Textile tools from Apliki, Cyprus

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We dedicate this book to Betchen Barber,
the pioneer of the study of Aegean Bronze Age textiles.

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Front cover: clockwise: MM II Quartier Mu, Malia, Crete, map (after Poursat 1996, pl. 81), spindle whorls from Phaistos, Crete (courtesy of P. Militello), Khania, Crete, Late Bronze Age ribbon, reconstructed loom weights in TTTC experiments.
Back cover: Splicing (drawing: Annika Jeppsson)

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Chapter 6.14

Textile tools from Apliki, Cyprus

Joanna S. Smith, Joanne Cutler, Eva Andersson Strand and Marie-Louise Nosch

The Late Bronze Age mining settlement of Apliki *Karamallos* (Taylor 1952; Kling and Muhly 2007; see Fig. 6.14.1 for a plan of the site) is situated on the north coast of Cyprus. Sixty-one Bronze Age textile tools from Joan du Plat Taylor's excavations at the site are recorded in the TTTC database; of these, 49 are loom weights, and 12 are spindle whorls. All of the textile tools are dated to Late Cypriot (LC) IIC/IIIA (1300–1200/1156 BC) (for the absolute dating, see Manning and Kuniholm 2007). Sixty of the tools come from House A. This building, which has extensive evidence for metal working activities, has a central courtyard and contains a large storage room; it may represent either one or two households, depending on whether the building is interpreted as a single complex or as two residences. Most of the textile tools were recovered from Rooms 2, 3 and 5; these rooms are only a few metres wide, and appear to have been multi-purpose spaces, used for the storage of food and tools as well as for food preparation (Smith 2007, 229).

Only one pyramidal weight comes from a Late Bronze Age context in Area B, which consists of three smaller buildings.

Spindle whorls and spinning

Of the 12 textile tools from House A that are classified as spindle whorls, six are biconical, four are lenticular, one is cylindrical and one is spherical. All of these objects are manufactured from clay; four are made of fired clay, seven (four lenticular, three biconical) are of burnt clay (not intentionally baked) and one biconical whorl is low fired.

Eight of the spindle whorls were found in Room 2, while two were recovered from Room 5. The remaining two whorls were from Rooms 1 and 3 respectively.

House A, Room 2

Only one of the whorls recovered from Room 2 was complete, with a weight of 45 g and a diameter of 4.1 cm; this whorl, found among the floor debris, is spherical in shape and is made of fired clay. The remaining seven whorls (three biconical and four lenticular) are of burnt clay and were found in a group, together with three loom weights, under a layer of burnt ash with carbonised wood immediately above (Smith 2007, 236). Two of these whorls are approximately half preserved, and weigh 20 g and 25 g,

