Courtyard, floors of 1st phase).

⁴² Professor Claus Reinholdt – currently preparing a comprehensive publication about all the Bronze and Early Iron Age moulds from Mainland Greece, the Isles (including Crete), Cyprus and Troy – has most generously shared his great knowledge on moulds with me and provided me with this information about 80-TC 038 and with the following references (personal communication). For the clay-mould from Palaikastro, cf. MacGillivray *et al.* 1989, 429, pl. 64a. For the technique of the manufacture of double axes, cf. Evely, 1993, 51-58, figs. 21-22. For a mould of marly sandstone from Khania with a matrix for a big plug (possibly for a chisel or a large nail) on one side and a matrix for a blade (possibly for a dagger or a small knife) on another other side, see *GSE II*, 43-44, 180, 71-S 012, pls. 99, 100a:1. According to Professor Reinholdt, the side of this mould lacks a fixing hole, and was probably used for “open” casting, presumably for a chisel. The other side of this mould, with two diagonally placed fixing holes, was used for two-part casting.

⁴³ I am most grateful to Professor Reinholdt for providing me with this information about 87-TC 017.

⁴⁴ For crucibles from the LM III period in Kommos, cf. Blitzer 1995, 504-505, M 18-28, pls. 8.77D-F, 8.78A-D, 8.104. Most of the crucibles from LM III Kommos have a maximum wall thickness that oscillates between c. 0.020 and 0.030. There are, however, two examples that have a lower maximum thickness, that of 0.010 (M 24) and 0.018 (M 26). The maximum preserved thickness of the wall of 87-TC 020 is 0.015. For crucibles from Knossos, cf. Catling & Catling, 1984, 219-220, pls. 199, 206-207. For crucibles from LM

ing or poured metal, as well as the fact that it also has incised grooves on its interior, makes this identification doubtful. It might just have been some sort of a terracotta container. The frequency of pumice stones with deep grooves seems to be evidence for their use as blade sharpeners.

When the original function of the bronze objects found in LM IIIB:1 and LM IIIA:2 can be defined, or at least presumed, the following categories of bronze artefacts emerge: needle, pin, bead, pendant, tweezers, maybe a spatula, maybe a chisel, knife/dagger, razor, arrowhead, hook/fish-hook, nail and sheet (occasionally decorated in repoussé).

77-M 051 (*Pls.* 221, 235c:3, LM IIIB:1, Room C, between layer of stones and floor), mentioned above, is the only bronze object that can be identified for certain as a needle.⁴⁵ Pins to adorn and hold the dress, and maybe also the hair, in place can be discerned. All of the six objects tentatively classified as pins derive from LM IIIB:1 strata.⁴⁶ There are two rounded objects identified as beads.⁴⁷ An axe-shaped pendant made of bronze, 77-M 046 (*Pls.* 221, 244g:2, LM IIIB:1, Street, in middle layer), is very well-preserved. A couple of similar pendants, dated to the LM II period, have been found at Knossos.⁴⁸

Three objects might tentatively be identified as tweezers. 76-M 001 (*Pls.* 229, 261a:2, LM IIIA:2, Rubbish Area North, 11-Pit G) might be part of one leg of tweezers of the type with flaring ends, although its use as an axe-shaped pendant (of the type mentioned above) or small spatula can not be excluded.⁴⁹ 84-M 022 (*Pl.* 234c:8, LM IIIB:1, Room C, on floor) seems to be a fragmentarily preserved leg of a pair of tweezers. A bronze fragment, 71-M 018 (*Pl.* 261d:2, LM IIIA:2, Rubbish Area North, dump), might be a part of a pair of tweezers, but it could also be a part of a small spatula, small chisel or the like.⁵⁰ Furthermore, one of the aforementioned objects containing metal from Laurion is 77-M 058 (*Pl.* 258a:3, LM IIIA:2, south of Building 1, deposit 2). Since the preserved part of its end is angular, it might have been a chisel.⁵¹

The following three very fragmentary pieces were presumably knives or daggers. Both 71-M 017 (*Pl.* 253c:8, LM IIIB:1, north of Buildings 1 and 2, north of Room H) and 82-M 020 (*Pl.* 260d:4, LM IIIA:2, Courtyard, floors) have smaller holes that seem to be rivet-holes for fastening the blade to a shaft. Of the third fragment 73-M 044 (*Pl.* 241c:1, LM IIIB:1, Room E, in upper floor), only a small part of the point of is preserved.

A further three pieces seem to have been razors rather than knives because of their curved blades.⁵² The blade of the comparatively well-preserved 74-M 004 does not narrow at the end, which makes its use as a razor even more probable.⁵³

There are two arrowheads, both of the LM IIIB:1 period, that are almost completely preserved.⁵⁴ The better preserved one, 80-M 012, belongs to Avila's type 1a, because of its shape and lack of any attachment-holes.⁵⁵ Because of their small size, arrows belonging to Avila's type 1a, are considered to have been used for hunting small game, rather than as a weapon used for a martial purpose. This type of arrow is most commonly in use during the LH period (although appearing already during the MH period).⁵⁶ The fragmentary state of 82-M 015 makes it difficult to state any further details about

its original shape, although since it is thinner than 80-M 012, it seems plausible that it was originally also a small-sized arrow.

Two hook-shaped objects, both from the LM IIIB:1 period, have been recorded: 70-M 016 (which is thinner) (*Pl.* 253c:9, north of Buildings 1 and 2, north of Room H) and 77-M 048 (which is broader) (*Pl.* 239c:1, Space G, in upper floor). If they were not only folded wire/strap, they could originally have had a function as hooks for different purposes. 70-M 016, which is comparatively thin, might be a fish-hook, but since it is only fragmentarily preserved, it cannot be stated whether it originally had a barb or not.⁵⁷

Five specimens from the LM IIIB:1 period have been

IIIC Khania, cf. *GSE* II, 180, 71-M 040b, pls. 95, 100a:3, 71-M 050, pls. 95, 100a:2, 77-TC 120, pls. 95, 107a:7, and for a possible crucible from LM IIIB:2 Khania, cf. *GSE* III, 269, 01-TC 024, pl. 162c:4.

⁴⁵ One more object, 87-M 005, is described as a needle in *GSE* III, 52 and 268, n. 22. Although recorded in *GSE* III, it was actually found on the upper floor of LM IIIB:1 Space G (see above p. 83). Since it has not been classified as a needle in the database of the *Centre for Textile Research*, University of Copenhagen (in 2007), it is hereafter classified as a pin.

⁴⁶ 80-M 013 (*Pl.* 234c:3, Room C, on floor), 77-M 045 (*Pl.* 244g:1, Street, in middle layer), 71-M 032 (*Pl.* 241b:2, Room H, levelling deposit), 71-M 009 (*Pl.* 241a, Room H, constructions), 87-M 005 (see preceding note) and the rounded object, 78-M 006 (*Pl.* 252d:2, north of Buildings 1 and 2, area of floor fragments, above the floors) that seems to be a knob of a pin. For pins, cf. Catling 1964, 237-239. For pins, generally labelled "needles", from Knossos, cf. Catling & Catling 1984, 215, pl. 205.

⁴⁷ 70-M 012 (*Pl.* 253a:6, LM IIIB:1, north of Buildings 1 and 2, north of Space G, lower layer) and 77-M 084 (*Pl.* 256f, LM IIIA:2, bedding below walls of Building 1). For beads of bronze, cf. Catling 1964, 74-75, 237.

⁴⁸ Catling & Catling, 1984, 217 pl. 205, nos. 27 and 28. These pendants seem to be a simpler version of pendants of the same shape, but adorned with pointillé ornament from Mavro Spelio, and Tomb V of Knossos New Hospital site, cf. *op. cit.*, 217 with further references. The use of these small axe-shaped objects has been debated. Branigan refers to them as cosmetic scrapers, cf. *op. cit.*, 217 with further reference. The presence of a loop on 77-M 046 makes a use as a pendant the most plausible.

