Università
Ca'Foscari
Venezia

Corso di Dottorato di ricerca

in Scienze dell'Antichità

CICLO XXXI

Tesi di Ricerca

Textile tools from Egypt and Southern Levant

SSD: L-OR/05; L-OR/02

Coordinatore del Dottorato
ch. prof. Luigi Sperti

Supervisore
ch. prof. Lucio Milano

Dottorando
Chiara Serena
Spinazzi-Lucchesi
Matricola 987987

Summary

1 Introduction

The aim of the present work is to compare the developments in the field of textile production technology in the southern Levant and Ancient Egypt. Notably, its main concern is to understand to what extent the two regions had a shared tradition or, conversely, if they take different directions from a certain moment onward. As a matter of fact, many contributions mostly focus on comparing the two textile traditions, without directly investigating the tools and techniques used in both areas. The issue in such studies lays in the scarcity of published tools, which has been the cause of limited knowledge in the actual industry of spinning and weaving. Such a lack of data has, as a major consequence, lead to incomplete or incorrect conclusions in the field. Therefore, the present work proposes to amend such lack in the knowledge of textile production by directly analysing materials from selected sites of both southern Levant and Egypt. Nonetheless, also by using all the documentation available from published excavations reports the present contribution intends to provide a picture of the developments and an easier and more clear way to compare these two regions. The broad geographical area covered by the research comprehends Egypt, from Delta to the Nubian border (with also a few sites slightly southern considered for the importance of their findings) and sites in the Southern Levant, such as Israel, Palestine and the Jordan western area.

The chronology is extremely wide as well, since it takes into considerations tools from the Neolithic to the beginning of the Persian period. After that period, reports of a decrease in loom weights weight in the Levant might points toward the introduction of new fibres, as suggested also by textual sources. Therefore, it appears compulsory to investigate the second half of the first millennium with a more focused study that, at the present state of the archaeological documentation, was not possible in this work. During the whole period under investigation, few fibres were used for textiles production, mostly flax and wool, and changes in tools could be linked to specific textiles productions rather than with the adoption of a new fibre.

The objects investigated in the present work do not permit the creation of a specific and intrinsic chronology. The study has, therefore, to rely on information provided by excavators and on the updating of sites stratification. Also, given the broad chronology and geographic area under study, the thesis was not focused on micro-chronological patterns of change but aimed to understand picture of textile production as a whole. For this reason, discussions concerning chronological reassessments between the two regions, especially for the EB II – Early Dynastic and for the passage from the Late Bronze period to the Iron Age, are not covered here. However, the objective problems currently under debate are considered and taken into account (Mączyńska 2008; van den Brink and Levy 2002; Stevenson 2016; Finkelstein et al. 2017). Different terminologies used by various authors have

complicated the picture, too. Consequently, a simplified chronology with some of the main alternative names is adopted as presented in tables 1-2.

Table 1 Chronological chart of Ancient Egypt[1]

Upper Egypt			Lower Egypt
			Fayyum A (5400-4300)
			El-Omari (4700-4300)
Badarian	4400-3800	Tasian?	Merimde (4700-4200)
Naqada IA-IIB	3800-3450	Predynastic	Buto I/Maadi (4000/3900-3500/3400)
Naqada IIC-D	3450-3325		
Naqada IIIA-IIIB	3325-3085		
Naqada IIIC-D/First dynasty		3085-2867	
Early Dynastic period/Protodynastic (Dyn. 1-3)		3000-2500	
Old Kingdom (Dyn. 4-6)		2500-2110	
First Intermediate Period (Dyn. 7-10)		2110-1980	
Middle Kingdom (Dyn. 11-12)		1980-1760	
Second Intermediate Period (Dyn. 13-17)		1760-1540	
New Kingdom (Dyn. 18-20)		1540-1077	
Third Intermediate Period (Dyn. 21-24)		1076-723	
Late Period (Dyn. 25-30)		723-343	

Table 2 Chronological chart of the Levant (Sharon 2014)

Period	Alternative names		Absolute date
			9750
PPNA			8500
PPNB			7750
[PPNC]			6500
Ln1	PNA, Early pottery Neolithic		6000
Ln2	PNB, Late PN, Early Chalcolithic		5500
	[Middle Chalcolithic]?		4500
Chalcolithic	Late Chalcolithic		3900/3700
EBI	Proto-Urban		3200/3000
EB II			2850/2600
EB III			2500/2300
IB	MB I (Albright)	EB IV (Syria)	2200/1900
MB I	MB IIA	MB I	1750
MB II (early)	MB IIB	MB II	
MB II (late)	MB IIC	MB III	1640/1540
LB I	LB I	LB I	1400
LB IIA	LB II		1330/1300

[1] Bibliographical sources for this chart: (Stevenson 2016; Midant Reynes et al. 2003; Hornung et al. 2006).

LB IIB	LB III (Amiran)	LB II	1200/1150
LB/IR	IA IA	LB III (Panitz-Cohen/Ussishkin)	1150/1000
Iron I	IA IB		
[Iron I/II] (Mazar)		Early IA IIA	1000/900
Iron IIA	IA II		925/800
Iron IIB	IA III	IA IIB-C	730/700
Iron IIC	IA III	IA IIB-C	608-586
Iron III/Persian		IA III	

All the objects that could be possibly related to textile production are included in the study, from traditional spindle whorls and loom weights to objects with a less certain function, such as perforated sherds, basalt rings and pin beaters. The purpose is to understand when they appear in both areas and if they are particularly spread in specific periods and less in others. The inclusion of more controversial and less traditional objects in the research allows a deepened analysis of their manufacture, the presence or absence of wear traces and their finding in connection with other objects linked to textiles.

In the choice of the categories of objects, the most recent studies about textile tools have been followed. Firstly, studies directly connected with the areas under exam have been helpful to understand which were the problems under debate and which sites could provide the most useful sets of tools to resolve them. The starting point is “Prehistoric textiles” of E. Barber, which present an overview of some of the most important findings in the Mediterranean area and still represents a fundamental instrument of research. Concerning the Near East, a few more specific studies have appeared, especially “Gli strumenti di tessitura dall’Età del Bronzo all’Epoca Persiana” of L. Peyronel, “Essai sur le tissage en Mesopotamie” by C. Breniquet and “Textiltechnik im Alten Orient” by E. Völling. In addition to the mentioned indispensable works, the publications and studies of O. Shamir must be taken into consideration. Although she has not yet presented an overall work on textiles production in Israel, her studies on textiles and tools carried at dozens Levantine sites are nonetheless, a needful instrument for the study of the region Excluding the work of B. Kemp and G. Vogelsang-Eastwood's “The Amarna textile industry”, only a minority of articles and books deal with textile production and even less with tools.

From a methodological point of view, the publications of the Centre for Textile research in Copenhagen have provided the parameters for studying tools, like in the case of minimum or maximum weight of a spindle whorl or a loom weight. Their work is mostly based on their personal experience and research, coupled with a strong programme of testing techniques and ancient tools to grasp them as better as possible. Given the different sources of fibres in Northern Europe, mainly

wool, and South Mediterranean, where flax is predominant, not all the results and parameters can be directly applied to the areas under study and will be therefore discussed in light of the actual findings from Egypt and Southern Levant.

For acquiring and refining the necessary skills for studying fibres and textile tools, and for

Figure 1Setting a warp on a modern loom with rigid heddle

understanding their usage, was necessary to receive a specific training; in part previously gained before starting the PhD. Throughout the three years, an intensive course of weaving was performed in Turin, by Marina Costantino, a local weaver. It was an individual face to face lesson structured around the specific needs of the author, focused on acquiring basic knowledge about different weaving techniques and understand all the processes of setting a loom. Furthermore, card weaving was also included.

Figure 2 Attempts of spinning with a spinning bowl in Leiden

A second, more complete course was attended at the Textile Research Centre in Leiden. It was structured in several sections aimed to give each a broad knowledge of textiles. The course analysed different types of fibres, wool, flax, silk, cotton as well as less common fibres, tested their characteristics and analysed them using an optical microscope. The course included sessions of spinning and weaving and parts of the fibres were dyed. Finally, it analysed different types of textiles, from the Neolithic remains of charred linen fabrics from Çatal Hoyuk to modern silk kimonos, to teach how to recognise fibres and weaving techniques by observation. The course was taught by G. Vogelsang-Eastwood, the highest expert of Ancient Egyptian textiles.

Finally, during a stay at the Centre for Textile Research in Copenhagen, it was possible to spend a day at the Open Air Museum of Lejre where ancient textiles are recreated with the same tools and substances used in antiquity. It was possible to carry on a simple

Figure 3 Two moments of flax processing in Lejre

experiment which consisted in preparing flax fibres for spinning. After retting (which requires several days and was not performed that day), flax fibres were subjected to breaking, scutching and hackling (combing with iron teeth combs which were not available for periods under study), spliced and spun.

Given the broad chronological and geographical setting, this thesis will not provide a list of all the textile tools published from Egypt and Southern Levant. Instead, it focuses on case studies and compares them to relevant materials known from the two areas. Originally, nine case studies were selected, but problems concerning permissions for studying of materials and difficulty of locating them have restricted the work to seven sites. Sites selected are Megiddo, Hazor, Beth Shean and Tell el-Far'ah (N) for Southern Levant, while for Jericho and Tell el-Far'ah (S) only few items were available and will not constitute a case study. Kahun, Gurob and Deir e-Medina are the three sites selected for Egypt; however, it seemed relevant for this study to locate some Pre- and Proto-dynastic materials, generally poorly published, to better understand the development of the Egyptian textile industry. Materials from these sites will be listed in the catalogue under the entry "other sites". Each case site is studied individually and the most relevant findings are further discussed in the region general chapter.

The thesis is therefore structured as follows: a first introductory chapter about fibres and first textiles findings regarding the two areas under study, so to provide a frame of possible raw materials and techniques available for the periods under examination; a second chapter about spinning and weaving techniques and the presentation of categories of selected tools. The core of the thesis is made up of two chapters, one for Southern Levant and one for Egypt. Each chapter discusses the different categories of materials (*e.g.* spindles, spindles whorls, etc.) followed by subchaptersrelated to case studies. At the end of each chapter, conclusions about the area examined are provided. The last chapter is dedicated to the final conclusions and to comparison between the two regions. It is then followed by a catalogue of all materials studied and by drawings of selected items.

2 Raw materials

In this chapter, a wider geographical area will be considered to understand which types of fibres were actually available in Egypt and Southern Levant during the long period under study. Evidence from the Mediterranean area, Mesopotamia, Iran and India will be therefore included, but the focus will be maintained on the geographical area under examination.

2.1 Flax

There are around 230 species of *Linum* around the world, but the most common wild flax is *Linum angustifolium*: it is widespread in Mediterranean and most Europe and produces blue flowers, while other sub-species are characterized by pink, yellow and white flowers (Baines 1989, 13). *Linum angustifolium* is probably the wild ancestor of the domestic *Linum usitatissimum*, from which the fibre used for textile production is extracted. According to R. Forbes (Forbes 1956, 4:27), the wild variety grows in the Mediterranean and Atlantic coastal areas as well as in Iran and Iraq, but not in Egypt.

Figure 4 Linum usitatissimun (Kohler Medizinal Pflanzen)

Flax is the term used to denote the plant and its products, seeds and fibres, while linen is the final product of the process, which converts fibres into a spun thread. The stem of flax is composed by a central void, called lumen, and a woody core, around which the fibres, known as bast, protect and support the central part where nutrients are carried, and closed by a cortex and an epidermis. Fibres occur in bundles, extended from the root of the plant to the tip and are glued into a substance composed by pectineus gums, waxes and non-cellulosic materials, which should be removed in order to prepare the fibres for spinning. Each stem can contain a variable number of bundles, generally between 15 and 35, and each bundle can contain from 10 to 40 single fibres or ultimate bundles; the ultimate bundles generally remain together during the transformation into linen (Kemp and Vogelsang-Eastwood 2001). They are three times thicker at the root end than at the top. The main component of fibres is cellulose, with small cells, which overlap at regular intervals. A

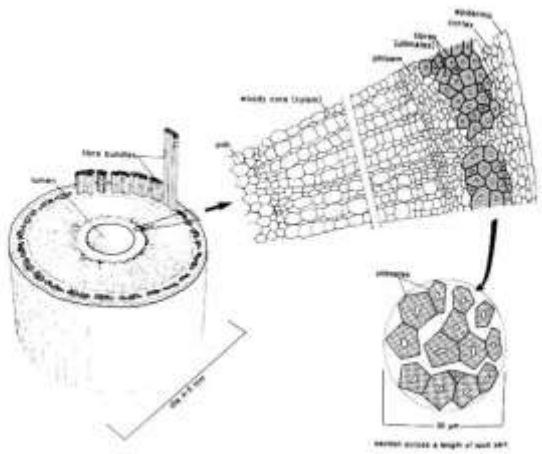


Figure 5 Section of a stem of the flax plant (Kemp/Vogelsang-Eastwood 2001, fig. 2.1)

single fibre can measure from 45 to 100 cm and its appearance is smooth, cylindrical, with joints along the length, where cells overlap.

Flax fibres have a natural twist to S, which becomes visible when they are wet and held at one end; the other end will twist to S naturally, due to the orientation of the microfibrils inside the fibres.

2.1.1 *First flax textiles*

Flax produces both fibres for textiles and seeds useful for eating and producing oil and its stems may have been used in the first times to produce also basketry or cordage, because of its great strength. It is not known which of these products encouraged men to domesticate it, but it certainly happened in very early times. Recent findings of wild flax fibres in Georgia date its first usage at least to 30000 years ago (Kvavadze et al. 2009).

The first thread in the world is made of flax and comes from Wadi Murabbaʿat in the Judean Desert. It was not found in a regular excavation but it was purchased from Beduin, who plundered the caves; nevertheless, the analysis made with an Accelerator Mass Spectrometry prove that it dated to 10.220±45 BP. It is wound around wooden pegs in order to fasten them and to create a sort of wooden comb. It is also covered by asphalt. Yarn is z-spun and S-plied and build a twine structure which probably originally covered most of the comb (Schick 1995, 201).

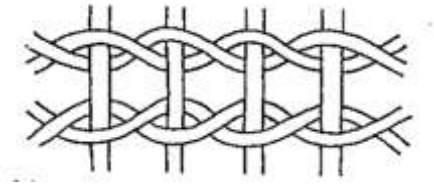


Figure 6 Weft twining example (Schick 1988:37)

The earliest examples of linen fabrics come from the well renowned Naḥal Ḥemar cave in the Southern Judean Desert and are dated to the Pre-pottery Neolithic B (6900-6300 B.C.). In this cave hundreds of artefacts made of vegetable fibres (including *Linum sp*.) were preserved, like cordage, baskets, mats, yarn and fabrics (produced with different techniques like looping, knotting, twining and weaving) (Shamir 2014 p. 143). Cordage is generally produced with unspun strands, with a final twist to Z, while nets are made of linen threads z-spun and S-plied, as are the majority of yarns found in the cave. Some specimens are s-spun and Z-plied and a few items are cabled. Fabrics are not actually textiles, since they are not woven but others technique like knotted netting and knotted looping are employed, but the most frequent technique is weft twining. Actual textiles fragments are probably later in time, since C14 dated them to 660±200

Figure 7 Nahal Hemar textile (IAA website)

years BP (Schick 1988, 38). Several needle-shuttles and awls were also presents, but no other tools directly connected with textiles production (i.e. whorls or parts of looms).

Actual textiles were found in the Pre-pottery Neolithic levels of Çatal Höyük. They have been preserved thanks to high temperatures caused by the great fire, which destroyed buildings of Level VI. Under houses and shrines, clay layers sealed several tombs, which preserved several fragments of textiles wrapped around bodies. There are both twined fabrics and tabby weave textiles, with different density in weave and different thickness of threads. Threads are z-spun and S-plied (Burnham 1965, 171), as the majority of Naḥal Ḥemar. There has been a large debate over the identification of fibres in past years since at the beginning they were said to be wool. Their brittle and charred conditions result in difficulty in seeing fibres characteristic under a polar microscope. Helbaek (Helbaek 1963, 44) was the first to conduct studies on this fibres, without using sophisticated analysis, and concluded that most of them were made of wool, while some strips were made of vegetable fibres. Microscope analysis conducted subsequently by Burnham (Burnham 1965, 170) identified the presence of scales on the surface but the absence of kemp and hair in textiles made the author hesitate about this identification. Presence of wool was completely ruled out by Ryder (1965, 175; Ryder and Gabra-Sanders 1987, 91), which conducted several tests on the fibres as well as SEM analysis. Flax was the most probably fibre used for producing Çatal Höyük textiles and it was confirmed by recent findings. Several new fragments of textiles were found in new excavations in the site and those submitted to SEM analysis were proved to be *Linum usitatissimum* (Fuller et al. 2014, 121–22). As the older findings, threads are z-spun and S-plied (S, 2z).

Some evidence of flax in PPN levels have been found also in the Anatolian site of Çayönü, but organic materials are preserved only carbonized or mineralized. A pseudomorph fragment of cloth has been found wrapped around a tool made from an antler and has been dated to 7000 BC. Fibres were not spun but twisted together as in twine and set on a frame made of four sticks, but not produced on an actual loom. Also, linseeds were found in Çayönü and they were recognised as wild flax, probably *Linum bienne*, but certainly not *Linum usitatissimum*, which instead is attested in Tell Ramad (Syria) around 7190-6700 BC (Zeist and Roller 1991, 82).

Jarmo, in northern Iraq, provided information about weaving skills but unfortunately not on raw materials. In this site, in fact, impressions in clay and bitumen of textiles and basketry have been preserved and among textiles, tabby and basket weave are present. All these impressions are dated to 7000-6000 BC (Adovasio 1975, 224).

The Late Chalcolithic period (4500-3700 BC) has preserved a larger number of linen textiles, especially from caves in the Judean desert in Israel. These caves were used as refuges, burial places and sometimes for living in the Chalcolithic period, for a short time in EBI (Davidovich, 2012) and

again in the Roman Period. Textiles from the earlier period are quite different from those of the Roman period, both for fibres and techniques. Wool, for instance, seems not yet be used and thread production is characterised by splicing. Several caves have yielded linen textiles, but the most famous are the cave of the Treasure, Nahal Mishmar (a burial site rich of textiles, basketry and cordage) and the Cave of the Warrior[2]. From this evidence it is clear that Chalcolithic threads are generally s-spun and S-plied (s, 2S) with clear evidence of the use of splicing; weave is generally a simple tabby, sometimes warp-faced with very few decorations made by hollows and soumak. No dyes have been so far recognised, but black stripes made of paint or asphalt are visible. Flax was probably cultivated in the Jordan Valley, at sites like ʿEn Gedi, Jericho or the Beth Sheʿan Valley and not imported from elsewhere, like Egypt, (Shamir 2015, 21), but no specific studies of fibres provenance have been conducted. It is inferred from the very different quality of the contemporary Egyptian textiles, but since the paucity of evidence of the Egyptian production in this period, it seems difficult to make such a strong statement.

Egypt, in fact, has preserved a very limited number of archaeological sites for the period between 7000 and 5400 BC (Shaw 2003, 35) and, so far, no traces of textiles have been found. The first Egyptian textile comes from the Neolithic Fayum A culture (around 5000 BC[3]) together with evidence of basketry. It is a tabby textile made of linen with loosely spun yarn with a z-twist and S-ply[4] and an uneven woven (Jones, 2008, p. 107). It was found in upper K pits, a large series of Neolithic granaries of the Fayum, northeast of Kom W. The linen piece was inside a disintegrate cooking pot and was found loose in the gravel outside the annex granary to silo 16 (Caton-Thompson and Gardner 1934, 46) together with two oval polishing pebbles and a fish vertebra. Analysis initially did not prove it was made of *Linum usitatissimum;* however, in silo 59, a flax seed of *Linum usitatissimum* was

Figure 8 Fayum Textile (Jones 2008, fig. 2)

[2] For a complete list of caves and textiles see Shamir (2015) and Schick (2002).

[3] New radiocarbon tests of the Upper K Pits have confirmed such a date, although with a very large errors (Wendrich et al. 2017, 120–21). No other textiles have been found, but several specimens of basketry are attested.

[4] Schick (1988, 40–41) reports a personal communication of R. Hall (curator of the Petrie Museum) which states that the Fayum textile is s-spun and Z-plied, differently of what stated by Crowfoot (1958, 431), who wrote z-spun and S-plied. Jones definitely proved it is z-spun S-plied.

recognised. A recent analysis conducted on this textile have definitely confirmed the original identification (Jones and Oldfield 2007, 34).

Several textiles have been found in the Badarian tombs but they occur less frequently than skin garments (Brunton & Caton-Thompson, 1928, p. 40). It is an interesting detail since the following tradition will tend to exclude the use of animal skins and fibres from the funerary ritual. These skin garments were more frequently worn by men rather than women and hair is inside, in contact with bodies. Generally, they are goat and antelope skins, but, at least in two cases, a black fur has been recognised. Linen garments, shrouds and bandages are present, but less frequently and in bad condition. They can occur in the same burials of skins and they can also cover the head of the deceased, while skins seem not to occur higher than shoulders. Unfortunately, these textiles are in such a bad condition that it is difficult to recognize the fibre of which they are made. In his reports, T. Midgley states that they are probably not made of linen but of a vegetable fibre like grass (Brunton & Caton-Thompson, 1928, p. 67). Flax was known in these sites since one flax seed has been recognised[5]. Recent analysis conducted by J. Jones (2002, 326), however, are questioning the identification of fibres in early analysis and it is probable that most of the Egyptian fibres were actually flax. One peculiarity of Badarian textiles is that warp and weft are not at a right angle, but weft yarns are put diagonally (with an angle which can vary between 20-40°) to avoid that the textile frays. The same characteristic is present in some Predynastic textiles but seem to disappear from Naqada III onwards (Jones, 2008, p. 113). It has also been suggested that a change in the weaving equipment occur in the Predynastic period, but it has not been recognised yet.

Figure 9 Deshasheh dress UC31182

A greater number of linen textiles survived in Egypt from the Predynastic period[6] onwards allowing a better knowledge of Egyptian textile production than that of every other ancient culture. However, it has always to be kept in mind that Egyptian textiles come nearly exclusively from tombs and this fact restricts the typologies of cloth survived and limits our knowledge of the actual dresses and fabrics used in daily life.

[5] Badari tomb 3000, object 3, identified as *Linum bienne* (Brunton & Caton-Thompson, 1928, p. 63)
[6] For a list of textiles recently analysed see (Jones, 2008, p. 101)

2.1.2 *Fibre preparation*

Linen is a very suitable fibre for clothing, but also for curtains, bed sheets and towels. It has several properties, being comfortable, fresh and non-itching; it can be washed several times without worn and tend to become softer after a long use. It is easy to clean and to remove dirt and its transpiring property make it a perfect choice for warm and dusty countries. All these qualities well explain its success in ancient times, in spite of the difficult and time-consuming process to make it. Egyptian representations show just part of this process, the moment of harvesting and the preparation of yarn for spinning, leaving in doubt how exactly fibres were extracted from bundles. Generally, the process includes plucking the plant, beating or rippling it to eliminate the seed heads, retting, drying and beating or scutching and finally hackling the stems[7]. The ancient system was briefly but exhaustively described by Pliny[8]. Stems are dried for a few days and free from the seed heads by beating with a wooden mallet or with the aid of a wooden comb. To separate stems from fibres, retting is the method usually practised in ancient times (but no evidence are available for Ancient Egypt)[9]. They can be either submerged in a flowing stream or in low pools or left in the field and exposed to the action of dew and rain. The aim is to dissolve the pectinous substance, which surrounds the fibres, by fermentation. The first method is certainly the faster and produce a golden fibre, while the second fibres of a darker and greyish colour.

At the end of retting, the fibres have to be dried again and clean from the bark and woody core and it can be done with sticks (willowing), mallets or using a wooden knife which scrapes the fibres (scutching). Finally, fibres have to be combed (hackling) to separate the long fibres, suitable for spinning, from the shorter (tow), which can be used either to produce a coarser yarn or as padding for cushions and mattresses.

Flax can be cultivated both for seeds and fibres, but it is not possible to obtain both seeds and a good quality of fibres. For seeds, in fact, plants should have more space among each other in order to have a shorter plant but with more branches. For textile production, the longer the fibre the better it is. To obtain long stalks, seeds have to be sown near each other so the plant will grow taller with branches on the top. Furthermore, the moment of harvesting will influence the final result of the fibre. Young and green plants will give finer and better quality fibres than ripe and yellow plants. To preserve the entire length of the plant, it should not be cut but plucked.

[7] Several authors describe this process, e.g. Forbes (1956, pp. 29-30), Barber (1991, p. 13) and Peyronel (2004, pp. 29-31), more specifically Baines (1989, pp. 13-14) and Kemp/Vogelsang-Eastwood (2001, pp. 25-34).
[8] See Forbes (1956, p. 29) for description and comment.
[9] See Vogelsang-Eastwood for a discussion about retting in tombs paintings and the possible use of decortification (Kemp & Vogelsang-Eastwood, 2001, pp. 30-32).

2.2 Hemp

Hemp (*Cannabis sativa*) is another bast fibre, which has stems longer than flax (high up to 5 m) and from which coarser fibres and textile can be produced. It is very suitable, thanks to its strength, to produce ropes and cords and for sails because of its resistance to seawater (Peyronel, 2004, p. 31). If the association of Fiber A with hemp in Midgley reports (Brunton, 1937, p. 145) is correct, then it is highly probable that it was used in Badarian, Predynastic and pan-graves cloths[10].

Other ancient findings from Europe date its first usage to 5500-4500 B.C., but they consist only of seeds and not of actual fabrics (Peyronel, 2004, p. 32). Since it has a very similar structure to flax, it is very difficult to recognise it correctly. They differ because flax has a natural S-twist, while hemp a natural Z-twist; it means that the fibre, once wet and stuck on one end, will start to twist at the other end following its natural inclination. More recent and trustworthy analysis have evidenced that hemp was certainly in use in the Levant in the Chalcolithic phase. It was used a DNA analysis and it proved that not only it was used to produce textiles, but also that a mixture of hemp and flax was employed, making the identification of the two fibres, without sophisticated analysis, extremely difficult (Murphy, 2011)[11]. The process of preparation of fibres is very similar to that of flax.

2.3 Nettle and ramie

Nettle (*Urtica dioica*) might be employed in textile manufacture; nettle stems contain bast fibres and they are extracted with a similar process as flax, but are coarser. It might be used to produce cloth as well as sacks and ropes. Its use as textile and basketry fibre might be very ancient, if the imprints found from the Czech Republic at Dolní Vestonice, and which are dated to 32-29000 years ago, are really of *Urtica sp*. (Soffer, 2001).

Another member of *Urtica* family is *Boehmeria nivea*, from which the more used ramie is obtained. Nettle fibres have been positively recognised in a textile from Kastelli Chania in Greece and it is dated to the Minoan period. The fragment of fabric is a dense tabby weave, weft-faced, decorated with an additional thread. Warp is made of S-plied thread, probably of flax fibres, while weft consists of un-plied threads of animal origin, probably goat hair. The additional thread has been recognized as being S-plied, of plant origin, and its characteristics make highly probable an identification with nettle fibres, more specifically ramie (Moulhérat and Spantidaki 2009). The use of goat hair and ramie

[10] See Barber (1991, p. 15) for another proposal of identification as *Hibiscus cannabinus.*

[11] Other methods of fibres differentiation are the presence of calcium oxalate cluster crystals in nettle and hemp, but not in flax or the analysis through synchrotron radiation micro-beam diffraction and micro-fluorescence. See Gleba (2011, p. 9).

in the Minoan period is very interesting because it proves the continuity of usage of a larger number of fibres besides the more common flax and sheep's wool known by textual sources.

2.4 Cotton

A very intriguing fibre is cotton. It is native of India, Senegal and Sudan where first evidence of this plant has been found. It does not belong to the bast family, but it is derived from many trees and herbs of the *Gossypium* family. Fibres are very short and grow on branches as padding for seeds. It is generally thought that cotton arrives in the Mediterranean area from the Indus Valley, where it was used to produce textiles in Mohenjo Daro and Harappa at least from 2500 B.C. onwards (Peyronel, 2004, p. 33). After these first examples, cotton disappears from Mesopotamia or Levant to reappear only in the first Millennium BC; garments made of cotton fibres have been found in the Assyrian Queen's Tomb in the 8th century BC. Also, texts seem to indicate the exploitation of cotton during the first millennium. The Akkadian word kitinnû and the Neo-Babylonian term karpassu have been proposed to be identified as cotton, as well as biršu in Assyrian texts. The first mention of cotton trees appears in the royal text of King Sennacherib (704-681 BC) which quotes a "tree bearing wool". However, the origin of these trees is indicated as Babylonia, so this fibre could have been known in that region before it arrives in Assyria (Gaspa 2017, 157–58).

Herodotus writes that a corselet made of cotton was sent from pharaoh Amasis as a gift to Athena (Barber, 1991, p. 33), but no findings of cotton are known from Egypt in this period.

First archaeological evidence of cotton comes, surprisingly, from Jordan, where the fibre is not native. The site of Dhuweila in eastern Jordan have provided, in fact, some textile impressions on plaster but also small tufts of fibres, which have been radiocarbon dated to 4500-3000 BC, i.e. Levantine Chalcolithic or Early Bronze Age phase. Little doubt can be raised about the correct identification since it has been observed under a Scanning Electron Microscope, which clearly shows the typical convolutions of cotton fibres. The problem is the origin of the fibre, which was certainly imported since it is not native of that region. Both India (Mohenjo Daro) and Sudan (A-group culture of Nubia) cotton samples are dated to the mid/late-3 millennium B.C., but the findings from Mohenjo Daro, associated with materials of the mature Harappan Period, might be later. Only the Nubian materials have a chronology near (but lower anyway) to that of Dhuweila. Since no findings of cotton (seeds or cloth) are known from Ancient Egypt, despite the huge amount of textile preserved, it is possible that it was transported through another route than the more obvious contact through Egypt (Betts, 1994).

2.5 Wool

Wool is an animal fibre, which forms the protective fleece of several animals, especially sheep, goats and camels. It is composed of a protein, keratin and a few percentages of lipids, while vegetable fibres, such as cotton or flax, are mainly composed of cellulose. Protein substances are more exposed to chemical or environmental damages than vegetable fibres. Wool fibres are covered by small scales, which facilitate the adhesion of the fibres during the spinning and felting process, without needing the addition of other substances. They are also kinky, causing the formation of small air-pockets between kinks that give to wool good insulating properties (Barber 1991, 20). This structure makes wool flexible and elastic but has also high hygroscopy and a lower rate of flame spread. Wool fibres have a good compatibility with dyestuffs, which means that are definitely more easily to dye than vegetable fibres. Furthermore, wool occurs in nature in several hues, from black to white, giving the chance to create multicoloured textiles.

Quality of wool is generally stated by various factors, such as colour, crimps, yields and fibre diameter, which is the most important element. Generally, sheep's fleece is made up of three elements: kemp, hair and underwool. Kemp is the outer and coarser part, with long and thick fibres but break easily. It is not possible, therefore, to spin them on their own. Hair and under wool are thinner, especially under wool, and can be spun either separately or together, depending on the type of yarn desired (Andersson Strand 2015, 42). Quality of fibre can depend from several factors, such as the origin of the fibres on the animal body (thighs, shoulder or side) and on the animal itself, ram, ewe or wether (wether being the best choice for wool).

2.5.1 First woollen textiles

Sheep original fleece was quite different from that of modern sheep. It was probably more similar to that of modern mouflon and, only with domestication and selection, it becomes woollier. Herding probably starts around 8500 BC in Taurus and spread to Levant and Mesopotamia gradually (Vila and Helmer 2014, 22). Neolithic communities exploited sheep breeding and select animals for meat, milk and fleece. Archaeozoological data, however, show that sheep were kept for their fleece starting only from 6500 BC (Vila and Helmer 2014, 23). Sheep and goats gradually became essentials in the economy of the Mesopotamian area and overwhelmed other breeding from the Uruk period onward. Wool was available to spinning only after the domestication of sheep, while plant fibres were exploited definitely earlier, as shown by flax findings. The selection of wool quality and the presence of sheep with uniform fleece, with few or total absence of kemp fibres, took place in different periods in the Mediterranean area. Samples from Tell el-Amarna (14th century BC) and Akrotiri (1645-1600

BC) show that it was already achieved in the Middle-Late Bronze Age in the Eastern Mediterranean (Gleba 2012, 3648).

In the Near East, first findings of woollen textiles are dated to the end of the fourth Millennium B.C. and come from the renowned site of Šahr-i-Soḫta in eastern Iran (period I) (Good, 1999, p. 110) and from Novosvobodnaya in the northern Caucasus. The Iranian textile is made from fibres of the Urial sheep (*Ovis vignei*) in two colours, yellow and brown, and probably preserve a starting border. The textile of the Caucasic Maikop culture is even more interesting. In fact, most of it is composed of wool, but also by a plant-fibre. The warp yarns occur in brown and beige colour while weft only in a beige colour and in both systems they are not plied. This forms a pattern of dark stripes on a light background (Shishlina, 2003, p. 333).

A fragment of a woollen textile comes from the Anatolian site of Arslantepe and was found in level VIB2 (Early Bronze Age I) in a royal tomb. It is of a fine quality and fibres are of goat hair and not sheep hair (Laurito, et al., 2014, p. 160).

First findings of wool for the Sothern Levant come from the tombs of Jericho (Shamir, 2015, p. 22; Crowfoot, 1960, p. 521) and do not predate Middle Bronze Age, definitely later than other regions. It might be possible that future excavations will predate the beginning of the wool exploiting at least to the Early Bronze Age, but certainly not for the Chalcolithic period, since the caves findings have shown that only vegetable fibres were in use.

Wool was certainly the predominant fibre in Mesopotamia, but our knowledge is based on textual sources rather than on actual archaeological finding. Archaeozoological findings in southern Mesopotamia testify a gradual decrease of usage of cattle and pigs and an increase of presence of sheep and goats for meat, dairy products and probably wool. Texts show a large-scale exploitation of wool from the half of the 3rd millennium onwards, but it starts to occur from the Late Uruk documentation. It was manufactured at all levels of society, from the domestic production to temple and palace workshops, from everyday usage to goods for gods and exports as a currency of exchange (Breniquet & Michel, 2014, p. 2).

There is little evidence of use of wool before the Roman Era in Egypt and they come scattered from all periods of Egyptian history. Unfortunately, no ^{14}C test has been conducted on these specimens, so their chronology, deducted by archaeological contexts, can be challenged. The first findings come from the Neolithic site of el-Omari (DATA) and have been labelled as wool. Hairs of wool come from A 16 room C, but not directly studied by Greiss (1955, p. 228); n°15 from A 91 is a piece of sheep skin with wool of different colours (natural or not?) directly studied by Greiss (1955, p. 229)[12].

[12] Unfortunately, Greiss' report is extremely concise and does not offer any information about textiles except the definition as "cloth".

Another finding has a Predynastic date and comes from Naqada, Tomb 26 and it is described as a "brown and white woollen knitted stuff" (Petrie & Quibell, 1895, p. 24). In this case, the excavators exclude to be intrusive materials due to rats activities because of the difference with any other material found on the site and because of the depth of the finding.

Another finding dates to the First Dynasty and has been found at Helwan (Saad, 1951, p. 44). It is an actual cloth, which was wrapped around a body in tomb 36H5 but no other indications are given. Greiss (Greiss, 1955, p. 231) does not confirm the identification (if he even identified the correct textile) and writes "fibrous material associated with a coffin remains. Light and dark golden colour; human hair". Another Old Kingdom specimen comes from the Pyramid of Menkaure at Giza, where a skeleton is recorded as being "enveloped in coarse woollen cloth of a yellow colour" but is generally considered as intrusive (Lucas & Harris, 1962, p. 147). Several examples of wool are known from Middle Kingdom Kahun and some from New Kingdom Amarna, as well as specimens of goat hair. One of the Kahun fragments, however, has been radiocarbon dated and was proved to be Roman (Vogelsang-Eastwood, 2000, p. 269).

48 fragments of sheep wool come from the workmen's village of Amarna, 36 of which are definitely identified as wool, some of them from intact deposits. Other woollen objects come also from the Main City but have been excavated at the beginning of the 20th century (Kemp & Vogelsang-Eastwood, 2001, pp. 35-38).

Bones of ovine are regularly found in Egyptian excavations of all periods and they are frequently recorded in texts. Sheep and goat are also represented in several paintings, starting from rock art representation in Southern Egypt and Lower Nubia from at least Predynastic time and in some tombs of Pharaonic age. Two species of sheep are generally represented, one with long and spirally horns (*Ovis longipes palaeoaegyptiacus*) occurs in the oldest images, the other (*Ovis platyura aegyptiaca*) with curl horn, which probably provides a better quality of wool[13].

Besides sheep and goat's wool, Egypt has provided evidence also of camel wool from the Fayum Neolithic culture, where a rope was identified as made of this fibre (Caton-Thompson & Gardner, 1934, p. 88). Camel is not frequently used in Egypt, but there are a few hints, which prove their knowledge from the Egyptians. A figurine of a camel is known from Maadi, and camel bones were recognised in the site of Helwan (Saad, 1951, p. 38). Camel's hair has not been recognized in the Near East, prior the 5th century BC, except for an uncertain identification from Šahr-i-Soḫta (Völling 2008, 73, Tab.1).