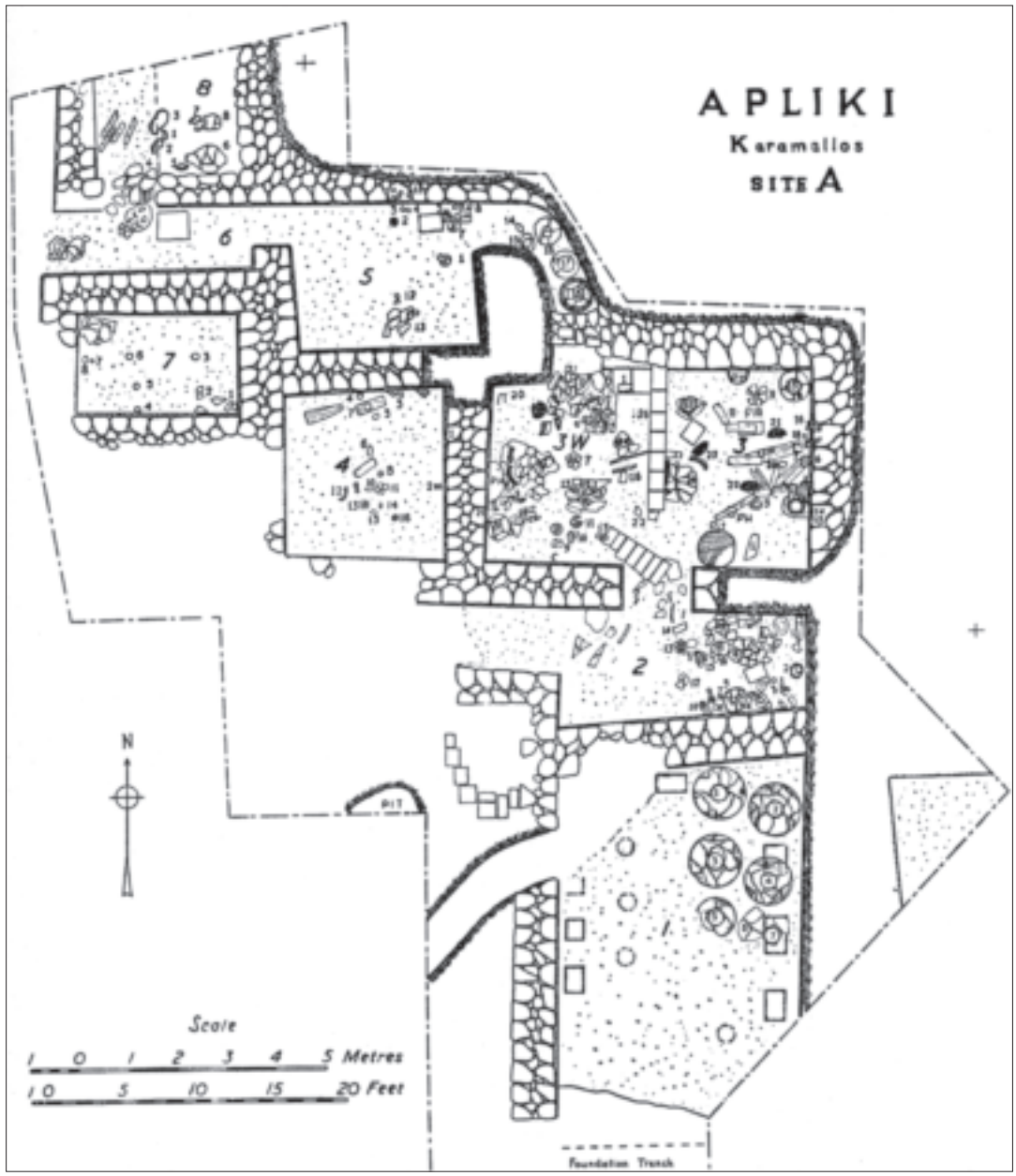

Fig. 6.14.1. Site plan, Area A (plan: reproduced by kind permission of the Society of Antiquaries of London from Taylor 1952, fig. 3, © reserved, as reproduced in Kling and Muhly (eds) 2007, 74, plate 4).

suggesting original weights of *c.* 40 g and 50 g. The rest are more than half preserved, with weights ranging from 35 g to 105 g. It is estimated (Smith 2007, 230) that the partially preserved spindle whorls are each missing less than 20 g of their original weights, thus suggesting a range of original weights varying from >35–<55 g to >105 g–<125 g. The lightest of these whorls, at *c.* 40 g, would be suitable for spinning thick thread. It is possible that the heaviest tools may have been used for spinning twine (cf. Smith 2007, 230). However, it should be noted that the whorls are made of unbaked clay. Whorls of unbaked clay are rare, although ethnographic examples are not unknown (McCafferty and McCafferty 2000, 42). The use of unbaked clay would be far from optimal (although may have been expedient), given the wear caused by fitting the whorl on a spindle ready for use, the constant rotation during spinning, and the friction of the secured yarn against the whorl. The shape and weight of the unbaked clay whorls (as well as that of the fired clay whorl), would not rule out the possibility that some or all of them were used as loom weights, rather than as spindle whorls. If they were used as whorls, they are likely to have had a short use life.

House A, Rooms 1, 3 and 5

The single, fired clay, cylindrical whorl from Room 1 is almost complete, and weighs 145 g. The whorl from Room 3 (biconical in shape and made of low fired clay), was found in a basket in black ash with burnt timbers, along with 27 loom weights (Fig. 6.14.2; for the loom weights, see below). It is more than half preserved, with a weight of 90 g.