⁴⁹ For tweezers of the type with flaring ends from Kommos, cf. Blitzer 1995, 512, M 82, pls. 8.84 and 8.108 (LM IB-II) and 515, M 126, pl. 8.108 (LM IA). For tweezers of the type with flaring ends from Knossos, cf. Catling & Catling 1984, 215, no. L 126, pls. 198h and 205:1.

⁵⁰ For spatulae, cf. Catling 1964, 263-265; for chisel, cf. Blitzer 1995, 513, M 97, pls. 8.83, 8.108.

⁵¹ Cf. e.g. Catling & Catling 1984, 214, no. M 47, pl. 201.

⁵² 77-M 039 (*Pl.* 244d, LM IIIB:1, Street, in upper layer), 80-M 016 (*Pl.* 236a:3, Room D, between layers with stones and floor) and 74-M 004 (*Pls.* 229, 256c:2, LM IIIA:2, Space E, above 15-Floor 5).

⁵³ Cf. Catling 1964, 229-230, pl. 40.h.

⁵⁴ 80-M 012 (*Pls.* 221, 233b:6, Layer with stones) and 82-M 015 (*Pl.* 249c:4, Courtyard, floors of 1st phase. For an arrowhead from LM IIIC Khania, cf. *GSE* II, 180, 84-M 033, pl. 105d:9, and from LM IIIB:2 Khania, *GSE* III, 269, 84-M 029, pl. 159e:6.

⁵⁵ When considering the corroded state of 80-M 012 it is not surprising that its length (0.037) is somewhat on the larger margin to fit into this group (with a maximum length of 0.035). For the same reason 80-M 012 is a bit thicker (0.005) than arrows belonging to Avila's Type 1 (which have been cut out of bronze sheets of a thickness of around 0.001). The more fragmentarily preserved arrow (which is also corroded), 82-M 015, has a thickness of 0.002.

⁵⁶ Cf. Avila 1983, 83-88, Taf. 24 and 64. It is true that there are some small depressions on 80-M 012. However, since they are neither going through, nor fit into the scheme for the placing of attachment holes on arrows, they are probably due to corrosion. For arrows with attachment holes, cf. Avila 1983, Taf. 24-26.

⁵⁷ For fish-hooks from LM IIIC Khania, cf. *GSE* II, 180, 80-M 006, pl. 107b:6 and 84-M 035, pls. 95, 105b:2. For fish-hooks from Kommos, cf. e.g. Blitzer 1995, 511, no. M 60 and 515-516, nos. M 127, M 142, M 145, pl. 8.85; and from Knossos, cf. Catling & Catling 1984, 215 and n. 112 with further reference.

identified as nails. The best preserved one, 87-M 007 (*Pls. 221, 234c:10*, Room C, on floor) has its head and part of its pin preserved. 77-M 052 (*Pl. 251c:3*, between Buildings 1 and 2, 11-Pit F2) is indeed corroded, but its thicker end seems to be the remaining part of its head. Of the remaining three pieces, only the pin is preserved, but because of their relative thickness it seems probable that they are part of nails.⁵⁸

On the LM IIIB:1 floor of the Corridor/Space I some fragments of bronze sheets were found, 71-M 003 (two pieces, *Pl. 237e:3*) and 71-M 033 (two pieces, *Pls. 221, 237e:2*). 71-M 033 has a punched decoration made with small dots. Between two decorative borders there is a figurative motif consisting of a large quadruped. Its head is missing, but its neck, body, bent legs and what seems to be its tail are visible. In the same Corridor/Space I, but in and below the floor, one more fragmentary bronze sheet (in two pieces) was discovered, 77-M 067 (*Pl. 238c:3*), containing metal from Laurion, as mentioned above. It has a proportionally high level of Sn (32%). If not coincidental, it might be due to an intentional way of making the metal gain a silvery sheen.⁵⁹ It can be conjectured that this kind of bronze sheet, occasionally with repoussé work, adorned wooden furniture and equipment, alternatively bronze weapons, shields or maybe metal vessels.⁶⁰

STONE TOOLS

The stone tools are rather evenly spread in both LM IIIB:1 and LM IIIA:2 layers. The different kinds of stone tools were no doubt used for a wide range of different industrial activities. Percussion stones were presumably used when hammering bronze and splitting different kinds of hard glass-like stones such as, flint, calcite, steatite and rock crystal.

Polishers and different kinds of abrasives like whetstones and pumice stones were probably used to smooth the surfaces of different materials such as bronze, bone or stone and to sharpen the edges of the bronze knives and the like. The few, small-sized flint stones (see below, p. 404) might have been used for small scale works, such as jewellery and inlays. Grinders and querns were certainly used in food preparation. Presumably they were also used for other purposes, for example in the textile industry, where grinders/querns, and probably also percussion stones, might have been used for extracting colours from plants, herbs or murex shells. Polishers would have been used also for smoothing and flattening textiles. The stone tools represented in LM IIIB:1 and LM IIIA:2 Khania⁶¹ are of basic and functional types that are identified through the whole of the Bronze Age. With the exception of a few fragmentary flint stones, the stone tools are not primarily worked, but have been chosen from stones in the natural area around Khania, preferably from the sea-shore since they consist of smoothed water-worn stones.

In the present material, eight basic categories of stone tools can be distinguished – percussion stone, axe-like stone, grinder, quern, polisher, whetstone, pumice stone and flint stone. Furthermore, most of these categories are subdivided into different types. The categories are based on the presumed function of a stone, which in turn is deduced from

the material of a stone and also from its shape, but above all from the different kinds of traces of wear.⁶² However, these divisions are not absolute, and different traces from abrasives and percussion marks on several of the stones indicate that the same stone had multiple uses simultaneously as a percussion stone, grinder and polisher. Pumice stones had a dual function as both abrasives and sharpeners. In many more cases, one side of a stone fits well into the grip of the hand and has a smoothed surface from wear. For grinders, percussions and polishers hard compact stones (often of a greenish-grey colour) were preferred. For abrasives/whetstones hard, almost metallic stones like phyllite or schist, or softer stones like marly sandstone were chosen. Furthermore, as a rule, whetstones are a flat shape.

With the exception of pumice and flint stones, the size of most of the stone tools belongs to the cobble category (size oscillating between 0.064 and 0.256), while a smaller part belongs to the pebble category (size oscillating between 0.004 and 0.064).⁶³ Half of the pumice stones are of a pebble size, while the remaining half belongs to the granule category (size oscillating between 0.020 and 0.040). All of the seven pieces of flint stone are of a granule size.

Percussion stones

Percussion stones are represented by seven specimens altogether. They are easily distinguished by percussion marks, usually occurring on their short sides.

Two percussion stones of an elongated oval shape, characteristic of Type 1, have been identified.⁶⁴ On 80-S 043 (*Pl. 237a:1*, LM IIIB:1, Room D, constructions) the distinctive percussion marks on the short sides are visible. One of the short sides has obviously been used more than the other one, since the percussion marks are denser here. The fact that the surface on this side is also faceted also shows that the tool

⁵⁸ 73-M 037 (*Pl. 242a:4*, Room E, pits in floor), 77-M 053 (*Pl. 251c:4*, between Buildings 1 and 2, 11-Pit F2) and 77-M 064 (*Pl. 244c*, Room U, possible levelling deposit, containing metal from Sardinia, as mentioned above). For nails from Kommos, cf. Blitzer 1995, 513, M 99, M 100, pl. 8.107.

⁵⁹ See *GSE II*, 212.

⁶⁰ For fragmentarily preserved sheets, occasionally with repoussé decoration, and their probable origin as parts of larger metal vessels, cf. Catling & Catling 1984, 211-212. Another possible function of the fragmentary sheets without decoration is that they derive from saws, Catling & Catling 1984, 218. However, since the sheets 71-M 003 and 71-M 033 were found in a floor deposit in the same Corridor/Space I, it seems plausible that they both belong to the same original work, even if the fragment 71-M 003 happens to be an undecorated part of this work. Concerning the sheet 77-M 067, it can be argued that if the silvery sheen is intentional, it seems plausible that this sheet was also used for a decorative purpose, rather than that it constitutes a part of a saw.