[13] (Kemp & Vogelsang-Eastwood, 2001, p. 34), also for further bibliography.

Even if certainly present in Egypt, so far very few specimens of wool have been found in Egypt. Tata (Tata, 1986, pp. 184-186) proposes that wool was probably sent abroad to countries which made a larger use of this fibre, but the most likely explanation continue to be that offered by Herodotus, who explains that wool was considered impure by ancient Egyptians. This element has led to an exclusion from the funerary contexts, which are our main source for the knowledge of Egyptian textiles, and have caused a substantial reduction of our chances to find woollen textiles. It is surprising, though, how strictly this prohibition was observed, since wool has not been found in any tomb of any age (Pharaonic of course) and of any social level. Moreno Garcia[14] pointed out, however, that in many cases only tombs of a part of the society are excavated, like in the case of el-Bersheh, whereas the tombs of the poorer people have been compromised by water. In these tombs we could have had a better chance to find woollen textiles than in those of the Pharaonic court and of the élites, which were more aware of the religious prescriptions and closer to the priestly class. Furthermore, it is well known that a number of Asiatic people were present in Egypt, and at least for this part of the population we could expect to find some scraps of woollen textiles. Another possible explanation, which should be kept in mind, is that soil composition affects the preservation of materials and it is especially true for textiles. Basic environments destroy animal fibres, while vegetable fibres are not preserved in acid conditions (Gleba, 2011, p. 7). As suggested also by Kemp (Kemp & Vogelsang-Eastwood, 2001, p. 54), the dry climate of Egypt does not preserve every organic material in an equivalent manner. It is then likely that some soil with a basic PH might have helped to decrease the quantity of preserved woollen fabrics.

2.5.2 Wool processing

During the Bronze Age wool was probably obtained by plucking or cutting by knives. Only with the introduction of iron, it has been possible to produce good shears and to proceed to shear the animal. There is a remarkable difference between the two techniques, since cutting/shearing can be done twice a year, while plucking can be carried out just once a year, when the animal is moulting. Therefore, it is necessary to have the animals available when moulting, and this excludes that wool can be obtained without breeding.

After the wool is obtained, it can be sorted following several criteria, such as colour, fineness, crimp and length (Gleba 2008, 98). Wool can be washed before cutting or plucking, but in this case it is necessary to add a little fat to help the spinning process, which is not necessary if it is washed after

[14] Pers. comm. On wool consumption in Egypt see his speak during the workshop "Textiles in Ritual and Cultic Practices in the Ancient Near East from the Third to the First Millennium BC" held in Copenhagen on 6th-7th October 2015.

spinning, because lanolin is still present. However, washing the sheep before the wool is extracted, makes the wool easier to card (Forbes 1956, 4:21). Washing the fibres is also necessary before the dying process, otherwise the dyestuffs will not be able to penetrate inside the fibres; generally, fibres are dyed before the spinning process.

Wool has to be prepared for spinning, teasing it by hand or combing in order to remove dirt from the fibres, untangle them and separate long fibres from the under wool. Combing or carding the fibres allow obtaining two completely different yarns, since the combed fibres produce a strong and hard yarn, while the carded ones a soft, elastic and fluffy yarn (Barber 1991, 20). However, it is not clear which tools were in use in the period under examination, since combs were generally linked to personal care (as seen further) and carding seem to appear in Roman times. The more carefully this operation is conducted, the easiest the spinning process will be and the yarn more uniform. As well as flax, wool discarded during these operations can be used for other purposes, such as padding or insulation (Andersson Strand 2015, 44).

3 From fibre to textile: spinning and weaving

Much has been written about spinning and weaving techniques[15]. This chapter aims to summarize the principal phases of these processes in order to better understand the archaeological materials and their function presented in the following chapters. For this reason, only a brief presentation of the general topic will be given.

3.1 Spinning

Spinning is the process which transforms fibres in a single, continuous yarn. The operation can be performed by using different methods and tools, and the result can differ considerably. The thread can be more or less even depending on the quality of fibres preparation, on the technique employed and on the ability of the spinner.

First threads and cordage were probably produced in the Upper Palaeolithic (Barber 1991, 39) and the first form of spinning was probably hand-spinning. In this method, fibres are simply drawn out from a mass and twist between hand-palms or palms and thigh; then more fibres are added and rolled again until the required thread is obtained (Carington Smith 1976, 69). However, this method is time-consuming and requires to wind the yarn around some objects in a separate step otherwise it will tend to untwist.

The following step probably consisted of the use of a spindle instead of the palms. A spindle could be a simple stick, which helps in the twisting of fibres and simultaneously allow winding up the yarn already produced. If a small weight – the spindle whorl - is added to the rod, the spindle will be able to rotate freely much longer. With this simple tool, spinning becomes much faster and the thread is much more even than that produced simply by hands. Furthermore, one hand is now free to control the provision of fibres and keep the spindle rotating. Spinning with a spindle has been performed until the spinning wheel was invented in the Middle Age (Carington Smith 1976, 70).

Several methods of spinning with a spindle have been used and Crowfoot classification (Crowfoot 1931, 9–20) distinguish between six methods[16]. For this work, it seems useful to explain the last three methods:

- Grasped spindle spinning: a rove already prepared is passed through a ring or a fork and rotated with both hands. It is evaluated by Crowfoot as more suitable for doubling (Crowfoot 1931, 14)

[15] For further and more specific readings see: (Barber 1991, 39–50; Crowfoot 1921, 1931; Kemp and Vogelsang-Eastwood 2001, 74–81)

[16] Hand spinning, spinning by twisting a hooked stick, rotation of spindle in hand, grasped spindle, supported hand spindle, suspended hand spindle. Most of the later texts on this subject use this classification as a starting point.

- Supported hand spindle: drafting of fibres is a separate action. Spindle rests lengthwise on the thigh. It rotates on the floor or in a cup. Very similar to suspended spindle
- Suspended spindle spinning/drop spinning: the spindle rotates freely in the air and it can be either rotate by fingers or along the thigh to add momentum.

During the spinning process, the thread has to be wound around the shaft. With the drop spindle techniques, it happens when the yarn produced is so long the spindle reaches the ground. After the yarn has been wound up, the process can start again until the shaft is full.

Spindle whorl can be put equally on the top of the spindle or at the bottom (or even in the middle of the shaft). It is generally believed that the position of the spindle whorl on the shaft is culturally determined. However, some technical issues might influence this position. If the spindle is to be rolled along the thigh, a high-whorl spindle is preferred; if it has to be twirl between thumb and fingers, a low-whorl spindle might be preferred (Carington Smith 1976, 76).

It is generally believed, thanks to iconographic sources, that Ancient Egypt used a high-whorl spindle, while the Aegean-Anatolian area, as well as Europe, a low-whorl spindle. Mesopotamian and Levantine have fewer iconographic sources that can help in recognizing the spindle whorl position and it will be discussed in the following chapters.

As seen in the previous chapter, wet fibres have a natural twisting orientation, which is s for flax and nettle, z for hemp, while cotton can rotate in both directions but give best results when is z-spun (Forbes 1956, 4:151). Animal fibres, like wool, do not show an orientation when moistened and can be spun in both directions. The natural orientation, however, might help in the process of spinning but it is not binding; all fibres can be spun in both directions. To prevent the yarn from untwisting and to add strength, the thread is generally doubled or plied, which means that an extra yarn with the same twist of the first is added, and the two are then spun together, generally in a contrary direction to that of the single yarns. The directions are called s (counterclockwise) and z (clockwise), from the central part of the letter, which resembles the twist lines visible on a yarn. It means that if two threads are s-spun, they will be plied in a Z direction (conventionally Z, 2s). When plied threads are twisted together, it is called cabling. Analysing of ancient textiles, however, show very different adaptation of thread directions. Thread quality is determined by its thickness and by being tightly or loosely spun. The angle of the twist determines the tightness and it can be defined as loose if it is less than 25°, medium if it is between 25 and 45°, or tight if it is more than 45° (Jones 2002, 324).

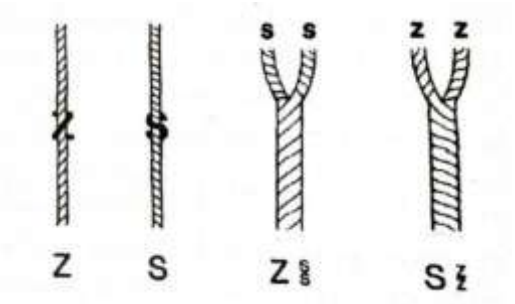


Figure 10 Spinning directions (Gleba 2008, fig. 17)

First flax threads show, as seen in the previous chapter, that the first direction of spinning used was z, and the plying direction was its contrary, meaning S. It worth noting that this is true both for textiles from the Near East as well as Egypt, as shown in tab. 1. During the Chalcolithic period, it is possible to assist to a change in the spinning direction, with a prevailing of s-spun and S-plied threads at least in the Levant (Schick 2002, 223–24).

Table 3 Spinning directions in first textiles

Wadi Murabbaʿat	z-spun, S-plied (Schick 1995, 201)
Naḥal Ḥemar	cordage Z-plied nets z-spun, S-plied; fewer s-spun, Z-plied examples of cabled threads (Shamir 2014, 143)
Çatal Höyük	z-spun, S-plied (Burnham 1965 p. 171)
Fayum fragment	z-spun, S-plied (Jones 2008, 107)
Badarian textiles	z-spun, S-plied (Brunton and Caton-Thompson 1928, fig. lix)
Nahal Mishmar and other Chalcolithic caves	s-spun, S-plied (Schick 2002, 231)
Predynastic textiles	Transition from z to s (Jones 2008, 111) Naqada IIB s-spun, S-plied

Slowly, also in Egypt flax textiles characterized by the combination of s-spun and S-plied threads, seem to prevail. Thanks to the major quantity of preserved textiles it is clearly visible a transitional phase in the Egyptian Predynastic period. It possibly begins at the end of the Naqada I phase but it certainly continues during the Naqada IIA phase, while with the beginning of the IIB phase textiles show the complete adoption of s-spun, S-plied solution (Jones 2008, 109, 111). This structure will be prevalent for all the subsequent Pharaonic phases, and a Z-twisting will be found only to a lesser extent. Textiles generally show an S, 2s structure of threads, both for warp and weft, but occasionally z-twist can be observed on nets and sewing threads (Kemp and Vogelsang-Eastwood 2001, 60). In Amarna textiles, for example, the s direction for spinning and plying covers the 99% of the entire set of samples (Kemp and Vogelsang-Eastwood 2001, 59). The s-twist seems to be particularly suitable for spinning flax, because it follows the natural orientation of the fibres. It is curious to observe that also Amarna wool samples show the same structure, S, 2s (Kemp and Vogelsang-Eastwood 2001, 60). It might be explained with the spinning technique prevailing in Egypt, meaning the drop spindle. A right-handed person will tend to roll the spindle along the thigh from the hip toward the knee, producing an s-spun thread, made of flax or wool indifferently. However, if the momentum is not added by rolling the spindle on the thigh of the spinner, but simply by the use of thumbs and fingers, like a top, the spinning direction will be this time the exact contrary. This type of movement, however,

is generally used with spindles with low-whorls, while the use of the thigh is preferred with high-whorl spindles (Carington Smith 1976, 78–79).

Ancient Egyptian and probably Levantine people seem to not have used a distaff to keep fibres in order before they were added to the spindle. For keeping parallel long fibres such as those of flax they develop another method which is called splicing. It consists by joining the single fibres together to form a long roving, which can be coiled to form a ball of yarn and only subsequently it is actually spun. More specifically, the bundles of the fibres are overlapped for a dozen of centimetres and this part twisted by rolling it by hand, on the thigh or on another surface. Some glue substances may be added to reinforce the joining point, such as saliva, but also water might be sufficient to free the natural glue present in the flax.

Splicing has been recognized both on Egyptian and Levantine textiles (Gleba and Griffiths 2011, 287) from the very beginning of their history, and continue to be performed in Egypt until probably the Roman conquest. In the Levant, it seems to disappear during the Bronze Age (Shamir 2014, 147). Other cultures have developed the same technique outside the area under consideration, such as Central Europe (Leuzinger and Rast-Eicher 2011, fig. 3 d; Gleba and Harris 2018).

Table 4 Occurrences of spinning and weaving scenes in the Egyptian iconography

REPRESENTATIONS OF SPINNING AND WEAVING SCENES	
Bowl from el-Badari	Bowl with representation of a horizontal loom. On the side, two figures beside vertical poles might have been engaged in warping (Cortes 2011, 94)
Saqqara, VI dynasty	Relief with a man with a spindle on one hand (note the conical spindle whorl!) and a ball of yarn under left leg (Firth and Gunn 1926, 36; Barber 1991, 76).
Tomb of Baqt, Beni Hasan (MK)	Upper register: 3 men spinning, one with grasped spindle, two drop spindle. One man preparing a net, two men preparing balls of yarn. Lower register: 4 women couching on the floor preparing roves; 3 spinners, each with two spindles (drop spindle) and two spinning bowls; 7 women attending two looms (Percy Edward Newberry and Griffith 1893, fig. IV)
Tomb of Khety, Beni Hasan (MK)	Upper register: 3 men spinning, one with grasped spindle, two drop spindle. Two men preparing a net, one man matting. Lower register: 4 women couching on the floor preparing roves; 3 spinners, each with two spindles (drop spindle) and two spinning bowls, 5 in total because they share the same bowls; 7 women attending two looms. (Percy Edward Newberry and Griffith 1893, fig. XIII)
Tomb of Khnumhotep, Beni Hasan (MK)	A spinner with one drop spindle and two yarns, two bowls and a crouching woman preparing fibres. A horizontal ground loom with two female weavers and a male supervisor.

	(Percy Edward Newberry and Griffith 1893, fig. XIX)
Tomb of Daga, Thebes (MK)	Upper register: a woman warping, two women crouching and attending to a horizontal loom. Lower register: 3 women preparing fibres, one attending to a spinning bowl and another spinning with two drop spindles (Davies 1913, fig. XXXVII).
Tomb of Djehutyhotep, el Bersheh (MK)	Upper register: 5 women couching on the floor preparing fibres/roves. 3 spinners with one spinning bowl each. One woman attending warping on three pegs. Lower register: 2 women pulling threads from boxes of balls of yarn (?). 3 women warping a loom. (Percy E. Newberry and Griffith 1894, fig. XXIV)
Tomb of Sarenput I, Elephantine, (MK)	Upper register: one person couching on the floor preparing fibres/roves. Two spinners with two spinning bowls each. (Müller 1940, 41)
Tomb of Neferrenpet, Sheikh Abd el-Qurna. Chief of the weavers in the Ramesseum (Ramesses II)	Two people couching on the floor preparing roves. Two warping frames with an attending person each.4 vertical two-beam looms with a total of 5 weavers (men and a woman). Upper register in a very bad state, a man, 4 women and ½ children are employed. Scale with coils of thread and raw material (white and yellow). (Davies 1948, fig. XXXV)
Neferhotep, Thebes, 18th dynasty	Representation of temple estate: A vertical two-beam loom with one operator and probably a second one on the right, with a second weaver. (Davies and Davies 1933, 38, pl. XLIX)
Tomb of Djehutynefer, Thebes, 18th dynasty	Two people preparing fibres, two preparing coils of yarn. Grasped spinning scene, one spinner, two spindles fixed two a ring each and both rotating in a bowl. Two vertical two-beam looms with a total of 3 weavers (N. de Garis Davies 1929, fig. 1a)
Ostracon from Deir el-Medina (NK)	Grasped spinning scene: two spindles hanging from a ring. (Vandier d'Abbadie 1937, fig. LXIV)
Funerary papyrus of Dirpu, 21th dynasty, Deir el-Bahari	The deceased is taken by hand by a cat-headed goddess and in the other hand carries a high-whorl spindle with dome shaped spindle whorl and thread wound around the shaft. (Piankoff 1957, fol. 7)
FUNERARY MODELS	
Weaving model, tomb of Meketra, Thebes, 11th dynasty	Three couched women preparing fibres; three spinners with two spindles and a spinning bowl each; two women warping on the wall with a spindle each; two horizontal ground looms, with three weavers in total. (Winlock 1955, 29–33, pls. 26–27, 66–67)
Weaving model tomb of Anpuemhat and Usernekhbet, Saqqara (MK)	Two people couching on the floor preparing fibres/roves. A spinner with two spindles and a spinning bowl. A horizontal ground loom with two weavers. (Tata 1995, 133–36, fig. 16; Kemp and Vogelsang-Eastwood 2001, 325)

Weaving model of Gemniemhet, Saqqara (MK)	Two people couching on the floor preparing fibres/roves. A spinner with two spindles and a spinning bowl. A horizontal ground loom with two weavers on their left. On the other side less clear part with a standing spinner, two people preparing fibres and three people working on a loom. (Firth and Gunn 1926, 52–54, pls. 22b, 31c)
Model from Girgeh (MK)	A woman preparing fibres, one spinner, one woman warping on a warper fixed to the ground, two weavers. (Tata 1995, 129–30; Hayes 1953, fig. 172)
Model from tomb of Khetya, Beni Hasan, Tomb 575 (now Liverpool) (MK)	No walls represented. A spinner with two spindles, one with high whorl and the other with low whorl, but originally both were high-whorl. Spinning bowl is now lost. Two weavers work on a horizontal ground loom (only poorly preserved) (Garstang 1907, 133; Tata 1995, 136–38)
Sedment tomb 1525 (MK)	No walls represented. Standing spinner (yellow skin) and crouching figure (red skin) (Petrie and Brunton 1924, fig. 17; Allen 1997, 31)
Deir el-Bahari, Montuhotep (MK)	Possibly model of textile workers: two men with raised leg (spinners?), rods which might have belonged to the model. (Arnold 1981, 33, pl. 50a, 58d; Allen 1997, 31)
Model from tomb of Djehutynakht, el-Bersheh 10A (MK)	No walls represented. A spinner with one spindle, a crouching person attending the spinner. Two weavers work on a horizontal ground loom (only poorly preserved). (Allen 1997, 31) Boston MFA 21.891.
Unknown, Munich	Model of a man with raised leg, possibly a spinner (Breasted 1976, 53, pl. 47c; Allen 1997, 31)
Unknown, Berlin	Model of a weaving room, with remains of a standing figure and four squatting figures. (Johl 1924, 9–10, Abb. 41-43; Allen 1997, 31)
Karenen and Nefersemdet, Saqqara (MK)	Model of a room with arched beams which possibly represented a weaving workshop. No figures or implements preserved (Breasted 1976, 53; Allen 1997, 32)
Karenen and Nefersemdet (MK)	Model of a room with arched beams which possibly represented a weaving workshop. Five figures preserved, one with right leg raised (Breasted 1976, 54; Allen 1997, 32).
Djehuty, el-Lisht	Workshop with granary, bakery and weaver's shop. One woman preparing fibres, one probable spinner with spinning bowl and two weavers. (Allen 1997, 31) Indiana Univ. Art Museum, 58.34.
Iti, Lahun, tomb N17	Small model of a spinning bowl with a hole in the bottom, where a peg to attached to the model should be inserted. Petrie museum UC 6665i (Petrie, Brunton, and Murray 1923, 33–34)
Unknown Lisht, tomb 428	Model of limestone spinning bowl (Allen 1997, 31). MMA 15.3.99

3.2 Spinning tools

As seen previously, a spindle is a simple rod to which a weight might be attached to extend the rotatory movement. However, recognising what actually is a spindle or a spindle whorl in an archaeological context might be difficult. Spindles can be confused with pins, for hair and dress, or with kohl-sticks. Spindle whorls can be confused with beads, and in many cases it is impossible to define what is a spindle whorl and what is a bead. For this study, objects are generally classified following the indications of the excavators, because they had the opportunity to handle them and to analyse them in context with the other findings of the site. However, in some cases, the original indication seemed not correct and objects have been reconsidered.

3.2.1 Spindles

Spindles can be made of several materials, primarily wood, but also luxurious examples were produced, made of metal, ivory and bone. Given the organic nature of the everyday use tools, almost all the ancient spindles have disappeared, except in some specific contexts. Most of the spindles known from all over the world are then the precious specimens and are quite rare to find.

Even if they could be of different shapes and different length (and a look to modern spindles could be a good exercise in that sense), it seems useful to trace some lines which could help in recognizing an item as a spindle.

Length is certainly an important parameter in a spindle since it determines the ease of its use. A spindle should be long enough to be easy to manipulate, but also to accommodate the spun yarn in order to avoid that it unspins. However, it should not be too long or will be complicated to twist and will reach earlier the ground (for drop-spinning) producing only small quantity of yarn before needing to be wound up again. In her work on pre-roman Italian spindles, M. Gleba (2008, 103) reports that local spindles are generally 30 cm long, but this length is reduced during the Roman period, when spindle's length ranges between 12 to 27 cm. Some exceptions are also present, with objects reaching 40 cm. Length is probably related to the weight of the spindle whorl and thus to the fibre in use and the final product desired.

The shape of the spindle can vary greatly as well. A spindle can be a simple cylindrical rod, or could have a thick central part and thin ends. Generally, it tends to tapers toward one or both the extremities, and has the thicker part at one-third of the length, while for the other two thirds the shaft gently becomes thinner toward the tip, which could be either rounded or pointed.

Other features might help in recognizing spindles. The first and more easy to identify is a notch or a groove in the upper part of the shaft, where the yarn can be fastened to make easier the process of

spinning. It could be present if the spindle whorl is placed in the upper part of the shaft as well as if it is in the middle or in the lower part of the shaft. A function similar to that of the groove can be carried out by a hook added to the upper part of the spindle. Spindle whorl is generally not placed at the very top or bottom of the spindle in order to leave some space to fasten the fibres with which the spinning begins. It does not require a very long area, a couple of cms could be enough.

3.2.2 Spindle whorls

Spindle whorls might appear at a first sight a more easily recognisable item and the use of several materials, often non-perishable, allows to find a larger number of these tools. However, it is not always possible to be certain of their usage. Spindle whorls can be frequently confused with beads, especially if small and made of good materials, as well as buttons and mace heads or models of mace heads. Furthermore, some items made of reworked pottery sherds and stone rings might have been used as spindle whorls. In this chapter, general parameters to distinguish a spindle whorl are given as well as the typology used in this thesis, while in the next chapter specific issues regarding Levantine and Egyptian materials are treated.

A spindle whorl is an object with a hole in the centre to attach it to the spindle shaft and provide weight and making the rotatory movement continue for longer. However, this does not mean that it has to be a rounded object. It can be, in fact, rounded, dome, conical or even cross-shaped[17]. Moreover, different materials of production can be used. The most common in ancient times must have been wood, as it is still nowadays. Unfortunately, wooden objects have rarely preserved in the archaeological contexts, leading to the loss of the great majority of spindle whorls produced in antiquity. Other materials have been used, such as pottery, stone, bone or ivory, glass and probably fayence and these are generally found in the excavations. Pottery is a cheap and easy to model material, so it is not surprising that pottery spindle whorls can easily be found in archaeological contexts. However, they present some inconvenient which makes this material not a perfect choice. First, clay spindle whorl are very heavy and need to be properly fired to obtain a light and resistant material. Second, spindle whorls easily fall on the floor during spinning, even in the case of high whorl spindles, since the break of the thread might cause the fall of the whole spindle. A fall could be devastating for a pottery whorl, as well for those made of glass or fayence. Wood instead, could provide a good and virtually indestructible spindle whorl at a low price. A too soft wood, however, would quickly wear and the hole would be subjected to warping. Stone spindle whorls require a higher initial investment, but they are resistant to breakage and deformation and could last longer than the

[17] At the TRC in Leiden even a sheep-shaped spindle whorl (perfectly working) was present.

other materials. Diameters and height being equal, a stone spindle whorl would result in a much heavier object than a wooden or bone one and would be, therefore, adapt only to certain types of production. Bone spindle whorls are cheap, quite easy to produce, resistant to warping and breakage due to falls, but similarly to stone, their light weight makes them suitable for spinning only certain types of threads. However, experiments conducted on replica of Arslantepe whorls, proved that bone (and perforated sherds) spindle whorls were the most effective for spinning both wool and hemp (Laurito, Lemorini, and Perilli 2014, 164).

Besides a large variety of shapes and materials, dimensions and weights can vary a lot, according to the type of fibre which has to be spun, and if it is used for spinning or plying. Several tests conducted by the CTR have shown that a light and small spindle whorl is suitable for spinning thin threads, while a larger and heavier example will produce a thicker yarn (Andersson Strand 2015, 47–48). This depends on the fact that a light spindle whorl will produce a yarn which contains fewer fibres than a yarn produced with a heavier spindle whorl. It is much more time consuming to spin with a lighter whorl than with a heavier whorl, but in the end the length of the yarn produced with a light whorl will be much more than that produced with a heavy whorl, using the same amount of raw fibres (Andersson Strand 2010, 13–14). Extremely important for the final result is also the quality of the raw material and the accuracy in preparation. A coarser fibre will produce a coarser thread and, obviously, a coarser textile. Another interesting result is that wool requires much more time for spinning than flax (and hemp) thanks to the long vegetable fibres of which it is made (Andersson Strand 2015, 46)[18].

[18] Other tests contradict this result (Olofsson, Andersson Strand, and Nosch 2015, 84)

A spindle whorl with a light-medium weight (15-30 g) allows more differentiated products than a very light or a very heavy one (more than 40 g) (Andersson Strand 2015, 48). It would be expected to find more medium weight spindle whorls, especially in domestic contexts, rather than extremely light or extremely heavy whorls. The lightest whorl tested by CTR had a weight of 4 g, but according to Liu study (Liu 1978, 90) the lightest weight for a spindle whorl, known so far, is 1 g with a diameter of 8 mm. This data makes the differentiation with a bead extremely difficult. Large and heavy whorls, on the other side, might be confused with weights (loom weights, net weights, etc.). The heaviest spindle whorl is probably to be considered those weighing 140-150 g (Gleba 2008, 106). The hole of the whorl might help, since it has to be mounted on a shaft, while a bead requires a smaller hole, and a weight can have a large, irregular hole. The expected range for hole diameter of a spindle whorl is between 0.3 and 1 cm (Gleba 2008, 107), however larger holes are also known (see catalogue for Egyptian complete spindles).

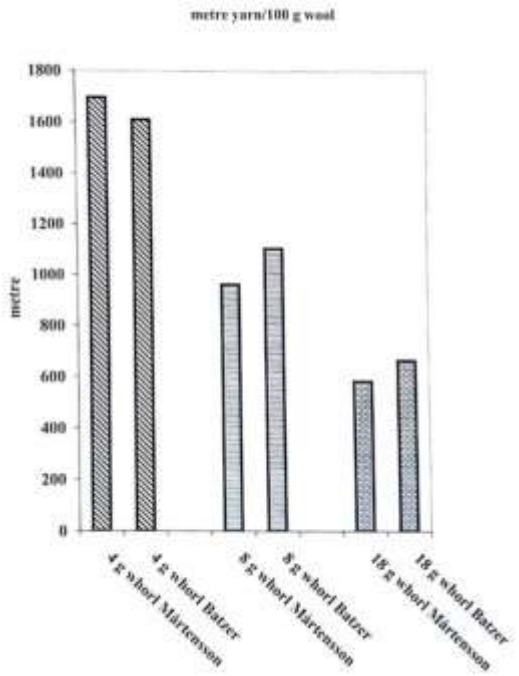


Figure 11 Lenght of yarn obtained from 100 g of wool with different spindle whorls by two different spinners (Andersson Strand 2010, fig. 2.4)

Another element that should be considered is the length of the spindle shaft in relation to the weight of the spindle whorl. In fact, CTR tests have shown that very light whorls, like those weighing 5 g, can be used only with a short shaft (less than 12 cm) (Andersson Strand 2015, 48). However, this might depend on the choice of fibres or on the position of the spindle whorl (low whorl VS high whorl), as the findings from the Egyptian site of Gurob clearly demonstrate. More tests should be conducted to better comprehend what actually affected the spindle rotation on the test already done and which are the new limits of dimensions and weights to be considered in light of the study of the ancient Egyptian tools.

Average output of thread/h	
4 g	35 m
8 g	40 m
18 g	50 m
Time for spinning 2 km of yarn (1 m^2 of cloth)	
4 g	57 h
8 g	50 h
18 g	40 h

Figure 12 Some of the results of CTR tests on wool (not considering time necessary to prepare the raw material) (Andersson Strand 2010, 13)

The typology used to describe the spindle whorl of this work is based on the CTR typology used for their database, since it allows a quicker comparison with other regions of the

Mediterranean. However, it was not possible to ignore Levantine and Egyptian traditional terminology, so some tools have a different name. Furthermore, not all the typologies present in the Mediterranean are known in the Near East, and the scheme here adopted is a simplified one to better fit with the regional context of the tools investigated.

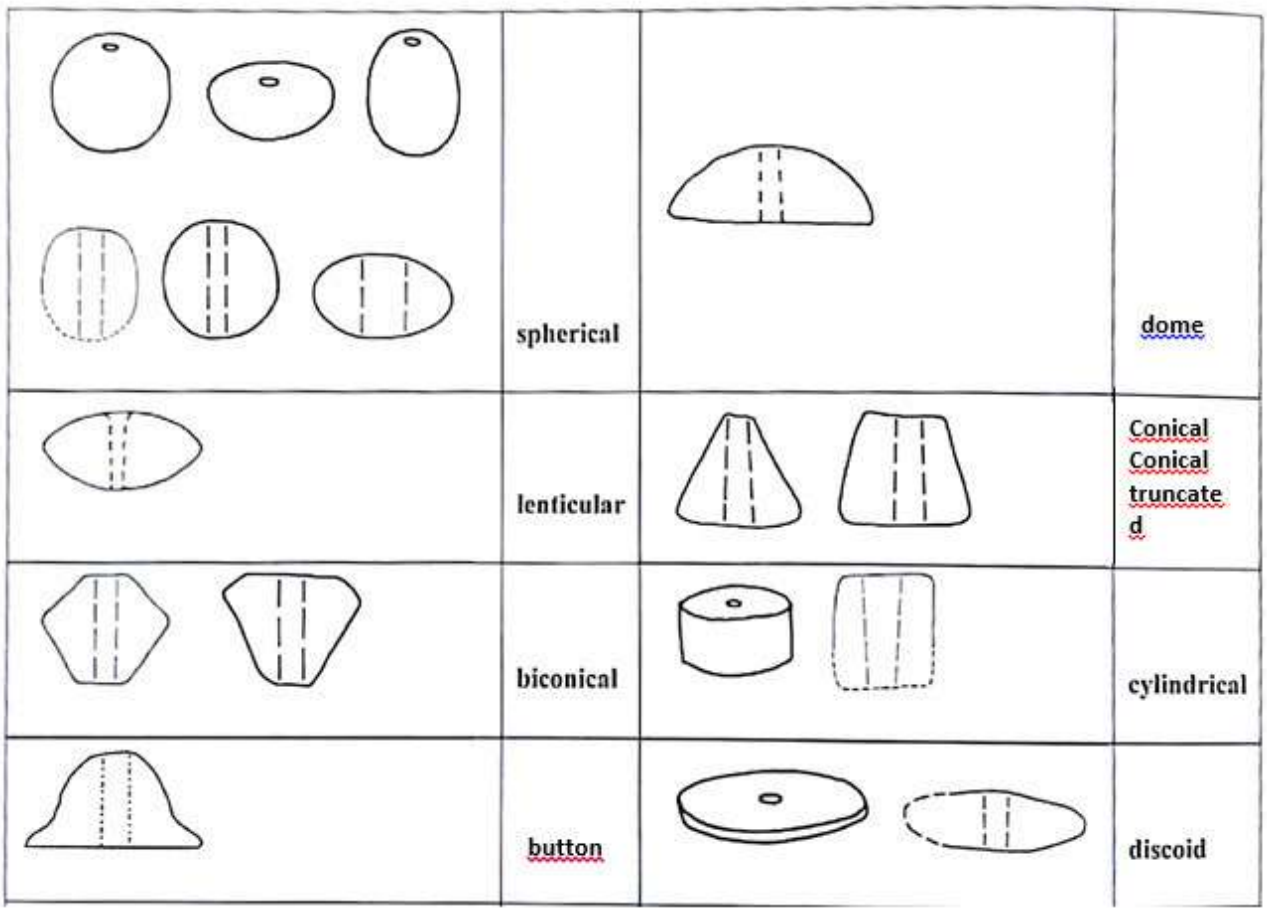


Figure 13 Spindle whorls typology (adapted from Andersson Strand and Nosch 2015, fig. 5.1.5)

3.2.3 Perforated sherds

Perforated pottery sherds or reused pottery sherds are made by reworking a sherd by breaking down its edges to obtain a more or less rounded object. A hole has to be drilled in the centre, in general starting from both sides. It is not necessary that the edges are perfectly rounded, even if sometimes objects with well smoothed contour are known. Perforation is crucial for spindle whorls, since shaft has to be inserted and be strongly attached to not fall during spinning. The most adapted shape of hole would be cylindrical or slightly conical, but even irregular holes can be used with the insertion of padding or wedges between shaft and spindle whorl. It is not even necessary that the hole is perfectly centred, since a slight eccentric perforation can be used without great difficulty. Of course, a lateral position is completely useless for spinning. The large majority of these reworked sherds

shows an hourglass hole, caused by the perforation from both sides. Even if it is not a perfect solution, hourglass perforation does not preclude the usage as spinning tools.

Holes can be made in several ways, but some objects show too small holes for allowing the insertion of a shaft, and sometimes are not vertical but quite sloping. Furthermore, some holes which show the beginning of perforation from both sides do not match in the centre. All these examples are not suitable for spinning, but are described in the catalogue as failed attempts.

Perforated sherds are rarely reported in publications and, in many cases are mixed with normal sherds, even if it is evident that they have been reused. It strongly depends on scholars traditions, and varies a lot from region to region, as well as from period to period (with prehistoric reports much more informative than all the others). This is particularly evident for Egyptian contexts, from where it is extremely hard to obtain information about these tools.

Several interpretations have been suggested for these objects, from gaming pieces, accounting objects, pendants, ornaments, children's spinning top, etc. (Gibbs 2008, 90). However, experiments with replicas have shown that it is possible to spin with them all the available fibres, from wool to flax (Gibbs 2008, 91; Shamir 1996, 150). Since their irregular perforation, they make the spindle wobble during spinning, and for this reason, they were not considered an optimal choice for spinning (Rahmstorf et al. 2015, 271). Nevertheless, the experimental tests have shown that it is extremely easy and quick to produce these objects, which require just a couple of minutes for shaping and drilling with the use of basic tools. Even if most of them may not represent the best choice, they represent a very cheap and effective solution for obtaining a spindle whorl, in some cases even better than traditional pottery whorls (Laurito, Lemorini, and Perilli 2014, 164).

Other objects linked to the preparation of threads might be identified in spinning bowls and basalt rings. Since both categories are mostly represented in the areas under study, they will be discussed in the next chapter using Levantine evidence.

3.3 Weaving

Weaving is the action of creating a textile from two systems of threads, which are disposed perpendicularly, called respectively warp and weft. Warp is the basic structure and has to be kept in tension; warp threads run in parallel at equal distance and has equal length. It is possible to warp directly on the loom, but it is an operation generally made separately on pegs on the wall or on two couples of vertical poles, which work as warper. At right angles, the weft thread is inserted, allowing the creation of different patterns. The simplest form of weaving is the tabby weave and consist of passing the weft thread over and under one thread of the warp, alternatively. In the following line, the weft will pass over the warp threads which were under in the previous passage and vice versa. When there is the same number of warp and weft threads in a textile it is called a balanced tabby. When the warp threads outnumber those of weft it is called warp-faced, otherwise is weft-faced. Each thread of warp and weft can also be doubled, which means that two (or more) threads of weft are passed over and under two threads of warp. This is called basket weave. When the thread is doubled in only one of the two systems it is called half-basket weave. Also, tapestry weave is made by using one set of warp and weft, but weft do not run from one edge (selvedge) to the other, it works only in a small area of the warp to create different patterns and designs. Several threads of different colours are therefore required for tapestry weave. Twill weave is obtained working with several sets of warps, but since is not known (so far) in the areas and periods under examination, it will not be considered. In general, classifications about weaving, mats, baskets, cords, nets are generally not considered, as well as the insertion of sequins or metal elements. However, some of these procedures require tools very similar to those used for textiles or linked to textiles, such as spindles for producing threads for nets and needle stronger than those for sewing for netting, looping and knotting (Desrosiers 2010, 34–35). It has always to be kept in mind when dealing with textile tools.

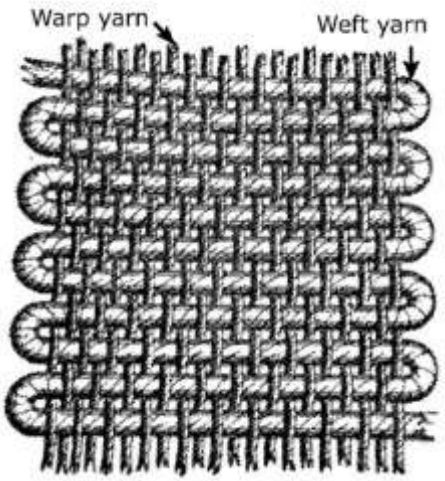


Figure 14 Warp and weft system (Dury, Lervad 2016, fig. 6)

Besides this, types of fabrics produced with "a single continuous element" [19], meaning without the two systems of warp and weft, might be used and actual textiles made with these techniques are found in Naḥal Ḥemar (Shamir 2014, 243). Producing textiles need very simple elements to be produced,

[19] See Desrosiers (2010, 34–39) for classification of these methods.

which are used to keep the warp in tension. It can be done to elements already present in the surrounding space, such as a tree or a pole, but generally, more objects are required to keep the warp threads separate from each other.