The two whorls from Room 5, both made of fired clay, are biconical in shape. One of the whorls is complete, with a weight of 40 g and a diameter of 4.3 cm; the other is more than half preserved, and weighs 45 g. They appear to have fallen from a niche, along with 11 loom weights.

Like the whorls from Room 2, the whorls from other contexts in House A may have been used to spin thick thread or twine, but it is also possible that some or all of them were used as loom weights rather than as spindle whorls.

Loom weights and weaving

Thirty-one of the 48 loom weights from House A are torus shaped, 13 are pyramidal, three are cylindrical and one is conical. The torus loom weights include two pierced sherds and a pierced stone. Thirty-two of the loom weights are complete or only have small fragments missing (17 torus, 12 pyramidal, two cylindrical and one conical); they vary in weight from 20 g to 270 g, with the majority weighing less than 150 g (Fig. 6.14.3). The presence of a few heavier, incomplete weights should also be noted (a torus weight weighing 200 g and a cylindrical weight weighing 280 g).

The two main types of weight, pyramidal and torus, fall within very similar weight ranges. The torus weights are generally thinner, however, and would therefore have been suitable for producing denser fabrics, with more warp threads per centimetre. With the exception of the two cylindrical weights,

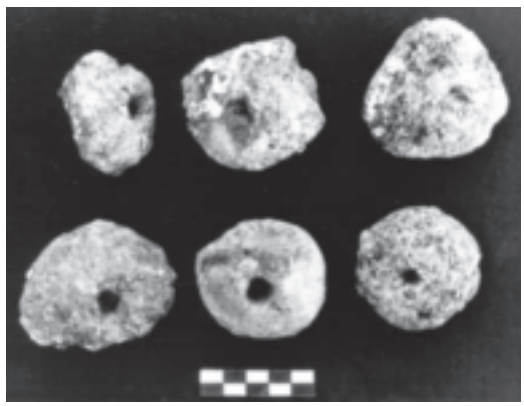

Fig. 6.14.2. Five loom weights and a spindle whorl from House A, Room 3, LC IIC/IIIA (photo: after Smith 2007, 248, plate 65.A3:22.4-9).

Fig. 6.14.3. Loom weights, LCIIC/IIIA, House A: type and weight/thickness. Please note that some markers represent more than one loom weight.

none of the loom weights would be suitable for use with thread needing *c.* 15 g tension or more.

Most of the loom weights were recovered from Room 3 (27 weights) and Room 5 (11 weights), with low numbers of weights deriving from other rooms in the building (four from Room 1, four from Room 2, one from Room 4 and one from Room 7).

House A, Room 3

The 27 loom weights (26 torus and one cylindrical) recovered from Room 3 are all of burnt clay (not intentionally baked) (Fig. 6.14.2). They were found in a basket, in black ash, together with one spindle whorl and three further shapeless fragments of unbaked clay, which may also represent between one and three further loom weights. Fourteen of the torus loom weights are complete or only have small fragments missing; their weight varies from 50 g to 140 g, and their thickness ranges from 2.3 cm to 4.0 cm. (Fig. 6.14.4).

All of these loom weights would work well with very thin thread requiring *c.* 5 g tension, but the resulting thread count range of *c.* 8–16 warp threads per centimetre is too large a variation to be optimal (Fig. 6.14.5). In a twill weave, the thread count would be approximately double. All of the loom weights would also work well with thread needing *c.* 7.5 g tension, but the thread count range of *c.* 5–10 warp threads per centimetre is still quite large. However, if thread needing *c.* 5–7.5 g tension were used, the thread count range would be a much narrower *c.* 8–11 warp threads per centimetre. This demonstrates that these loom weights would function very well together in the same loom setup. The fabrics made with them would be open in a balanced weave, and they may therefore have been weft faced.

The preserved weights and thicknesses of the remaining 13 loom weights suggests that all except one of them would have fallen within the same weight/thickness range as the complete loom weights. The exception is the cylindrical loom weight, with a preserved weight of 280 g, which would not be suitable for use with thread requiring less than *c.* 10 g tension, and would not be optimal for use with the other loom weights in the group.