⁶¹ The classification of the stone tools, as well as observations on their material, size, traces of wearing etc. are based on Blitzer 1995, 403-535, treating stone tools from Kommos.

⁶² For a presentation of the standard categories of stone tools from the Greek-Swedish Excavations at Khania, see *GSE II*, 30-31.

⁶³ Blitzer 1995, 417, following the Wentworth scale.

⁶⁴ Cf. Blitzer 1995, 425-427, Hand tools, Type 1. Implements with pecked and battered ends, e.g. GS 8 (Date: LM IIIA:1-2), pls. 8.4, 8.89; GS 20 (Date: LM IIIA:2-B), pls. 8.4, 8.89.

has been held in different angles when working. The long sides are a little smoothed and fit well into a grip of a hand. Another, more fragmentarily preserved, sample of Type 1 is 87-S 012 (*Pl. 240a:1*, LM IIIB:1, Space G, dump below upper floor).

Type 2, of a more conical shape, is represented by two specimens,⁶⁵ 80-S 040 (*Pl. 255a:1*) and 80-S 048 (*Pl. 255a:2*), both with percussion marks on each of the short sides. The longer sides of 80-S 048 are faceted and smoothed, presumably because the stone has been used as polisher too. Faint percussion marks on these smoother parts indicate that these were also occasionally used for hammering. Both stones were found in a levelling deposit (mixed with items from the underlying LM I destruction) in Space A-D in the LM IIIA:2 Building 1. Since these two stones fit very well with debris from the LM I House IV it is plausible that they actually belong to this period.

Three LM IIIB:1 specimens represent Type 5, of a crescent shape, vaulted and with one long-side edge thinner than the other.⁶⁶ 80-S 030 (*Pl. 233c:1*, Layer with stones), has percussion marks on both of its short sides. On each of 80-S 044 (*Pl. 237c*, Room D, the bench) and 82-S 041 (*Pl. 248e:3*, Courtyard, floors of 2nd phase), only one of the short sides is preserved, and it is covered with percussion marks, which is also valid for the lower part of the long sides of 80-S 044. The upper parts of the stones are thicker, have smoothed, worn surfaces and fit well into a grip. Furthermore, the long sides of 82-S 041 are faceted from wear, indicating that this tool had the double function of a percussion stone and a polisher.

Axe-like stones

Two of the three flat, axe-like stones with a faceted edge are from the LM IIIA:2 period.⁶⁷ The third one is 82-S 013 from the LM IIIB:1 period (*Pls. 227, 247a:5*, Courtyard, 19-Pit Q).⁶⁸ It can be noted that both 84-S 013 and 84-S 014 were found in the same context, together with a deliberately bent scrap bronze (84-M 038). Presumably these small-sized “axes” were suitable for lighter work, such as beating bronze objects, a conjecture that is sustained by the traces of wear on two of the stones (the third one has such a corroded surface, that it is impossible to detect any traces of wear).⁶⁹

Grinders and a quern

Grinders are represented by 11 specimens altogether – all found in the LM IIIB:1 strata. They are faceted and abraded on one or more sides as a result from rubbing the tool in a forward and backward direction when grinding. Occasionally there are marks from percussion too, indicating that the stones were sometimes used also in this way in preparatory work for e.g. food production (pounding, tenderizing etc.).

Type 1, of a roughly pyramidal shape and with one side flattened from wearing,⁷⁰ is represented by one single piece, 83-S 007 (*Pl. 237a:2*, Room D, constructions).

Six specimens, of a rounded shape and roughly worn over the total surface, can be attributed to Type 2.⁷¹ 77-S 050 and

78-S 016 have percussion marks in addition to abrasive marks. 78-S 016 has, furthermore, become almost cubic from wearing.

Four grinders adhere to Type 3. They are of a flatter shape than the preceding type, and often have one side that is flat from wear and another one that is cupped, fitting into a grip. The vertical sides of these stones are often faceted from wearing.⁷²

The LM IIIB:1 quern 82-S 021 (*Pl. 247d:1*), which is the only quern on the whole reported from LM IIIB:1 and LM IIIA:2 levels, was found in 19-Pit Q in the Courtyard of Building 2 together with i.a. the grinder 82-S 011, mentioned above.

Polishers

Altogether eight specimens constitute polishers. They are characterized by their smoothed surfaces, containing thin, shallow, parallel grooves. The sides of the polishers are, furthermore, often faceted wear.

Type 1, of a rectangular shape,⁷³ is represented by one sin-

⁶⁵ Cf. Blitzer 1995, 438-440, Hand tools, Type 3. Triangular/trapezoidal cobbles with three pecked margins, e.g. GS 189 (Date: LM IIIA-B), pl. 8.12.

⁶⁶ Cf. Blitzer 1995, 463-465, Hand tools, Type 11. Severed cobbles, e.g. GS 487 (Date: From mixed Minoan to Classical deposit, Minoan [?]), pls. 8.34-35; GS 502 (Date: LM IIIA:2 or MM III), pls. 8.34-35.

⁶⁷ 84-S 013 (*Pls. 232, 259a:1*) and 84-S 014 (*Pls. 232, 259a:2*, both found in Rubbish Area Southeast, 20-Pit K/N).

⁶⁸ The best parallel for these axe-like stone from Khania found among the Kommos material are Hand tools, Type 11. Severed cobbles: a) hammer- or adze-like implements, cf. Blitzer 1995, 463-464. One important difference between this category from Kommos and the axe-like stones from Khania is, however, that the last-mentioned stones lack the percussion-severed used ends, characteristic of the Kommos axe-like stones. A better parallel for the axe-like stones from Khania is constituted by a similar kind of stone tool, found in the Unexplored Mansion at Knossos. It is identified in two variants, one a flatter and the other stubbier. The length and width are the same for the two variants (oscillating in length between 0.040-0.065 and in width between 0.040-0.050), but the stubbier variant has a thickness of 0.022-0.038, whereas the flatter one has a thickness of c. 0.010. The axe-like stones from Khania, although a bit longer (0.085-0.116), and for the width, on the larger margin (0.050-0.063) as compared to the samples from Knossos, thus adhere to the stubbier variant since they have a thickness of 0.019 in one case and of 0.025 in two cases. This kind of axe is evidenced in large numbers at various sites in Crete from the Neolithic period until the very early MM periods, after which it occurs only sporadically until the end of the Minoan period, cf. Evely 1984, 237 and n. 88 and 89 with further references, pls. 218, 1 and 230, 19.

⁶⁹ Cf. Evely 1984, 237, where it is noted that the Knossian counterparts of the axe-like stones from Khania, have chipped ends from use, but, considering their size, they were presumably not “... used for any especially arduous duties”.

⁷⁰ Cf. Blitzer 1995, 451-453, Hand tools, Type 7. Hand stones, e.g. GS 365 (Date: LM IIIA:2), pls. 8.19, 8.66B.

⁷¹ 78-S 016 (*Pl. 235h:4*, Room C, levelling deposit), 77-S 050 (*Pl. 238c:4*, Corridor/Space I, in/below floor), 73-S 020 (*Pl. 243b:1*, Room E, walls), 77-S 030 (*Pl. 250d:1*, between Buildings 1 and 2, upper deposit), 82-S 026 (*Pl. 248e:1*, Courtyard, floors of 2nd phase), 01-S 031 (*Pl. 239e:7*, Space G, 23-Floor 11). Cf. Blitzer 1995, 451-453, Hand tools, Type 7. Hand stones, e.g. GS 373 (Date: LM IIIB), pl. 8.22.

⁷² 82-S 011 (*Pl. 247a:3*, Courtyard, 19-Pit Q), 73-S 024 (*Pl. 242b:2*, Room E, extension between walls), 72-S 105 (*Pl. 238a:3*, pit in central part of Space I), 82-S 027 (*Pl. 246b:1*, Courtyard, deposit 2). Cf. Blitzer 1995, 451-453, Hand tools, Type 7. Hand stones, e.g. GS 375 (Date: LM IIIA:2-B), pl. 8.23.