Weft can be inserted between warp threads separating each of them manually or by mechanizing and speeding up the process. In order to accelerate the weaving, warp has to be separated into two groups (odd and even threads for tabby weave) and each group should be pick up separately to create a space between them, called the shed. Weft yarn can be quickly pass through this opening, which in normal looms is naturally present (Kemp and Vogelsang-Eastwood 2001, 312). A very simple device, such a flat bar, can be used to open the counter-shed and lift temporarily the second group of warp yarn and keep the shed open. The bar (shed-stick or shed-rod) can be used for beating the textile, anytime a new portion is created and can take the name of beater, but the beater can also be a different object (Kemp and Vogelsang-Eastwood 2001, 312). Generally, however, the counter-shed is open by a heddle, which is a bar external to the warping system, to which one of the two groups of warp threads is attached by a single thread.

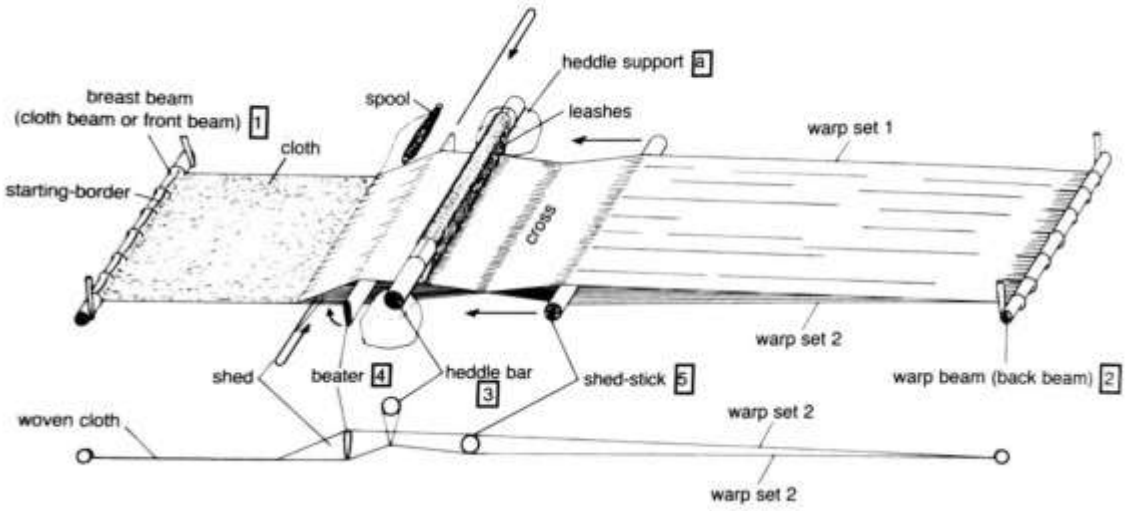


Figure 15 Horizontal ground loom (Kemp, Vogelsang-Eastwood 2001 p. 312 fig. 9.2)

A loom is a structure that keeps the warp in tension. It can vary between simple objects to very large wooden frames. The simplest form of loom for weaving is generally considered the back-strap loom, which is still used in several areas of the world, such as South America and South-East Asia.

The back-strap loom is made up of two rods between which the warp is tensioned, one attached by a rope to a pole or any fixed element at one side, while that on the other side to a belt passed around the weaver's waist. The weaver can vary the tension of the warp by simply moving him/herself or reclining. Shed and countershed can be open by the use of shed sticks and heddle-rods, as seen previously. This simple loom allows the creation of very complicated motifs in reasonable times.

However, it is possible to create only narrow strips of cloth (50-60 cm) which is the width the arms of a person can reach.

Figure 16 Modern Peruvian weaver using back-strap loom

A similar functioning system was in use in the horizontal ground loom. The loom is made up of two beams fixed to the ground through poles and one or two weavers can operate simultaneously, creating large pieces of textiles. This loom was certainly in use in Egypt at least from the Naqada period, since it is represented on a bowl dated to the late Naqada I-early Naqada II period. It was discovered in a female tomb in Badari, in Middle Egypt. On the other side of the interior rim, a set of vertical lines are represented connected on the top by a long line and human figures are attending at this structure, which is generally interpreted as a rope where the thread for warping is hanging (Cortes 2011, 94–95).

Actual looms have not preserved nor in Egypt nor in the Levant, except for two rods from the Cave of Treasures which have been interpreted alternatively as beams for a horizontal ground loom (Shamir 2015, 18) or as beams for a back-strap loom (Breniquet 2010, 53). No traces for the use of a back-strap loom have been found so far in the Near East and this is the reason for which Shamir interprets the beams as those of a horizontal ground loom. However, their narrow size and particular shapes make them completely similar to those still in use today for the back-strap loom.

The horizontal ground loom is known for Mesopotamia from textual sources at least for the third Millennium BC (Waetzoldt 1972, 130–32), while in Egypt is known from several Middle Kingdom representation on tomb paintings and on wooden funerary models, such as those of Meketra or Usernekhbet (see tab. 4).

The vertical two-beam loom seems to appear later in the iconographic documentation from Egypt, while it is not clear when and where it could have been used in the Near East. In fact, it leaves no clear archaeological evidence and its existence in the Levant has been speculated by the absence of evidence for the use of other looms. This loom is made up of a frame, which is set vertically and has to support the upper beam, heddles and other tools (Kemp and Vogelsang-Eastwood 2001, 335). The warp is tensioned by a second beam placed on the lower portion of the frame.

Several tomb paintings show the use of this loom in New Kingdom Egypt, with one or two weavers per loom, both men and women (see tab. 4). On this type of loom, textiles are woven from bottom to top.

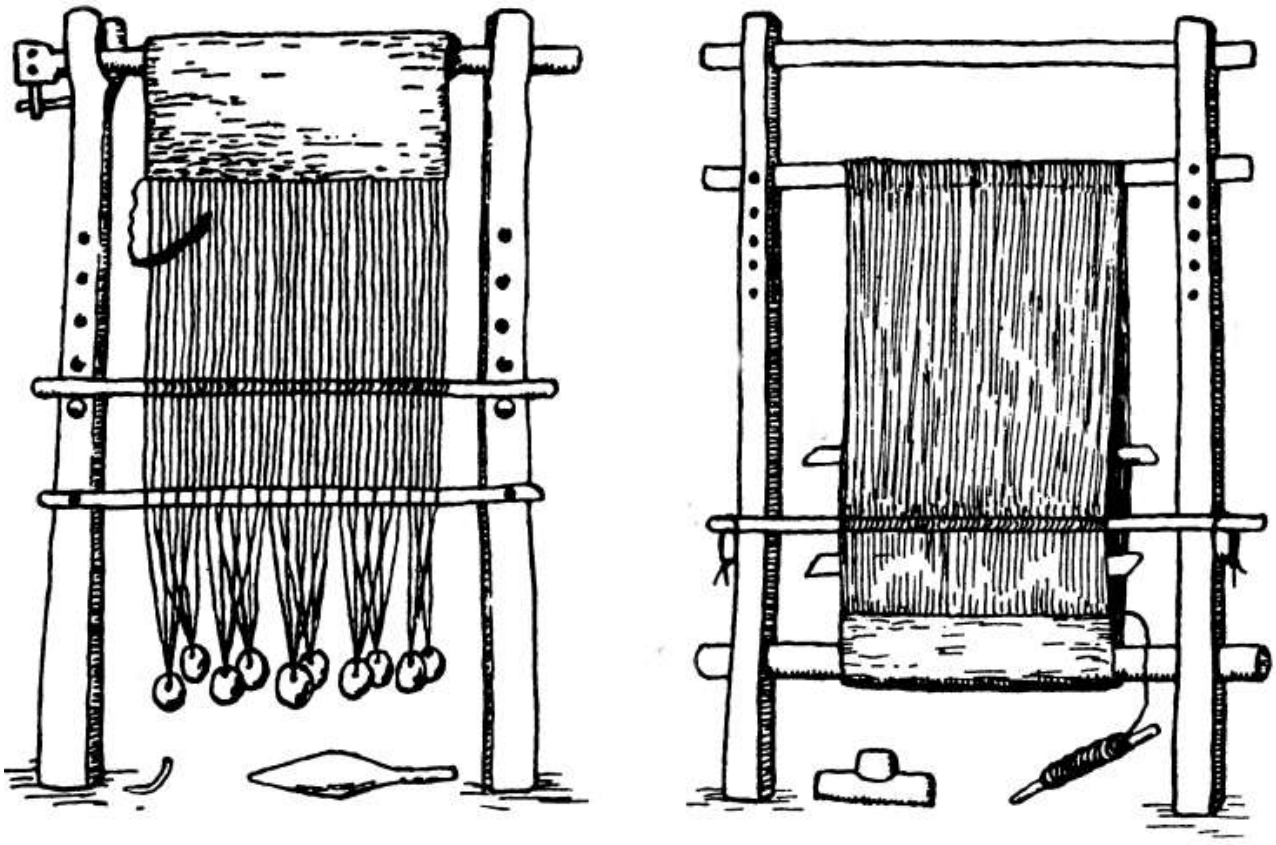


Figure 17 Warp-weighted loom and vertical two-beam loom (Crowfoot 1937, fig. 1)

Another type of loom, the warp-weighted loom, leaves clear archaeological traces and, for this reason, its use can be positively identified. It is made by a frame, similar to the vertical two-beam loom, but the second beam, close to the ground, is replaced by a series of weights. Warp is attached to these weights which keep it tensioned. They are generally made of stone or clay, and tend to survive in the archaeological layers. The loom was generally leaning to a wall and its functioning is pretty much the same of that seem for the other looms. Several heddles can be used to create different kind of textiles. Weaving, however, proceeds from the top to the bottom (on the contrary of the vertical two-beam loom). The warp has to be prepared separately and transferred to the loom, generally making a

starting border or a heading band. Its weft becomes the warp of the loom (Gleba 2008, 123). The length of the cloth is limited by the highness of the loom and several solutions can be adopted to increase the length of the fabric: standing on a stool, positioning the loom in an upper store or location, make the upper beam a roller or digging a trench under the loom (Gleba 2008, 123–24). The latter solution can leave clear marks on the ground and can help to reconstruct the exact position of a loom.

3.4 Weaving tools

Looms have hardly preserved in archaeological contexts, for their perishable nature but also because its part might have been reused as construction materials and fuel. No complete looms are known from the Near East and our knowledge is based mainly on iconographical sources, scanty archaeological traces, such as holes in the ground and charred beams, as well as objects directly pertaining to looms. These comprehend heddles and mechanism to raise them, weaving swords and beaters or spatulae and loom weights.

Heddles and actual beams are very difficult to identify even if preserved, for they are simple rods or poles of wood, impossible to distinguish if broken or out of context. It is possible that parts of looms exist in museum storages but, so far, they have not been identified. Other objects which were part of the loom assemblage come from Egyptian and rarely Levantine contexts, and will be therefore examined in the next chapters.

3.4.1 *Loom weights*

Loom weights are objects made of clay or stone, which were attached to the warping threads for giving tensions. Given their unperishable nature, these objects are the part of the warp-weighted loom more likely to survive. They can have shapes, dimensions and weights very different, even in the same context, and sometimes they are difficult to recognize. In fact, weights can be used for several purposes, the most common being counterweights, for example for matting or tensioning straw roofs. Furthermore, they can be attached to nets for fishing and this usage tends to be underestimated in archaeological studies. Clay or roughly baked clay weights can be certainly be excluded from fishing activities, but stone, pebbles and well baked weights can be used for both activities (weaving and fishing). Weights can even be used in looms for adding tensions to warp or beams without being actual loom weights (Johl 1924, 7). Contexts might help in understanding what is a loom weight and what a counterweight, since loom weights can be found in large quantities and, in some lucky cases, found in distinct rows between charred beams or post-holes (Barber 1991, 93, 101–2). However, even

weights attached to a net can fall in rows and leave

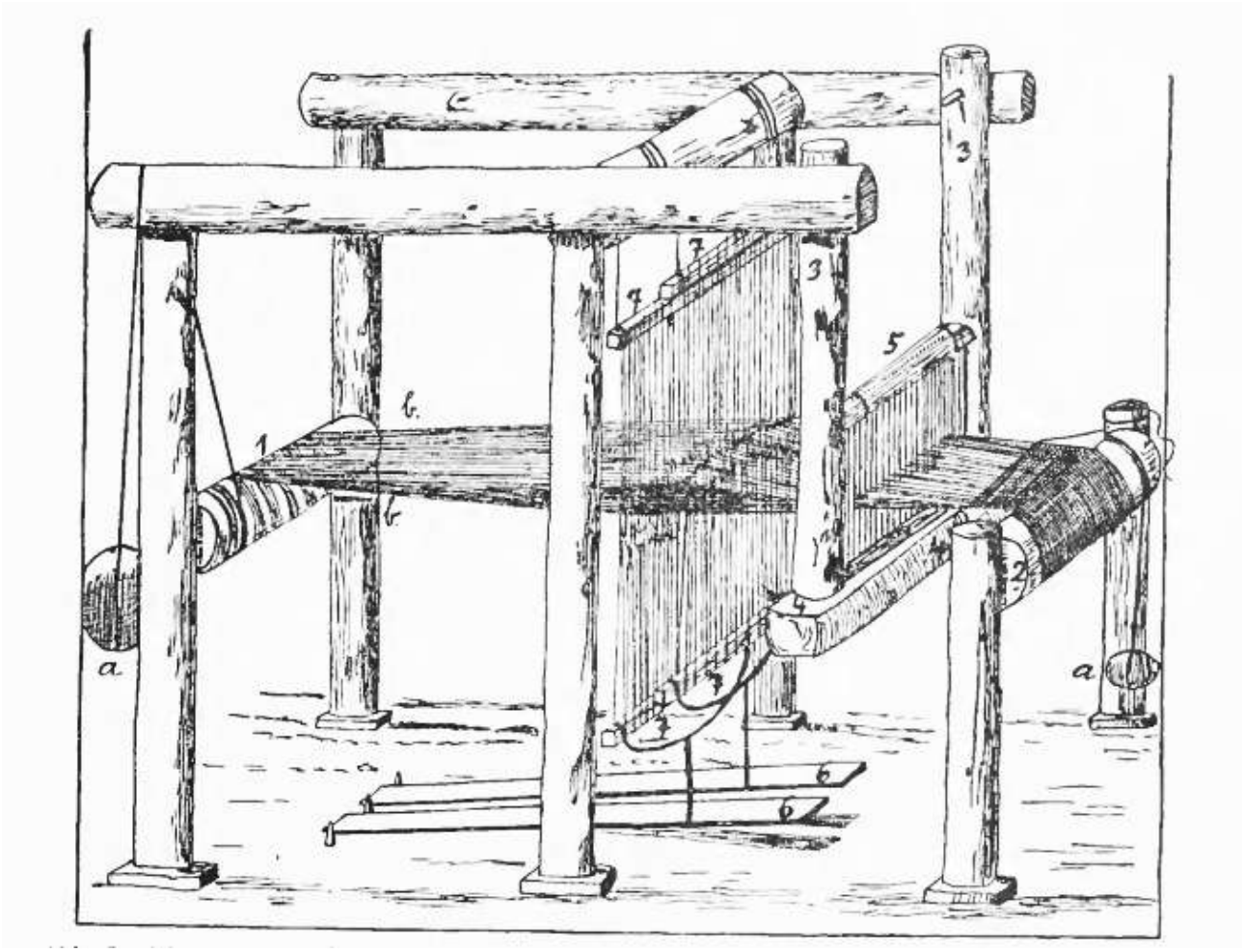


Figure 18 Modern loom with weights tensioning the beams (Johl 1924, Abb.8)

archaeological traces similar to those of loom weights.

Shapes can vary a lot and depend both on cultural traditions as well as on practical necessities. Some types of loom weights are found only in some regions, such as the typical Minoan discoid weights, others appear to be ubiquitous. Shape and dimensions can deeply influence the fabric that can be woven on a loom, so there are limits to the variability of dimensions.

As for spindle whorls, the typology adopted for this work largely depends on CTR typology, but it has been adapted to cover the specificity of the Levantine production, as well as scholarly traditional terminology (e.g. torus=doughnut shape). Discoid weights are very seldom found in the Levant but they have been kept, while other shapes have been simplified, such as the cylindrical one. Finally, a biconical shape with vertical perforation was added. Egyptian weights, completely different from all other known typology and very few in numbers in the catalogue, have not been added but will be treated separately in chapter 5.

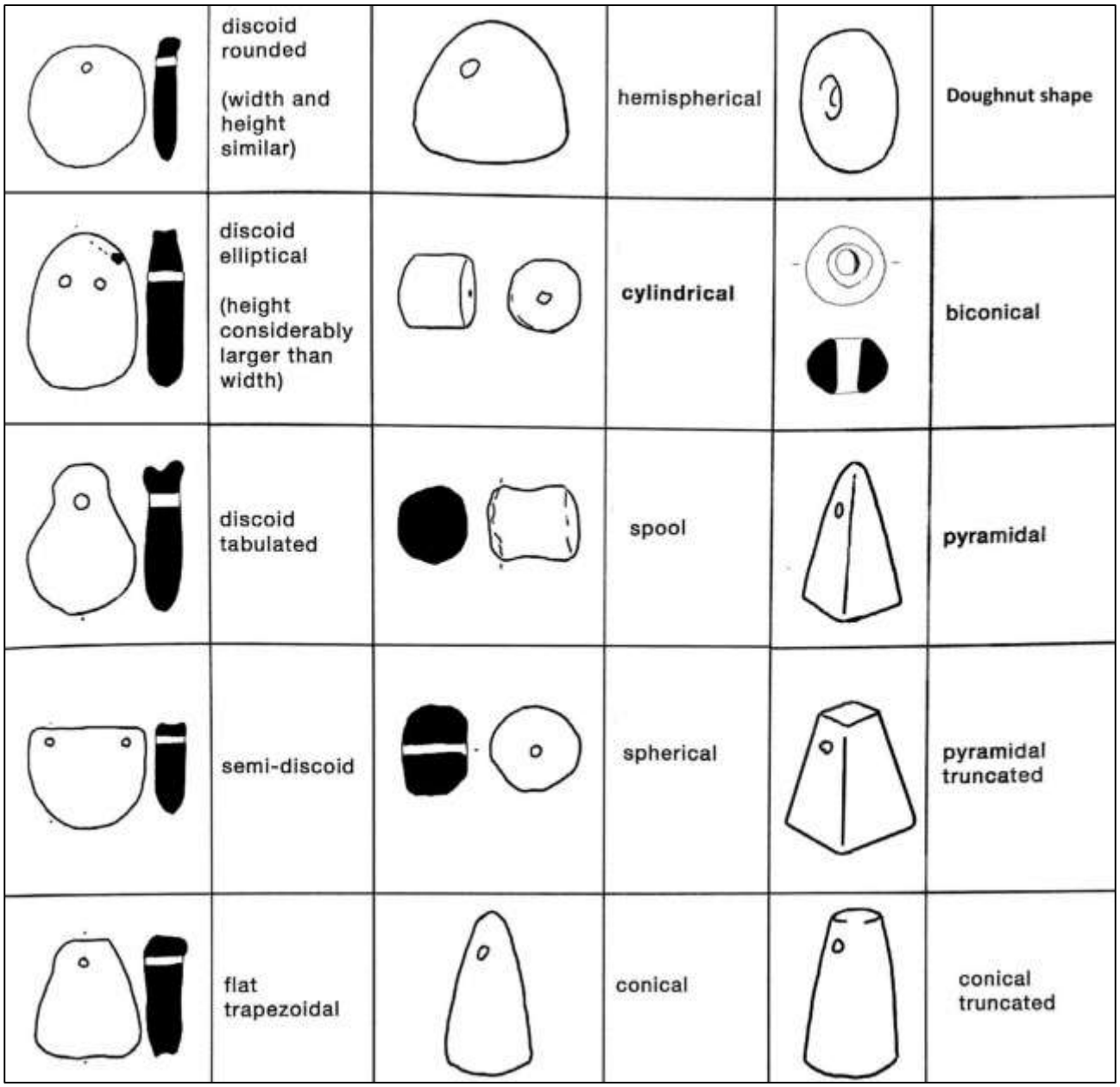


Figure 19 Loom weights typology (adapted from Andersson Strand, Nosch 2015, fig. 5.1.4)

Weight is a key parameter when choosing a loom weight during warping. In fact, warp threads require different amount of weights depending on their thickness and quantity of fibres. A thick yarn requires a greater tension, and therefore a heavier loom weight, than a thin thread, while a thinner thread requires a lighter weight otherwise the tension could break it. Furthermore, each loom weight is not attached to a single thread, but to a group of threads requiring that quantity of tension. A weight of 100 g could be attached to ten threads requiring a tension of 10 g, to five threads requiring a tension of 20 g each, and so on. Experimental tests conducted in the frame of the TTTC experimental program of the CTR have demonstrated that weaving with less than 4 threads attached to a loom weight or with more than 30 threads per loom weight is possible but very unlikely (Mårtensson, Nosch, and Strand 2009, 390, 393). The number of thread attached to a loom weight and the thickness of the

loom weight will determine also the thread count of the fabric. The experiments proved, moreover, that the total width of the loom weight row defines the width of the cloth, independently by the starting border width (Mårtensson, Nosch, and Strand 2009, 384–87). Weight and width are therefore crucial information to understand the type of fabric that could be created using a set of loom weights. The basic weave that can be created on a loom is a tabby weave, which for a warp-weighted loom implicated two rows of weights. Twill (2/2) requires four rows of weights. For the period and contexts under examination, twill is not known, while tabby weave is the most common type to be found. It is interesting, however, that warp-weighted loom develops in contexts where twill was not known or not so spread, since it is more suitable to produce twill than tabby. Tabby is, of course, possible on a warp-weighted loom, but it might create difficulties, especially when a very dense tabby is created[20], whilst it is perfect for twill. However, warp-weighted loom might have been used to create other types of textiles, such as tapestries; unfortunately, tapestry can be realised in all types of loom and does not require a specific set of tools (Smith 2013, 165).

Weaving with a group of weights of similar dimensions and weights might seem the obvious choice, but archaeological finds rarely match these expectations. To understand this strange fact, might be useful to consider ethnographic data, as those collected by M. Hoffmann (1964, 65). In fact, she observed that weights of different individual mass could be used contemporaneously on the same loom, and that more threads were attached to the heavier weights and fewer to the lighter weights, in a proportional way. In other cases, she observed that even in a homogeneous set of loom weights, some more heavy specimens are intentionally placed at the lateral threads, probably to reinforce the lateral selvedges.

3.4.2 Spatulae and pin beaters

Spatulae and pin beaters are a wide category which has not found a precise interpretation. Even if they are known from all over the world and in many prehistoric studies (Cheval and Radi 2013) are definitely considered as tools linked to textile production, in the area under examination have been considered in many different ways (tools for eating, writing, cutting, piercing etc. (Ariel 1990, 129). I propose here a distinction between spatulae and pin beaters. The first one is a flat object, generally obtained by ribs of cows or, more rarely, other mammals. The second are metapodial bones, mainly of sheep and goats, left unworked on one side and cut to obtain a point on the other side [21]. This distinction is dictated by the possible different usage due to their shape and thickness. While the first

[20] Andersson Strand pers. comm.
[21] For their manufacturing see (Doyen 1986, 33–39)

type is very thin and can be inserted between the warp threads and parallel to the weft, the second has to be manipulated following the warp threads and certainly cannot be inserted in the shed.

Doyen proposes a usage for spatulae during weaving, for beating the weft thread or for disentangling yarns or fixing small errors and knots (Doyen 1986, 51). He connects them with the appearance of a specific typology of loom weights, but this hypothesis has been contested and rejected by Cecchini (1992, 16) on the basis of the archaeological evidence which does not match the chronology of those specific loom weights. However, she agrees with the interpretation as textile tools, especially for beating the threads (Serena Maria Cecchini 2000, 229). In the work about Tell el-Amarna textile production (Kemp and Vogelsang-Eastwood 2001, 358–73), the objects here defined as bone spatulae are called pin beaters, but since the second is a more generic term, it has been preferred to use it to define the second category of objects.

The pin beaters included in this study are very simple tools made from metapodial bones with a point on one end. This category may include a very large and undefined set of tools, which could be used for very different purposes. At the beginning of the research, it was decided to exclude these tools since the difficulties to understand which were truly linked to the textile industry and which not. However, a direct ethnographic evidence in Peru suggested the necessity to consider these tools more carefully and to insert in the research at least those clearly recognizable. The Peruvian weaver used this tool to keep the warp in order while weaving, meaning that she passed the beater over the warp parallel to the direction of weft. She did it very quickly, several times and with a certain amount of strength that would have destroyed the thin and fragile spatulae.

Figure 20 Modern pin beater from a Peruvian loom

3.4.3 Sewing Needles

Needles are known since the Late Paleolithic period (Barber 1991, 39), but only a small quantity is known for the periods under consideration. Several types of needles exist today and it is highly probable that needles for different purposes start to develop quite early in history. Sewing needles were probably the first type to develop and have different dimensions according to different tasks

they are/were used for. Sewing a coarser textile is obviously easier and quicker with a large needle, but it would ruin a fine, dense fabric, for which a smaller and thinner needle is required. Needles can be used also to produce sails, cushions, mattresses, nets and for tapestry weaving or sewing skins and leather. Different measures[22] are therefore required, but at the present state of the documentation, there is no chance to distinguish the actual purpose of each needle. In this work, needles will be distinguished from bodkins, which are used to thread cords and ribbons through premade holes in a garment and are therefore quite thick. However, a very large set of objects fall into this category, and since measures are the only parameter used to distinguish bodkins from needles, the methodology used is far from being accurate. Therefore, all the objects are examined together under the vast category of needles and bodkins, being aware of the multiple functions for which they could have been used.

3.4.4 Combs

Combs are essential objects in the preparation of raw fibres for spinning. Wool, in fact, after plucking/cutting from the sheep, necessitate being sorted to separate different qualities of fibres. From the accuracy of this operation, the final thread and cloth largely depend. Several criteria might be employed for sorting, such as colour, fineness or length and separating long hair from short underwool can be easily done with a comb with long teeth. Moreover, combing help in removing dirt and tangles making easier the process of spinning, and more even the thread spun (Andersson Strand 2015, 44).
Nowadays, flax requires three different combs for separating fibres, after rippling, retting, breaking and scutching. The combs have different distances between the long iron teeth and allow to separate tows from long fibres and to separate short and thick fibres (used for cords and strings) from long and thin fibres (used for weaving)[23]. Such tools do not exist in archaeological records, as the combs with iron teeth used for wool preparation do not appear until at least the Roman period (Rast-Eischer 2008, 161–62).
Wooden, ivory and bone combs, instead, are frequently found in archaeological records and sometimes the excavators put them in relation with fibre processing and not for combing hair. Studying the Egyptian and Levantine artefacts, however, actual tools for combing fibres cannot be recognized. On the contrary, many objects come from funerary contexts and were certainly linked to hair combing.

[22] A look at the site of the TRC https://trc-leiden.nl/trc-needles/tools/knotting-looping-and-netting can help having an idea of the so many different types of needles and of their different usages.
[23] I would like to thank the personnel from the Museo Unico Arte Tessile Sarda, Samugheo in Sardinia, for showing me the implements and for kindly answering to all my questions.

Egyptian tombs show a frequent presence of wooden combs in female and male graves since the Predynastic period (Capel, Markoe, and Bryan 1996, 75) with a very large variety of typologies according to periods (Ashton 2011). On the contrary, Egyptian tombs never present textile tools (except a couple of examples in the whole Pharaonic period) and this fact points to the interpretation of all of these combs as toilet equipment.

A similar situation might be suggested from the tombs of Jericho, where combs are frequently found, especially wooden combs dated to the Middle Bronze Age. Jericho is one of the very few sites of the Levant where organic artefacts have partially preserved. Most of these combs were found near the head of the deceased or near the chest, and the finding of hairs plaited in that point have enabled to determine their use as hair combs (Kenyon 1960, 250, 341, 391 (tomb H18), fig. 221; Kenyon and Holland 1965, 462, tomb G73). Furthermore, many combs were found in baskets, together with wigs and other toilet implements, but very seldom with possible textile tools. Since the combs from Jericho present another large typology, it seems that all the combs known in the archaeological record, single, double, with short or long teeth, were probably to connect with hair combing and not to fibres processing. If some of the findings have to be linked with textile activities, it is not possible to distinguish it at the present state of the documentation. Finally, all the ancient Egyptian scenes of spinning and weaving show the preparation of flax fibres performed by hand or, possibly, with the use of two sticks, but never with combs. For all these reasons, it has been decided to exclude combs from the present study, except some objects certainly not used for personal care.

4 Textile tools from Southern Levant

4.1 Spindles

From the Near East, very few spindles have been preserved, so they will be all presented here. In fact, they can help in the discussion for understanding the position of the spindle whorl at the top or at the bottom of the shaft.

Some examples of complete spindles are known from graves of the III millennium B.C. At Kish, in Iraq, several examples of spindles were found, four made of copper and three of wood (Völling 2008, 247) and are dated to the Early Dynastic IIIa (2500-2350 B.C.). One example has a hook on the upper part immediately over the spindle whorl, which is dome shaped. A second example has a discoid spindle whorl near one of the end and the other end is pointed. Two examples, instead, have a flat head and could not be considered as spindles nor distaffs[24]. Similarly, the example from Abu Salabikh (Postgate and Moon 1982, 131, 134, pl. Vc; Barber 1991, 57) with flat head is not convincing as distaff. The three wooden shafts from Kish palace do not have a spindle whorl preserved and are broken at their ends (Völling 2008, 248). Their cigar shape and shortness make them very different from any kind of spindle analysed in the Near East, however, as pointed out by E. Völling, the presence of a groove useful to fasten the fibres might indicate a use in spinning (Völling 2008, 248).

At Abu Salabikh a copper spindle was found in a grave, in context with other metal pins and the "distaff" with flat head already cited. The possible spindle has a large discoid spindle whorl near one of the end of the shaft, while the other end shows a thickening near the point. Other two discs made of silver (probably beads) with a tiny hole were present in the grave (Postgate and Moon 1982, 131, 134, pl. Vc).

At Tepe Hissar, in Iran, a copper spindle dated to the 3rd millennium (Hissar IIb) has been excavated. The shaft is 22 cm long and has a long, spiral groove on the upper end, while the lower end has a rounded tip. Under the groove, in the upper part of the shaft, two spindle whorls are present: one is conical, and the second appear as spherical (Schmidt 1937, 120, pl. 29). A second object, made of schist, is considered by E. Völling (2008, 247) as a spindle, but its huge dimensions make it unlikely (Schmidt 1937, 222, pl. LXIV).

[24] For interpretation as distaffs see (Barber 1991, 57).

Two precious spindles come from the cemetery of Alaca Höyük, in Turkey, one from tomb L and the other from tomb H. They are made of silver and gold or electrum, both with a discoid spindle whorl

Figure 21 Spindles from Alaca Hoyuk at the Ankara Museum

on the shaft. In both cases it is placed around the middle of the shaft (Barber 1991, 60–61). They are dated to the Early Bronze Age as are the two examples from Horoztepe, very similar to those from Alaca, and other two from Merzifon (Barber 1991, 61)[25].

Figure 22 Two spindles from Merzifon at the Ankara museum

A completely different object comes from Karataş-Semayük, and it is a thin silver shaft, pointed at both ends. It preserves a biconical spindle whorl on it, at one third of its length. Not far from it, a disc was found and the excavator reports that it "fits neatly against the truncated biconical whorl" (Mellink 1969, 323, pl. 74).

From the half of the second millennium onwards, bone and ivory spindles and distaffs begin to spread all around the Mediterranean area, including the Southern Levant, which will be discussed later. Syria, Anatolia, Cyprus and subsequently Greece and Italy show the diffusion of this category of objects (Borgna 2003; Sauvage 2014). Most of these items are found missing a spindle whorl, therefore they can only tentatively be indicated as spinning tools. Some objects, however, still preserve a spindle whorl and their use can be linked to thread production with more certainty. Since complete spindles and bone shafts have been already extensively discussed[26], this chapter will consider only complete examples from Northern Levant and Anatolia (and not from other Mediterranean areas), while specimens from Southern Levant will be discussed later.

[25] E. Völling interprets them as distaffs (Völling 2008, 255).
[26] See among others (S. M. Cecchini 1992; Peyronel 2004; Borgna 2003; Sauvage 2013, 2014; Spinazzi-Lucchesi 2018) with further bibliography.

In Troy, some spindles were found as well. Two fragmentary objects are dated to the Early Bronze Age, were made of wood and one was found charred in a box with traces of a yarn and a clay spindle whorl (Götze 1902, 340, 390; Peyronel 2004, 51). A third example is made of ivory, has a flat end while the other seems a tenon with a small hole through it. A spindle whorl, slightly dome shaped, is placed near the middle of the shaft (Balfanz 1995, 107–8; Völling 2008, 257). It is dated to Troy VIIa (ca. 1250-1180 B.C.).

Ugarit has preserved three examples of spindles made of bone and ivory. Unfortunately, none of the objects can be considered complete. One has a flat end, the shaft tends to taper towards the other end, which is missing; the dome shaped spindle whorl is placed at ¼ of the length of the spindle, near the flat end. A second example is very similar to this one, but is broken in three pieces and the smallest end is missing in this case too. A third object, which will be compared with one of Lachish, is complete, but a mortise at the end of the flat tip suggests that a further element should be expected. The other end preserves a large pomegranate-shaped decoration. A discoid spindle whorl is placed at the middle of the shaft. All of them are dated to the Late Bronze Age II (Gachet-Bizollon 2007, 16:115–16, 120, 260–61, pl. 19). Excluding the examples from Megiddo (which will be discussed later), no other shafts with a spindle whorl in place have been recorded.

Other complete spindles are known in the Levant for the first millennium B.C. but are made of metal, although bone and ivory shafts continued to be extensively produced.

In Marlik, in Iran, a complete spindle made of bronze was found. It shows a groove for attaching the thread near one end of the shaft, while the other has a rounded point. The spindle whorl is a flat bronze disc and is placed immediately under the groove. It is dated to the beginning of the first millennium B.C. The shaft is 26 cm long and the total weight of this metal spindle is only 50 g, so it could have been actually used in the thread production (Negahban 1996, 302, pl. 132; Barber 1991, 59; Völling 2008, 247).

Two spindles from Deve Höyük, in Turkey, are made of metal and still preserve their original spindle whorl. Both have one flat end, and tapers towards the other end, which is well decorated. In one case the spindle whorl is placed near the flat end (or it was, now it appears to have moved toward the half of the shaft), while in the other is near the half of the shaft. They have been generally interpreted as kohl sticks given the large collection of kohl sticks found in the site (Moorey 1980, 98, fig. 16). In the same direction seems to point examples from Kamid el-Loz, slightly later, with one “spindle” example and several bronze kohl sticks (Poppa 1978, 78, Taf. 7; Völling 2008, 255).

If the objects here listed have to be considered as spindles (and not distaffs or kohl-sticks) then the position of the spindle whorls appears quite variable. Some objects which have a hook or a groove can be oriented with certainty and in these cases the whorl is placed in the upper part of the shaft,

giving a high-whorl spindle. However, many others from Anatolia seem to have the spindle whorl in the middle of the shaft. No examples which could be considered as low-whorl spindles are, so far, known from the areas under consideration (Syria, Anatolia, Mesopotamia and Iran). If we compare this poor and tentative evidence with the few available iconographic sources, the picture seems to be more clear.

A mosaic panel of Mari, dated to the early 2nd millennium BC, represents a group of women who are working with some threads. If a spindle has to be recognised as the object hold by the standing woman, then it is possible to say that the yarn is wound around the top of the spindle with the whorl placed on top of it, as in the case of the high-whorl spindles (Barber 1991, 57).

Figure 23 Elamite spinner, Louvre museum Sb 2834

No other iconographic sources are available for the second millennium, while much more are known for the first millennium. A relief from Susa portrays a lady while spinning and the whorl is placed in the higher part of the shaft (Porada 1965, 68, fig. 43; Barber 1991, 58). Other examples of spinners are represented on Syro-hittite reliefs, in which ladies hold generally two objects which could be interpreted as spindle and distaff (S. M. Cecchini 1992, 10) and the thread is always wound in the upper part of the shaft. However, it should be noted that all the examples here cited (except the Elamite spinner), show the spindle hold in the hand of the woman, without a clear representation of the spindle whorl, which could even be absent, and, as already noted by E. Barber (Barber 1991, 59), no scenes of drop-spinning are known for the Near East.

In any case, Mesopotamia, Northern Syria and Anatolia seem to have preferred to spin with a central or high-whorl, but other techniques could certainly have been used at the same time. So far, no archaeological artefacts and iconographical elements are known which prove the knowledge of the low-whorl spindle spinning in the Near East and Egypt shares with this region the same predominant technique. How about the Southern Levant?

4.1.1 Spindles from Southern Levant

Spindles are even more rare findings in Southern Levant and the very few items which might have been used as spindles are very different from each other, come from different periods and do not allow any form of general consideration or typologization.