The object recorded as a biconical spindle whorl, made of low-fired clay and with a preserved weight of 90 g and thickness of 4.1 cm, would also fit well within the overall weight/thickness range of the loom weights, and this suggests that it may have been used as a loom weight rather than as a spindle whorl. If used as a spindle whorl, it could not have been used to spin the very thin thread suitable for use with the associated loom weight group.

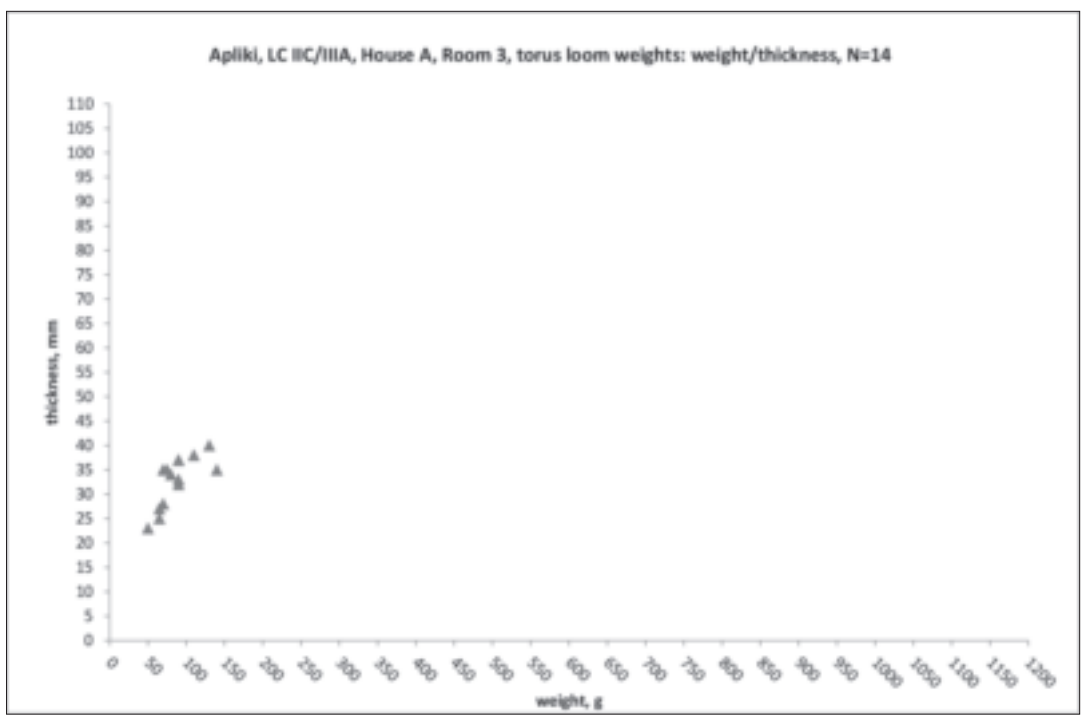

Fig. 6.14.4. Torus loom weights, LC IIC/IIIA, House A, Room 3: weight/thickness. Please note that some markers represent more than one loom weight.

The loom weights in Room 3 were in storage at the time of the destruction of the building. The combined thickness of the 14 complete or almost complete weights is *c.* 46 cm. Adding in the thickness of the partially preserved torus loom weights and the object registered as a probable spindle whorl gives a total width of *c.* 85 cm. In a tabby weave (with 14 loom weights in the front row and 14 loom weights in the back row),the weights could be used to produce a fabric *c.* 43 cm wide. If the three additional fragments represent one to three further loom weights, the fabric woven could have been up to *c.* 50 cm wide. It is additionally possible that the loom weights stored in Room 3 may have been used in different combinations with the preserved and fragmentary weights found in Room 2.

Warp thr/cm	5 g, N=14	7.5 g, N=14	10 g, N=3
4 thr			
5 thr		1	
6 thr		4	1
7 thr		3	1
8 thr	1	4	1
9 thr	3	1	
10 thr	5	1	
11 thr	2		
12 thr	1		
13 thr	1		
14 thr			
15 thr			
16 thr	1		

Fig. 6.14.5. Torus loom weights, LC IIC/IIIA, House A, Room 3: weight tension/number of threads per cm in a tabby. The total number of analysed loom weights is 14.