⁷³ Cf. Blitzer 1995, 441-443, Hand tools, Type 5. Whetstones and abrading stones, e.g. GS 231 (Date: MM III or LM III), pl. 8.90.

gle item, 80-S 032 (*Pls. 227, 234b:6*, LM IIIB:1, Room A, in the shaft). Its surfaces are worn from polishing on all six facets. The percussion marks on one of the short sides indicate that this tool was also used as a percussion stone.

Two specimens belong to Type 2, which is of an oblong, rounded shape.⁷⁴ 84-S 053 has, furthermore, two natural decorative encircling bands in a darker colour.

Type 3, of a rounded or discoid-shape,⁷⁵ is represented by five items. Three of them are of a rounded shape.⁷⁶ Each of them has one side that is flattened from polishing (on 84-S 045 this side has even two facets) and the opposite side is vaulted and smoothed and fits well into a grip. 80-S 042 (*Pls. 227, 234b:1*, LM IIIB:1, Room A, in the shaft) is of a more discoid shape. It seems to have had a double function as polisher and percussion stone since its sides are smoothed and faceted and its two short sides have percussion marks. Another fragmentarily preserved polisher is 70-S 269 (*Pl. 253a:7*, LM IIIB:1, north of Buildings 1 and 2, north of Space G, lower layer).

Whetstones

Whetstones, characterized by faceted surfaces covered with grooves, are represented by ten samples altogether.

Seven of them can be identified as Type 1.⁷⁷ They are made of a hard, metallic grey schist and are of an elongated, roughly rectangular, thin shape. Their edges are faceted by whetting and their surfaces covered with thin grooves.⁷⁸ Furthermore, 71-S 015 has an intentionally incised depression at one of its short ends, maybe to hook up the tool when it was not in use. The fourth one, 70-S 342 (*Pl. 253a:8*, LM IIIB:1, north of Buildings 1 and 2, north of Space G), although very fragmentarily preserved, shows the clear characteristics of Type 1. It can be assumed that a further three thin fragments of schist⁷⁹ derive from whetstones of Type 1.

The remaining three specimens belong to Type 2.⁸⁰ They are made of marly sandstone and quartzite respectively and are characterized by an elongated shape (being a bit thicker than the preceding type of whetstones) with a square profile and the long sides faceted by whetting. Their surfaces are covered with thin parallel grooves.

Pumice stones

The pumice stones constitute the most common type of stone tool, comprising 16 specimens.⁸¹ 11 of them were found in an LM IIIB:1 context, and the remaining five in an LM IIIA:2 context.⁸²

Some of the pumice stones have traces from their use as abrasive and sharpening tools. They have flattened surfaces and sometimes deep grooves. The pumices are of an irregular to a rounded shape, or occasionally of a cupped shape (one side flat from wearing, the opposite side cupped from the grip of a palm). One, or several sides are faceted from whetting and their surfaces are covered with grooves, which are sometimes deep from the sharpening of blades such as on

80-S 045 (*Pl. 234b:4*) and on one of the four pieces belonging to 84-MISC 063 (*Pl. 259b:5*). Two other pieces belonging to 84-MISC 063 fit with each other. The larger of the two fitting pieces has a partly preserved depression in the shape of about half of a rectangle, widening towards one side. The smaller piece fits into this depression. Presumably a tool (of a miniature axe-like shape or the like) was placed in the depression and rubbed with the smaller piece at sharpening. Occasionally the pumice is pierced. 77-MISC 015 (*Pls. 226, 252a:3*) has a centrally placed hole. 87-MISC 004 (*Pl. 235e:3*) has traces of a hole at one end. This might have been a suspension-hole, to have the tool conveniently within reach (maybe hung on a wall, maybe fastened on a belt or the like and carried around). It has also been conjectured that pumice stones with a centrally placed hole, like 77-MISC 015, were fastened to a shaft and spun around when in use.⁸³ Furthermore, one can surmise that pierced pumice stones could have had been used in other ways as e.g. amulets or floats, either as a primary use, or as a secondary use when they had become worn out as a tool.

Stone weights

Two intentionally pierced stones⁸⁴ obviously had the function as some sort of suspension weights. That their shape recalls

⁷⁴ 82-S 001 (*Pl. 236c:8*, LM IIIB:1, Room D, on floor) and 84-S 053 (*Pl. 255c:5*, LM IIIA:2, Space A-D, levelling deposit). Cf. Blitzer 1995, 441-442. Hand tools, Type 5. Whetstones and abrading stones e.g. p. 447, GS 297 (Date: MM III), pl. 8.18B.

⁷⁵ Cf. Blitzer 1995, 441-442. Hand tools, Type 5. Whetstones and abrading stones e.g. p. 447, GS 296 (Date: MM III?), pl. 8.18B.

⁷⁶ 84-S 045 (*Pl. 255c:6*, LM IIIA:2, Space A-D, in lower floor), 84-S 017 (*Pl. 259a:3*, LM IIIA:2), 84-S 018 (*Pl. 259a:4*, LM IIIA:2, the two last-mentioned stones from 20-Pit K/N in the Rubbish Area Southeast).

⁷⁷ Cf. Blitzer 1995, 441-442. Hand tools, Type 5. Whetstones and abrading stones e.g. p. 444, GS 252 (Date: LM IIIA:1?), pls. 8.17B, 8.91.

⁷⁸ 74-S 012 (*Pl. 256d:6*, LM IIIA:2, Space E, levelling deposit), 71-S 015 (*Pls. 232, 261d:7*, LM IIIA:2, Rubbish Area North, dump) and the more fragmentarily preserved 71-S 007 (*Pl. 262e:2*, LM IIIA:2 Rubbish Area North, deposit B).

⁷⁹ 82-S 003 (*Pl. 233c:5*, LM IIIB:1, Layer with stones, in four pieces), 73-S 045 (*Pl. 243b:4*, LM IIIB:1, Room E, walls), 70-S 268 (*Pl. 253a:4*, LM IIIB:1, north of Buildings 1 and 2, north of Space G).

⁸⁰ 74-S 011 (*Pl. 243a:9*, LM IIIB:1, Room E, levelling deposit), 82-S 002, (*Pls. 227, 236c:7*, LM IIIB:1, Room D, on floor), 84-S 036 (*Pl. 260d:3*, LM IIIA:2, Courtyard, floors). Cf. Blitzer 1995, 441-442. Hand tools, Type 5. Whetstones and abrading stones e.g. p. 443, GS 237 (Date: LM I or LM III), pls. 8.17A, 8.90.

⁸¹ Cf. Blitzer 1995, 509. Pumice Abrading/Polishing Tools, e.g. M 45, (Date: MM III-LM I or LM IIIB), pl. 8.81.

⁸² LM IIIB:1: 80-S 045 (*Pl. 234b:4*, Room A, in the shaft), 77-S 059 (Room C, between layer with stones and floor), 87-MISC 004 (*Pl. 235e:3*, Room C, constructions), 84-MISC 093 (*Pl. 235f:1*, Room C, constructions), 74-S 015 (*Pl. 242a:6*, Room E, pits in floor), 82-S 042 (*Pl. 247a:4*, Courtyard, 19-Pit Q), 82-S 039 (*Pl. 249a:2*, Courtyard, floors of 1st phase), 77-FR 016 (*Pl. 251c:6* between Buildings 1 and 2, 11-Pit F2), 77-MISC 012 (*Pl. 252a:4*), 77-MISC 015 (*Pls. 226, 252a:3*, both between Buildings 1 and 2, 12-PIT E), 77-MISC 023 (*Pl. 251c:1*, between Buildings 1 and 2, 11-Pit F2), LM IIIA:2: 74-S 014 (*Pl. 256d:7*, Space E, levelling deposit), 84-MISC 092 (*Pl. 258c*, Rubbish Area Southeast, 20-Pit G), 84-MISC 104 (*Pl. 258b*, Rubbish Area Southeast, deposit B), 84-MISC 063 (*Pl. 259b:5*, Rubbish Area Southeast, 20-Pit K/N) and 84-MISC 077 (*Pl. 260b:2*, Building 2, Room B1).

⁸³ Evely 1993, 112; Evely 1984, 229, pl. 211d.