A possible spindle was found in the Ashalim Cave, in northern Negev Desert; it is a wooden shaft with a lead perforated object still attached to it. Fibres found on the object might be due to post-depositional animal activities (Langgut et al. 2016, 981). The shaft has a length of 22.4 cm and a thickness of 1.5/1.7 cm and is made of *Tamarix* (tamarisk) wood. The weight is 26.6 g. On one of the end, an incised groove is present and the spindle whorl is placed right under it. The whorl weighs 155.75 g, and is very heavy. If this item is actually a spindle, it is certainly a high whorl spindle. Several lead mace heads are known in the Chalcolithic Levant and this object could have been a mace (Bar-Adon 1980, 130; Sebbane 2014). However, the lead head is light in comparison with the other mace heads and the groove does not find an explanation for this usage.

Figure 24 Possible spindle from Ashalim Cave (Langgut et al. 2016, fig. 6)

Another cave, the Qina Cave, in northern Negev Desert has preserved evidence of four wooden shaft, without whorls. Three basalt perforated objects were found in the same cave, 30 m from the shafts. However, their hole perforation is not suitable for the use with the shafts. Shafts are made of *Tamarix* (tamarisk) wood, as the Ashalim object, and have very different length and weights, since they are 19 (but broken), 40, 48, 56 cm long and they weigh 9.3, 15.9, 19.9 and 59.8 g. One of the shaft has a groove near one end. Some fibres were found on the shafts and were identified as bast (Langgut et al. 2016, 981). They have been interpreted as spindles and/or distaffs. All the objects are dated to the Chalcolithic period and the ^{14}C analysis place them at the very end of the 5th millennium (Langgut et al. 2016, 980, tab. 1).

No spindles have preserved for the Early and Middle Bronze Age and three possible spindles are known from Late Bronze Age Megiddo. These items are well known and published (Barber 1991, 62; Peyronel 2004, 319) but some considerations are necessary anyway.

The first item has been found with the position of the whorls still recognizable, with "*a pin passed through the whorls into holes in the spindles*" (Guy and Engberg 1938, pl. 84:1) and a second one

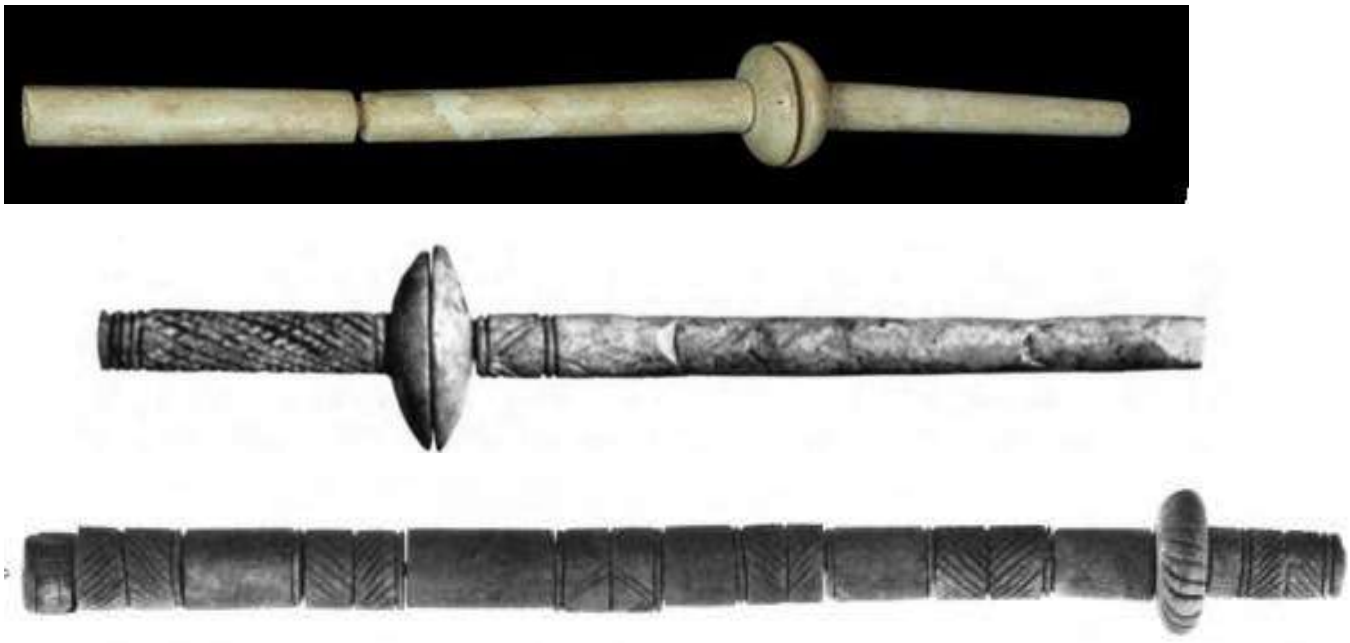


Figure 25 Three possible spindles from Megiddo: M 3530 (Lamon/Shipton 1939, pl. 95:38, Israel Antiquities Authorities); b433a (Guy/Engberg 1938, 172, pl. 142); M 3568 (Loud 1948: pl. 197:2);

was reconstructed on the basis of the first. All the three items are made of several cylindrical parts, attached to one another with different methods. In the first two cases with tenons and mortises, in the third case with a "core" that originally kept in place the various parts. The last item very difficulty could have been used as a spindle. If a purpose linked to textile production has to be found, it would rather be that of a distaff, but other uses are possible as well.

The first two items are very likely to have been spindles. However, the way spindle whorls are placed in the shaft is extremely interesting. In fact, two spindle whorls are in use at a time, so when considering very small and light whorls from Megiddo, it has to be reminded that they can have been used doubled [27]. Furthermore, whorls are not placed on the shaft, but on a peg. It means that the hole of the whorl has to be adapted to fit into the peg and not to the shaft, being much smaller. This creates problems in recognizing small whorls from beads, since even a hole diameter of 2 mm can be acceptable for whorls. Finally, the position of whorls in the first two shafts is on the opposite side. In

[27] The doubling of the whorls is very different from the case of Hissar, since in that case the second whorl could be added or removed during spinning according to weight needs. In this case, the two whorls are fixed in the shaft and cannot be removed until the thread has been taken away.

the first case, it is near the thinnest part of the shaft (and the mortise on the flat end allows to think that further elements were added), while in the second is near the large and flat end of the shaft.

From the first millennium B.C. a spindle with linen thread wrapped around it was found in Tell el-Hammeh but no other indications are given (Cahill 2006, 441). Dozens of wooden whorls were also present. Another fragmentary spindle is known from the Phoenician town of Achzib and is dated to the IA II. The preserved length is 6.7 cm and it has a very large diameter, 3 cm. At one of the broken end, a discoid whorl is placed.

Figure 26 Spindle from Achzib, IAA 1948-491 @The Israel Museum

Figure 27 Shaft from Lachish (BM 160174) L.

During the Late Bronze Age several bone shafts, very similar to those interpreted as spindles, were found in Megiddo and other Levantine sites, similarly to what happens in the Northern Levant. No spindle whorls were found on these items so their interpretation as spindles, although in many cases probable, remains not sure. Their production continues in the Iron Age, although they are less numerous. In the sites here discussed, the largest quantity was found in Megiddo, but few were found also in Beth Shean, Hazor (especially for Iron Age II) and Far'ah.

A special mention deserves Lachish, for ivory objects closely resembling complete "spindles" from Ugarit. Six complete shafts were found in a votive cache of the so-called "fosse temple" and are dated at the end of the Late Bronze Age. Three of them have an elaborate top, in two cases resembling a pomegranate (Tufnell, Inge, and Harding 1940, 59–62, pl. XX). Another, similar object comes from a grave (Tufnell 1958, 87, pl. XXVIII). Similar objects are known from other sites in IA levels, such as Achzib and Tell Sera.

These objects, however, are very thick and seem very different from actual spindles of everyday use. It is possible, then, that they were used as distaffs to hold fibres rather than for spinning.

4.2 Spindle whorls

Few spindle whorls are known from Neolithic levels, but in Jericho a couple of stone spindle whorls can be dated to Pre-pottery Neolithic B, one spherical and the other discoid. Pottery spindle whorls appear in levels of Pottery Neolithic and have a discoid shape. To these, other two discoid stone

spindle whorls must be added (Wheeler 1982, 626). Beth Shean earliest whorls are dated to level XVIII but their belonging to Neolithic or Chalcolithic phase is not clear. All of them are made of stone, mostly limestone, except one perforated pebble of ovoid shape (Braun 2004, fig. 4.9). From Late Neolithic levels of Tel Kabri are known six discoid pottery whorls, but no stone specimens (Oren 2002, 368, fig. 10.14). A few are also reported in Sha'ar Hagolan (Garfinkel 1999, 29).

Much more numerous are the spindle whorls recorded for the Chalcolithic period. In Beth Shean, some spindle whorls belong to level XVII, dated to the Chalcolithic period (or beginning or the EB I), and they show a great continuity (Braun 2004, fig. 4.9). Already cited are the three basalt discs (or should they be considered as rings?) found in the Qina cave. They have a diameter ranging between 4.2 and 4.9 cm, a height between 1.4 and 1.7 cm and a weight between 50 and 68 g. This data show that they are very homogeneous between them (Langgut et al. 2016, 981, tab. 3). Limestone and basalt discoid whorls appear also in Nahal Mishmar (Bar-Adon 1980, 183–84).

Other sites preserve, beside discoid spindle whorls made of stone and pottery, some examples of well shaped biconical spindle whorls (Shamir 2014, 147, 166).

Discoid and biconical whorls (including perforated sherds which will be treated in the next chapter) are known in large quantities from sites of the Beer Sheva valley, where a dramatic increase in their numbers can be detected (Levy and Gilead 2013, 31). Biconical spindle whorls are reported having an average diameter of 4.5 cm and an average weight of 64 g.

Figure 28 Biconical pottery whorls from different Chalcolithic sites (Shamir 2014, fig. 7-17).

Biconical, cylindrical and discoid shapes are dominant also in the Early Bronze Age strata at Beth Shean, made of both pottery and stone. A similar production is known also from Megiddo, but almost all the specimens known from this site are made of pottery. Furthermore, beside discoid and biconical whorls, dome shaped and cylindrical whorls are also present, showing a broader range of typologies. Unfortunately, objects from both sites are broken and cannot allow a comparison of weights. The probable weight of those of Megiddo should ranges between 27 and 50 g, which means a medium quality yarn. A wide typology of shapes is known also from Tell el-Far'ah N, where cylindrical, spherical, conical and discoid whorls are present. However, all the whorls available for study are made of stone, contrary to the production known for Megiddo. Furthermore, they are much heavier than those of Megiddo, showing a lower quality production. A very large batch of spindle whorls come from EBA layers of Jericho. Almost all the objects have a discoid shape, continuing the

Southern Levantine tradition of discoid whorls, but cylindrical and one dome shaped whorls are present too. As in Beth Shean and Far'ah N, the majority is made of stone but several items made of pottery are known as well. A single specimen of a dome shaped bone whorl was found for these layers (Wheeler 1982, 635, fig. 258:16). Few EB I whorls are known from Ashkelon (Area E), but are very interesting since they provide useful data for comparison with basalt rings, which will be discussed later. Two of the twelve whorls are disc-shaped and made of limestone. Their measures are 3.2 and 4.2 of diameter, 0.8 and 1 cm in height and 9.5 and 25.2 g in weight (Shamir 2004, 98). Similar to the objects of Ashkelon are those of Tell Yarmuth, where discoid limestone spindle whorls were found (Miroschedji 1988, 88, pl. 49). A continuity with Late-Neolithic materials is visible in Tel Kabri, where five discoid pottery whorls were found in EBA contexts (Oren 2002, 368, fig. 10.14).
Tell Abu el-Kharaz in the Jordan Valley is a key site in the comprehension of textiles tools, since they are quite well published and sometimes organic materials have preserved, given a major understanding of their use. However, spindle whorls are almost absent from EB layers (excluding basalt and limestone rings which will be treated separately), just one single limestone whorl is known (Fischer 2008, 147). Furthermore, not a single perforated sherd has been reported.

Middle Bronze Age layers show a slight increase in spindle whorls production and the introduction of new typologies and materials. In Megiddo, pottery spindle whorls are still predominant and biconical shapes are still in use together with a conical specimen. MB I sees the introduction of bone spindle whorls, generally dome shaped since they are cut from animal bones epiphyses, but occasionally conical examples are known. Stone spindle whorls begin also to be produced as well and they show a large variety of typologies: discoid, dome, cylindrical and spherical. Weights vary a lot but, excluding an object with a weight of 130 g, all the other specimens weigh less than 50 g. Bone spindle whorls tend to be small and extremely light, weighing from 1 to 5 g. Even if some of them were probably not to be considered as spindle whorls, the presence in this site of two spindles with double whorl mounted through a peg does not allow to safely exclude any of these objects.
Similarly to Megiddo, Beth Shean assists to the introduction of bone and ivory spindle whorls, mostly dome shape. Discoid stone whorls continue to be produced, but pottery whorls completely disappear. Many others typologies of stone whorls are known, such as cylindrical, lenticular and conical. Between the bone/ivory whorls button and conical examples are also present. Very few weights are available for this period, but as in the case of Megiddo, they seem oriented to a very fine yarn production, with many whorls weighing ca 10 g. However, Megiddo preserves a large quantity of objects weighing less than 5 g, which constitutes a remarkably difference.

Hazor has shown little evidence of spindle whorls and only for MBII layers and, contrary to the other sites, they are completely homogeneous for shape and materials. In fact, all the specimens are made of bone, and almost all have a dome shape. A discoid and a conical truncated whorls, still made of bone, are the only exceptions.

Tell el-Far'ah (N)[28] shows a great continuity with the EBA layers. In fact, stone is still the most common material employed and only one pottery whorl is present, as in the earlier period. Like the other sites here considered, bone whorls are introduced during the MBA and have a dome shape. Weights show a remarkable difference and are oriented to a medium-low quality production. One of the bone "whorl", however, is extremely small and should have had a very light weight, similar to the lightest from Megiddo.

Many other sites have provided examples of Middle Bronze spindle whorls and Jericho is certainly one of the most important. Unfortunately, settlement was badly eroded for this phase and spindle whorls come mainly from graves, continuing a funerary tradition which was well established already in the EBA. Most of the whorls are made of stone, but pottery is also largely employed. Bone spindle whorls appear in this level too but a remarkably finding is made by three wooden whorls (Wheeler 1982, 586). Shapes continue the tradition of earlier periods, being mostly discoidal and partly biconical. Wooden whorls instead, are conical and dome shape.

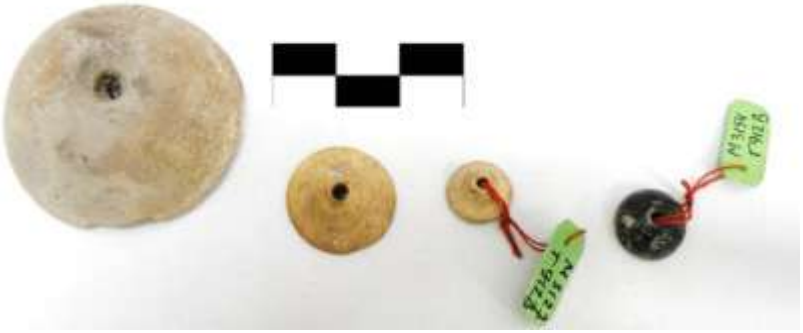
Another very interesting MB context is Tel Kabri, where textile tools have been well published. A large number of loom weights were found (and will be discussed in chapter 4.7) but very few whorls are known for this period. Of the twelve found in the palace area, only six come from clear contexts. Furthermore, two more whorls come from graves. Most of the whorls are made of pottery, but also bone, fayence and hematite whorls have been found. Shapes varies between discoid, biconical and dome (Oren 2002, 368–69, fig. 10.15).

Some whorls from Gezer probably belong to MB phases, but Macalister publication is far from being clear (Macalister 1912, 70–73, pl. 132)[29].

[28] As discussed in chapter 4.12 only part of whorls were available for study and therefore all the consideration here presented have to be considered as partial.

[29] See Peyronel (2004, 191) for an attempt of reassessing some of the whorls.

Late Bronze Age levels in Megiddo are characterised by a very rich production of spindle whorls, which, however, is only a forerunner of the impressive quantity of the Iron Age layers. Bone whorls have become the most common type in the site and, obviously, they are largely dome shaped. However, pottery and stone whorls are still present. Beside the common dome shape (which is not confined to bone since stone implements are present too), spherical, conical, biconical, discoid, lenticular and few button-shaped objects are known from the site. As will be discussed in chapter 4.9, it is very difficult to clearly understand which of the smallest items should be considered as whorls and which not. In fact, some of the objects have a weight inferior to 1 g and a hole diameter of 0.2 cm, and they appear too small for being spindle whorls[30]. Other objects have a weight of 15-20 g and 50-60 g, proving that different types of yarn were produced in the site.



As for Megiddo, even in Beth Shean bone is the most common material used for producing spindle whorls and, as usual, almost all are dome-shaped. Another large group of whorls is made of stone, especially gypsum which is a typical feature of that region. Only two pottery whorls are known from the site. Unfortunately, very few weights are recorded for this stage and it is not possible to draw many conclusions about the type of yarn production. However, the large presence of bone whorls points to a production of very fine quality.

Fewer spindle whorls are available for Late Bronze Age Hazor, but it has to be reminded that in this phase no domestic buildings have been excavated. However, they show a trend very similar to those of Beth Shean. The large majority (almost double) of whorls are made of bone, while stone is more rarely employed. Two pottery whorls are also known. Shapes are quite varied, even if dome, as it should be expected, is predominant. However, some different shapes are present:conical truncated, button, spherical, cylindrical and one lenticular item. Yarn production was certainly of a very fine quality, since the heaviest (recorded) object weighs 37 g, and the average weight is only 11 g.

In Tell el-Far'ah stone is the dominant material, on the contrary of Hazor, Megiddo and Beth Shean, even if the available objects are very few. Bone whorls are present, but to a lesser extent. However, similarly to the other sites, dome is still the most common shape, both for stone and bone whorls.

[30] It is true that the lightest whorl reported by Liu (see chapter 3) weighs only 1 g, but it was used to spin short and delicate cotton fibres. There are no proofs that cotton was known in the Near East before the Neo-Assyrian period and this fact make the use of such small objects as whorls highly unlikely.

Whorls can be divided in two groups, one with very light whorls weighing less than 10 g, and the other with weights ranging between 15 and 33 g. The possible quality of yarn is therefore to be considered of very fine and medium quality.

The practise of displacing spindle whorls in graves is well exemplified by Megiddo, but some whorls are also known from tombs in Akko, found in a salvage excavation. All the four specimens are made of stone and can be considered dome shaped (Ben-Arieh and Edelstein 1977, 10, 12, 26, figs 14:16-8).

Figure 29 Buttons and dome shaped objects from Tel Dan (Israel Museum)

Several spindle whorls are known from the settlement of Tel Dan, mostly made of black stone, probably serpentine, and conical or button shaped. Dome shaped bone and ivory whorls are also present (Ben-Dov and Gershuny 2011, 333, fig. 198). Dome and conical whorls have a diameter between 1.5 and 3 cm and a height ranging between 0.4 and 1.5 cm. Another interesting context is a grave, the so-called Mycenean grave, which contained 34 possible dome spindle whorls (but many could have been decorative implements), 100 button whorls and 18 button/dome whorls, for a total of 154 possible whorls (Biran, Ben-Dov, and Arensburg 2002, 157). They are mostly made of bone and ivory, but stone objects are numerous as well. Button whorls have a diameter between 1.5 and 3 cm and a height of 0.4-0.8 cm. Furthermore, ten bone shafts were present in the grave, but only a couple of them could have been employed as spindles (or pins), all the others certainly not (Biran, Ben-Dov, and Arensburg 2002, 155, fig. 2.120).

IA I

The Iron Age period sees a tremendous increase in the production of spindle whorls, but it has also to be reminded that these phases are the most investigated in whole Israel, due to their connection with the Biblical text. The result is that larger areas of mounds are exposed for these periods than any other period in history, and many sites are known only for their Iron Age levels. Giving the large quantity of materials available, and the changing occurred between Iron Age I and II, where possible, it has been decided to investigated the two phases separately.

In Megiddo, the most common material is bone, used for producing dome whorls as well as other typologies. Stone is also very frequent, almost as much as bone, with a predominance of limestone and steatite. The most common shape is dome, however also conical and discoid are quite spread. Other shapes are much rarer. Some pottery whorls are also present. Most of the whorls fall under two groups of weights: a very light weight of less than 10 g, a second group ranging between 15 and 25 g. Very few whorls are heavier. Production seem quite differentiated, and different types of yarn could be produced with these objects. However, most of the production was oriented toward a fine or medium-fine quality yarn.

In Beth Shean stone is the most common material, and several types of stone were employed to produce whorls. Gypsum is very popular, as in all the Beth Shean valley, but also limestone in largely used. Several whorls are made of ivory/bone and a small number is made of pottery. As for Megiddo, the dome shape is dominant, but conical and cylindrical whorls are numerous as well. Beth Shean textile production was probably oriented to a very fine production, since the largest group of whorls fall under the 10 g of weight. Several weights are present between 10 and 30 g, and very few exceed 30 g.

Hazor and Far'ah materials were not possible to separate between IA I and II, so they will be treated in the next section.

The number of spindle whorls known for IA II levels in Megiddo is impressive and no other Levantine sites have given a similar evidence of spinning activity. A great change compared to LBA and IA I levels is given by the choice of stone as the favourite material for producing whorls. Bone whorls are still present, but to a lesser extent, and a few group of pottery whorls is also known. Steatite and limestone are the most common stones to have been employed, very few other materials are known from the site. The large majority of whorls are conical or dome shaped, and conical are the most frequently found. Other shapes, such as spherical, cylindrical and biconical are represented. Very few weights are available for this period, but some extremely light objects (button) are still present, as in earlier periods. Medium and quite heavy weights are also present, proving that production was quite differentiated.

In Beth Shean, as for all sites under consideration, stone is the most common material employed for whorls, bone and pottery being almost absent. Most of the whorls are made of the typical gypsum of the region and only secondarily other materials, especially limestone and steatite to a lesser extent, have been used. Almost all the whorls are dome shaped, with few examples of conical and cylindrical objects.

In Hazor, the largest group of whorls belonging to IA I and II is made of stone, while bone whorls appear very rarely and pottery whorls are quite common. Shapes are quite varied, but dome and conical shapes are the most frequent employed. Only seldom conical truncated, discoid and cylindrical shapes are known. Weight is quite heavy, and lack the extremely light objects typical of the LBA, which have weights of 1 or 2 g. However, light whorls weighing less than 10 g are present, as well as those with a medium weight and those with a heavy weight. Production appears, therefore, very differentiated and pointing mostly to a medium quality product.

In Tell el-Far'ah, stone is the most common material used for producing whorls. As for the other sites under consideration, a typical feature of IA II levels is the rarity of bone whorls and the appearance of a quite substantial group of pottery whorls. Dome and conical shapes are not very frequently employed, on the contrary of the other sites, while the most common shape to be found is the cylindrical one. Nothing can be said, unfortunately, for the typology of yarn which was produced in this period.

44 whorls are known from IA levels of Tell Keisan, but this site is very interesting for the coexistence in the same loci of various objects linked to textile production. Several shapes are present, mostly dome, conical and cylindrical. Conical and conical truncated are the most common type of whorl in Keisan, are mainly made of stone but very few ivory and pottery examples are present. Weights are quite light, mostly under 10 g or comprised between 10 and 20 g. Very common is also the dome shape and even in this case whorls are made of stone, except one object made of bone. They are definitely heavier than conical examples, since only one specimen weighs less than 10 g, mostly weigh between 10 and 20 g but a few exceed 20 and even 30 g. Some whorls are also biconical and discoid but weights are very different between each other. All of them are made of stone (Nodet 1980, 315–17, pl. 96).

Remarkable are the evidence coming from IA layers of Tell Abu al-Kharaz, especially of IA II. As for the other sites here considered, the production of spindle whorls is mainly made of stone, especially limestone, while bone and pottery examples are much more limited. Conical and biconical shapes are very common, while dome shape is present but to a lesser extent (Fischer 2014). However, weights are very different from those of the sites so far considered, since they are much heavier. Of the objects with recorded weight, only 6 have a weight under 10 g, 6 between 10 and 20 g, 15 between 20 and 30 g, 9 between 30 and 40 g, 8 between 40 and 50 g and finally, 4 between 50 and 60 g. This distribution points toward a medium quality production, but fine and low quality yarns were also made, but to a lesser extent.

Very few spindle whorls are known from Tall Jawa, but the site is extremely important since contexts were well preserved and materials are very well published. Furthermore, it is interesting to note the

quantity of perforated sherds in comparison to that of whorls. 115 whorls are recorded, four are made of limestone, three of basalt and one of ivory. These have dome, conical and cylindrical shapes, although basalt whorls resembles very much basalt rings. All the others whorls are perforated sherds (Daviau 2002, 184, figs. 2.145-9).

Another interesting context, Iron Age Beth Shemesh, has provided a very large quantity of loom weights but only 15 spindle whorls, mostly made of perforated sherds, but some stone implements are also present. Furthermore, they do not belong to layers where textile production is largely testified, but from earlier layers (Bunimovitz and Lederman 2016, 583). Other sites[31] testify a similar incongruity between spinning and weaving implements and they have been explained with the loss of wooden whorls or with the import of finished yarns. Both explanations can be valid, since spinning could happened in rural and domestic contexts and prepared yarns could be brought to the weaving workshop.

This brief presentation of some key sites of Southern Levant allows the discussion of some problems specific of the region and other common for anyone working with whorls. The first problem, which involves the corpus here presented, is the distinction between a spindle whorl, a bead or a decorative element. As seen for Megiddo, light and small objects with small holes could have been used as whorls, since they could have been mounted on tenons rather than shafts and used in couples. However, the batch of objects from Tel Dan is much more problematic. In fact, an incredible number of whorls have been found in a grave, some of them are quite large objects, other are very small and light and many were found grouped together. Even if most of these objects could have been used as whorls without specific technical problems, it does not seem very likely. The excavators propose an explanation as decorations, for dresses or other objects, which seems quite reasonable. However, objects completely similar to those of Dan, dome and button shaped, have been found in almost all southern Levantine sites and, at the moment, there are no chances to distinguish them from actual whorls. A similar problem was enhanced by J. Carington Smith, since large groups of steatite whorls appear in Mycenaean contexts, mostly made of conical shapes. They appear very similar for diameters and weights to the Levantine whorls here discussed and, as in the Levant, they can be found in single specimens as well as in large batches (160 in Tsountas), without a distinction between sex of the deceased nor a specific connection with graves, since they occur also in settlements (Carington Smith 1976, 440–42).

[31] Such as Tel Miqne/Ekron (Shamir 2007a, 46) and Tel Batash/Timnah (Mazar and Panitz-Cohen 2001, 259).

Placing whorls in tombs seem to be quite a common feature in the Levant, especially in the Bronze Age, and many examples can be made, from Megiddo to Jericho, Akko and Gezer. Very few sites, with large cemeteries exposed, do not share this practise and a very interesting case is Tell el-Far'ah South. Both graves of Middle and Late Bronze Age lack evidence of whorls, as well as to other textile tools[32]. It is possible that whorls were made of wood and therefore have not preserved or that other believes and rituals were practised in the site. Very few whorls come also from graves in Tell el-Ajjul, but in this case a small number was found (Petrie et al. 16, pl. XVIII). The symbolic reason for the presence of whorls in graves has been suggested as a connection between the female sphere and the textile activity. Such explanation is certainly possible, but it does not seem to perfectly match the archaeological evidence. Other theories have supported the idea of a specific meaning for the deceased (Maeir and Panitz-Cohen 2004, 44), but again the archaeological evidence, with the presence of large quantities of whorls and spindles, as in Megiddo, or of loom weights or even perforated sherds seem not to point in this direction. It seems evident that these simple objects symbolize the textile production, but what was the ultimate reason for bringing in tombs it is far from being clear.

Stone and bone spindle whorls show similar traces of manufacture. Generally, in conical and dome shaped objects, the upper part of the whorl has circular concentric signs left by a lathe, while flat bases have evident and perpendicular scratches. Some specimens instead have circular signs also on the base, and sometimes these signs are voluntarily deepened to form decorative motives. Circular

Figure 30 Two whorls from Megiddo, one made of stone (12/H/40/AR8) and one of ivory (08/K/89/AR6)

signs indicates that the objects were refined with a wheel and scratches are remaining of scraping

[32] Pappalardo, pers. comm.

after cutting the object. Similar traces have been identified in other Northern Levantine sites, such as Ugarit and Ebla (Sauvage 2013, 190–91; Peyronel 2004, 163).

One of the big issue regarding Levantine whorls, is their position on the shaft of the spindle, being a high whorl spindle or a low whorl spindle. As seen in the preceding chapter, Egypt has a high whorl tradition (but see chapter 5 for discussion), the Aegean has a low whorl tradition and the survived examples from Anatolia seem to point to a high or middle whorl tradition. The few iconographic sources available for Mesopotamia and Northern Levant seem to point to a high whorl tradition, but nothing survived from Southern Levant. Given that most of the areas around it seem to prefer a high-whorl spindles, it would seem logical that the same tradition would be present in Southern Levant as well. The few survived complete spindles do not allow a safe conclusion, since the Chalcolithic spindle from Ashalim Cave (if it is a spindle), points to a high whorl spindle, while the examples from Megiddo to both the possibilities.

Analysing spindle whorls, it is possible to note that non-symmetrical shapes, such as dome or conical, tend to have a slightly conical hole, which thickens toward the base of the object, with a difference of 0.5-1 mm. This allows a better cohesion of the whorl to the shaft, especially if the shaft is not perfectly cylindrical but tapers toward the point. This would suggest a usage in the lower part of the shaft. However, the study of the Egyptian spindles has shown that this conical hole can be perfectly valid even if the whorl is placed at the top of the spindle, especially if the spindle has a sort of thickening in the middle. A second interesting element is constituted by wear traces near the hole and on the edge of non-symmetrical whorls (a similar discussion will be made for Egyptian Predynastic spindle whorls in chapter 5.2). On stone and sometimes bone whorls it is possible to see that the inferior hole is neatly cut and does not show any traces of manufacture. Instead, the upper hole frequently shows small chips, fractures or completely damaged areas, which seem to indicate fallings that spoil those areas, present as well on the external edge of the whorls. Similar wear traces are compatible with a low-whorl spindle spinning, while a high whorl position would have damaged only the lateral edge. It is therefore possible that in Southern Levant the position of the whorl would have been on the bottom of the shaft, even if much more studies on wear traces on whorls produced during spinning are certainly required (as difficulties on Egyptian materials show as well)[33].

[33] O. Shamir agrees with the possibility that Southern Levant preferred low-whorls spindles. Pers. comm.

4.3 Perforated sherds

As seen in chapter 3, perforated sherds are simple pottery sherds reworked for obtaining a rounded object and with a perforation in the middle. É. Nodet considered these objects as the result of the use of body sherds as pivot for drills during the perforation of other objects (Nodet 1980, 320). Once the perforation of these discs was completed, they could have been used as spindle whorls. Some objects, which bare traces of several hollows, more or less deep, could have been used as such. However, it does not seem likely that all these objects result in a single perforation made from both sides just as a casualty. The intention of obtaining a through hole is evident.

Even if the perforation was intentional, it does not mean that they were used as spindle whorls, but just that this is one of their possible usages. In fact, many of the objects present in the corpus were certainly not to be considered as whorls and Megiddo constitute a perfect study case. Hole is generally made by drilling the sherd from both sides and, in most cases, the result is a hourglass perforation. In some specimens, hole has been intentionally regularized and the final result was an almost cylindrical hole (00/K/42/AR1 or 98/K/41/AR14). In other cases, nothing has been done to refine the hole, which keeps its hourglass shape. Furthermore, some holes are slim and oval and could not allow the insertion of a shaft (as 08/K/17/AR3). In some cases, hole has not been made by vertically perforating the sherds, but diagonally, and this feature makes the objects unlikely to have been whorls (as 13/H/10/AR2). All these elements have to be considered when deciding if a perforated sherd could have been used as a whorl or not, but not always publications have recorded them.

Perforated sherd are a common element of Levantine excavations since the Neolithic period and they reach their peak of production during the Iron Age (Shamir 2007b, 267).

A large number is known from the Neolithic site of Naḥal Zehora of which 112 are perforated sherds (Types B and C) (Orrelle, Eyal, and Gopher 2012, 638–41). Edge can be perfectly rounded and smoothed as well as roughly cut. Many other Neolithic sites display similar artefacts, such as Jericho (Wheeler 1982, 626)[34].

They continue to be produced in large numbers in the Chalcolithic period, often with their discoid stone counterpart. The analysis of Levy and Gilead (2012, 131) for Ghassulian sites comprised between Beersheba and the Negev show that perforated whorls (after discarding unfinished or unsuitable objects) constitute almost half of the total whorls assemblage. Interestingly, some of them have also been found in the Cave of the Treasures (Bar-Adon 1980, fig. 58).

During the Bronze Age, their production seems to decrease but are still present in the sites here considered as well as in many other sites such as Jericho (16 for the EBA and only 9 for the

[34] For other references see (Levy and Gilead 2012, 131) and (Orrelle, Eyal, and Gopher 2012, 639)

MBA)(Wheeler 1982, 626), Ashkelon (Shamir 2004, 98), Yarmuth (Miroschedji 1988, 87, pl. 47), Jerusalem (Shamir 1996, 149) and MBA Tel Kabri (Oren 2002). One example from Kabri was found in a grave, as well as few examples from Megiddo (5529). Only one perforated sherd has been published for EBA Tell Abu al-Kharaz (Fischer 2009), while they are common in the Iron Age. Late Bronze Age sees a new increase in their production, especially in Megiddo and Hazor, but their peak of production is certainly reached in the Iron Age.

In Megiddo, they are very common both in Iron Age I and II, but in the same period we see an exploit in the production of spindle whorls too. However, they represent almost one third of the IA I production of whorls, while are much less used during the LBA and IA II. Very few perforated sherds have been reported for all periods of Beth Shean, but they seem more common in IA II period. However, compared to spindle whorls they reach their peak of usage in EBA. In Hazor, they are very rare during the Early and Middle Bronze Age, quite common in the Late Bronze Age but their peak of production is reached in IA II. In Tell el-Far'ah N, perforated sherds are not very common, especially for the Bronze Age and, as in many other Levantine sites, they are more common in the Iron Age.

In all the sites under consideration, they represent a small percentage of the Iron Age whorls corpus, but this is not the same in all Levantine sites. In fact, some sites have testified a larger presence of perforated sherds than purposely made spindle whorls, showing a preference for these simple and cheap objects. In Tall Jawa, in Jordan 115 spindle whorls are listed for the Iron Age, but only 7 are purposely made. All the others are perforated sherds. This number is absolutely impressive, but they appear similar for dimensions and features to the other implements known from the Levantine region. The largest sherds measure 8.5-9 cm, while the smallest 3-3.5 cm. Thickness can range between 0.6 and 2.5 cm and holes between 0.2 and 1 cm. Some holes are slightly off-centre, but they show were traces that prove that they were not discarded (Daviau 2002, 184–88, fig. 2.144). A similar situation (but with smaller numbers) is known from Kadesh Barnea, where 23 spindle whorls out of 27 are made from reworked pottery sherds. Only one has an incomplete perforation (Shamir 2007b, 265). Similarly, in Beth Shemesh spindle whorls are mostly made from perforated sherds, and only secondarily made on purpose. The peak is reached in IA I, as in Megiddo, while very few whorls were found in IA II (Bunimovitz and Lederman 2016, 583).

4.4 Spinning bowls

Spinning bowls are generally identified as a typical Egyptian spinning tool. However, other Mediterranean area have shown to known this implement, even if it is generally believed that they

have been introduced from Egypt. Bowls with loops inside were known archaeologically since Petrie's excavations in Egypt (William Matthew Flinders Petrie 1890, 25) and were early recognized as the objects represented in funerary paintings and models, in connection to spinners.[35] In these scenes, it is evident that threads are pulled through the bowl and spun or plyed and most archaeological findings show traces of rubbing under the loops.

When complete or partially preserved they are quite easy to identify. In fact, they are characterised by the presence of one or multiple loops inside the bowl, attached to the bottom of it. They can vary between a single loop to four loops and in a single case a double row of loops it is present. Several of these bowls are known in Late Bronze Age contexts in the Southern Levant, and they are generally considered as products related to the Egyptian domination of the region. In fact, in Egypt they appear quite early, at least in the Middle Kingdom (but see chapter 5 for a reassessment of their chronology) and continued to be in use until the Late Period. However, for some unknown reasons, studies on spinning bowls have always ignored the Ghassulian bowls published by Perrot in 1967 (Perrot, Zori, and Reich 1967). It is possible that this lack depends on the different shapes of these bowls and is thanks to the work of J. Levy that they have been correctly recognised (Levy and Gilead 2013). In fact, one comes from the Neve Ur in the Beth Shean Valley, and the other from Safadi, near Beersheba and both are dated to the 5th millennium BC. However, they not present loops inside, but a quadrangular feature attached to the bottom and the side of the bowl, which could have been used in the same way of the loop.