House A, Room 2

Three of the loom weights from Room 2 (two torus and one cylindrical), were found together, under burnt ash and carbonised wood; they are made of burnt clay (not intentionally baked). Only one of these loom weights (cylindrical) is complete, with a weight of 190 g and a thickness of 4.4 cm. The remaining two weights are more than half preserved, with extant weights of 200 g and 105 g and thicknesses of 4.7 cm and 3.3 cm respectively.

The seven spindle whorls found in the same deposit are also made of burnt clay. If, as discussed above, the objects classified as spindle whorls are also considered as possible loom weights, the weights of the overall group would therefore range from >35 g to >200 g, and the thickness range is 1.6–4.7 cm. Twenty-one other fragments were also recovered, possibly representing the remains of additional loom weights/spindle whorls (Smith 2007, 232).

If used as loom weights, the tools registered as whorls would be suitable for use with very thin thread, requiring *c.* 5 g tension (with, in a few cases, a few less than 10 threads fastened to them). The complete loom weight and the heavier of the incomplete weights, on the other hand, would be optimal for use with slightly heavier thread tensions, with the complete weight being best suited for use with *c.* 10–20 g thread tension. If used for spinning, the tools registered as whorls would not be suitable for producing thread appropriate for use with the associated loom weights.


a


b

Fig. 6.14.6(a) and (b) Pyramidal loom weights from House A, Room 5, LC IIC/IIIA (photos: (a) after Smith 2007, 250, plate 67.A5:28; (b) after Smith 2007, 249, plate 66.A5:26).

Fig. 6.14.7. Loom weights, LC IIC/IIIA, House A, Room 5: type and weight/thickness.

House A, Room 5

The 11 loom weights recovered from Room 5 were found in or near (as if they had fallen from) a niche in the north wall; 10 polishers and rubbers, a whetstone, a pottery disk and two bronze gravers were also found in the niche (Smith 2007, 232–233). Eight of the loom weights are pyramidal (Fig. 6.14.6) and three are torus; two of the torus weights are re-used pottery sherds and one is a pierced stone. All except one of the loom weights are complete or only have small fragments missing (Fig. 6.14.7). They vary in weight from 80 g to 150 g and their thickness ranges from 1.8 cm to 4.8 cm. The preserved weight of the remaining incomplete loom weight, at 150 g, suggests that it would have been heavier than the other weights.

All of the loom weights would function well with very thin thread requiring *c.* 5 g tension. Five would additionally work well with very thin thread needing *c.* 10 g tension, but only one would be optimal for use with slightly thicker *c.* 15 g tension thread. In a tabby weave with thread needing *c.* 5 g tension, the resulting fabric would have *c.* 9–18 warp threads per centimetre. If the two pierced sherds and the pierced stone were excluded, the thread count range would be much narrower (9–13 per centimetre for thread requiring *c.* 5 g tension). This suggests that it would not be optimal to use the pierced sherds and the pierced stone in the same setup as the other loom weights. In balanced weaves, with approximately the same number and type of warp and weft threads per centimetre^2, the textiles produced would have been open, and the fabrics may therefore have been weft faced. The two fired clay whorls from this deposit, weighing 40 g and >45 g, would not be suitable for spinning the very thin thread appropriate for use with the associated loom weights.

Summary

The majority of the loom weights from Apliki would be suitable for use with thread requiring less than 10 g tension, suggesting an emphasis on the production of textiles made with very thin thread. If used to weave balanced tabby fabrics, many of the resulting textiles would be open, and they therefore may have been weft faced textiles. In general, the torus loom weights could be used to produce a textile with a slightly higher number of warp threads per centimetre than the pyramidal weights. None of the objects registered as spindle whorls would have been suitable for spinning the types of thread that

could have been used with the loom weights. From their weight, shape and dimensions, it is possible that some or all of these tools may have been used as loom weights.

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