⁸⁴ 73-S 019 (*Pl. 242b:1*, LM IIIB:1, Room E, extension) and 77-S 039 (*Pls. 232, 256g:2*, LM IIIA:2, Space F, related?).

the terracotta loom weights of type 2a and type 2c respectively, if not coincidental, might speak in favour of their use as loom weights, although another function as suspension weights cannot be excluded.⁸⁵

Four other stones, of sand- or limestone, between about 0.500 and 2.000 in weight, and of a rounded or roughly rounded shape, presumably functioned as weights of some sort. Two of them have an intentionally pierced, large hole.⁸⁶ The third one, 82-S 030 (*Pl. 247d:2*, LM IIIB:1, Courtyard, 19-Pit Q), weighing 1.948, seems to have an intentionally pierced hole. The fourth one 84-S 024 (*Pl. 261b*, LM IIIA:2 Rubbish Area Southeast, 20-Pit L/AJ), weighing 1.620, has broad, ground depressions emanating from a central depression on one side. It seems as if a rope had been tied to the stone and fastened with a knot. Since these four stones have eroded surfaces, as if by water, around the holes and grooves respectively, it seems likely that they were used as fish-net sinkers (and not anchors, considering their relatively low weight).

Stone weapons

Because of their rounded shape and size, it seems plausible that the two stones, 87-S 010 (*Pl. 235e:4*, LM IIIB:1, Room C, constructions) and 73-S 268 (*Pl. 241c:3*, LM IIIB:1, Room E, in upper floor) have been used as slingstones.

HUNTING AND FISHING

It appears from the bronze and stone artefacts of LM IIIB:1 and LM IIIA:2 Khania presented above,⁸⁷ that there are only a few pieces that can be identified as weapons. They are restricted to two LM IIIB:1 bronze arrowheads, of a small-sized type considered to have been used for hunting small game, 80-M 012 (*Pls. 221, 233b:6*) and 82-M 015 (*Pl. 249c:4*) as well as to two LM IIIB:1 slingstones, 87-S 010 (*Pl. 235e:4*) and 73-S 268 (*Pl. 241c:3*). In addition to this, there are some fragmentarily preserved bronze pieces that seem to have been knives or daggers, 73-M 044 (*Pl. 241c:1*, LM IIIB:1), 71-M 017 (*Pl. 253c:8*, LM IIIB:1) and 82-M 020 (*Pl. 260d:4*, LM IIIA:2). If knives and not daggers, their use as weapons cannot be excluded, although they presumably had multiple functions.

Considering the lack of martial indications among the buildings of LM IIIB:1 and LM IIIA:2, it seems plausible that not only the arrowheads, but also the slingstones and maybe the knives/daggers as well were used for hunting. There are bones from different kinds of wild animals represented, mainly from the Cretan wild goat (the kri-kri) but occasionally also from boar, deer, hare (*Lepus europaeus*) and wild birds.

Because of the proximity of the settlement to the sea and the abundance of shells in the rubbish heaps, as well as the occasional find of a crab's claw 77-MISC 027 (*Pl. 248c:1*, LM IIIB:1, Courtyard, walls), the importance of marine invertebrates,⁸⁸ and presumably also of fish, should probably not be underestimated.⁸⁹ Furthermore, the archaeological evidence of fish-bones at Monastiraki in the Amari valley, far from the

sea, indicates that fish was considered to be a product important enough to preserve and to transport for certain distances.⁹⁰ Marine motifs were one of the favourites of Minoan artists, and are occasionally represented also on pottery from LM IIIB:1 and LM IIIA:2 Khania.⁹¹ Fish-hooks are rather commonly found in Minoan settlements,⁹² and Minoan Khania is no exception.⁹³ The hook 70-M 016 (*Pl. 253c:9*, north of Buildings 1 and 2, north of Room H) from LM IIIB:1 Khania, might have been a fish-hook.

The identification of an anchor stone, (*Fig. 31, Pl. 39c*) re-used in the construction of 14-Wall 6 in the Annex in the LM IIIB:1 Building 1,⁹⁴ indicates that fishing could have taken place from boats, and not only from the shores around Khania. Four other water-worn stones with rope-impressions have been identified as fish-net sinkers: 77-S 042 (*Pls. 226, 252a:1*), 73-S 283 (*Pl. 262d*), 82-S 030 (*Pl. 247d:2*) and 84-S 024 (*Pl. 261b*). This identification is further strengthened by the fact that one of them, 77-S 042, was found together (in-between Buildings 1 and 2, 12-Pit E) with two small rounded pumice stones in the same pit, 77-MISC 015 (*Pls. 226, 252a:3*) with a hole pierced through, and 77-MISC 012 (*Pl. 252a:4*).⁹⁵ The two pumice stones might have been used as floats (maybe as a secondary use?). It is possible that long needles such as 77-M 051 (*Pls. 221, 235c:3*) were not only used for textiles, but also in net production. Other possible tools for this use are the long bone implements.⁹⁶ Objects similar to the small flat awl-shaped bone specimen 72-B 003 (*Pls. 224, 238a:1*, LM IIIB:1, pit in central part of Space I) have been found in LM I and II deposits at Kommos together with fish-hooks.

⁸⁵ When discussing the spatial distribution of loom weights in Kommos, stone suspension weights are also included, see Dabney 1996, 245, with reference to Blitzer 1995, GS 519-558, Type 12A-D.

⁸⁶ 77-S 042 (*Pls. 226, 252a:1*, LM IIIB:1, between Buildings 1 and 2, 12-Pit E) and 73-S 283 (*Pl. 262d*, LM IIIA:2, Space H, levelling deposit).

⁸⁷ Since all of the tools and weapons of bronze and stone have been treated more thoroughly above, objects relevant also to this section are only briefly mentioned here.

⁸⁸ For the importance of marine invertebrates in the Minoan diet, cf. Rose 1995, 240-273. All of the shells from marine invertebrates found at LM IIIB:1 and LM IIIA:2 Khania does not indicate that they were actually eaten, for example the murex shell was presumably used, at least to a degree, for extracting its pigments. However, even though the marine invertebrates could have been primarily collected for eating, it does not exclude that their shells had secondary uses such as for utensils, ornaments, jewellery or objects of symbolic values (cf. Balzinger 1999, 70).

⁸⁹ For evidence of fishing at Minoan Kommos with outlooks to other places in the Minoan world, cf. Rose 1995, 204-239. The archaeological material from Khania has, however, not yet gone through the special examination that is needed to make it possible to trace fish-bones.

⁹⁰ Kanta 1999, 94-95.

⁹¹ See e.g. 73-P 0247 (*Pl. 169a:9*, conical rhyton), 82-P 1648 (*Pl. 174g:5*, closed vessel) and 74-P 0146 (*Pl. 194g:3*, kylix) in the present work.

⁹² Cf. for Kommos, Blitzer 1995, 511-517, M 60, 69, 70, 71, 72, 93, 106, 127, 142, 145, pl. 8.85. Cf. for Knossos, Evelyn 1984, 215, pl. 205, 23, a "fish-hook" of an uncertain identification.

⁹³ For fish-hooks, from LM IIIC Khania cf. *GSE* II, 180 (80-M 006, pl. 107b:6 and 84-M 035, pls. 95, 105b:2).

⁹⁴ See above, p. 82.

⁹⁵ The lack of any pierced hole on 77-MISC 012 does not exclude its use or intended use as a float, since it might have been tied to a net, alternatively not yet been pierced.

⁹⁶ 77-B 002 (*Pls. 224, 252b:3*, LM IIIB:1, between Buildings 1 and 2, 12-Pit K) and 77-B 004 (*Pls. 224, 237e:1*, LM IIIB:1, Corridor/Space I, on floor).