After this early appearance, no other actual spinning bowl is known in Southern Levant before the Late Bronze Age. The oldest example comes from Tell el-Ajjul, in a context dated to the 14th-13th century BC and has two loops inside (William M. Flinders. Petrie 1932, pl. XXVII). Beth Shean has preserved a very large collection of these bowls, dating from the Late Bronze Age II to the beginning of the Iron Age (from the very end of the 18th dynasty/beginning 19th to the 20th dynasty). Most of the bowls belong to the Iron Age I. Many other sites have preserved examples of spinning bowls (see tab. 6) and the latest examples come from Tell Qasile (level VII, 8th century) and Tell Jemmeh (level 198, 7th century). This last example is very important, since its shape closely resembles Late Period findings from Mendes (Allen 1997, 26).

Table 5 Spinning bowls from Southern Levant

Bir es-Safadi	1	Ghassulian	(Perrot, Zori, and Reich 1967)
Beersheba	1	Ghassulian	(Perrot, Zori, and Reich 1967)
Ajjul	1	LB II	(William M. Flinders. Petrie 1932)
Megiddo	1	LB III	(Loud 1948, fig. 70:3)

[35] For an exhaustive list and for a discussion of these scenes, see Allen (1997, 30–32) and Kemp/Vogelsang-Eastwood (2001, 69, 77–79, 318–27, 335–38).

Hazor	1	LB II	(Bechar 2017, fig. 7.72)
Beth Shean	6 33	LB II IA IA-B	(Fitzgerald 1930); (James and McGovern 1993); (Panitz-Cohen 2012, 437); (Panitz-Cohen and Yahalom-Mack 2009); (Martin 2009).
Tell Jerishe	1 2	LB II IA	(T. Dothan 1963, 99)
Keisan	1	IA I	(Briend, Humbert, and Puech 1980, 224, pl. 73:10)
Ashdod II-III	1	IA I	(M. Dothan 1971, 105)
Tell Qasile	2 3 2 3	Level XII/XI Level X Level VII Unstratified	(T. Dothan 1963)
Beth Shemesh	1	IA I	(Grant 1932, 27)
Tell Jemmeh	1	IA II	(F. Petrie 1928, 22)

As it is possible to see from tab. 6, Levantine spinning bowls are spread in Southern Levant and are not typical of a specific region. Furthermore, they are not present in each site, but are quite rare findings, except in Beth Shean. It has to be said, however, that they are certainly underestimated since they are produced following local pottery traditions and many broken parts of spinning bowls could have been found without have been recognised. A good example is the specimen from Hazor, where the loop preserved resembles very much a handle, and if the sherd would have been more compromised, it would certainly not have been identified as a spinning bowl.

From the available evidence, it seems that spinning bowls were first used in the Levant and after that dismissed, for appearing again with the Egyptian domination of the region. I agree with this traditional interpretation. In fact, spinning bowls in Egypt appear to be connected with a peculiar process of flax fibres preparation, meaning splicing. Splicing is known in the Levant too in the early periods, but it disappear in the Middle Bronze Age and was probably not used in Late Bronze Age and Iron I periods, when spinning bowls are found. This would seem to point against a relation splicing=spinning bowls, and if it is true for the Levant (and all other areas where splicing is used) it might be true also for Egypt. G. Vogelsang-Eastwood strongly disputed against a connection between splicing and spinning bowls even for the Egyptian area and interprets spinning bowls as tools for plying and cabling threads (Vogelsang-Eastwood 1987). Both activities (spinning after splicing and plying) can probably be performed with such bowls but she is certainly right in connecting the bowls mainly to plying. Losing their strength connection with flax, it can be assumed that every fibre, including wool, could have been used in connection with such bowls. If they could be used as tools for keeping the balls of yarns in order and avoiding tangles, like modern knitting bowls, why are they so rare in the Levant? The explanation might be sought in the Egyptian domination. In fact, they appear in the Levant when the

Egyptian presence in the region became stronger and almost disappear when the Egyptians left the country. It would seem that they were produced for Egyptian families living in that sites, and not required again after their departure. Even the latest examples show close contacts with Egyptian materials. They were not used by the local population and this might have depended upon many factors, such as scepticism towards foreigners customs or different spinning traditions which did not require such tools. This explanation is only one of the many possible, and evidence here exposed is far from being conclusive. However, this is the impression produced by the materials from Beth Shean and the rarity of similar findings in other sites.

4.5 Bone spatulae and beaters

As seen in chapter 3, bone spatulae and beaters are two different objects that can have been used during the process of weaving for keeping the warp in order and beating the weft, although in different manners.

Bone spatulae are generally made from ribs which were cut in half longitudinally, worked to obtain a point, while the other end could be slightly polished or worked to become rounded. The surface with the inner bone part (which will be considered as the lower part) exposed, could be left coarse or could be completely polished to obliterate the cancellous bone and obtain a perfectly smoothed object. Both types of treatment appear in the corpus, but those which have not been artificially polished are extremely interesting since they clearly show the smoothing of the object through repeated contact with a soft material, such as threads. Points can be divided in different categories and for this work three of them appear more adapted: short, triangular point, a pen-nib point, and an elongated point. Bone spatulae seem to appear since the Neolithic period in Southern Levant, but, according to L. Peyronel (2004, 363), their usage could have been different from those of later periods and it is more complex to link them to the textile production than their Iron Age parallels. Furthermore, he connects these spatulae to the usage of the warp weighted loom (Peyronel 2004, 371–72), an hypothesis that should be completed rejected in light of the Egyptian documentation, where the same objects with the same wear traces are known, without evidence of the usage of the warp-weighted loom. These simple tools seem not to be connected to a specific loom nor, so far, to a specific type of weaving (*e.g.* tapestry). It is more probable that they were simply used for beating small portion of threads, and it should also be reminded that certainly similar wooden tools were known as well, as known from Ancient Egypt and as it is today.

The acquisition of the necessary know-how to distinguish the wear traces (which are not, or better not only, the parallel striations on the surface) required a long time and the possibility to directly

examined a large quantity of materials coming from different sites and contexts. Of course, the corpus used for this thesis is limited and it was not possible to examined all the bone spatulae from southern Levant, to understand which are objects are exactly the same spatulae known from the Iron Age and which not. For this reason, all the objects from sites which have not been directly studied are considered only on the basis of their morphology and of the description given by the publications. Hopefully, a completed study of bone spatulae, their manufacture and their wear traces will be available and will allow more specific conclusions.

Pin beaters are much more difficult to classify and they certainly had a broad range of usage, of which the one linked to weaving is only a small percentage. In fact, they were probably used more frequently as borers and in relation to the preparation of leather, but it is not always easy to understand it.

Bone spatulae appear for the first time in southern Levant during the Neolithic period, as testified by findings in the Nahal Hemar Cave (Bar-Yosef and Alon 1988, fig. IV:1) and in slightly later Ard es-Samrra (Getsov and Bazilai 2009). Similarly, pin beaters are also found in Neolithic and Chalcolithic contexts, such as Nahal Hemar Cave (Bar-Yosef and Alon 1988, 18) and the Cave of the Treasures (Bar-Oz and Yeshurun 2014), two contexts very important for the findings of textiles.

The production of bone spatulae with triangular and pen-nib point, as well as pin-beaters, is well represented in Tell Abu al-Kharaz, where several examples were excavated in EBA layers (Fischer 2008, 118, fig. 119). In this site, some objects were analysed looking for micro-wear, and the results were compatible with contact with fibres (Cristiani 2008). Furthermore, some of these bone spatulae (defined shuttles in publications) and a pin beater were found in the same context with the two "looms" of Kharaz (Fischer 2009, 111, fig. 8).

Several objects which could be considered as bone spatulae and beaters are known from Megiddo Early Bronze Age levels, and three spatulae (one with a triangular point the other with a pen nib point are earlier). The only object of these phases available for study is a very smoothed bone spatula, with convex inferior side and worn off tip. Small traces of wear are detectable on the surface and some parts of the surface appear completely polished by rubbing with soft materials.

Several bone spatulae are known from Early Bronze Age Beth Shean as well, mostly with a triangular point. Only a single pin beater comes from these layers. Tell el-Far'ah (N) has preserved a large sample of points and spatulae belonging to the Early Bronze Age, but only part of them has been selected for this study. Those with a very sharp point, which could have been used as borers, have been excluded. Differently from Megiddo, the spatulae with a pen-nib point are not present in this phase, while several examples of triangular and elongated point are listed in the catalogue.

A situation similar to the Early Bronze levels is witnessed both in Megiddo and in Tell el-Far'ah, with numerous examples of spatulae and beaters. No examples are known in this period in Beth Shean, while they begin to appear in Hazor, although in very few examples.

The production of both categories seem to enter in a deep crisis for the whole Late Bronze Age and Iron Age I period, which is a very interesting fact. In fact, several bone spatulae are known from New Kingdom Egyptian sites (e.g. Gurob and Amarna) and were probably used on the vertical two-beam loom, which appear as the common loom in Egypt. A similar loom has been supposed to have been introduced from Levant to Egypt or vice versa, but its presence is frequently speculated for Late Bronze Age Palestine. It is therefore noteworthy that bone spatulae seem to disappear with the alleged presence of this type of loom. Might it be connected with specific types of production or weaving which were not in use anymore in the Levant but continued in Egypt? From the available data, it seems difficult to prove it.

The Levantine production of bone spatulae and, to a less extent, of pin beaters, flourished again during the IA II, with hundreds of excavated examples[36]. The four sites under study do not constitute an exception and therefore larger numbers of implements were available for study.

In Megiddo, shapes are not much different from earlier periods, with triangular and elongated points as the most common types, while pen-nib points are quite rare. In Beth Shean they continue to be quite rare findings. The common shapes are the triangular and the pen-nib point. Noteworthy is the lacking of these implements from the context where at least two looms were found, since only a single bone spatula is recorded. Hazor is the most interesting context, since a larger amount of objects were available for study. Point shape is generally triangular, with less occurrences of elongated and pen-nib points. In some cases it has been possible to see that the wear traces were located manly toward the point and in general the first half of the spatula, while the second half, that with a rounded or flat end, was not so much exposed to wear. This is clearly visible by the cancellous bone which is almost invisible or have disappear near the pointed end. A similar wear pattern is visible also on the spatulae from Far'ah and of the Egyptian sites (see next chapter).

4.6 Basalt rings

Basalt rings are very specific and recognizable objects, quite spread in the Levant especially during the Early Bronze Age. They are mostly made of basalt but occasionally limestone specimens can also occur. They have dimensions usually ranging between 3 and 5 cm and a large central hole, around 1 cm. Hole is generally hourglass and upper and lower surfaces are generally slightly convex, which

[36] See Peyronel (2004, 364) for a list of occurrences of bone spatulae in the Levant.

gives to these object the typical ring conformation. Heights can vary greatly, generally from 1 to 3 cm, and some of these specimens can appear quite spherical. They can be perfectly rounded and smoothed or having a less careful finishing treatment. Weight is generally light, from 20 to 60 g. Their small dimension distinguish neatly them from the broader category of the perforated discs, where many other objects are included, such as pivot for drilling, digging sticks, etc.
Their usage is not known and their connection with textile production is based almost exclusively on the findings from Tell Abu al-Kharaz, in Jordan.

Figure 31 Different types of basalt rings from Tell Abu al-Kharaz (Fischer 2009, fig. 5)

In this site, two findings are mostly important. The first one is the discovery of one such basalt ring with still part of a wooden shaft in the hole, which suggests a very probable use as a spindle whorl (Fischer 2009, 112). In this case, the basalt ring appear quite thick, but individual measures are not given. The recorded weight is 38 g (Fischer 2008, 118, fig. 119:8 N381., 2009, fig. 6). This object has certainly an hourglass hole and shows beyond doubts that similar objects could be used as spindle whorls. A second important recovery was made in Area 1 (L316 and 328) where the remaining of two vertical warp-weighted looms were found. The organic materials of which the looms were made have not preserved, however charred traces of beams and poles are still detectable. At the foot of one of the looms, 8 rings (seven of basalt and one of limestone) were found packed in a strict row. They probably belong to the "group 2" of Fischer classification, which includes basalt rings poorly finished and heavier than "group 1", reaching up to 90 g (single weights are not given and are not possible to obtain from Fischer publications).

Figure 32 Row of rings fallen from a loom (Fischer 2009, fig. 3)

Other objects connected with spinning production were present in the room, such as other spindle whorls, bone spatulae and an awl (Fischer 2009, 111). There are, however, some objections against their interpretation as loom weights. First, it is a single row of objects, and if they were in used for producing a textile, at least two rows of weights would have been necessary to weave the basic tabby, four for the twill. Second, they are very few and could have produced only a very narrow strip of textile (see chapter 3). Finally, they are very light (even if considering the maximum weight given for the group, which is 90 g). If a (fine) yarn requires a tension of 10 g, a maximum of 9 threads could be attached to a single loom weight, which gives a maximum of 72 threads in the whole warp. Even less if weights are lighter or if a thicker yarn was used. Assuming (from fig. 4.10) that the row of weights measures 15 cm, warp threads would be 4.8 every square cm, which results in a very open fabric. Given all these difficulties, it seems quite improbable that these objects were used as loom weights in a warp weighted loom (in the same site lightest IA loom weights weigh 189-272 g, more then double) and other functions should be look for.

Besides findings of Kharax, basalt rings appear frequently in excavation reports since the Chalcolithic period, even if a Neolithic example is known from Tel Te'o (Savage 2011, 102). They spread during Early Bronze Age and continue to be produced in the early phases of Middle Bronze Age.

Site	Period	Reference
ʿAfula	EB I	Sukenik 1948: pl. XIII:14–16
Abu al-Kharaz	EB I	Fischer 1993: pl. 13
Abu Hamid	Late Chalcolithic	Abu Hamid 1988
Ai	EB I	Calloway 1980: fig. 84; pls. 94:11, 15, 16; 140:19
Ain Assawir	EB IB	Eli Yannai, personal communication
Arad	EB IB	Amiran 1978: pl. 67
Azor	EB IA	Shamir, 1999:32, fig. 1
Bab edh-Dhraʿ	EB I	Schaub and Rast 1989: Charnal House 51 (stone)
Beʿer Resisim	EB IV	William G. Dever, personal communication
Beit Shan	EB I	Fitzgerald 1935: Pl. VI: 23, 25
Ein Helu	EB IV	Karen Covello-Paran, personal communication
H. Illin Tahtit	EB I	Braun 1994: ch. 12:3
Halif Terrace	EB IB	Alon and Yekuteli 1995: 180
Hama	ʿAmuq G–I	Thuesens 1988
Handaquq	EB II[1]	Mabry 1989, Burial 21, Stratum 2
Handaquq (S)	EB	Meredith Chesson, personal communication
Jericho	EB I–IV	Wheeler in Kenyon and Holland 1982: 626–27
Jerusalem	EB	Shamir 1996a: fig 22: 11–15, pl. 12:1–2, 7[2]
Lachish	EB I	Tufnall 1953: 71
Lod	EB IB	Eli Yannai, personal communication
Maadi	Nagada III	Rizkana and Seeher 1988: 52, pl. 95:17–22, IX:5
Meʿona	EB I	Shamir 1996b: 22
Megiddo	EB I	Loud 1948: pl. 171:1, 2, 4, 7, 8; Guy 1938
Neve Ur	Late Chalcolithic	Perrot et al. 1967: fig. 13.4.
Nizzanim	EB IB	Yekuteli and Gophna 1994: 176, fig. 17:4, 5
Palmahin Quarry	EB I	Braun 1994: ch. 12:3
Q. es-Samra	EB I	Leonard 1983: fig. 20
Qaqun	EB IA	Eli Yannai, personal communication; Solomon forthcoming
Qarn al-Qubish	EB IB–II	figure 3.1
Qiryat Ata	EB I	Golani forthcoming
Shadud	EB I	Braun 1985: 98
Shefayim	Late Chalcolithic	Gophna 1992: fig. 4.5.
Site 49–5	EB IB/II	Yekuteli 2001b: fig. 1.11
Site H	EB IB	Macdonald, Starkey, and Harding 1932: 19
T. ʿErani	EB IB	Yekuteli 2001: 671 in Wolff (ed) 2001
T. ʿUmayri	EB I	Dorothy Irvin, personal communication
T. Judeidah	ʿAmuq G	Braidwood and Braidwood 1960: fig. 249:11
T. Madaba	EB IB–II	Figure 0000
T. Tʿeo	PN and EB IA	Gopher and Eisenberg 2001: figs. 9.1:15, 17, 18; 9.5:8
T. Turmus	Late Chalcolithic	Dayan, Y. 1969: fig 9.2–9.6
T. Yarmut	EB I	de Miroschedji 1988: fig. 16.9, pl. 49.7
Tel Gat Hefer	EB IIIa	Karen Covello-Paran, personal communication
Umm Hamad	EB IB	O'Toole in Betts 1992: 132, fig. 283:9, 10
Yaqush	EB	Alex Joffe, personal communication
Yiftahʾel	EB I	Braun 1994: ch. 12:3

Figure 33 Table of Chalcolithic and EB evidence of basalt rings in the Levant and Egypt (Savage 2011, tab. 1)

These small rings are spread on a very large area, which reaches Egypt in its most Southern border and Syria in its northern evidence. The centre of production and/or consumption, however, is the Southern Levant, where the largest findings are focused. As for the example of Tell Abu al-Kharaz, S. Savage proposes a use as spindle whorls (Savage 2011, 101–2). However, this explanation is far from being convincing or exhaustive. First of all, it does not explain the second type of evidence from Kharaz, meaning the weights found in a row. Second, their incredible diffusion cannot be explained with simple spindle whorls, especially in Egypt. Basalt has not so many sources to explain this wide use, while similar objects could be made with ubiquitous limestone. They were probably made of

basalt because they have to be particularly resistant. Could they have been used as net weights which have to resist to long periods under water? This would seem a reasonable explanation. Unfortunately, not all the sites where these objects were found seem close enough to fishing sources to justify their presence. Another problem concerns their chronology. In fact, it is true that they know an intensive production in EBA phases, however, in the catalogue, several examples of basalt rings with same shape, features, measurements and weight are dated to Iron Age levels, and it seems impossible that all of them should be considered out of context.

To sum up, basalt rings can certainly have been used as spindle whorls, at least part of them, but it is highly probable that they had another purpose, as shown in Kharaz. This purpose seem not to be connected with the warp-weighted loom, since these weights appear too light for tensioning a warp and the finding from Kharaz clearly shows that only one row was present and not two. What this other function could be, requiring a hard material such as basalt and allowing a diffusion in regions far from Southern Levant, is far from being clear. Their production decreases in Middle and Late Bronze Age but does not disappear, as Megiddo materials clearly show.

4.7 Loom weights

Looms have not preserved in southern Levant, except for some wooden pieces which could (but is far from being sure) have been beams. They come from the Cave of the Treasures and are suitable to produce narrow strips of cloth. O. Shamir interprets them as part of a horizontal ground loom, while C. Breniquet as parts of a backstrap loom (Shamir 2015, 18). Both the options are possible, although there are no proofs that the backstrap loom was known in the region. However, since nothing can be said about the type of loom in use, there is no reason to exclude this possibility.

No other evidence of looms are, so far, known, until the introduction of the warp-weighted loom, which leaves clear proofs of its existence: the loom weights.

In the Early Bronze Age, there are no clear evidence of the usage of the warp weighted loom, since the objects possibly recognised as loom weight, besides basalt rings, are mostly pebbles or irregular objects which do not constitute a recognizable category. They could have been used for many purposes, from net weights to counter weights. First objects which can be considered as loom weights with quite certainty begin to appear in Southern Levant in the Middle Bronze Age. They have a conical shape with a horizontal perforation and are generally well fired, but unfired specimens are made as well.

This kind of object appear in Megiddo at the very beginning of the MBA and are produced until the beginning of the LBA, but a few examples appear aslo in LBA contexts. Shapes can slightly vary,

from conical to slightly pear shaped, but it is clear that they belong to the same category of objects. There are some exceptions which are known, of the examined sample, only from Megiddo. The first exception is the presence of loom weights with the suspension hole pierced vertically through the objects, and not horizontally as in the other implements. This does not constitute an obstacle in their usage as loom weights, since they could have been attached to a ring or another element before being suspended to the warp (similarly at what is generally hypothesized for all loom weights). The second peculiar feature is the presence of a surface treatment on some objects, which include a red slip and burnishing, which is generally not known for this category of objects. This proves a certain attention for these mundane objects. Another feature, the presence of a scarab sealing on few examples, is known from other sites as well, such as Tell el-Far'ah (N and S) and Tel Kabri. This practice is known not only from loom weights but also for other objects, especially pottery vessels. Scarab sealings have generally egyptians and egyptianizing iconographies on bases, even if this practice is typical of the Syro-canaanite region. From the few examples of which weights are available, it seems that the sealing impressions did not denoted a specific category of objects or linked to a specific production, but they could be considered as property marks placed on few items of a whole group (it would be very interesting in that sense to check group b 459); otherwise they could indicate the production in a specific workshop[37]. Few weights are available for this period, and seem to indicated a preference for heavy tools, spanning from 337 to 628 g.

In Beth Shean, conical loom weights seem to appear slightly later than Megiddo examples, but they are well attested for MB II. They are carefully produced and made both of clay and unbaked clay. No examples such as those of Megiddo, with vertical hole or burnishing are present. Beth Shean loom weights are slightly lighter than those of Megiddo, ranging between 267 and 596 g, but are absolutely comparable.

Similarly to Beth Shean, conical loom weights from Tell el-Far'ah (N) do not show the striking features of those from Megiddo. They appear well shaped and made both of fired and unfired clay, but it is evident that some attention was paid in producing them (contrary to the IA doughnut shaped weights). Even if they represent a very small sample, three of them were found in the same context, evidence of their contemporary use. They appear quite light, ranging between 233 and 446 g, but the sample is too small for being statistically valid.

No conical loom weights are known from MB Hazor, but a few are known from LB levels, which is quite problematic. It is possible that they were relics of earlier periods, but their absence from lower levels does not point towards this explanation.

[37] For a wider discussion see (Peyronel 2004, 208–10).

Similar weights are known in many other sites from southern Levant, and Jericho has preserved some groups of conical loom weights found together (Wheeler 1982, 623–24). They appear perfectly comparable with those so far examined and almost all from contexts datable to MB II-III.

A very interesting context is provided by the excavations from Tel Kabri, where 73 loom weights were found in MB IIB levels, 63 from the palace area. The intact items have all conical shape with horizontal perforation and are made of fired clay, except a single stone specimen (Yasur-Landau et al. 2015, 348). The largest batch is represented by 26 weights found in Room 690 in the palace, where they were divided in two groups of 13 objects. Other 10 weights were found in the nearby area and 5 more in successive excavations. They were found in debris of the collapse of the second storage, similarly to Minoan palaces (Goshen, Yasur-Landau, and Cline 2013, 47). Weights range between 235 and 600 g, similarly to the other southern Levantine contexts. 6 of them show traces of scarab sealings.

Conical loom weights are known also in southern sites, such as Tell Beit Mirsim (Albright 1938, 56, pl. 45) and Tell el-Far'ah (S), even with a scarab imprint (see catalogue). This shows a great diffusion in Southern Levant of such a type of loom weight and a great homogeneity. However, they seem not to be known in Syria (and Hazor confirms its belonging to northern material culture rather than southern), excluding isolated examples from Alalakh (Peyronel 2004, 200–201), nor in Egypt.

Late Bronze Age levels do not show evidence of large production of loom weights and it has been hypothesised that warp-weighted loom was abandoned for the vertical two-beam loom known in contemporary Egypt or even that the invention of such a loom was made in Syria or in the Palestinian area (Serena Maria Cecchini 2000, 213). The disappearance of the conical loom weights was probably not sudden, since some examples can be found in Late Bronze Age levels, as visible for Megiddo, Hazor (where they appear for the first time in LBA I contexts) and Beth Shean. Their small quantity however, could indicate that they might have been relics from earlier periods, or that they were employed as counter weights and no longer as actual loom weights.

Iron Age I sees the re-introduction of the warp-weighted loom, on an unprecedented scale. The production of loom weight becomes ubiquitous and reaches its peak during the Iron Age II, with thousands of weights excavated, and finding of hundreds of them in single sites.

In Megiddo, a large quantity of loom weights are known for IA I phases, but unfortunately they have been published without any information of shapes and measures. They appear to be made either in fired and unfired clay, and a new type of weight is attested, the doughnut shape, even if one item was recovered in a LB III context.[38] A single example of a conical loom weight is also

[38] In Tell Ta'annek they appear even in MB II/LB I contexts (Peyronel 2004, 205)

present. Only one spool weight is known for IA I and one for IA IIB. Only 45 loom weights are known from IA II levels.

Figure 34 Map of loom weights findings in Iron Age II levels

Almost all the specimens have the typical IA shape, meaning spherical or doughnut. Few examples of biconical weights, as well as some reworked vessels base are also known. One batch of 20 cylindrical weights has to be reported.

Few loom weights are known from Iron Age I Beth Shean and are almost all made of clay. They have a cylindrical shape but some specimen are of the spool-type[39], a typology known in the site since the Late Bronze Age IIB. An oval object made of gypsum was found, but no examples of pear-shaped gypsum weight, which instead were present in LB levels. A very large quantity of loom weights is known for the IA IB-IIA phase, mainly made of clay, either fired and unfired. The clay weights have generally a doughnut/spherical shape, but a couple of conical examples were found too. A typical weight of Beth Shean and the surrounding valley, the pear shaped gypsum loom weight, is also well represented. Most of the IA II weights of Beth Shean have the doughnut shape and are made of clay and they were found almost all grouped in the same room. Some pear shaped or slightly conical examples, generally made of stone, are also present. Spools, instead, disappear after the IA I.

Only a single object can be recognised with certainty as a loom weight for IA I Hazor, while most of the items are dated to IA II. They appear spherical/doughnut shaped and made of baked or poorly baked clay. Very few objects have a biconical shape but are quite small. No spools were found in the site, a remarkable feature since the general strong connections with northern Levantine sites, where spool are largely used. However, since they are mainly known from IA I levels, their absence in Hazor might be due to the difficult phase of the site in that period.

Several loom weights are known from IA II levels of Tell el-Far'ah (N) and are mostly spherical/doughnut shaped made of clay, either fired and unfired. Very few examples of weights made of stone are also present. The most remarkable difference of the weights of Far'ah compared to the other sites is their light weight, which is only 167 g on average.

Iron Age loom weights are known from almost all sites in the Southern Levant, but are also common in Syria (Peyronel 2004, 250–57, 288–91). Some contexts appear particularly interesting, both for the presence of large quantities of loom weights and because well published.

Tell es-Safi/Gath witness an intense weaving activity, with some six hundred loom weights found in different contexts, suggesting household and industrial production (Cassuto 2018, 56). Three loom weights have been exposed for Iron Age I levels and are defined of the spool type, with central perforation. However, from the picture (which is not clear), they seem of the cylindrical type found in a large batch in Megiddo (Cassuto 2017, 193, fig. 17.5) and not of the spool type. Much many loom weights are known from IA II phases. In stratum A, almost 300 spherical loom weights made

[39] See chapter 4.10 for the discussion about spools with several scarab impressions.

of clay were found, in association with a domestic context. Other clusters of loom weights were identified in area D, for a total of almost 300 objects, again in connection with a cultic area (Cassuto 2017, 193–94).

Not far from Safi, another possible textile workshop of Iron IIB was discovered in Ḥorbat Shimʿon. Almost 160 loom weights were excavated in clusters inside a large building, which was originally identified as a workshop for pottery production. Most of them are doughnut/spherical shaped, but a large number of spools and a few conical weights are also present. These suggested that weaving was largely practised in the site and that the production would have been quite differentiated, given the different typologies of loom weights recovered(Dagan and Cassuto 2016, 44, fig. 6). In association with loom weights, some spindle whorls were uncovered in the site, together with basins and stone tools which could have been used for many purposes, not last for preparation of dyes and other materials required by textile processing. It is possible, therefore, that an actual textile workshop was present in this little sites, similar to those hypothesised for Tel ʻAmal and Tel Burna (Dagan and Cassuto 2016, 45) [40].

To the 10th century BCE is dated another interesting context in Tell el-Hammah, are A. Two adjacent room were excavated which were destroyed in a conflagration, which preserved part of carbonized wood and organic material. Between the numerous finding, severan wooden spindles and spindle whorls were recovered, as well as several gypsum[41] and clay loom weights and bone spatulae(Cahill 2006, 441). The context is very interesting because it proves not only that wooden implements were used and therefore should be always taken into consideration, but shows also the complete set of textile tools, from spinning objects to loom weights and spatulae. A second very large batch of spherical clay loom weights is dated to the 9th/8th century from the same area (Cahill 2006, 446), proving the continuity of textile production in that part of the site.

The Iron Age sees the introduction of completely new typologies of loom weights, such as the doughnut/spherical clay loom weights which become extremely common, especially during the IA II. The sudden reintroduction of loom weights and the warp weighted loom at the very beginning of the Iron Age has been sometimes connected with the arrive of foreigners and the appearance of a specific loom weights typology, the spool. Even for the Middle Bronze Age a similar exogenous explanation was adopted, since other region of the Near East (especially Anatolia) knew the warp-weighted loom and were considered as responsible of its introduction in southern Levant (Barber

[40] Another workshop was identified in Beth Shean area S-7 (see chapter 4.10) with two clusters of loom weights and several grinding stones from the same room. Although this interpretation is fascinating, no conclusive evidence have been brought to light and it might also be a case of multi-tasking spaces, meaning food preparation and weaving.

[41] Typical of the Beth Shean Valley.

1991, 300). The absence of loom weights from the Syrian area, however, does not weigh in favour of a similar interpretation.

The introduction of the spools in the Iron Age from abroad, however, is much more convincing. In fact, similar weights seem common in the Mediterranean region and could therefore be introduced in the Levant by foreigners, such as the Sea Peoples. Most of the spools found in Southern Levant seem connected with Philistine settlements (Ashdod, Ashkelon, Tel Miqne/Ekron, Tell Qasile) but their early appearance in sites like Beth Shean complicate this picture. Furthermore, they are generally connected with the Aegean area, where they are very common, but they have been found in Anatolia as well as in Italy. The survey of L. Rahmstorf (2005) highlighted that they seem not to have a clear point of origin from which they spread in the Mediterranean and that the only fixed element is that they seem to appear suddenly during the 13th century (in Anatolia, Crete and Southern Levant) and become quite common and spread in the 12th century, mainly in the Aegean area.

Between the typologies of loom weights it might be possible include a special category of perforated sherds. These sherds, in fact, are made from base of vessels which have been reworked to eliminate the edges and perforated in the centre. They are larger, thicker and heavier than usually perforated sherds, and in many cases perforation is quite crudely made. For these reasons a possible function as loom weights and not as spindle whorls have been suggested. However, even if they could certainly work as loom weights, their chronological distribution in Hazor, during Late Bronze and Iron Age I periods, when no other evidence of the usage of the warp weighted loom is known, seem to indicate that another function should be seek.

4.8 Needles

As seen in chapter 3, under the category of needles are grouped together sewing needles and bodkins. They were selected for this research even if they are not directly connected with the production of a textile, but rather to finishing operations, which can happen immediately after its realization or far in time and space from it. However, since they are clearly connected with the processing of textiles (and leather), their appearance in the same contexts with other textile tools might seem relevant to identify workshops and rooms connected with textile manufacturing. It has to be stressed that we know very few of the finishing operations on textiles since very few hems and fragments of stitching have survived. It seemed, however, that embroidery was not known (or very rare) for the regions and periods under consideration, so the needles here examined were used mostly to join pieces of textiles or refinishing hems. From the survived Egyptian textile materials, it appears clear that sewing was not very common, since clothes were frequently worn simply wrapped around the body and closed

with knots, fibulae and pins. It should therefore not be so surprising if needles do not appear as frequently as one can imagine. No wooden needles or bodkins have preserved in southern Levant and only bone and metal implements are known. Bone needles appear quite frequently in the Neolithic and Chalcolithic period and are less common during the Bronze and Iron Age (Peyronel 2004, 138). They appear generally highly polished and carefully manufactured, but differences in sizes are remarkable, highlightening different usage of the tools.

The corpus from Megiddo is quite small and comprised a very large typology of different objects and materials. It appears clear that bone needles become less frequent from the EBA to the LBA, but even if in very few specimens, they continue to be produced down to the Iron Age. In the MBA period, hole can be produced by bending the upper part of the shaft on itself and then melting the joining point. This appears as the most common typology in Megiddo, but fewer examples of eyes made by perforating the shaft from one side are still present. Needles appear in Megiddo in all possible contexts, from tombs to domestic unities and can be sometimes associated to other textile tools as well as not.

Very few needles and bodkins were recovered from Beth Shean but both categories seem to be known. Bone is extremely rare, since almost all the specimens were made of bronze. Hole seems to be perforated from one side of the shaft, but at least from Late Bronze Age strata the typology with the eye produced by bending the upper part of the shaft on itself is also present.

Some more needles are known from Hazor, where as for the other materials, evidence of textile tools are very few for early periods. Therefore, it is not possible to verify a decrease in the production of bone tools, since almost all the specimens are made of bronze. As for the other sites so far considered, both techniques of producing the eye are known and used in the site simultaneously. Both Megiddo and Hazor have preserved needle cases, with groups of needles still present inside. It is a very interesting feature, since it proves that some form of specialisation was present in the site and that required more than one needle with similar dimensions. One needle comes from a grave, showing that the practice of placing needles in funerary context was known in this site as well.

In the site of Tell el-Far'ah (N), Early Bronze Age levels clearly show a large use of bone needles, which become less common during the Middle Bronze Age, with the introduction of bronze implements and become very rare in later periods. Bone needles are characterised by a very well polished surface and by the presence of large, squared head where a round hole is cut. The Middle Bronze Age needles show a continuity in the technique of producing bone needles and the appearance of needles with made by bending the upper part of the shaft on itself. In the Late Bronze Age the typology made by perforating the shaft from one side of the needle becomes also common and both typologies will be present in the Iron Age. Many needles come from contexts where other textile tools

were found, but they do not show a recurring association and, in general, they are found with only one other textile tools and never in groups.

From this brief presentation, it seems clear that only a small quantity of needles is known and this is common to many other Levantine sites, such as Tell Abu al-Kharaz (Fischer 2008), Tel Dan (Ben-Dov and Gershuny 2011) or Tel Jawa (Daviau 2002, 201), just to make some examples. They did not prove to be useful in identifying contexts of textile production, since are generally found scattered through sites and rarely in association with other textile tools. However, the two types of eye manufacturing are very interesting especially if compared with the Egyptian materials, where only one tradition will be carried forward from the early periods to the Late period. Finally, needles can be found in graves, as spindle whorls, loom weights, basalt rings, etc. and no specific meaning can be attribute to this item in comparison with the other textile tools (see chapter 5 for a complete different situation in Ancient Egypt).

4.9 Megiddo

4.9.1 Introduction

Tell es-Mutesellim is a large mound situated in a strategic position, at the foot of the north-east flank of the hills of the Carmel Ridge, through which the nearby Wadi Ara act as a pass. It also overlooks the alluvial plain of the Jezreel Valley, which connects the Jordan Valley with the coastal plain of Palestine. An abundant spring, Ain el-Kubbi, is situated below the northern slopes of the terrace and another one, Ain er-Ruzz, is not far to the north-west. Another spring is located in a cave on the south-west slope of the mound (Davies 1986, 7). The Jezreel Valley is crossed by various tributaries of the river Naḥal Kishon, which runs to the northwest into the Mediterranean, and by Naḥal Ḥarod, which flows into the Jordan River in the south-east. Both rivers are quite near to the site, at a distance of only a few kilometres and could provide it with some of the fresh-water fish (Lernau 2006, 492).
Several excavations have been conducted during the 20th Century, which exposed large areas of the mound and provide a first chronological frame. Between 1903 and 1905 a German Expedition directed by G. Schumacher dug several trenches on the top and the slope. Between 1925 and 1939 the Oriental Institute of Chicago led a new extensive campaign of excavations under the direction of C. Fischer, P.L.O. Guy, R.S. Lamon and G. Loud. The Hebrew University of Jerusalem carried out three seasons of excavations and several soundings under the directorship of Y. Yadin between 1960 and 1972[42].
From 1992, a new excavation project is exploring Megiddo on behalf of the Institute of Archaeology at Tel Aviv University, directed by Israel Finkelstein and David Ussishkin. The 1992–1996 seasons excavated five areas, both on the edge of the mound and in the lower part[43]: F on the lower mound; G in the Late Bronze gate; H on the north-western edge of the mound; J in the Early Bronze Age temples compound; and K on the south-eastern edge of the mound. The 1998–2002 seasons see the continuation of work in four areas, F, H, J and K, and two new fields were opened: L in the northeastern sector of the mound and M in and around the Schumacher trench in the centre. The 2004-2008 seasons continued the work in areas H, J, K, L and M, and two new areas were investigated: P in the Lower Terrace and Q in the southeastern sector of the mound (Finkelstein, Ussishkin, and Cline 2013, 3).

[42] For further readings see Davies 1986, 12–24.
[43] The areas explored do not use letters A-E, since they have been employed by the Chicago team (Finkelstein, Ussishkin, and Halpern 2000, 5).