They have been interpreted as needle points, mounted in a haft (probably of wood), which could have been used for the manufacture of fish-nets for example.⁹⁷

JEWELLERY, PERSONAL ADORNMENTS, INLAY- AND APPLIQUÉ WORK

Precious stones, ivory and bone, were presumably combined with bronze⁹⁸ or even gold to create jewellery, personal adornments or inlays and appliqué work. Since some of these luxury items in precious materials were found in an unfinished state, it seems likely that they were locally fabricated, even if a part of the raw material, like bronze and gold, had to be imported to Crete.⁹⁹ In contrast to this, steatite, the material of which the beads/buttons/spindle whorls¹⁰⁰ were fabricated did not need to be imported since it was locally available in the Amari district in central Crete.¹⁰¹ Steatite fragments have been found at several places at the site.¹⁰² These fragments, if not unintentionally chipped off, seem to have been chipped off from the core at manufacturing. The bead/button/spindle whorl 80-S 026 (*Pls.* 226, 233b:5), has six vertical facets on its outside, indicating that the object is unfinished since during manufacturing of beads/buttons/spindle whorls their outsides were roughly cut into vertical facets before they were finally smoothed and polished.¹⁰³ The steatite from which the beads/buttons/spindle whorls are made, varies in colour between black to violet, grey and green, occasionally with lighter veins. Furthermore, all of them but one are conical and belong to Furumark's Type a1. The remaining one, 73-S 028, is of a shanked shape and belongs to Furumark's Type c.¹⁰⁴

Beads were also fabricated in bronze, faience, or terracotta.¹⁰⁵ The faience bead (like its two bronze equivalents) is of a rounded shape, while the terracotta bead is of a biconical shape. The latter also has an incised decoration of vertically running incisions all around.

Pendants were likewise fabricated in different materials. One axe-shaped pendant is made of bronze, 77-M 046 (*Pls.* 221, 244g:2, LM IIIB:1, Street, in middle layer). Another pendant, in black steatite, is shaped as a shell of the *glycymeris*-type with a flat bottom and six grooves radiating on the upper, cupped side from back to front 73-MISC 012 (*Pls.* 226, 254b:3, LM IIIB:1, north of Buildings 1 and 2, deposit 1). Traces of a string-hole near its back indicate that it was used as a pendant.¹⁰⁶ Similar shells, although made in faience, have been found at Zakros. Since they lack string-holes, they were probably used for inlay work or maybe as gaming markers.¹⁰⁷ Even though a *glycymeris* shell, 82-MISC 015 (*Pl.* 246b:2, LM IIIB:1, Courtyard, younger deposit), has a naturally made hole at the umbo, (bored by carnivorous gastropod) its function as a pendant might not be excluded.¹⁰⁸ A small pierced horn seemingly from a goat kid, 87-MISC 003 (*Pl.* 239c:4, Space G, upper floor) is an example of another kind of pendant, probably an amulet.¹⁰⁹ The crab's claw, 77-MISC 027 (*Pl.* 248c:1, LM IIIB:1 Courtyard, walls), if not only trash, might have been intended to be used as an amulet. An interesting parallel is offered by the finds in the LM IIIB:1 Tomb

10 in Odos Palama in the cemetery at Khania. Here a pierced crab claw was found together with other pendants; two beads/buttons/spindle whorls, and two beads (of stone and bone respectively). Since the exact find positions of these pendants are not recorded, there is no possibility to state whether they belonged to one necklace (or maybe to several necklaces), or whether they were worn in other ways. It has been suggested that the claw was used as an amulet for one of the two children, who were buried in the tomb together with a woman.¹¹⁰ A disc-shaped bone object with a slightly cupped upper side, 84-B 010 (*Pls.* 229, 255b:1, LM IIIA:2, Space A-D, floor), with a centrally pierced hole and a reticulate decoration on its upper side, might have been used as a pendant, although other functions as e.g. a bead or button, cannot be excluded.

Rock crystals occur rather frequently. They were presumably used for different kinds of inlays, as jewellery or as ornaments or knobs on personal equipment like dress-pins and hair-pins. The two smaller prism-shaped rock crystals might have been intended as decorative knobs for long pins.¹¹¹ However, the remaining 10 rock crystals are less worked, being of a rounded, an elongated or an irregular shape.¹¹²

The worked boar's tusk, cut at both ends, (80-B 008, *Pl.* 235e:2, Room C, constructions) brings to mind Mycenaean helmets, although other uses are also conceivable.¹¹³ One

⁹⁷ Blitzer 1995, 497, pl. 8.102.

⁹⁸ Since all of the bronzes have been treated more thoroughly above the bronze objects relevant also to this section are only briefly mentioned here.

⁹⁹ The same conditions seem to prevail also at Kommos, see Dabney 1996, 263 and n. 5 and Shaw 1996, 391.

¹⁰⁰ Also mentioned above in section "Other possible textile implements".

¹⁰¹ Blitzer 1995, 420.

¹⁰² Among others 80-S 034 (*Pl.* 236c:3, LM IIIB:1, Room D, on floor) and 78-S 014 (*Pl.* 237b:2, LM IIIB:1, Room D, constructions, filled-in door).

¹⁰³ For the manufacturing of beads/buttons, see Evely 1980, 136-137; Evely 1984, 239; Evely 1993, 196.

¹⁰⁴ Furumark 1941, 89.

¹⁰⁵ Bronze beads: 70-M 012 (*Pl.* 253a:6, LM IIIB:1, north of Buildings 1 and 2, north of Space G, lower layer) and 77-M 084 (*Pl.* 256f, LM IIIA:2, bedding below walls of Building 1). Faience bead: (yellow to cream coloured with darker dots), 70-MISC 004 (*Pl.* 253b:2, LM IIIB:1, north of Buildings 1 and 2, north of Space G). Terracotta bead: 77-TC 070 (*Pls.* 228, 256c:1, found *in situ* with a razor 74-M 004, in LM IIIA:2, Space E, above 15-Floor 5).

¹⁰⁶ In Hillbom 2005, 279-280 it is suggested that 73-MISC 012 might have been used as a gaming marker. This cannot be excluded, but the pierced hole speaks in favour of its use primarily as a pendant.

¹⁰⁷ Platon 1971, 218-219; Hillbom 2005, 280.

¹⁰⁸ See p. 137 in the present work. For *glycymeris* shells with and without a hole in Kommos and with comparative material, cf. Reese 1995, 252-256.

¹⁰⁹ See above p. 83. 87-MISC 003 is described in the catalogue in *GSE* III, 52.

¹¹⁰ Hallager & McGeorge 1992, 17-19, pl. 16B, n. 36.

¹¹¹ 77-S 018 (*Pls.* 224, 244e) and 77-S 019 (*Pl.* 244g:4, both LM IIIB:1, Street, in middle layer). See Platon 1971, 217. Long pins, mounted by a decoration in rock crystal, are also considered to have been used as hair-pins, cf. *op cit.*, 218; Evely 1984, 238 and n. 101 with further references.

¹¹² LM IIIB:1: 84-S 030 (*Pl.* 234c:11, Room C, on floor), 80-S 035 (*Pl.* 235d, Room A, constructions), 77-S 055 (*Pl.* 237d, Corridor/Space I, 8-Pit T), 73-S 142 (*Pl.* 241e:1, Room E, upper floor), 73-S 219 (*Pl.* 243a:8, Room E, levelling deposit), 77-S 037 (*Pl.* 243b:5, Room E, walls), 82-S 037 (*Pl.* 249b:4, Courtyard, floors of 1st phase), 77-S 026 (*Pl.* 250d:4, between Buildings 1 and 2, upper deposit), 77-S 035 (*Pl.* 250e:1, between Buildings 1 and 2, lower deposit), LM IIIA:2: 84-MISC 078 (*Pl.* 260b:1, Building 2, Room B₁, in floor).

¹¹³ For boar's tusk, see also *GSE* II, 178 and *GSE* III, 268 with further references.

side of a small piece of ivory (70-B 003, *Pl.* 252g:3, north of Buildings 1 and 2, north of Space G) is even and polished, while the other side is unworked, indicating that this item was intended for an inlay. Tesseræ of calcite seem to have been used in a similar way.¹¹⁴

Fragmentarily preserved bronze sheets, with or without repoussé decoration, like 71-M 033 (*Pls.* 221, 237e:2), 71-M 003 (*Pl.* 237e:3) and 77-M 067 (*Pl.* 238c:3), have presumably been used as appliqué-work.

A tiny fragment of a gold-foil, 81-M 001 (*Pl.* 235g, Room C, bench/walls), is evidence that precious golden pieces were occasionally used at the site in the LM IIIB:1 period.¹¹⁵

VARIOUS ITEMS

The remaining small finds mirror both work and amusement in the daily life of the inhabitants of the LM IIIA:2 and LM IIIB:1 settlement. There are two potters' rubbing tools in terracotta.¹¹⁶ The best parallel for the odd terracotta object, 78-TC 013 (*Pls.* 221, 235h:3, Room C, levelling deposit) is what has been interpreted as an ear of a quadruped from a large figurine, found in MM III-LM III Kommos.¹¹⁷

A further, fragmentarily preserved, terracotta object, of which only its lower part is preserved 71-TC 097 (*Pls.* 227, 254a, LM IIIB:1, north of Buildings 1 and 2, north of Room H), can be noted. It is of an elongated shape with a flat base. Its outer sides are rather straight, while its inside is cup-shaped. There are grooves on the outside and fingerprints on the inside of the object. It might have been a container of some sort.

There are some terracotta objects from both LM IIIB:1 and LM IIIA:2 levels, of a rounded (cupped or flat) shape that are reused pottery, such as the lower part of conical cups,¹¹⁸ the top of false neck stirrup jars or the foot of a vase.¹¹⁹ It is difficult to state any certain function for them, and presumably their functions varied. It has been proposed that these pieces might have been used as gaming markers.¹²⁰ The find of four of them, 84-TC 081, 84-TC 082, 84-TC 083 and 84-TC 084 together in a pit (20-Pit K/N in Rubbish Area Southeast) together with a knuckle-bone (see below), hints that they formed part of a set of gaming markers.¹²¹ There are, however, other possible functions for them, such as weights for a lighter balance (for spices or the like) or as stoppers/lids. A further two items,¹²² might originally have been the bottom parts of vessels and are of a deep cupped shape. Considering that one of them 84-TC 022 has been found in a context, together with 84-TC 019 and 84-TC 023 (tentatively identified as gaming markers), it cannot be excluded that these two objects have also been used as gaming markers. However, they would also have been functional as stoppers/lids.

One terracotta object, 77-TC 100 (*Pls.* 231, 261a:3, LM IIIA:2, Rubbish Area North, 11-Pit G) can be identified as a stopper. A further two terracotta objects have shapes that speak in favour of their use as stoppers/lids (and not balances or gaming markers since they do not stand up).¹²³ They are compact, and of a conical and biconical shape respectively.

A thin bone 74-MISC 001 (*Pl.* 243a:3, Room E, levelling deposit), probably from an animal's cranium, has a very small

piece of bronze attached to it. Since the bone has traces from fire, it might just have fallen into a smith's hearth. It can also be noted that a small piece of bronze was also attached to a worked piece of bone, 70-B 002 (*Pl.* 252g:2, LM IIIB:1, north of Buildings 1 and 2, north of Room G, upper layer). It seems most likely that the bronze was unintentionally fastened to the bone.

The knuckle-bone, 84-B 007¹²⁴ (*Pl.* 259b:1, LM IIIA:2, Rubbish Area Southeast, 20-Pit K/N) might be a coincidentally preserved bone from an animal, but it cannot be excluded that it had a certain function. Knuckle-bones (or *astragaloi*), mainly from sheep or goats, being used for certain functions not only known from the whole of the antique world, from the Early Bronze Age onwards, but also from later times and from other parts of the world.¹²⁵ They are thus widely spread both in time and space, and their function has no doubt varied at different periods and places.¹²⁶ In the Mediterranean Bronze Age they were often used as dice or gaming markers, but were also used as offerings in a religious or a funerary context and probably also as dividing tools.¹²⁷ Since 84-B 007 was found in a habitation area, its use

¹¹⁴ LM IIIB:1: 77-S 020 (*Pl.* 233b:9, Layer with stones), 80-S 033 (*Pl.* 235a, Room A, in 17-Floor 4), 71-S 052 (*Pl.* 238c:1, Corridor/Space I, in and below floor), 77-S 034 (*Pl.* 247e:2, Courtyard, related II), 82-S 010 (*Pl.* 248b, Courtyard, deposits above latest floors), LM IIIA:2: 74-S 008 (*Pl.* 256d:5, Space E, levelling deposit), 71-S 033 (*Pl.* 261d:6, Rubbish Area North, dump).

¹¹⁵ For blade gold found in e.g. Knossos, see Evely 1984, 254, Pl. 232, 8.

¹¹⁶ 70-TC 038 (*Pl.* 225, 252g:5, LM IIIB:1, north of Buildings 1 and 2, north of Space G) and 84-TC 017, (*Pls.* 229, 258f:4, LM IIIA:2, Rubbish Area Southeast, 20-Pit L/AJ).

¹¹⁷ Shaw 2006, 775, no. SC 13, pl. 4.47.

¹¹⁸ 87-TC 005 (*Pl.* 239e:8, LM IIIB:1, Space G, 23-Floor 11), 84-TC 085 (*Pl.* 248e:10, LM IIIB:1, Courtyard, floors of 2nd phase), 84-TC 023 (*Pl.* 258f:6, LM IIIA:2, Rubbish Area Southeast, 20-Pit L/AJ), 84-TC 081, 84-TC 082, 84-TC 083, 84-TC 084 (*Pl.* 203d:5-8, all LM IIIA:2, Rubbish Area Southeast, 20-Pit K/N), and 84-TC 086 (*Pl.* 209e:11, in a Post-Minoan context).

¹¹⁹ Top of false neck stirrup jars: 77-TC 057 (*Pls.* 224, 243b:11, LM IIIB:1, Room E, walls) and 84-TC 019 (*Pl.* 258f:1, LM IIIA:2, Rubbish Area Southeast, 20-Pit L/AJ), while 82-TC 024 (*Pl.* 249c:3, LM IIIB:1, Courtyard, 1st phase, 19-Pit T), is a reused foot of a vase. Furthermore, one object, 76-MISC 013 (*Pl.* 261a:1, LM IIIA:2, Rubbish Area North, 11-Pit G) also seems to be a piece of reused pottery.

¹²⁰ For reused conical cups, cf. *GSE* III, 236. Cf. also Hillbom 2005, 277, 289-290; *GSE* III, 58, 266. There is a lot of evidence for games in Bronze Age Khania, apart from possible gaming markers of bone and terracotta (see *GSE* I, II, III *passim*) there is a die – regarded as the oldest known die in Europe – found in LM IIIB:2 levels, see Hillbom 2005, 314-317 and *GSE* III, 70, 268. In the earlier *GSE*-volumes gaming markers are called markers, counters or pawns. Henceforth the term “gaming marker” will be consistently used. Furthermore a fragmentarily preserved ivory plaque, presumably part of a gaming board, has been found at Khania, see Burkhalter & Philippa-Touchais 2003, 1106, fig. 306 and *GSE* VII, forthcoming.

¹²¹ It can also be noted that further two of these objects, 84-TC 023 and 84-TC 019, were found together in another pit.

¹²² 77-TC 071 (*Pls.* 221, 237e:5, LM IIIB:1, Corridor/Space I, on floor) and 84-TC 022 (*Pls.* 229, 258f:7, LM IIIA:2, Rubbish Area Southeast, 20-Pit L/AJ).

¹²³ 77-TC 039 (*Pls.* 224, 252a:5, LM IIIB:1, between Buildings 1 and 2, 12-Pit E) and 73-TC 015 (*Pls.* 224, 243b:9, LM IIIB:1, Room E, constructions (walls)).

¹²⁴ For other knuckle-bones from the *GSE* excavations at Khania, see forthcoming *GSE* publications and Hillbom 2005, 313.

¹²⁵ Gilmour 1997, 170-171; Hillbom 2005, 312-314.

¹²⁶ Gilmour 1997, 167-175. See also Hillbom 2005, 312-314. For different kinds of games played with knuckle-bones among the Greeks and Romans, see Schädler 1996.