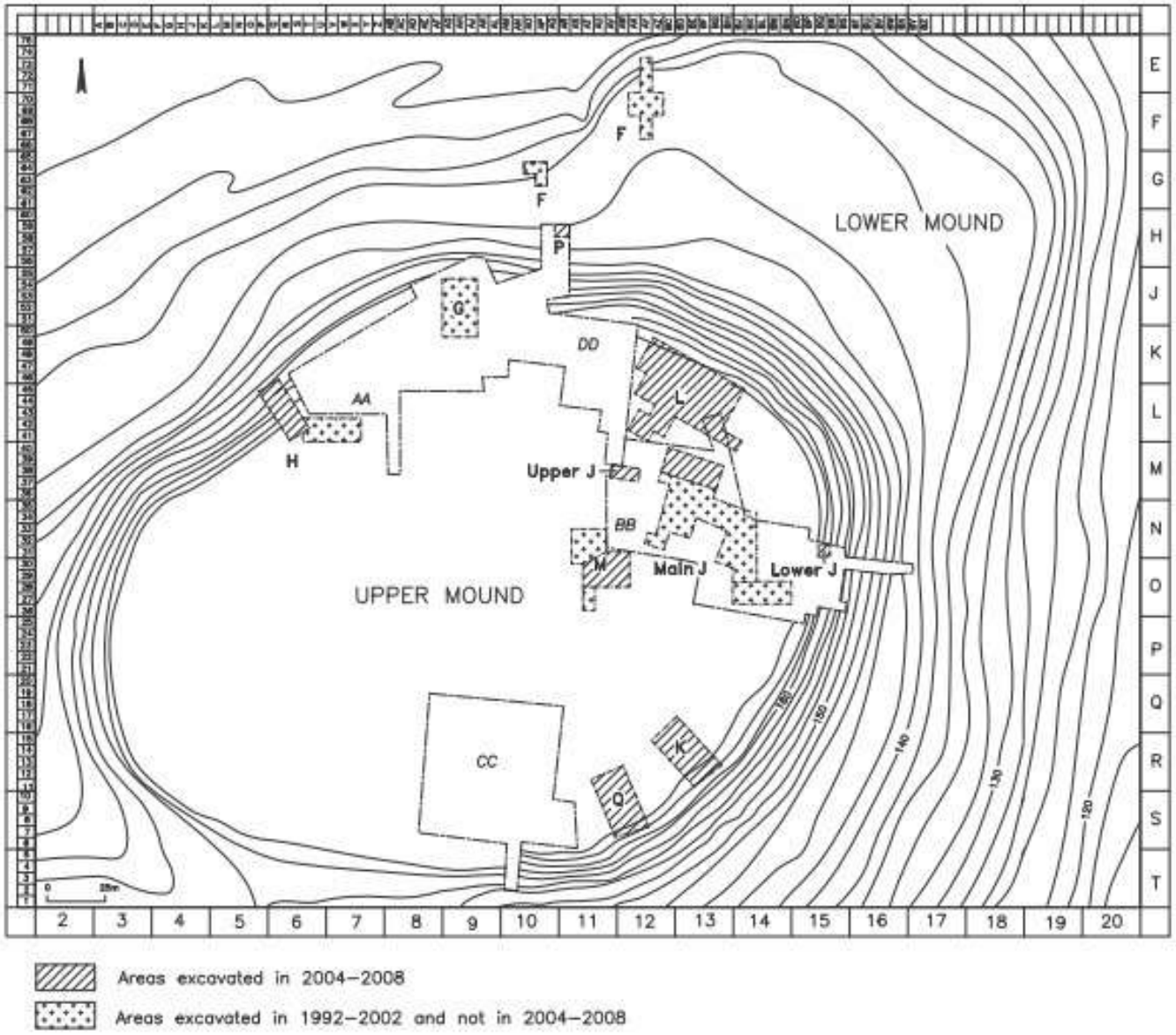


Figure 35 Map of excavated areas in Megiddo (Finkelstein, Ussishkin, Cline 2013, fig. 1.1)

Table 6 Chronological chart of Megiddo (Finkelstein et al. 2013 tab. 1.1; Yahalom-Mack et al. 2017 tab. 1)

Area Q	Area F	Area H	Area J*	Area K	Area L	Area M**	Area N	University of Chicago Strata	Period
			J-1					XX	EBI
			J-2					Phase in XIX: not identified as a separate level	EBIb
			J-3					XIX	EBIb
			J-4					XVIII	EBIb
			J-4n					Not detected	EBIb
			J-5, J-6b					XVII	EBIII

			J-6a					XVI	EBIII
			J-7					XV	EBIII-IBA***
			J-8					XIV	MBI
			J-9					XIV	MBI
			J-10					XIII	MBI
	F-12		J-11			M-11		XII	MBII
			J-12			M-10, 9		XI	MBII
	F-11		J-13	K-10		M-8	N-2, 3, 4	X (X-IX)	MBIII-LBI
	F-10		J-14, 15, 16	K-10		M-7	N-1	IX	LBI
	F-9		J-17?	K-9?				VIII	LBII A
	F-8			K-8, 7				VIIB	LBII B
Q-9	F-7	H-12 (LBIII-IAI)		K-6		M-6		VIIA?	LBIII
Q-8	F-6	H-10, 11		K-5		M-5		VIB	Early IAI
Q-7	F-5	H-9		K-4	L-5	M-4		VIA	Late IAI
Q-5, 6		H-8, 7, 6		K-3	L-4	M-3, 2, 1		VB	Early IAIIA
Q-4		H-5		K-2	L-3			VA-IVB	Late IAIIA
Q-3	F-4b	H-4, 3		K-1	L-2			IVA	IAIIB
		H-2						Not detected	IAIIB
	F-4a	H-1			L-1			III	IAIIB
	F-3							II	IAIIC
	F-2								Late Roman
	F-1								20th cent. CE

Megiddo has preserved an abundant quantity of textile tools, spanning from the very beginning of the Early Bronze Age to the Iron Age. For this research, it has been decided to study only materials, which are still in Israel, giving priority to findings of the renewed excavations directed by I. Finkelstein. This choice was dictated by the necessity to study objects with a precise dating, and with a broadly chronological sequence. Two institutions store the archaeological findings of Megiddo, the Tel Aviv University for the last years of excavations and the Israel Antiquities Authorities for the already published objects. Both of them have been visited to study the materials. A minimal part of old excavations objects is still in Israel, most of them at the Rockefeller Museum; most of the findings are abroad and thus not available for this research.

Of the renewed excavations, only a part of the already published objects was available to study, as well as a hundred unpublished objects. It has been decided to see also the already published object to be able to have a more general idea of materials and morphologies prevailing in Megiddo because this type of information is not always given in publications. When possible, all the available data

from older excavations are used to provide the broadest possible picture of the textile production in Megiddo. It means that not only the objects I have personally measured are included in the catalogue, but also those published but not available to my research. This allows having a more significant number of shapes and materials of objects on which carrying out the statistical analysis.
As for the other sites, in the research are included: bone shafts, which might have been spindles, spindle whorls, including those obtained from reworked and perforated sherds and loom weights. Ring-shaped basalt weights are considered separately since they form a very peculiar and easily recognisable category, probably related to textile production. Needles are included in this research as a hint of textile processing, even if not directly connected with textile production. Bone spatulas and pin beaters are also examined to look for signs of wear compatible with their use with soft materials and to check possible connections with other textile tools.

4.9.2 Spindles

As for many other Levantine sites, Megiddo has preserved several bone and ivory shafts which might be spindles or part of them. This production seems to begin in Megiddo in the very end of the Middle Bronze Age or beginning of Late Bronze I, and it reaches its peak during the Late Bronze Age II, with a decrease in the production during the Iron Age. Only two specimens of complete spindles (meaning with the spindle whorl inserted on the shaft) have been recovered, and both are dated to the Late Bronze Age I period. None of these objects is a "traditional" spindle, but they are quite peculiar items. The first one, M 3530, is formed by three elements joining together, forming a shaft with a flat end and the other tapering. One of the joining points is used to insert two spindle whorls, both dome-shaped, with the base in contact between them. They are therefore not properly mounted on the shaft but on the peg which connects the two elements of the rod, with a hole diameter much smaller than that of the shaft. A similar reconstruction has also been suggested for M 5368, although the two spindle whorls were not found on the shaft.
Completely different is b 433a, which was found in a funerary context together with whorl b 433b. It is cylindrical and made of several bone rings, most of them decorated. The core was disintegrated, but it is stated that it was reassembled as found in burial. The spindle whorls are shown as were mounted on the core as in the previous case. Petrie probably recovered a similarly composed shaft in Tell el-Ajjul (Petrie, Murray, and Mackay 1931, fig. XXIII:6), but the elements are drawn separately. Other shafts have been found complete but without spindle whorls, even if in many cases spindle whorls were present in the same context. They were made by a single element or by several elements joining together, as was the case of M 5368, as well as other examples of the Levantine region. Their

production is particularly numerous between LB II-III, with very few examples from IA I-II. It is interesting to note that a large number comes from LB II tombs (e.g. 1122, 877B1, 989C1), where several bone spindle whorls are also present. Between these objects, a pomegranate element to be mounted on a shaft is also present, with several parallels from other sites[44].

4.9.3 Spindle whorls

First spindle whorls are known in Megiddo from the Early Bronze Age I and their number is very low for all the EBA, probably due also to a smaller extension of the excavated strata of this period. They share the same material of production, *i.e*. pottery, while just two examples are produced in stone, one is a perforated pebble and the other a dome-shaped basalt whorl. Shapes are very different, they comprehend discoid examples, which constitute the largest group, to which must be added biconical, lenticular, cylindrical, and dome-shaped spindle whorl. Only for a part of them are available measures and the weight seem to span between 27 and 50 g ca, indicating a medium quality yarn production.

The Middle Bronze Age shows a more significant number of spindle whorls but extremely few if compared with later periods. Spindle whorls made of baked clay continue to be produced during the MBA, and even if they represent one of the largest group, several other materials are now employed. During the MB I bone starts to be used and the source of the material, epiphysis of cow or sheep/goats bones, will always influence the shape of spindle whorls extracted from it. Almost all the bone spindle whorls are, in fact, dome-shaped. To these two materials should be added a small sample of stone spindle whorls. Morphologies are quite varied, with biconical, cylindrical, spherical, discoid and dome shapes. Dome spindle whorls are almost all made of bone in this phase, while pottery spindle whorls seem to prefer rounded and spherical shapes; stone spindle whorls, instead, tend to have flat shapes, such as the discoid one. As for the former period, few measures are available, and seem very different between each other, with the largest diameter for a limestone spindle whorl (08/K/119/AR4). Excluding bone items, most weights span between 20 and 40 g, indicating a medium quality yarn production. Some bone spindle whorls are extremely small and light and therefore they might not be spindle whorls. They might have been, in fact, beads, buttons or decorative elements for textiles. However, as seen in chapter 4.1, two elements should be taken into account. First, spindles might have had more than one spindle whorl at the same time, as seen in M 3530, so the two weights and overall height can be more satisfactory than what it seems at first sight. Second, Egypt has preserved wooden spindle whorls very small and light (see chapter 5.10.3), that might have a similar effect on

[44] See for examples Ugarit (Gachet-Bizollon 2007, 16:119)

threads to the items under consideration. These two elements together are the reason for considering this kind of objects as possible spindle whorls.

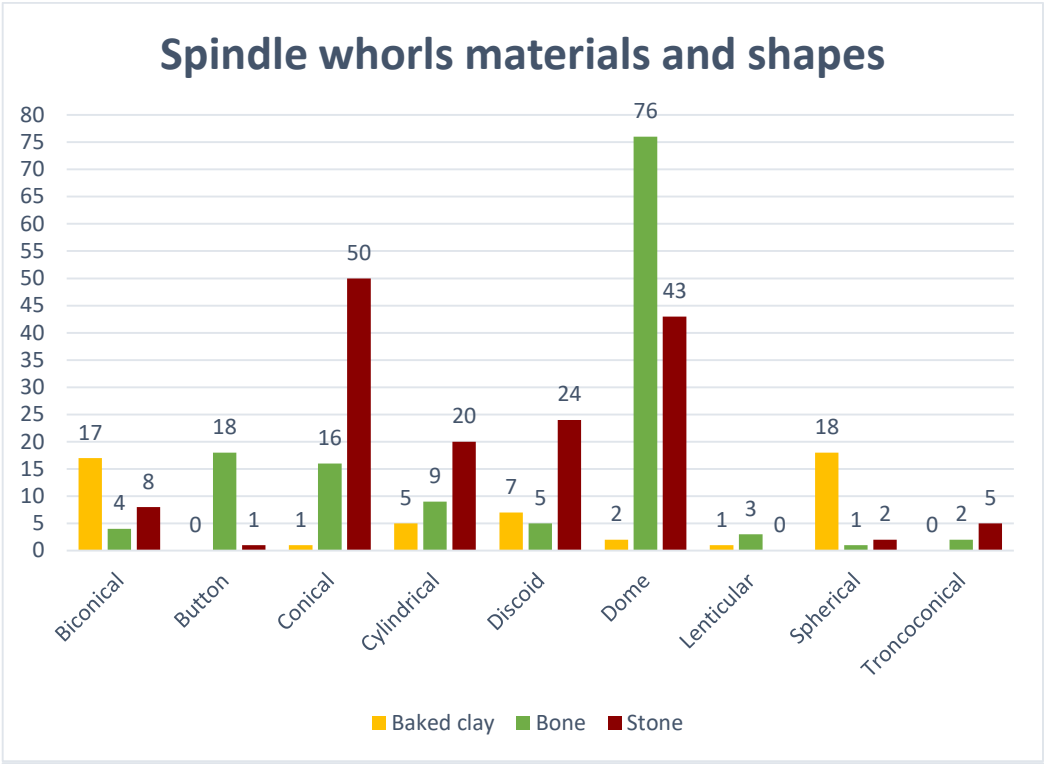
From the Late Bronze Age levels, a huge number of spindle whorls has been recovered, especially for the LB II period. For the whole period under consideration, bone spindle whorls largely outnumber those of other materials while pottery spindle whorls are just a few percentages of those recovered. It is interesting to note that most of the pottery spindle whorls, as in the preceding period, have a rounded shape or a form quite near to a sphere. A small number of stone examples is also represented, generally made by limestone or steatite. Since the majority of the spindle whorls are made of bone, most of them are also dome-shaped. However, some dome-shaped stone whorls are known. From LB II is also present the button shape, which is a conical shape with convex sides. These spindle whorls too are generally made of bone or ivory. Several other shapes are in use, but always in small quantities: conical, biconical, discoid and lenticular.

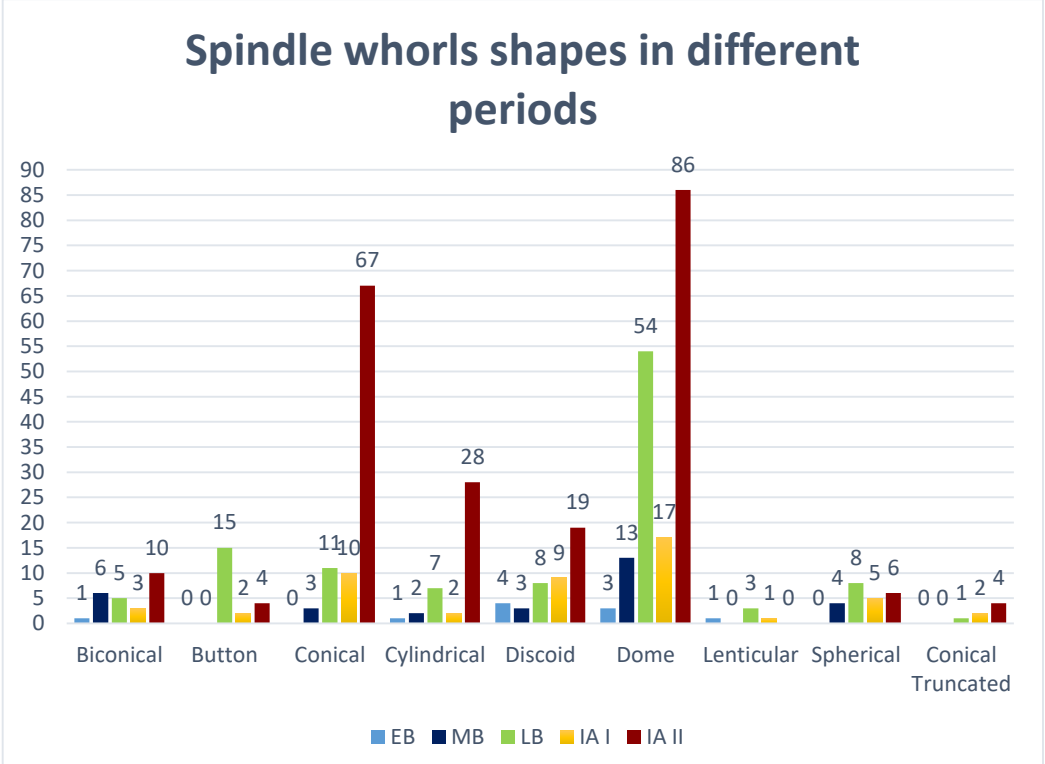
As for the other periods, measurements and weights are available only for a limited group of objects. However, it seems possible to see that the majority of the spindle whorls of which weight is available can be divided into two groups: the first one with a small weight around 3-5 g, and another between 15-20 g. Heavier spindle whorls are also represented, with weights up to 60 g. Some of the bone spindle whorls can arrive to weigh 1 g or less and therefore it seems quite difficult that they have been used for spinning. However, they are listed in the catalogue to represent better the complexity of tracing a clear line between what is a textile tool and what is not. A couple of examples of stone spindle whorls have the same problems, like 98/F/94/AR1 with a diameter of 1.6 cm, height 0.6 and a weight of 1.7 g. Furthermore, in this case, the hole size is just 0.2 cm, which is very small but not too small if it was mounted on a peg rather than on a shaft.

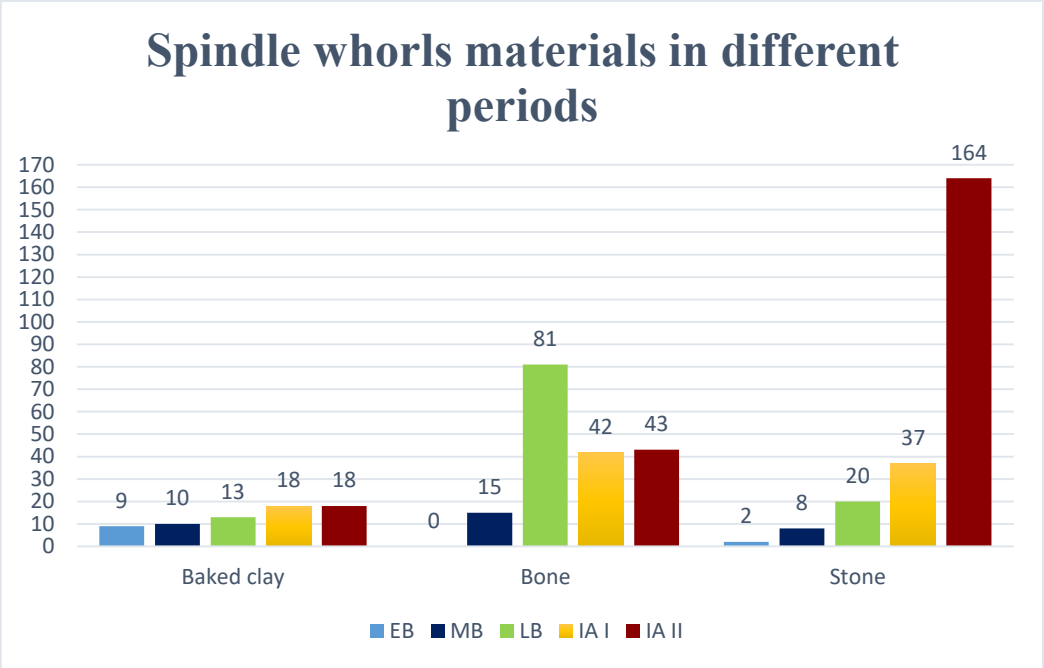
For the Iron Age period, it seems more reasonable to separate IA I from IA II, since some differences can be noticed. In IA I a huge number of spindle whorls have been produced (117, similarly to the quantity known for the whole LBA). Unfortunately, most of them are published by P. Paice in T. Harrison report of Stratum IV (Paice 2004, 59–109 pl. 30) and lack of all basics information, such as shapes or measurements. For the small group for which data are available, the material more commonly employed is bone/ivory, with 42 examples, not just for dome-shaped examples but also for other morphologies. A large number is also represented by spindle whorls made of stone, of which 37 examples are recognisable, but the choice of material can vary a lot between limestone and steatite, which are the most common, and fewer examples made of hematite, gypsum and serpentinite. Similarly to LB period, pottery whorls are quite rare, with only 18 examples reported. An extensive set of morphologies is employed, and the most common shape is the dome one, made of bone as well as of stone. Other common shapes are conical, with whorls made of bone and serpentinite, and

discoid, with stone and bone as the only employed materials. Very few examples are known for biconical, cylindrical and lenticular. It worth to note that the button shape is represented by only two specimens in this phase. A new shape appears, *i.e*. the conical truncated one, which was not known in the previous periods, but it will continue to be produced in the following periods in minimal quantities. As in the preceding periods, pottery spindle whorls have a spherical shape. Of the items for which measurements are available, diameters span between 0.9 to 6.4 cm, with many variations also for height and weight. It worth noting that a large group of stone spindle whorls have large diameters and heavier weights. Two groups of weights can be identified: the first group with very light weights, under 10 g, which includes almost only bone and serpentinite spindle whorls; the second group is between 25-35 g, and include a wider range of materials. The heaviest whorl weight is 82 g and is the same whorl with a 6.4 diameter.

Iron Age II is the period that has returned the largest number of spindle whorls, 225, but it is also the period for which the fewest measurements are available. It is marked by a completely different choice of materials, while morphologies are pretty much the same of IA I. 164 stone spindle whorls have been, recovered, definitely overtaking the use of bone. For this period, only 41 bone spindle whorls and 3 in ivory are known. To these, 18 pottery spindle whorl must be added. Stones typologies are quite varied, but the most common are limestone and steatite. Other types of stone such as slate, hematite, basalt, gypsum and serpentinite are represented by very few if not unique examples. Morphologies do not change in this period, with more than half of the shapes divided between conical (67) and dome-shaped whorls (86). In both categories, as it is imaginable, stone spindle whorls are the majority. It is not possible to link material to a shape (or vice versa) for IA II, except for pottery spindle whorls, which continue to be produced in rounded shapes, such as spherical, biconical and cylindrical. It is interesting to note that button is represented by only four specimens, witnessing the scarce consideration that was paid to this category in the Iron Age. Given the minimal number of measurements available, it is not possible to identify trends or specific characteristics. Diameters span as usual between a broad range (1.4-5.5) and weights between 2.1 g) and 99 g, without forming a cluster on specific measures.


Spindle whorls materials and shapes
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
17 4 8
0 18 1
1 16 50
5 9 20
7 5 24
2 76 43
1 3 0
18 1 2
0 2 5
Biconical
Button
Conical
Cylindrical
Discoid
Dome
Lenticular
Spherical
Troncoconical
Baked clay
Bone
Stone


Spindle whorls shapes in different periods
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
1 6 5 3 10
0 0 15 2 4
0 3 11 10 67
1 2 7 2 28
4 3 8 9 19
3 13 54 17 86
1 0 3 1 0
0 4 8 5 6
0 0 1 2 4
Biconical
Button
Conical
Cylindrical
Discoid
Dome
Lenticular
Spherical
Conical Truncated
EB
MB
LB
IA I
IA II



Plot 1 Plots of spindle whorls distribution, materials and shapes

4.9.4 Perforated sherds

Perforated sherds are known in Megiddo for all the periods under consideration. However, they were quite rare during the Early and Middle Bronze Age, while much more common in later periods. The peak of use is undoubtedly the Iron Age I, when their number is almost double of those of Late Bronze and Iron II period. If we consider all of them as possible spindle whorls, it is interesting to note that they represent almost one-third of the whole spindle whorls dated to IA I but only the 13% of the LBA or the IA II spindle whorls. They are characterised by a quite large diameter, 5 cm on average, and a rather small thickness, 0.86 cm on average. The biggest object (00/K/31/AR2) measures 1.4 cm of height and 13 cm of diameter, and it is not to be considered as a spindle whorl. In fact, its weight probably exceeded 200 g (as 98/K/33/AR7). Perforated sherds in Megiddo weigh between 7.1 and 107 with an average weight of 32.8 g. Most of the specimens weigh near 20-30 g.

In the catalogue are included all the perforated sherd with a single hole, even if the hole is hourglass or not perpendicularly perforated, making the fastening to the spindle more difficult but not impossible. Since the most significant of perforated sherds is that of Hazor, they will be discussed much more in detail in chapter 4.11.4.

The context of finding of reworked sherds is generally domestic and very seldom funerary. It seems, therefore, that their mundane aspect makes them suitable only for a functional purpose and they are not enough “precious” or symbolic as spindle whorls and loom weights to be found inside tombs. Some of these perforated sherds have been found in context with other tools, especially grinding

tools, only rarely with other perforated sherds, and in very few instances in association with other textile tools, including spatulas and needles.

4.9.5 Spinning bowls

Only a single fragment of a spinning bowl was found in Megiddo for all periods under consideration. It is dated to LB III and has the characteristic feature of two loops inside. Textile production in Megiddo is very well documented by large quantities of textile tools, and the finding of a single one bowl let provide evidence that such implement was very rarely employed in the site and unknown for most of its history.

4.9.6 Loom weights

As seen in the previous chapters, loom weights are objects with a specific weight with the purpose to keep the warp of the loom in tension. It is not clear when the warp-weighted loom starts to be used in the Levant, nor in which sites, and for this reason all the objects that can be used for this purpose are included and discussed in the catalogue, allowing to reject some of these specimens. Basalt rings will be discussed in the next chapter giving the difficulty in recognising between which was a spindle whorl and which a loom weight.

During the Early Bronze Age, very few objects that can have been weights have been recognised in Megiddo. Most of them are pebbles with a through hole, which can be used as loom weights as well as counter-weights, but given their small quantity and the significant difference in shape and size, it is difficult to recognise them as a uniform category.

The Middle Bronze Age sees the appearance of a new category of objects: the conical clay loom weights. In Megiddo, they are present in few quantities from Stratum XIII to Stratum X, which means from the very beginning of the MBA to the transition to the LBA. Conical clay objects are probably the most recognisable type of loom weight of the Levant; however they can vary a lot in their aspect, morphology and weight. One of the most striking features of Megiddo loom weights is the presence of conical examples vertically perforated, meaning from top to bottom, while usually the perforation is made parallel to the base, near the top of the object. In MBA Megiddo both types are present. Another unusual characteristic is the presence of a surface treatment in some objects. They are carefully shaped, baked, covered by a red slip and burnished. Some examples do not show such a surface

treatment but are well-fired, while most of the examples are made of simple unfired clay. It is not clear the reason for such a different finishing. Furthermore, some loom weights shows the imprints of a sealing, usually made by a scarab and in some cases Egyptian motives are clearly recognisable. A similar phenomenon is also present in Tell el- Farʿah (S), but not for example in Hazor or Beth Shean. Conical loom weights generally measure between 9 and 12 cm of height and 6 to 7.7 of diameter. Very few weights are available, but it seems clear that they are quite heavy, with the lowest weight which is 337 g and the highest which is 628 g.

Figure 36 Sealing still visible on C107

Figure 37 Sealing on C 637

The Late Bronze Age Period in the Levant is generally characterised by the absence of loom weights. However, Megiddo sees the peak of production of conical clay loom weights in the transitional phase between MB and LB, and some specimens are also known for the LB I period. The following LB phases (II-III) see a situation similar to that of the EBA, where no specific objects can be positively identified as loom weights, but a few perforated pebbles might have been used in textile production. New typologies of loom weights appear in the Iron Age and Megiddo is not an exception. However, the number of the published items is meagre, so very little can be said about them.

Unfortunately, most of the IA I loom weights have been published with few data. Most of them are made of clay, probably fired, and a few are made of stone and have a perforation and for this reason, have been listed as loom weights. For most of the weights, the shape is not given. However, at least from the very end of the IA I the doughnut shape, the typical Iron Age shape, has been recognised. From Megiddo, a spool or bobbin made of unbaked clay has also been recovered, and this typology

seems to continue in the following period. The available measures of weights seem to indicate quite heavy weights, with an average of 500 g. A cylindrical typology, with vertical perforation, is also present.

During the Iron Age II, most of the weights are produced in unfired clay with rounded shapes, which are divided between spherical, biconical and doughnut. Only one item made of stone is listed, but its purpose is not certain. Since only a few measurements of weight are given, it seems difficult to draw a conclusion.

Between loom weights, it is possible that a category of objects made by reworked bases of vases should be recognised. Few items of this typology are known from Megiddo, while a large collection comes from Hazor. For this reason, it seems more useful to discuss them in Hazor's related chapter.

Loom weights are generally found in domestic contexts, but in Megiddo, a few items have been recovered in burials, as well as spindle whorls. Two are conical loom weights made of fired clay coming from burials of MB (one MB I, the other MB III/LB I), while for other two, unfortunately, it is not possible to assign a precise chronology. One is conical and made of basalt, and the other is spherical and made of unbaked clay. It is therefore interesting to note that also the most mundane objects, made of unbaked clay can be placed inside tombs.

Only a few loom weights have been found together in context, while the vast majority come from scattered loci across the whole town. 26 conical loom weights made of unbaked clay were found in Locus E 3036 (Loud 1948, pl. 170), unfortunately, published with no other information about their context of finding and if and how they were grouped together.

Room 2069 has yielded more than 20 cylindrical loom weights, found together inside a broken vessel. Their shape is not standard, since they seem perfectly cylindrical, while they usually are produced quite crudely (Paice 2004, 59; Harrison 2004, 105, fig. 33).

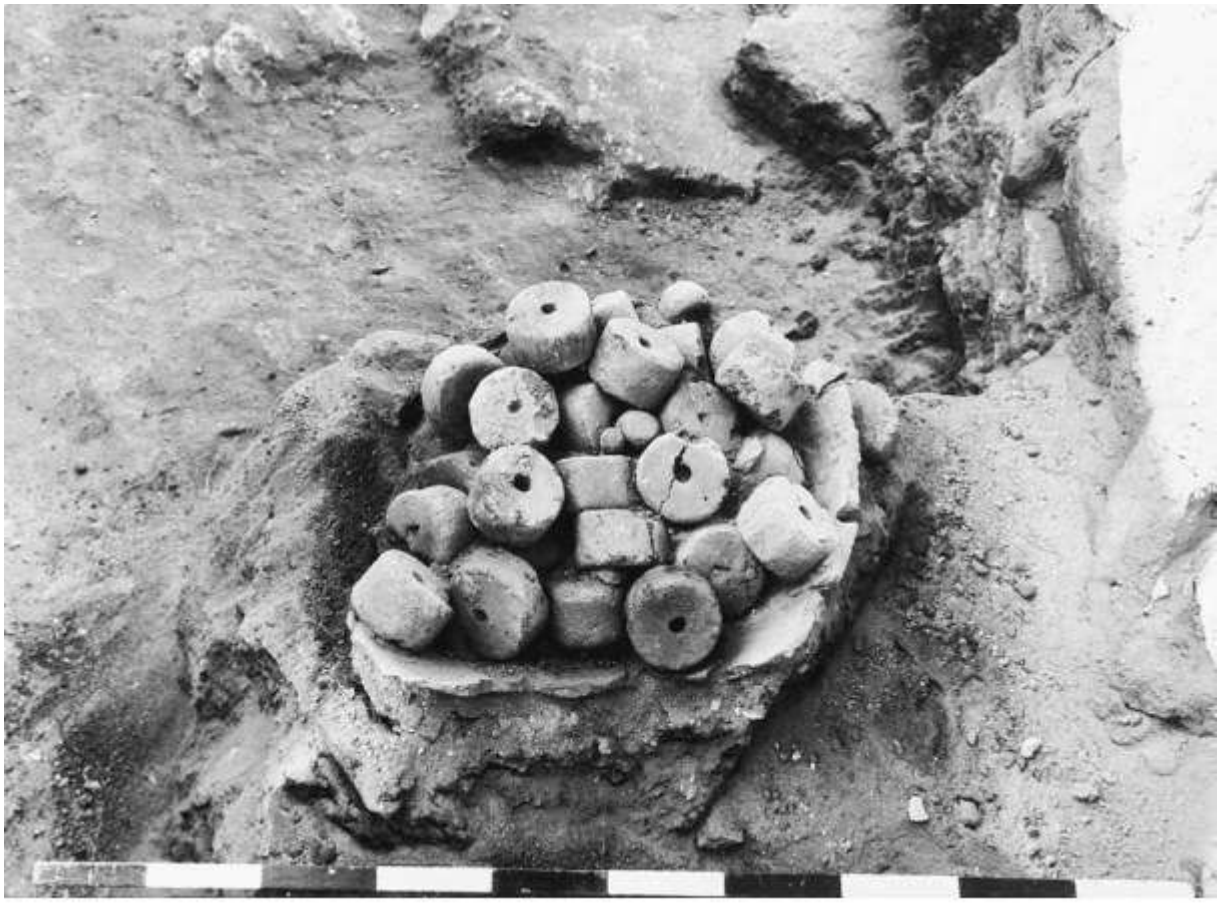


Figure 38 Cylindrical loom weight (Harrison 2004, fig. 33)

Cylindrical weights, non-perforated, also come from Buildings 2072 and 350 (Harrison 2004, 18). Another cluster of loom weights comes from an open area with trees in sq. R9, L.1750 with no description of the loom weights (Harrison 2004, 20).

From the renewed excavations at Megiddo, no numerous clusters have been recovered. Furthermore, only sporadically textile related tools appear in the same locus. Only L. 96/H/44 has returned 10 loom weights and a bone spatula (Sass 2000, 372, 12.16).

4.9.7 Basalt rings

Stone objects with the shape of a torus are spread in the Levant, especially in the Early and Middle Bronze Age periods. As discussed in previous chapters, they form a uniform category of objects, probably to be connected with textile production, but their specific function remains unknown. Even if they are easy to distinguish from other ring-shaped object, publications often lack essential details such as diameters and weights, making their identification from schematic drawings (when present) very difficult. This problem is particularly evident in Megiddo, given the long history of excavations and the different sensibility towards these objects. In the catalogue, pivot for drilling and other tools which have nothing to do with our basalt rings are also listed, and when it is possible, it is clearly

stated that they were not textile tools. In many cases, however, it is possible only to imagine that these tools had other functions, but it has not been possible to exclude them for sure. As in other Levantine sites, basalt rings are quite common in the Early Bronze Age. They appear as early as the EB I and continue to be produced during the EB III. For those for which the weight is given, they are light objects with a range from 22 to about 68 g. If they have to be considered as spindle whorls, they would have medium weight, while if they have to be considered loom weights their weight should be considered extremely light. They come both from tombs and domestic contexts.

During the Middle and Late Bronze Age, production of basalt rings seem to disappear, and they should not be present in layers dating to the Iron Age. However, several specimens, personally seen and measured, come from Iron Age levels, apparently contradicting what is generally known from other Levantine sites. For Iron Age I, only five items can be considered as basalt rings, while all the others are bigger and very heavy objects with other purposes. Most of the objects which are called basalt rings for IA II strata were undoubtedly not basalt rings since their diameters and weights allow to exclude their use in textile related activities. However, even for this period, a small number of actual basalt rings can be identified, thus confirming that their use during the Iron Age was not common but still present.

The only cache of basalt rings has been recognised by Braun for the Early Bronze Age I in the East Slope (Braun et al. 2013, 101–2). Unfortunately, he did not publish any description of the objects nor even their total numbers. He hypothesises that they might have been pertaining to a loom.

4.9.8 Bone spatulas and beaters

Several examples of what can be called spatulae and beaters have been found from all periods of Megiddo history. As discussed in chapter 3, it has been decided to study together the two categories since they should have shared a similar function, meaning fixing small errors during the weaving process and keeping the warp threads in order, avoiding overlapping.

Some items might have come from layers preceding the EBA, however, their chronology is far from being accurate. Several bone spatulas are known from the EB layers, with triangular and pen-nib points. Their production decreases during the MBA, when most of the findings are pin beaters, with long and thin points. The Late Bronze and the Iron Age I have preserved only a minimal quantity of both categories, suggesting that other tools or other materials, such as wood, might have been employed in these periods. The manufacturing of bone spatulae reaches its peak during the Iron Age II, to which most of the items belong. They include long and triangular points, while the other end is generally simply rounded to adapt their shape. A few objects with pen-nib points are also known.

4.9.9 Needles

The category of needles includes actual needles and bodkins as it is impossible at the present state of the research to distinguish their function. They might have been employed, in fact, to sew actual textiles, even if coarse, or to produce nets, mattresses and cushions. They have been included in this study above all for their clear link with textiles in their broader sense and to check if the context of findings might be the same of other textile tools.

Eighty needles and bodkins have been published from Megiddo, which is a very small number. However, it must be considered that wooden bodkins have certainly existed, as well as very thin bronze needles which might have been lost, broken (and therefore be unrecognisable) or recast.

From the EBA only a few objects, very different from each other, have been found. A group of five bodkins are made of bone, they are fragmentary, and only one of them has the eye preserved. A bone needle with a large triangular head was certainly not employed for sewing. Finally, a bronze needle has a central thickening and eye missing, which make the belonging of this object to the category of needle far from being sure. Few more needles have preserved for the MBA, most of them made of bronze with eye obtained by bending the upper part of the shaft, like those of Beth Shean and several other Levantine sites. Two bone needles are also present, one of them coming from a tomb. Late Bronze Age shows a similar situation, with bronze needles coming both from tombs and domestic units, all of them made of bronze. Dimensions are widely different, with small and thin needles as well as long and thick items. The most significant number of needles comes from Iron I levels, with very different dimensions and materials. One needle case has also been found, with needles still present. As in previous periods, most of the needles have the eye obtained by bending the upper part of the shaft. Ivory, bone and iron specimens are also present. Fewer needles are known from Iron Age II, almost all made of bronze and one made of bone. Measures and morphologies are the same of the previous period.

Needles are present both in tombs and domestic contexts, proving the continuity of their presence in funerary assemblages. In recent excavations at Megiddo, they are seldom found in same loci with other textile tools. However, Chicago expeditions found several contexts where needles are associated with spindle whorls and loom weights, always in small quantities.

4.9.10 Contexts of findings

Textile tools are found in all areas of Megiddo excavations and for all periods under consideration. Very few are known for Early Bronze Age levels, but this is justifiable given the small areas where the most ancient layers have been exposed. Textile tools are generally found individually, and large

batches are quite rare. This is particularly true for recent excavations objects, while the Chicago excavations see a more frequent connection of the various textile tools. Generally, spindle whorls are found in groups of two or three items. It is interesting to note that they are generally made of different materials, mixing bone with stone whorls and more rarely, given their lower number, with pottery and perforated sherds. Other textile tools, such as bone spatulae, needles and loom weights can appear in the same contexts with whorls. However, it should be noted that the vast majority of textile tools comes from scattered contexts, without objects clearly connected with the textile industry. The two batches of loom weights, 96/H/44 and E=3036 were found with other textile tools, one bone spatula for the first batch and a possible needle or toggle pin for the second one. It is therefore clear that no textile workshop can be identified in Megiddo. Textile manufacture was probably carried out at a domestic level, with the different phases of production located in different buildings. However, the materials employed and the careful polishing of bone and stone spindle whorls, suggest that it was not a poor production, but a certain level of centralisation or uniformity on the materials and the final products was required.

Textile tools are frequently found inside tombs, especially spindle whorls, which start to appear between grave goods in the Middle Bronze Age. During the Late Bronze Age, this tradition is intensified and witnessed especially by bone spindle whorls and buttons, while during the Iron Age it is less frequent. Whorls found in tombs can be made of bone, stone and even pottery; sometimes even perforated sherds can be found. Loom weights are rarely attested, especially for the MB III/LB I, even those made of unbaked clay. Most of the EB/MB basalt rings included in the catalogue come from tombs, which make their contextualization even more difficult. Bone spatulae and needles are rarely found in tombs, generally dated to MB or LB periods, and probably they did not have a significant meaning for the afterlife.

4.9.11 Conclusions: development of textile tools at Megiddo

Textile tools from Megiddo are very numerous and constitute a very interesting case study. Bone spindles and shafts are quite abundant, and at least one actual spindle has been recognised. The fact that spindle whorls were mounted on a peg and not on the shaft has important implication for the minimum hole diameter of the spindle whorls. A second item, with several rings and a possible spindle whorl, might have been a completely different object. However, even in this case, the possible "whorl" was mounted on a core and not on a true shaft. Bone spindles appear in Megiddo at the very end of the Middle Bronze Age or the beginning of the Late Bronze Age I, and their production reaches its peak during the LB II-III, for decreasing during the Iron Age. This is a trend common through all the Southern Levant.

Spindle whorls are indeed the most numerous textile tool in the site. The Early and Middle Bronze Age spindle whorls were mainly made of pottery and only from the Middle Bronze Age I bone whorls begin to be produced, even if in few quantities. Stone spindle whorls were also present but were not numerous. During the Late Bronze Age, the bone becomes the most exploited material for whorls, substituting pottery. Pottery and stone whorls are quite rare in this phase. Dome shape becomes prevalent, influenced by the shape of the natural source. During the Iron Age, the stone becomes more used. During the IA I, bone is still the prevalent material, but shapes are more varied than in the preceding period. Stone whorls are mostly made of limestone and steatite, and shapes are generally conical or dome. A new shape appears in this period, which is the conical truncated, but it will never be widespread in Megiddo. In IA II, stone whorls are two times more numerous than bone whorls. Shapes are generally conical and dome, except for pottery spindle whorls which continue to prefer rounded shaped, such as spherical and biconical. To spindle whorls, perforated sherds must be added. They are quite rare during the EB-BM periods, and they reach their peak of production during the IA I. Loom weights are introduced during the MB I, while the EB examples might have been only counterweights. MB loom weights are conical and made of both baked and unbaked clay. Three elements are remarkable: first, some are vertically perforated, which implies a very different system of binding. Second, some of them are covered by a slip and highly refined and polished. Finally, a lot of them present scarab stamps. They are produced for the whole Middle Bronze Age but also during the Late Bronze Age I, lasting longer than in other Levantine contexts. During the Iron Age period, production of clay loom weights flourishes again, with cylindrical, doughnut and spherical shapes. A single example of a spool loom weight comes from an IA I context.

Basalt rings can be considered either loom weights or spindle whorls. Their very light weight, however, is openly in contrast with the heavy weight of clay loom weights. The wide hole and its hourglass shape make their use as spindle whorls difficult too. The evidence of Tell Abu al-Kharaz, however, point to their use both as loom weights and spindle whorls[45]. They are common during the EB phases, as in many other Levantine sites, very rare in the following phases. Few examples were also recognised for IA I-II.

Bone spatulae and beaters are not very common in Megiddo. Spatulae appear during the EB phases, if not earlier, giving way to the beaters during the MBA. They are not present for LB and IA I phases and reach the peak of production in IA II.

[45] See chapter 4.6

Few needles are known for the EBA phase, with very different shapes and materials. During the MBA a new type of needle is introduced, with eye obtained by bending the upper part of the shaft on itself; this typology will be the most common also in the following period, as in many other Levantine sites.

4.10 Beth Shean

The large mound of Beth Shean (Tel el-Ḥuṣn in arabic) is situated in the northern district of Israel in a strategic position at the junction of the Jezreel Valley and of the Jordan River Valley. It is a steep mound, which dominates the fertile Beth Shean Valley and the site was built on a natural hill. It is located near two streams, ‘Asi and Ḥarod Rivers, which join together to the East of the mound. The presence of several water sources allowed the sustenance of many communities, which now form clusters of small mounds and are a typical feature of this region (Mazar and Mullins, Robert A. 2006, 3). The mound is larger than 4 ha in area, however only a part of it was occupied during the Bronze and Iron Age period. Furthermore, the whole summit of the mound was occupied only during the Early Bronze Age and byzantine or later period, while during the second millennium the settled area was limited to 1.5-2 ha, which can accommodate around 500 people (Mazar 2010, 241–42). In this period, the largest and most important site of the Valley was Tel Reḥov, 5 km south of Beth Shean.
The Egyptian centre of the Late Bronze Age seems quite small and without defensive walls, most of its buildings were administrative and cultic, but also a residential area has been excavated.

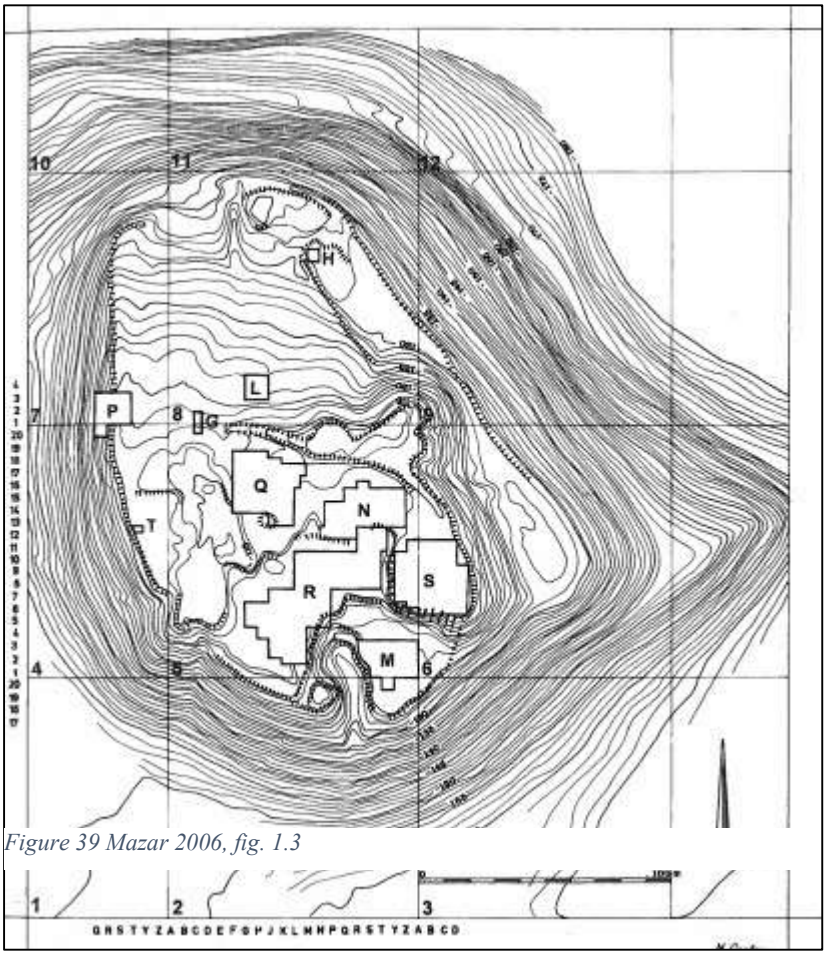


Figure 39 Mazar 2006, fig. 1.3

The first excavations were carried between 1921 and 1933 by the University Museum of the University of Pennsylvania (henceforth UME), leaded by C.S. Fisher, A. Rowe, and G.M. Fitzgerald. Several layers of occupation were exposed and divided in 18 different phases from the Neolithic period to the Medieval period. The most important findings belong to the Egyptian occupation during the Late Bronze and Early Iron Age period, with the identification of temples, a “Governor’s residency” and the households of the Egyptian garrison (Mazar and Mullins, Robert A. 2006, 8).

The final excavation reports appear only decades after the excavations, especially thanks to the commitment of Frances James; unfortunately, not all the layers which were excavated have been published. A second project of excavation was conducted by Y. Yadin and S.Geva during the 1983 and focused on layers of the IA I period, but the project was not continued afterwards.

Nine excavations seasons were conducted by the Hebrew University of Jerusalem from 1989 to 1996 under the directorship of A. Mazar. The new excavations were able to fully document the areas exposed by the UME and to investigate almost the complete stratigraphic sequence. The levels uncovered by Mazar team span from the Early Bronze Age period to the Islamic period, divided in 10 areas: L, P, G, Q, S, R, N, M, T (a small probe) and H (byzantine). Area L is located on the slope of the mound were UME excavations only exposed byzantine periods, while the new excavations brought to light also Middle Age burials and part of the Early Bronze Age phase. In area P, levels from the Medieval to the Hellenistic phase have been uncovered, as well the occupation of the Iron Age II period. Area G is a small trench that has demonstrated the presence of Middle Bronze Age layers immediately under the Byzantine layers, thus indicating the lack of the occupation of this part of the mound for most of 2nd and 1st millennium BC. Area Q is a key area, situated on the top of the mound, where UME excavations uncovered the so-called Buil

ding 1500 and the Governor's Residency. The period exposed in this area are the Late Bronze II and the Early Iron I. Area S covers a similar chronological frame, but it exposed also important buildings of Iron II. It is a large area on the south-eastern corner of the mound and it is published in volumes I and III (Mazar and Panitz-Cohen 2006; Panitz-Cohen and Mazar 2009). Area R was first excavated by UME and exposed a series of temples. Evidence from the Early Bronze Age to the Late Bronze Age have been published in volumes II and IV (Mazar 2012, 2007). Area N is located where UME identified building 1700 and some houses north of it. The chronology of this area spans between the LB II and IA B and it is mainly focused on the period of the Egyptian occupation. Area M is located on the south-eastern terrace of the mound where the UME excavations exposed partially EB levels, which are the focus of this trench. The last two areas, T and H did not reach levels of interest for this work.

Period	Century [BCE]	UME Level	HU Local Strata in Area R, S	HU Local Strata in other areas
Medieval		Ia		P-1
Early Islamic		Ib		P-2; L-1; H-1
Byzantine		II		P-3; H-2; L-2
Roman		III		P-4
Hellenistic		III		P-5
Iron IIB	Late 8th			P-6 (squatters)
Iron IIB	8th until 732	IV and parts of V		P-7
Iron IIB	9th-early 8th	Parts of V?		P-8a-b
	Mid-9th	Parts of V		P-9 (surface in probe)
Iron IIA	10th	Parts of V	S-1 (massive buildings)	P-10 (surface in probe)
Iron IB	11th	Temples od V and structures of Late VI	S-2 (revival of town)	N-2?
Iron IA	12th, Egyptian 20th Dynasty	VI Late VII	S-3 S-4 S-5?	Q-1; N-3a-b
LB IIB	13th, Egyptian 19th Dynasty	VII VIII		Q-2; N-4 Q-3
LB IIA	14th	IX1	R-1a	
LB IB	Late 15th	IX2	R-1b	
LB IA-B	15th	-	R-2	
Late MB IIB	16th	XA	R-3	
Late MB IIB	Late 17th	XB	R-4	
MB IIB	Late 18th/17th	XB/XI	R-5	
GAP				
Intermediate Bronze Age (EB IV/MB I)	23rd-21st	XI (mixed)	R-6	
EB III	27th-24th	Parts of XI and XII	R-7-R-12	M-1
EB II	29th-28th	Meager remains	GAP	Scattered sherds
Late EB IB	32rd-30th	XIII XIV		M-2 M-3; L-4
EB IB	33rd-32th	XV		
Early EB IB	34rd-33th	XVI		
Early EB IB	35rd-34th	XVII south		
Late Neolithic-Early Chalcolithic	6th-5th millennia	XVII north		
Late Neolithic-Early Chalcolithic	6th-5th millennia	XVIII		
Late Neolithic-Early Chalcolithic	6th-5th millennia	XIX = below lev. XVIII		

Figure 40 Chronological chart (Mazar 2010, tab. 1) and (Braun 2004, fig. 5.1)

Textile tools from the excavations of the Hebrew University are well studied and published, nonetheless this site was chosen for this research as one of the key site for three main reasons: the first one is that the materials, already studied, could provide a reliable set of objects to understand different definitions and labels given to this kind of materials. Second, the renewed excavation supply a trustworthy chronology in which also the items of the UME excavations can be examined. Finally, the site was under directly control and administration of the Egyptians during the Late Bronze Age/Iron Age I and it is evidently relevant for the aim of the research. It is clearly stated that the items used for the textile production were of Levantine production and did not influenced by the Egyptian domination (Mazar 2009, 20–21). However, given the paucity of Egyptian textile tools so far published, it seemed an obvious choice to test this statement in light of the objects studied during the research.

Beth Shean has returned an abundant quantity of textile tools, spanning from the very beginning of the Early Bronze Age to the Iron Age. As for the other sites, it has been decided to study only materials that are still in Israel, giving the priority to findings of the renewed excavations directed by A. Mazar. All the materials are stored in the Israel Antiquities Authorities facilities, which have been visited to study the materials. A very little number of objects of the UME excavations are still in Israel, most of them at the Rockefeller Museum, while most of the findings are in the University of Pennsylvania Museum of Archaeology and Anthropology (henceforth Penn Museum). To the objects I have been able to study directly, all the items available in the publications and in the Penn Museum online catalogue have been added to provide the largest quantity of textile tools as possible. Those in the Penn Museum are recorded in the catalogue with their number of inventory preceded by a P. in the field “notes”.

4.10.1 Spindles

Complete spindles have not preserved in Beth Shean for the periods under consideration. Even the bone and ivory rods which constitute a general feature of Levantine sites during the Late Bronze Age and Iron Age are not present in this site. Only one ivory shaft might be recognised in the broader category of spindles/shafts and is dated to the IA II.

4.10.2 Spindle whorls

First spindle whorls are known in Beth Shean since the Neolithic/Chalcolithic period. They occur in very few examples for all the earliest periods, including the EBA, probably due to the small areas,

which reach these layers. Neolithic and Chalcolithic layers have been published by Braun (2004) as revising the UME excavations and spindle whorls first appear in UME level XVIII. However, the stratigraphic sequence is quite compromised and the tools do not provide their own chronological sequence. Furthermore, it is clear that only a small part of the objects was retained by Fitzgerald and others were discarded (Braun 2004, 56). Evidence of textile tools of these earlier layers are therefore limited and only partially reliable. All the spindle whorls are made of stone, most of them of limestone and the most common shape is the discoid one. A similar pattern is clear also for level XVII, but in this period also the dome-shape begins to appear. In total, seven spindle whorls are published for level XVIII and six for level XVII.

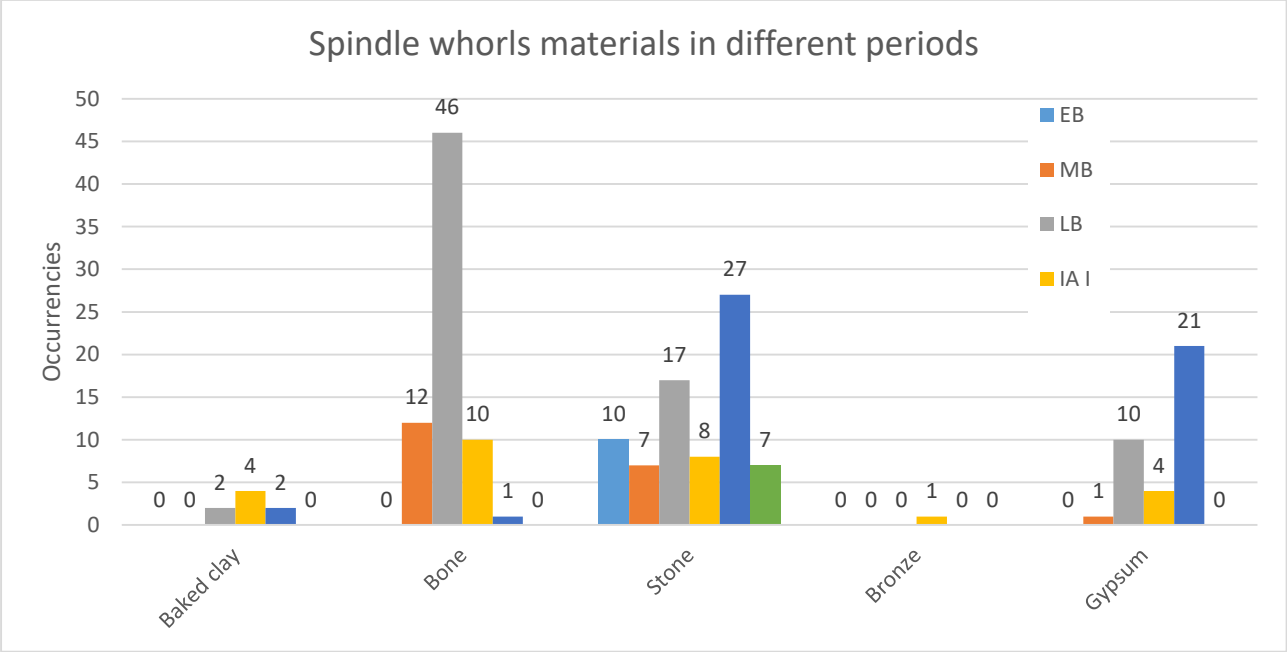
The Early Bronze Age period shows a small amount of spindle whorls with only 10 recorded. Most of them are made of stone, with limestone as the most common stone, but in this period, pottery spindle whorls are produced as well. Shapes are more varied than in the earliest periods, but the discoid shape is still prevalent. However, cylindrical and biconical shaped objects are also used.

A larger number of spindle whorls is published for the Middle Bronze Age, but the numbers are still quite low, with 27 objects for the whole period. Stone spindle whorls (limestone, gypsum and a few made of basalt) continue to be produced but to a lesser extent than in the previous periods and they are reached in numbers by bone spindle whorls which appear now for the first time. As for the other sites, the shape of the natural source influences that of the object, with most of the bone spindle whorls cut as a dome. It worth notice that not a single example of pottery spindle whorls is known for the MBA. If compared to Megiddo, where pottery is the only material used for the EBA and continue to be prevalent during the MBA, while stone is rarely employed, the difference between the two sites is remarkable. During the MBA in Beth Shean, the most common shape is the dome one, used for producing especially bone spindle whorls but also one of gypsum; the discoid spindle whorls, all made of stone, are also well represented. Very few examples of cylindrical, conical and lenticular are also known and one button-shape item appears for the first time. Very few weights are available for this period, and it seems that light spindle whorls under the 10 g were preferred, while a couple of examples are between 10 to 20 g, and another couple over 20 g.

The largest group of spindle whorls comes from Late Bronze Age levels and counts 77 objects. Compare to Megiddo, the whole assemblage of objects of Beth Shean is small, but it has to be reminded that the settlement was quite reduced for the whole second millennium and that Rehov was the most important site in the region of that period. Another point to be kept in mind is the difference in the chronological division that is adopted for Megiddo and Beth Shean. In fact, for Megiddo it is used the LB III phase to indicate most of the 12th century B.C., while for Beth Shean this century belongs to the IA IA phase. This work, as indicated in the general discussion, does not provide a new

chronological frame for each site, and follows the indications of the sites excavators. This choice might generate a bit of confusion, and for this reason macro-difference as those seen for the LB-IA transition are pointed out.

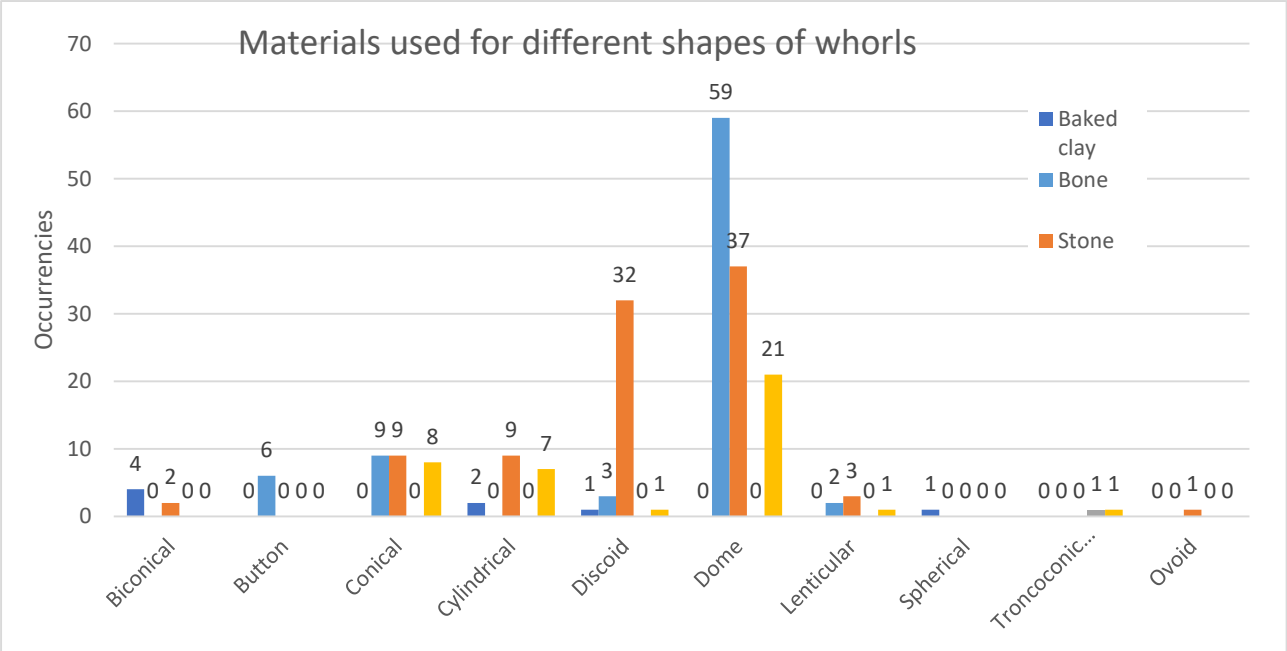
During the LBA in Beth Shean, spindle whorls were produced in bone/ivory or in stone. 45 bone spindle whorls have been excavated, most of them dome-shaped and only a few conical, discoid or button shaped. 30 spindle whorls are made of stone, the largest group made of gypsum, but also of limestone and steatite. Only a very limited number is made of serpentine, slate and sandstone. The dome shape is the most common shape also between the stone whorls, and constitutes the preferred shape in general (52 out of 77). Two pottery spindle whorls have also to be recorded. Beside the dome shape, conical spindle whorls are quite numerous (12 in total) as well as the discoid (7), while only 4 spindle whorls are made of different shapes, i.e. button, lenticular and biconical. Very few spindle whorls have been recorded with their weight, 9 out of 77, and the minimum is 2.34 g, while the maximum is 30.49, without a clear, recognizable pattern of distribution.



As for the other sites, IA I and IA II have been divided to better understand the development during this crucial period. As stated before, IA I coincides with the 12th century BC, and includes the Egyptian domination under the 20th dynasty. Spindle whorls from IA I levels are quite numerous, but less than in the LBA, with 53 examples recorded. There is a large variety of materials, especially regarding the stone whorls, which are the largest group. More than a half, in fact, are made of stone (29), a great part of gypsum, some of limestone, and few examples of chalk, basalt, marl, serpentine and steatite. Bone and ivory spindle whorls are still numerous (19) but less than those made of stone, differently from Megiddo. 5 spindle whorls are also made of pottery, which continues to be a material

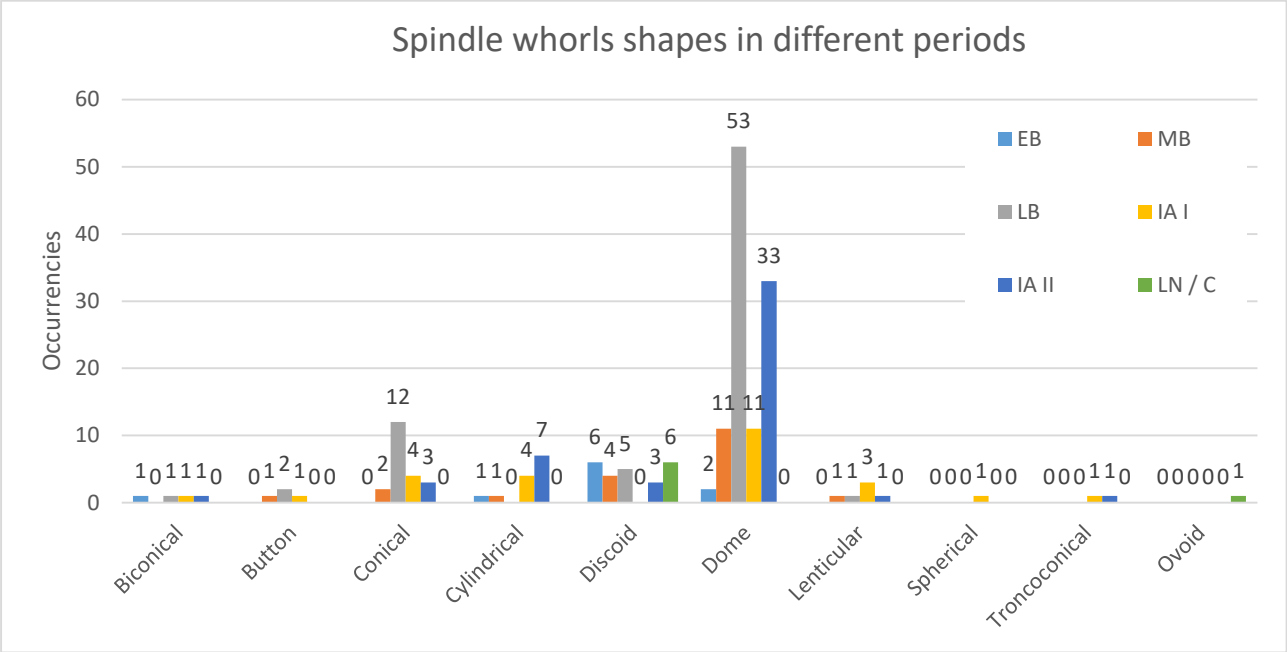
rarely used for this kind of tools. Finally, one bronze spindle whorl is recorded and it is the only known example.

Shapes are extremely varied. The most common shape is dome, but numerous examples are conical and cylindrical shaped. A few are lenticular, discoid, button (all made of bone), biconical (made of pottery), one spherical (pottery) and one conical truncated (bronze). Weights are available for a large number of items (35 out of 55) and clearly point to a preference for light and very light spindle whorls. Most of them, in fact, are under 10 g, some extremely light and probably not spindle whorl (but see discussion for Megiddo). Very few are between 10 and 20 g, seven between 20 and 30 g and just five over 30 g.



For IA II levels, only 44 spindle whorls have been identified, with a large variety of materials employed. As already seen for Megiddo, in this period stone spindle whorls are the predominant group, with just one example made of bone, and two of pottery. However, differently from Megiddo, the stone spindle whorls are not made of steatite for the largest part and secondary of limestone, but there is more variety. In fact, gypsum whorls are the most common (18), followed by those made of limestone; small groups of steatite, sandstone and serpentine have been recorded too. Shapes, on the contrary, are very homogeneous, with most of the spindle whorls dome shaped (32), only two conical, four cylindrical, and discoid, biconical and conical truncated single examples. It is clearly a different pattern than the one of Megiddo, where in this phase conical whorls are the most frequent group together with those dome shaped, while in Beth Shean only two conical examples occur. Unfortunately, no weights are provided for this period.

Some spindle whorls appear in funerary contexts, however in the same tombs are also present intrusive roman materials (e.g. tomb 42 (Oren 1973, fig. 34)), which make the attribution of these objects to the periods under consideration not sure.



4.10.3 Perforated sherds

Perforated sherds are known from Beth Shean for all the periods under consideration. They begin to appear in Level XVIII (Neolithic/Chalcolithic phase) and are not very numerous (but it is probable that only part of them was retained (Braun 2004, 56)) nor in the early phases as well as in the later periods. The highest numbers are reach in IA II (9 objects) but a similar number appear also for the EBA. However, if sum with the spindle whorls, their percentage over the whole corpus of spinning tools is much more relevant. In fact, they represent the 22% of the Neolithic/Chalcolithic spindle whorls, and reach their peak during the EBA where they cover the 44% of the whole spinning assemblage. In later phases, their percentage is definitely less relevant, with 17-18% during MBA and IA II, and under the 5% for LBA and IA I. They are characterised by a quite large diameter, 4.9 cm on average, and a rather small thickness, 0.89 on average. The largest sherd measures 7.4 cm of diameter, while the smallest 3 cm. Weights can measure between 8.5 and 59.4 g, with an average weight of 22.9 g. However, it should be noted that the few available weights do not show a regular distribution, but are divided between light weights (around 10 g) and heavier weights (slightly over 50 g). The heaviest examples belong all to the IA II, but in the same period, lighter weights are also present.

As for Megiddo, in the catalogue are included all the perforated sherd with a single hole, even if the hole is hourglass or not perpendicularly perforated, making the fastening to the spindle more difficult but not impossible. Since the largest corpus of perforated sherds I have collected is that of Hazor, in its chapter they will be discussed much more in detail.
They appear in domestic contexts as well as in large and public buildings and in many cases (for example 281338 and 380553) they are found in the same context with basalt rings for the EBA and with loom weights for the IA, as well as with spindle whorls.

4.10.4 Spinning bowls

As seen in chapter 4.4, spinning bowls are bowls with loops inside, that can vary from one single loop to four, and can be attached either to the base or the interior rim. Beth Shean has returned a very large collection of these items, spanning from the Late Bronze Age to the beginning of the Iron Age. The base is generally flat, but disc and ring bases are also known (Martin 2009, 445) and the loops are generally two (but examples with a single loop are known as well) (Dothan 1963, figs 1.10-11), attached to the base. They were locally made but are considered as products of the Egyptian domination of the Southern Levant, and for this reason labelled as Egyptian-style pottery. A large quantity of Egyptian-style pottery was found in Beth Shean for levels corresponding to the 19th and 20th Egyptian dynasties, while a very small quantity of this pottery is known for levels corresponding to the 18th dynasty. It is generally locally produced while only a very low percentage was imported from Egypt. Egyptian-style pottery includes mostly household vessels, most of them are coarse product and not certainly copies of luxury items (Martin 2016, 70). However, cooking pots were made following local typologies. It seems that Egyptian population, with Egyptian workers, lived alongside a local population. It has been noted that three commonly considered female activities, food processing by grinding cereals and cooking and textile production, were characterised in Beth Shean by the use of local objects, like those found in other Canaanite sites. This fact may indicate that this activities were carry out by local women married to Egyptian people or working for the garrison. Between the textile tools only the spinning bowls were not belonging to the local tradition (Mazar 2009, 19), but using a spinning bowl means adopting the splicing technique that was not used anymore in the Levant. However, changing the technique of textile production is not such a simple matter as seems to be suggested by the excavator. Spinning and weaving is a very traditional craft with few changings over long periods. It seems more probable that Egyptian spinners and/or weavers were present at Beth Shean besides local population. If the spinning bowls were not used for plying fibres after splicing but only for plying any kind of threads, their adoption by the local population might be more easily explained, because it does not imply a complete changing in the spinning

technique. Furthermore, the only textile fragments preserved from Beth Shean, are not described as showing splicing (Shamir 2009, 608).

The first example of spinning bowl comes from level IX of UME excavations, and it is therefore to be placed at the end of the 18th dynasty or at the very beginning of the 19th. A few other examples are known for the LB II period, corresponding to the 19th dynasty, while the large majority belongs to the IA IA, which should be placed during the Egyptian 20th dynasty. After this phase, spinning bowls disappear, with a single example dating to IA IB, and not a single example dating to later phases. The sudden disappearance of this tool from the site might indicate a resistance in adopting this tool by the local population and to a use confined to Egyptian spinners or closely linked to the Egyptian garrison. When the garrison leaves, the spinners which used the tool leave too.

4.10.5 Loom weights

As for the other sites, all the objects that can be used as loom weights are included and discussed in the catalogue, allowing to reject some of these specimens. As usual, basalt rings will be discussed in the next chapter giving the difficulty in recognizing between which was a spindle whorl and which a loom weight.

During the Early Bronze Age, no possible loom weights have been recognised while in the late Middle Bronze Age conical loom weights begin to appear. They are known for level XB of the UME excavations and from area R of Mazar excavations, spanning from stratum R-3 to R-5, with just one item which could be slightly earlier (R-5-7). MBA loom weights at Beth Shean are very homogeneous: all of them are made of clay, baked or unbaked, and are carefully shaped and pierced, except in one case, in which the holes made from the two sides are not joining. None of the examples shows a surface treatment or a vertical hole as in Megiddo, they are quite simple objects. The only feature typical of these examples is a slight convexity on the sides at the height of the hole. Furthermore, none of them exhibits a scarab imprint, as in the case of Megiddo and Far'ah (S).

They can measure from 7.9 to 11 cm of height, with a maximum diameter spanning from 5.1 cm to 8.2 cm. They are generally lighter than those of Megiddo, with a maximum weight of 596 g, and a minimum weight of 267 g.

From the Late Bronze Age, loom weights are not generally recovered in the Levant. However, in Beth Shean some objects of the UME excavations belong to levels IX-VII, which correspond to the LB II. The most striking feature is that all the possible typologies of loom weights seem to be represented. In fact, a couple of the typical MBA conical clay loom weights are recorded, which might be a relic of the previous period. The other types are doughnut and spherical loom weights

made of clay, gypsum pear shaped and clay spool loom weight. While the other typologies are all represented in later periods and do not represent a problem, spool shaped loom weights are more puzzling. They appear in LB II levels (15 for lev. VIII and 8 for lev. VII) and in IA I levels, some of them were found in clusters, one for level VIII with 15 spools grouped together in a semicircular stone niche, and one for level VII, where 3 objects were found together on a total of 8 objects (James and McGovern 1993, 188). The publications refer to them as bread models (James and McGovern 1993, 188; James 1966, figs 105.8-12), but from the beginning of the Iron Age, spool is a common shape for loom weights, and measures of these objects are similar to those of the other sites[46]. One item has five scarab impression on the surface which were read by James (James 1966, fig. 105.9) as imnyt "daily offerings". However, it seems quite strange that several imprints of the same type were made on a single object and I have found no reference of a similar tradition of offering clay models of food in Egypt for contexts which are not dealing with tombs. An alternative explanation was offered by Brandl (2009, 662–63), who sees in clay balls with several seal impressions objects connected with the fayence industry, with parallels from Tell el-Amarna. In his hypothesis, only the spool with hieroglyph impressions should be considered for bead production, while the other similar objects were actual spools. This explanation seems more plausible even if the early chronology of the other spools constitute a problem. However, it has to be taken with added caution given the presence of other loom weights typologies, which seem quite misplaced in Late Bronze Age levels.

Iron IA levels show a few examples of clay spools besides some examples of clay spherical loom weights and one made of gypsum.