¹²⁷ Gilmour 1997, 173.

as a die or a gaming marker seems to be the most plausible explanation. The fact that it was found in a pit together with four pieces (84-TC 081, 84-TC 082, 84-TC 083, 84-TC 084, see above), if correctly identified as gaming markers, strengthens the theory that it was used as a die.¹²⁸

CONTEXTS OF THE SMALL FINDS

The small finds included in *Tables 1* and *2* are limited to the most diagnostic ones, i.e. to such pieces that derive from floor deposits/on floors or pits where there are more than one occasional small find recorded. Thus, they constitute a minor part of all of the small finds that emanate from LM IIIB:1 and LM IIIA:2 Khania. The small finds from the LM IIIB:1 period (*Table 1*) are represented on floors and in pits in the adjacent Rooms C and D, Corridor/Space I, as well as in Space G and Room E in Building 1, in the space between Building 1 and 2 and in the Courtyard of Building 2. The small finds from the LM IIIA:2 period (*Table 2*) are to a lesser part identified on floors, but are to a larger part found in pits, mainly in Rubbish Area North and in Rubbish Area Southeast and in one case also in Space E.

The general picture gained from the distribution of small finds of the LM IIIB:1 period in their original contexts, is that the industrial activities seem to be rather evenly spread out over most of the settlement, in both indoor and outdoor places. The mixture of small finds from different branches of industrial activities also hints that the industrial activities to the most part took place side by side within the same rooms and spaces.¹²⁹ In most cases textile implements, such as loom weights, are mingled with remains that adhere to bronze production (such as slag, scrap-bronzes, and what might be a crucible) or to objects that indicate a fabrication of more valuable stones (chips of steatite and flint). They are also found together with stone tools, such as polishers, whetstones and pumice stones, which were presumably used in the fabrication of bronze objects and more valuable stones. It is possible that polishers were also used to smooth out textiles. The use of the KS whorls have been discussed above, and just as in later periods, it can be stated that during the LM IIIB:1 period, they are found in contexts both with and without textile implements,¹³⁰ but in each case also mixed with other categories of objects indicating industrial activities other than textile ones (such as the work with bronze and more valuable stones: rock-crystal, steatite and flint).¹³¹ Neither does the find context of the only bead/button/spindle whorl from an original context in LM IIIB:1 give any hint as to its use,

since it is found together with a grinder and an awl-shaped bone instrument. The importance of fishing as a livelihood is hinted at in another context in a pit (12-Pit E) with a fish-net sinker, mixed with two pumice stones, presumably floats. This supposition is strengthened by the fact that a long bone implement, maybe used for fish-net production, was found in 12-Pit K which is stratified below the latter pit.

For the LM IIIA:2 period the evidence is more scarce, but the same mixture of implements from different industrial branches is identified.¹³² Here loom weights are recognized beside pieces that indicate bronze production, such as scrap-bronzes and stone tools which were suitable when beating, polishing and sharpening bronze objects. In one, further case a loom weight was found together with a potter's tool. In another context three loom weights of Type 2 were found together. Because of their varying weights, it is, however, not particularly likely that they actually derive from the same loom.

For both LM IIIB:1 and LM IIIA:2 periods there are objects that have tentatively been identified as gaming markers, a conjecture that is sustained by the fact that four of them were found in the same pit as a knuckle-bone from a goat or sheep, an object often used as a die at many places during the Bronze Age. These finds are also reminders of a leisure life in the settlement.

¹²⁸ For games and game boards in Minoan Crete, see Hillbom 2005.

¹²⁹ The only exception is constituted by 11-Pit F2, between Building 1 and 2, where the scanty finds indicate merely bronze production.

¹³⁰ The textile implements found in original contexts are limited to loom weights in LM IIIB:1. In three cases the KS whorls are mixed with loom weights and in a further three cases without loom weights.

¹³¹ Together with loom weight(s): in Space G, dump below upper floor (one KS whorl), Room E, pits in floor (one KS whorl) and Courtyard 19-Pit Q (one KS whorl). Without loom weights: Room C, on floor (two KS whorls) and Corridor/Space I, on floor (one KS whorl).

¹³² The only exception is constituted by 5-Pit in Rubbish Area North, where the two finds merely indicate a bronze production.

Table 1. Selected list of small finds from the LM IIIB:1 period.

Context	Find	Inv. no.
<i>On floors</i>		
<i>Room C</i>	KS whorl	84-TC 010
	KS whorl	87-TC 012
	bronze pin(?)	80-M 013
	frg. of bronze tweezers(?)	84-M 022
	bronze nail	87-M 007
	rock crystal	84-S 030
	unworked(?) bone	84-B 003
<i>Room D</i>	loom weight (Type 2a)	82-TC 004
	piece of slag	77-M 057
	bronze frg. bent	77-M 060
	polisher (Type 2)	82-S 001
	whetstone (Type 2)	82-S 002
	chip of steatite	80-S 034
	<i>Corridor/ Space I</i>	KS whorl
bronze sheet		71-M 003
bronze sheet		71-M 033
bone pin,		77-B 004
gaming marker(?)		77-TC 071
<i>In pits</i>		
<i>Space G, dump</i>	loom weight (Type 2 a)	87-TC 007
	loom weight (Type 2a or b)	87-TC 011
	KS whorl	77-TC 044
	crucible(?)	87-TC 020
<i>Room E, pits in floor</i>	percussion stone (Type 1)	87-S 012
	loom weight (Type 2b)	73-T 027
	KS whorl	73-TC 011
	bronze nail(?)	73-M 037
	pumice stone	74-S 015
<i>Space I, pit in central part</i>	bronze wires and strips	73-M 036
	bead/button/spindle whorl	72-S 094
	grinder (Type 3)	72-S 105
<i>11-Pit F2</i>	awl-shaped bone instrument	72-B 003
	frg. of bronze nail	77-M 052
	frg. of bronze nail	77-M 053
<i>12-Pit E</i>	pumice stone	77-FR 016
	pumice stone	77-MISC 023
	fish-net sinker	77-S 042
	pumice stone (maybe float)	77-MISC 012
<i>12-Pit K</i>	pumice stone (maybe float)	77-MISC 015
	stopper	77-TC 039
	bone implement	77-B 002
<i>Courtyard 19-Pit Q</i>	bronze fragment	77-M 083
	bronze fragment	77-MISC 030
	loom weight (Type 2 a or b)	82-TC 018
<i>19-Pit Q</i>	KS whorl	82-TC 019
	axe-like stone	82-S 013
	grinder (Type 3)	82-S 011
	quern	82-S 021
	pumice stone	82-S 042
	flint	82-S 012
	fish-net sinker	82-S 030

Table 2. Selected list of small finds from the LM IIIA:2 period.

Context	Find	Inv. no.
<i>On floor</i>		
<i>Space E above 15-Floor 5</i>	frg. of bronze razor(?)	74-M 004
	terracotta bead	77-TC 070
<i>In pits</i>		
<i>Space E, 9/7-Pit A</i>	slag	74-MISC 004
	loom weight (Type 2a)	74-TC 005
	loom weight (Type 2a)	74-TC 007
<i>11-Pit G</i>	loom weight (Type 2a or b)	74-TC 008
	frg. of bronze tweezers(?)	76-M 001
	stopper	77-TC 100
<i>5-Pit</i>	gaming marker(?)	76-MISC 013
	bronze strips	71-M 029
<i>20-Pit K/N</i>	slag or bronze	71-M 022
	bent bronze fragment	84-M 038
	axe-like stone	84-S 013
	axe-like stone	84-S 014
	polisher (Type 3)	84-S 017
	polisher (Type 3)	84-S 018
	pumice stone	84-MISC 063
	loom weight (Type 2a)	84-TC 025
	gaming marker(?)	84-TC 081
	gaming marker(?)	84-TC 082
	gaming marker(?)	84-TC 083
	gaming marker(?)	84-TC 084
	knuckle-bone, die(?)	84-B 007
<i>20-Pit L/AJ</i>	loom weight (Type 1)	84-TC 018
	potter's tool	84-TC 017
	fish-net sinker	84-S 024
	gaming marker(?)	84-TC 019
	gaming marker(?)	84-TC 023
gaming marker(?)	84-TC 022	