All these objects so far considered do not appear in great quantities until the IA IB-II, when finally Beth Shean shows features similar to the other Levantine sites. A huge number of loom weights were recovered, especially from building 28636 from which 109 examples are known, all made of unbaked clay and of doughnut shape (Yahalom-Mack and Mazar 2006, 476, tab. 13.1). They were found in two main clusters in the central hall, while some others are scattered through the hall. A wooden beam found nearby might have been part of the loom. In the report, two or three looms have been postulated near the eastern wall. In one of the two clusters the weights covered an extension of 1.5 m and were possibly divided in two rows (Yahalom-Mack and Mazar 2006, 481). Together with these loom weights, three unfired conical objects were found. They could not have been used as loom weights since each object weights more than 1 kg and would have broken the warp threads. Their usage is not known, a function as jar stopper has been proposed (Yahalom-Mack and Mazar 2006, 474) but it is not satisfactory since it does not explain the presence of the hole in each of them. Another possible

[46] See the substantial work of L. Rahmstorf (2005).

explanation could be that they might have been used in the loom as counter weights, as can be seen in several ancient and modern looms.

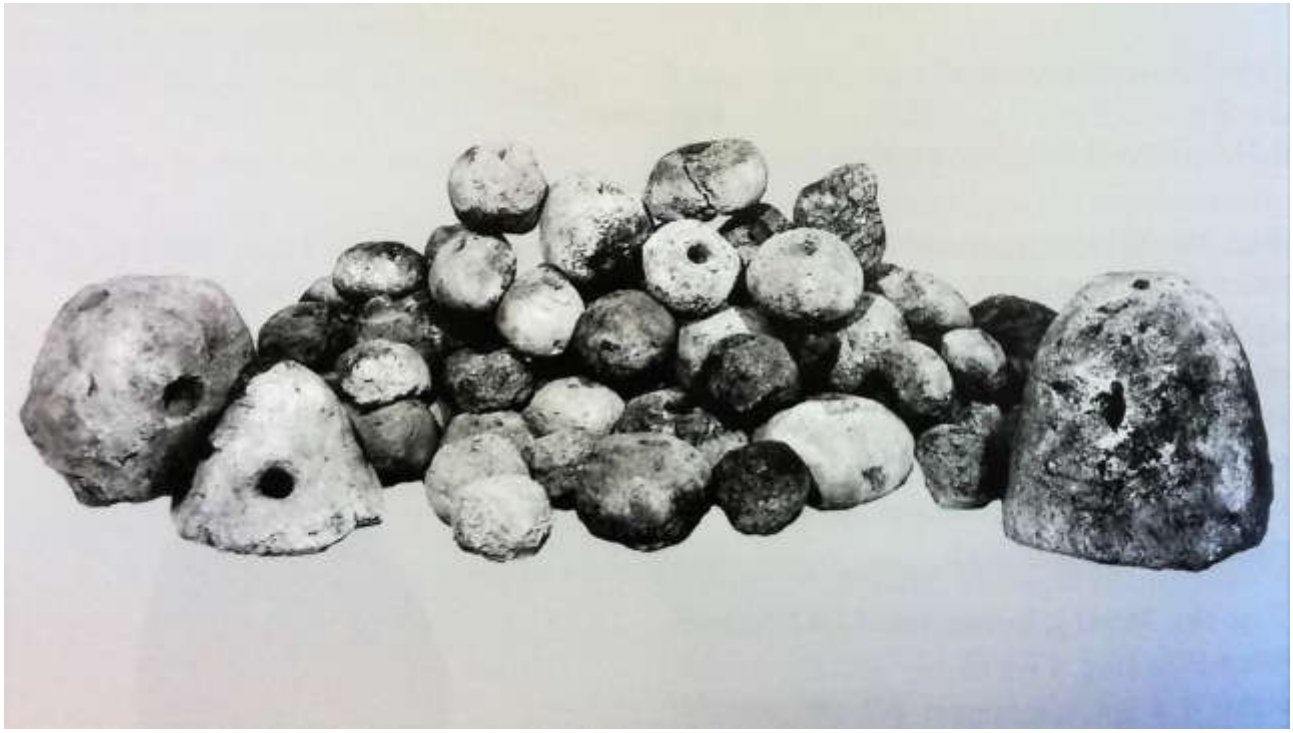


Figure 41Batch of loom weights from building 28636 (Yahalom-Mack and Mazar 2006, 478, ph. 13.16)

To this large batch, other 185 loom weights found in Mazar as well as UME excavations must be added. They are varied and different for shape and materials employed. The largest group (85) is represented again by spherical and doughnut shaped loom weight, almost all made of clay (baked or not) except one example which is made by basalt. Another very large group (75) is represented by the pear shaped objects, to which probably should be added the conical specimens (18). In this case the material is not homogeneous, but stone is the prevalent choice. In fact, only one pear shaped and 8 conical weights are made of clay. All the others are made of stone, with a strong prevalence of gypsum, which is very common in this valley. 47 pear shaped and 10 conical loom weights are made of gypsum, 16 of basalt and 9 of limestone. The use of stone loom weights is typical of this region as the excavations in Tell 'Amal (Shamir 2013, 1–2) and Rehov prove[47].

4.10.6 Basalt rings

Mazar excavations of Beth Shean have provided a well documented and chronological reliable corpus of basalt rings as defined in chapter 4.6. They are divided between polished and unpolished objects,

[47] A. Mazar pers. comm.

but it is a distinction which seemed not necessary for this research (Mazar and Rotem 2012, 368). A few items excavated by the UME were also available in the Rockefeller museum and therefore they appear in the catalogue. Unfortunately, in most cases it has not been possible to clearly link these objects to specific objects in publications. 27 basalt rings have been identified in Mazar excavations from area M-3 and M-2. 36 are the objects listed in the catalogue. To these many others should probably be added from Fitzgerald excavations in the "Deep cut", but only a small part was retained. In fact, a few are drawn in his publications but in level XIV it is clearly stated that "smaller rings of basalt […] were numerous enough to form a characteristic feature of this stratum" (FitzGerald and Bache 1935, 13). Both Mazar and UME basalt rings are dated to the EB IB, no basalt rings are known for EB III, differently from other sites such as Megiddo. Only three possible basalt rings are known for the MBA, while they disappear in later periods, coherently from what is known from other Canaanite sites. The height of the rings spans from 0.7 to 3.8 cm with an average value of 2.07 cm; the diameter from 1.8 to 5.3 with an average value of 3.9; the hole from 0.5 to 1.5 cm, with an average value of 1.08 cm. Weight is given for the large majority of these tools and it is comprised between 19.78 and 67.78 g, with an average value of 41.03. Similar measures are known also for other sites, such as Megiddo and Tell el-Far'ah N.

4.10.7 Bone spatulas and beaters

Some examples of what can be called spatulas have been found in small numbers in Beth Shean and not for all the periods under consideration. It is probable that other examples should be included, but many items lacking a drawing or a picture which can allow their identification as pertaining the textile industry. For this reason, it has been decided to not include these items in the catalogue.
The first examples of bone spatulas are recorded for the Early Bronze Age, from EB I strata as well as from EB III. They generally have a triangular point, when preserved, and none has the other end preserved. No MBA spatulas have been recorded and only two from the LBA levels. These examples have a large rounded point, and are therefore different from all the other specimens. Only one bone spatula comes from IA I levels, while 10 examples are known from IA II periods. They can have both triangular as well as pen-nib point, and the other end, when preserved, is rounded. Only a single bone spatula comes from building 28636 (and just 3 spindle whorls, proving that spinning activities were performed elsewhere), where the large batch of loom weights was found.

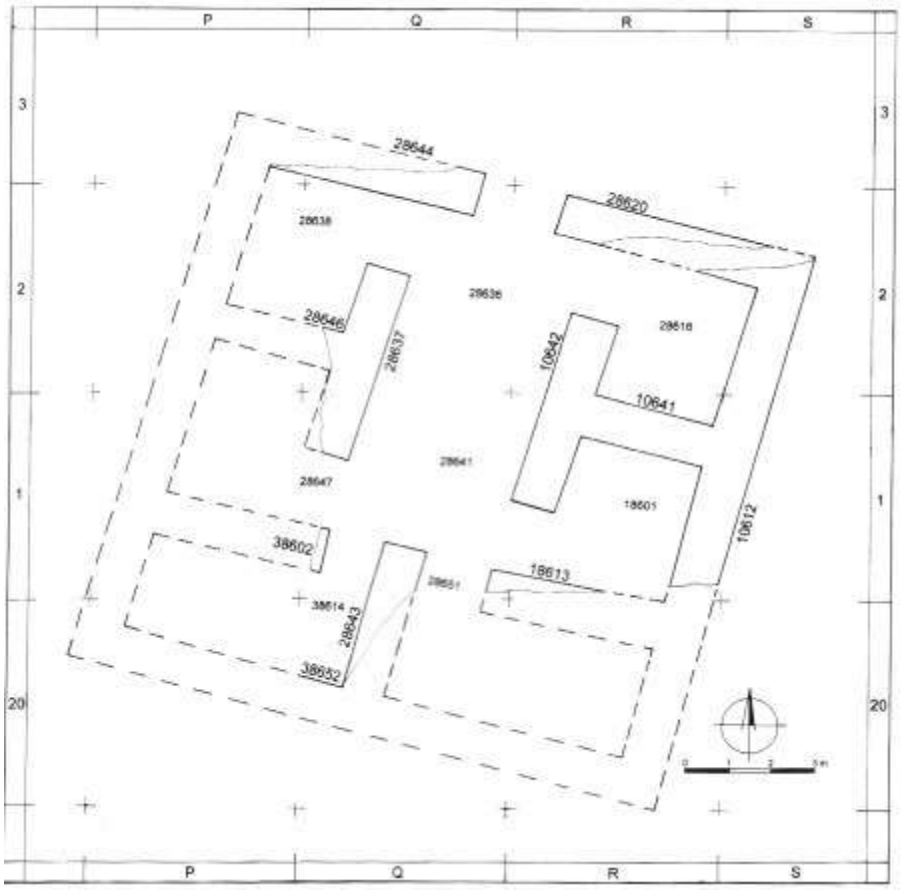
4.10.8 Needles

As seen for Megiddo, inside the category of needles are included actual needles as well as bodkins, since it is impossible to clearly distinguish between the two typologies. If the needles from Megiddo

were a small quantity, those of Beth Shean appear to be even less. Certainly, as it has been said for Megiddo, wooden needles and especially bodkins certainly existed. Furthermore, many needles without the eye preserved might not have been recognized. However, the quantity is definitely very small. Both bodkins and needles seem to be used in the site and the eye can be produced by perforating the shaft or bending the upper part of the shaft on itself. This technique was in used from the Middle Bronze Age in Israel and known in Beth Shean from the Late Bronze Age (Bonn, Moyer, and Notis 1993, 205).

4.10.9 Contexts of findings

Textile tools are found in all areas of Beth Shean excavations and for all periods under consideration. Very few are known for the Early Bronze Age levels, but this is justifiable given the small areas where the most ancient layers have been exposed and the selection to which they have been subject to. Textile tools are generally found individually and large batches are quite rare. As for Megiddo, spindle whorls can be found in groups of two or three items. It is interesting to note that they are generally made of different materials, mixing bone with stone whorls and more rarely, with pottery whorls. Other textile tools, such as bone spatulas and loom weights can appear in the same contexts with whorls. However, it should be noted that the large majority of textile tools come from scattered contexts, without objects clearly connected with the textile industry. The largest batch of textile tools found grouped together are those exposed in building 28636 and studied by O. Shamir in the first volume of Mazar's publications (Yahalom-Mack and Mazar 2006, 477–81). The building is a large dwelling (14x14 m), the largest found in this area for the Iron Age, and one of the largest excavated in Israel. It was destroyed by a violent



conflagration. It includes a central hall with six rooms on its three sides and it was probably the residency of a high-ranking family (Mazar 2006, 33). Two batches of loom weights come from the central hall of this building, but, in my opinion, they were not find in rows. The first batch, near the grinding installation, comprised ca. 70 weights and two wooden beam could belong to the loom (Mazar and Sumaka'i Fink 2006, 202–68). They did not appear aligned but piled in the corner and partially fallen. A second batch of 30 loom weights was found slightly northern with few others scattered around the hall. It is interesting to note that this hall was used both for food processing and weaving activities, as in many other cases in Israel. However, cooking was not performed in the building since no ovens have been excavated and therefore was probably carried out outside the building (Mazar and Sumaka'i Fink 2006, 219). As noticed before, spinning was probably carried out in other spaces and not near the looms, since just 3 spindle whorls were found in the building. The only other textile implement is a single example of a bone spatula.
Only a very small quantity of textile tools are known from funerary contexts and it seems that their presence in tombs was not a common feature.

4.10.10 Conclusions: development of textile tools at Beth Shean

Spindles are not present in Beth Shean and bone and ivory shafts are also extremely rare, differently from the other Levantine sites where at least some specimens are generally attested.
Spindle whorls are quite numerous and are known in the site since the Neolithic/Chalcolithic period. All the recorded items are made of stone, while pottery begins to be used only later, during the EB I. Stone spindle whorls continue to be produced during the Middle Bronze Age, but they are reached in number by bone spindle whorls, which are introduced in the site in this period. During the LBA period, bone spindle whorls are the most numerous, but those made of stone are numerous as well. During the Iron Age I and II, stone spindle whorls prevail again on those made of bone, even if they continue to be used frequently in the IA I, while become extremely rare in IA II. Pottery spindle whorls are extremely rare in this site, while in other cases, such as Megiddo, are the prevalent material for the EBA. Between the stone spindle whorls, gypsum appear to be a common material, especially from the Late Bronze Age and it will be exploited for loom weights as well. Gypsum items are a typical feature of the Beth Shean Valley and other sites of the region share the same material for textile tools, such as Tel 'Amal, Tell el-Hammah and Tel Rehov (Yahalom-Mack and Mazar 2006, 482).[48] The local source was probably the gypsum layer near Gesher, not far from Beth Shean. Steatite, instead, seems to be quite rare in this site.

[48] An impressive quantity of gypsum loom weights have been found in Tel Rehov (Mazar, pers. comm.)

To spindle whorls perforated sherds must be added. Only few specimens are recorded, but they appear in all the layers from the Neolithic/Chalcolithic level XVIII onwards.

Spinning bowls are definitely numerous in Beth Shean and are known from layers dating to the Late Bronze Age and Iron Age I. The first examples belong to layers that should be considered related to the 18th Egyptian dynasty, more examples occur in layers connected with the 19th dynasty, but the large majority can be dated to the IA IA, under the 20th dynasty. Only a single example can be placed in IA IB, meaning after the withdrawal of the Egyptian garrison.

In Beth Shean, conical loom weights do not predate the MBA II, while in Megiddo they seem to appear earlier. Late Bronze Age appear as a critical period for loom weight history in Beth Shean. In fact, Mazar excavations did not find any loom weight for this period, but UME excavations brought to light some specimens, which should be typical of IA II. Their chronology seems, therefore, very problematic and probably not so much reliable. Spool objects might be, in my opinion, loom weights as in all the other Levantine, Anatolian, Cypriot or Aegean sites (Rahmstorf 2005) but their chronology is, again, quite problematic. Warp weighted loom was not in use in the Southern Levant before IA I, a period in which Beth Shean appears strictly connected to Egypt, a country in which this type of loom was not in use. Their chronology in the site covers exactly the Late Bronze and IA I periods, being one of the earliest site to introduce this kind of loom weights. Three options are therefore possible: first, during the Late Bronze Age Beth Shean people used the warp-weighted loom (differently from Egypt and the rest of Canaan) and the spools were part of its equipment. On the other hand, spools in Beth Shean were produced with another purpose of those, identical, from other Mediterranean sites. Finally, the chronology of the loci where these objects were found should be totally reconsidered (maybe some pits were not recognized).

Iron Age II loom weights do not present any problem. They are quite numerous, and varied in shape and materials. Beside the spherical and doughnut-shaped loom weights, which are typical of the Southern Levant in this period, pear-shaped and conical examples are also known, most of them made of stone, which appear as a typical feature of the region.

Bone spatulae, beaters and needles are very rare in this site, a feature which clashes with evidence from other Canaanite sites but also with Egypt, where these tools, never with high numbers but more numerous than in Beth Shean, were in used as well. Their absence from Building 28636 is especially problematic, given the large evidence of textile production found in this context.

Textile tools found in Beth Shean seem to show that in the site textile production was not performed in an industrial scale, but rather points to a domestic production. Even the largest batch of loom weights was found in connection with other household activities, such as food processing, and with

a very low number of other spinning or weaving implements[49]. Therefore, no evidence of textile workshops (i.e. a specific place where textile production was performed) were found in Beth Shean.

[49] Following Cassuto (2008, 67) in the distinction of workshop and household production.

4.11 Hazor

4.11.1 Introduction

Hazor (Tel el-Qedah) lies in the Hula valley, at the eastern ridge of the Upper Galilee mountains 25 km north of the Sea of Galilee and 5 km SW of the lake Hula. At the South it is bounded by the Wadi el-Waqqas (Yadin et al. 1958, 1). The site was therefore provided with abundant fresh water and the Hula lake offer a wide range of fish. It stands in key position to control the way that connected Southern Canaan with Syria and from there the Mesopotamia. It worth noting that the material culture of the site shows more strictly connection with its northern neighbours than with the South (Ben-Tor 2016, 11).

The site is divided in two main parts, an acropolis or Upper City measuring about 6 ha and a Lower City, a large rectangular plateau at the North of the Tel, measuring about 50 ha. The site was inhabited in its widest extension only during the Middle and Late Bronze Age, while during the Early Bronze Age and the Iron Age only the acropolis was occupied. The estimated population for the second millennium is around 15000 people, while only 1200-1500 for the Iron Age (Ben-Tor 2016, 9).

Figure 42Ben-Tor 2016, fig. 5

The site was identified by a traveller (J. L. Porter) in 1875 but first excavations were conducted by John Garstang in 1928 and never fully published (Yadin et al. 1958, 3; Ben-Tor 2016, 11). He conducted soundings both in the Upper and in the Lower Town, giving a first assessment of the period of occupation. Larger excavations were conducted by Y. Yadin on behalf of the Hebrew University of Jerusalem. He conducted five seasons of excavations from 1955 to 1958 and in 1968 with an impressive quantity of workers and opening 15 areas, six in the Upper City and nine in the Lower City.

Since 1990 new excavations have been carried out by A. Ben-Tor on behalf of the Hebrew University of Jerusalem, codirected by S. Zuckerman from 2006 to 2014. The renewed excavations focused mainly on two areas, area A and M on the Upper City, in order to verify the chronology of the site and to answer some questions remained opened after Yadin's work. Area A is the central part of the acropolis, while area M is northern and at the point of junction of the Upper and Lower city (Ben-Tor 2016, 14–16).

In order to understand better the differences in textile tools quantity, it seems necessary to briefly sum up the history of the site. In fact, not all periods show the same pattern of occupation and some periods reflect moment of crisis and abandonment of the town.

Stratum: Upper Tell	Stratum: Lower City	Archaeological Period	Absolute Dates (Centuries B.C.E.)	Archaeological Remains	Historical References
XXI		Early Bronze Age II-III	28th	Residential units	
XX-XIX		Early Bronze Age III	27th - 24th	Residential units and monumental structures on acropolis (?)	
XVIII		Intermediate Bronze Age	22nd - 21st	Residential units on acropolis	
Pre-XVII		Middle Bronze Age IIA-B	18th	Burials and structures on the upper tell	Egyptian Execration Texts
XVII	4	Middle Bronze Age IIB	18th - 17th	Erection of the earthen rampart of the Lower City (?)	Mari Archive
XVI	3	Middle Bronze Age IIB	17th - 16th	Both Upper and Lower Cities are inhabited, public structures.	
XV	2	Late Bronze Age I	15th		Annals of New Kingdom pharaos
XIV	1B	Late Bronze Age II	14th		Amarna Archive
XIII	1A	Late Bronze Age II	13th		Papyrus Anastasi I
XII-XI		Iron Age I	11th	Pits and meager architecture	
Xb-Xa Ixb-IXa		Iron Age IIA	Mid-10th – early 9th	Six-chambered gate, casemate wall, domestic structures	United monarchy (Solomon?)
VIIIb-VIIIa VIIb-VIIa		Iron Age IIA-B	9th	Casemate wall still used, administrative structures and domestic units	Kingdom of Israel (Omride dynasty)
VIc-VIa Vc-Va		Iron Age IIC	8th	Casemate wall still used, administrative structures and domestic units	Kingdom of Israel: Jeroboam II – Pekah Assyrian destruction by Tiglath-pileser III
IV		Iron Age IIC	8th	Sporadic settlements	Post-Assyrian destruction; Israelite (?) settlement

III		"Assyrian"	7th	Governmental structures on and around the tell	
II		Persian period	5th - 4th	Citadel, tombs	
I		Hellenistic period	3rd - 1st	Citadel	

Figure 43 Chronological table (Zuckerman 2013, 69)

First occupation of the site occurred during the Neolithic and Chalcolithic periods, when the site show traces of human activities, especially pottery sherds and flint tools. To the IV millennium (Jemdet Nasr) is dated a Mesopotamian cylinder seal with female figures producing pottery or weaving (Ben-Tor 2016, 29, fig. 8). A first settlement seem to appear only from the EBA II but this period was exposed only in very limited trenches of the excavation. The town show traces of massive construction and public building already in the EBA III. It is clear, however, that the settlement was restricted to the Upper City, while the Lower City, as said previously, was occupied only during the Second Millennium BC. The Intermediate Bronze Age (Yadin MB I) is a period of general decline in the region and Hazor was probably reduced to a rural village.

Between IBA and MB II a phase of abandonment might have occurred, with isolated burials and poor structures found on the acropolis. MB IIB sees the flourishing of Hazor, with the beginning of the occupation of the Lower city, which will continue during the Late Bronze Age. The transition from the MBA to the LBA seems to be gradual, even if the acropolis was completely reorganized (Ben-Tor 2016, 79). Hazor was probably not destroyed during the military campaign of Thutmosis III and continue to be wealthy during most of the Late Bronze Age. Material culture continues to be local with little pottery showing evidence of Egyptian influence, while some luxury items and at least 18 statues were brought from Egypt. In the 13th century Hazor shows signs of decline and it is destroyed by a violent conflagration after the half of the 13th century. The renewed excavations exposed only public and cultic buildings of the LBA, no residential or domestic units were excavated.[50]

The site remained abandoned until the half of the 11th century, when the Upper City is partially, and only sparsely, reoccupied. Towards the half of the 10th century the settlement is enlarged and fortifications with a six chamber gate are constructed. In the following century, the town is enlarged outside the gate, with public buildings in the western part and residential units in the eastern part (A5 and M). The 8th century marks a period of decline for Hazor, even if the general urban planning is maintained. Stratum V is the last stratum before the Assyrian destruction of 732 BCE with Tiglath-Pileser III. After that the city never recovered its previous greatness (Ben-Tor 2016, 166–67).

[50] Bechar pers. comm.

Hazor has returned a quite large collection of textile tools, very few for the Early Bronze Age and much more for later periods. As for the other sites, only the items stored in Israel were examined, giving the priority to the materials of the renewed excavations directed by A. Ben-Tor. Almost all the items were stored at the Hebrew University of Jerusalem and only a very small quantity is stored at the IAA's facilities. Of the Yadin's excavations objects, only a small number was recovered, since the storeroom where its finding are located was not accessible. Furthermore, the objects, which were held at the Hebrew University, were often missing indication of number and provenance and it is therefore difficult to connect them with Yadin's publications. Of the renewed excavations, both published and unpublished items were examined. Published objects were studied as well since they were only cursory published and much more information were needed for this study. When possible, all the available data of the previous publication have been taken under consideration, in order to have a corpus as largest as possible. In the catalogue, objects which have been personally seen and measured are listed in a blue colour, while materials taken from published books are marked by the black colour.

As for the other Levantine sites, the research includes bone shafts, which might have been spindles, and spindle whorls, including those obtained from reworked and perforated sherds. All types of objects which could be used as loom weights are listed and discussed, even if in certain cases it is clear that they must have had a different purpose. To the more classical types of loom weights, I was suggested to add some perforated base ring sherds, which could have been used in weaving activity. As usual, ring shaped basalt weights are listed separately. Needles are included in the catalogue, even if much of them were not available to direct study. Bone spatulae and pin beaters are particularly numerous at Hazor and allow a deeper analysis of wear traces[51].

4.11.2 Spindles

As for other Levantine contexts, Hazor has preserved several bone shafts which might have been used as spindles, as well as pins and cosmetic sticks. This production seems to appear very late at Hazor, especially if compared to Megiddo, with only one shaft datable to LB II. A second item, made of bronze, is listed because of its dimensions, but it is very similar to kohl sticks of the Persian period from the same site. No traces of bronze spindles have been so far recovered in Southern Levant, but some examples exist for Anatolia. Furthermore, a spindle whorl from Beth Shean, of Roman period, preserved traces of a metal shaft. Although improbable, metal spindles should be considered as one of the many materials with which these tools were produced.

[51] For a brief presentation of Iron Age spindle whorls and loom weights from Area A see (Cimadevilla 2012)

All the other specimens belong to the IA II, mostly to IA IIC. Most of them are broken or small fragments, so they might have belong to other objects such as pendants. The surface is left undecorated, and sometimes it is not perfectly polished.
All considered, these objects are difficult to define with certainty and seem quite different from other shafts spread in the Levant and which could have been used as spindles.

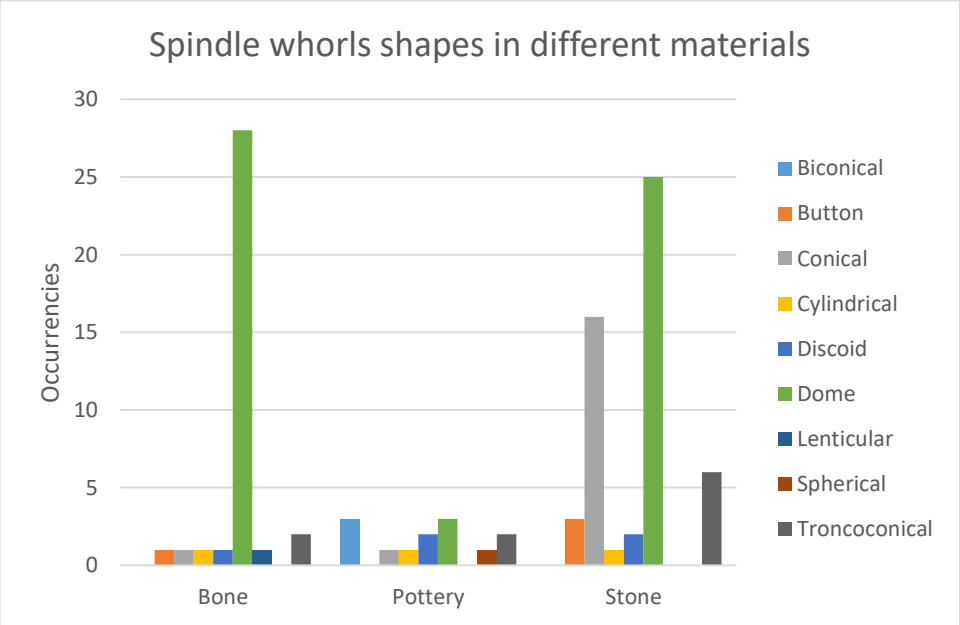
4.11.3 Spindle whorls

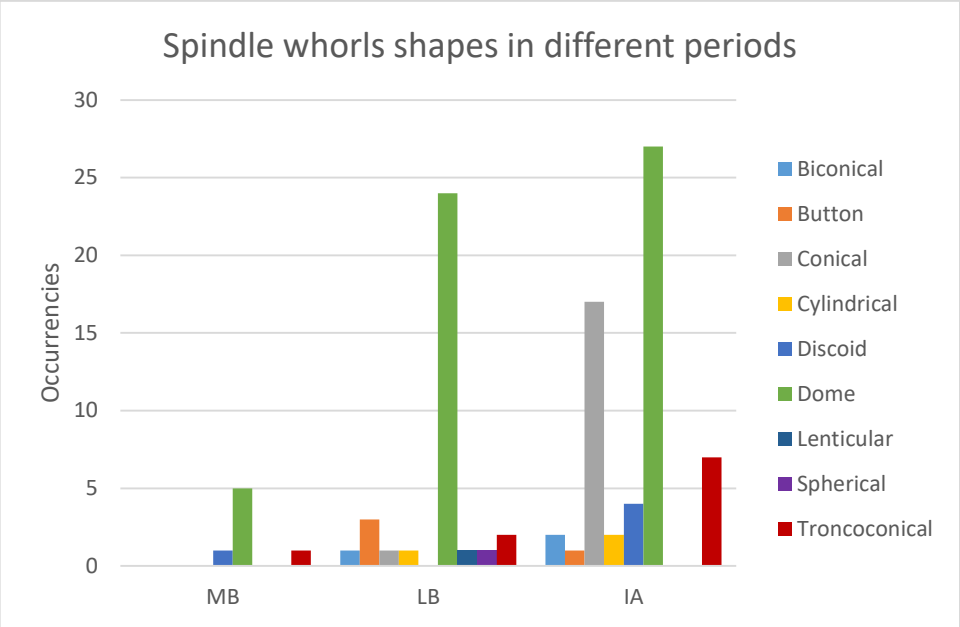
First spindle whorls are known from Hazor from the Middle Bronze Age II. Early and Intermediate Bronze Age layers did not show evidence of spindle whorls but, as stated before, layers of these early periods were uncovered in limited extension. Middle Bronze Age spindle whorls are characterized by a quite complete homogeneity. All of them, in fact, are made of bone, and almost all share a dome shape, which is normal given the source of material. Two spindle whorls, a conical truncated and a discoid one, have very small holes. All these spindle whorls have been published by Yadin and were not available at my time of research in Israel. Therefore, dimensions and weights are not given in the catalogue.
Much more numerous are the spindle whorls belonging to Late Bronze Age strata, but are definitely few if compared to Megiddo. 37 items are listed in the catalogue, most of them datable to LB II, while only a very limited number to LB I. Shapes and materials are much more varied than in the earlier period. The large majority is still made of bone, with 22 items made of bone or ivory. Stone spindle whorls are also quite widespread, since 10 objects are made of stone, probably most of them of serpentinite. Finally, two pottery spindle whorls are also present. These two have a spherical shape, a feature that is common with other sites, such as Megiddo, where they are found. Stone spindle whorls are mostly dome shaped, but conical truncated, button and cylindrical examples are also present. All the bone spindle whorls are dome shaped, except one object which is lenticular. Few measurements are available, and some objects are broken. However, it is possible to infer that these objects appear quite small and light, suggesting a textile production oriented towards fine yarns. In fact, the minimum weight is 1.24 g (of the bone button) and the maximum 37.42 g, with an average value of 11.6 g.
61 spindle whorls were recovered in IA levels, spanning from IA I to IA IIC, almost double than those of the LBA. Again, as for LBA levels, it is impressive to see how small is the number if compared with Megiddo, which shows 120 spindle whorls for IA I and 171 for IA II. Many reasons could be the cause of this difference, not last the failure in tracing back most of Yadin's materials. Hazor was almost deserted in IA I, and in fact only one spindle whorl belongs to this phase. 9 spindle whorls are dated to IA IIA, 17 to IA IIA-B and 34 to IA IIC, for a total of 60 spindle whorls for the

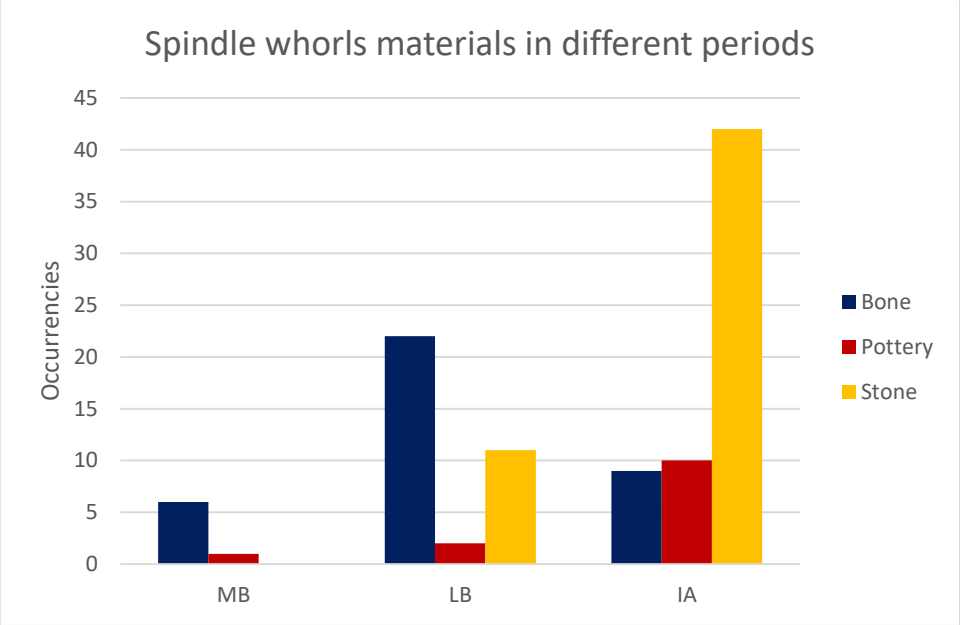
whole IA II. Only 9 spindle whorls are made of bone, a fact which appear opposite to the trend of the second millennium. 10 spindle whorls are made of pottery, which constitute a quite large assemblage. The largest set of spindle whorls for IA II is made of stone, with 41 examples preserved. This fact appear consistently with what seen for Megiddo, where stone overtakes bone in the IA II. Several kind of stone are present, limestone being the most common stone, but also hematite, alabaster, chalk and probably serpentinite are present.

Shapes are quite varied in this period, the most common being the dome shape, with 26 whorls, and the conical one, with 17 examples. To a less extent, conical truncated (7), discoid (4), cylindrical (2), biconical (2) and button (1) are represented. It is interesting to note that different materials are associated with all the shapes, so there is no evident specialisation. Only in the case of biconical shape only pottery is used. In all other cases, stone is predominant, as it is obvious since is the most common material used in the period. However, conical spindle whorls are all made of stone except a single example made of pottery. As for Megiddo, buttons are extremely rare and seem not to have had great popularity in both sites.

A quite large sample of measurements is available and allows some considerations. The minimum weight is 4.48 g, the maximum 81.04 g, and the average value is 29.86 g. In comparison with the LBA, spindle whorls have become much more heavier, pointing at a textile production of medium quality. At a closer look, however, it appears that they are not homogenously diffused. Almost all the items weigh less than 35 g, and only 7 whorls weigh between 54 and 81 g. Between 4 and 35 g they appear more evenly distributed.







4.11.4 Perforated sherds

Perforated sherds are known at Hazor for all the periods under consideration. However, they were quite rare during Early and Middle Bronze Age, while much more common in later periods. They reach their peak during IA II, when their number is almost double than in Late Bronze Age. If considered as possible spindle whorls it is interesting to note that they represent almost one third of whole assemblage of the LBA and that a similar percentage is present in the Iron Age II too.

Only one perforated sherd is known for the Early Bronze Age, three from the Middle Bronze Age and 17 for the Late Bronze Age. As seen for spindle whorls, IA I is a period of abandonment of the site and only one sherd is known. In Iron Age II, perforated sherds are 27. They are characterized by

a large diameter, spanning from 3 to 7.7 cm and an average value of 4.9 cm. Height is generally small, with 0.6 cm as minimum value, 2.8 as maximum and 1.13 as average value. Weights can measure between 6.4 and 65 with an average weight of 30 g. Half of the specimens have a weight between 10 and 20 g.

In the catalogue are listed all the perforated sherds with a single hole, even if the hole is not perpendicular or is hourglass. Furthermore, rounded and smooth objects are inserted together with irregular objects, which might have had a different purpose.

Since Hazor has preserved a quite large typology of these objects, it seems interesting to check them more in detail. Perforated sherds are perfect candidate as spinning implement, since they are cheap, largely available, light and with large diameters. However, not all the objects that are inserted in this very broad definition can be equally considered suitable for spinning. The ideal sherd should be similar to A 56432, which is perfectly rounded, with smoothed edge and with an almost cylindrical hole. However, variant can be infinite. A 46615, for example, is a well rounded and smoothed sherd but has a small, hourglass hole. Another object, A 3804, is rounded but edge has not been smoothed and hole is cylindrical. Similar to this is A 5062, but in this case hole has an hourglass shape. A 44890, is partially rounded, not smoothed and has a tiny hole. A 13410 has not a rounded shape, but edge has been smoothed and has a nice cylindrical hole. A 27060 is not rounded and not smoothed, but has a cylindrical hole. Finally, A 41698 has an oblique hole and is not rounded or smoothed at all. This short list highlights how much different perforated sherds can be between each other. A 56432 is perfect and A 41698 is its total opposite. They can be rounded or irregular, smoothed or left untreated but the most important thing is the hole. Hole should be suitable to insert a shaft. The more it is hourglass, oblique or irregular, the less is probable that the sherd was used as a spindle whorl. As is evident in the list, cylindrical hole can appear both in well worked sherds as well as in irregular ones. There is not a direct correlation between shape or smoothness and cylindrical holes. A quadrangular or irregular sherd can work as a spindle whorl? Maybe it is not the best choice, but it can work[52]. On the contrary, oblique or too small holes could compromise the usage of the object. To conclude, the most important parameter for a perforated sherd is the shape, diameter and position of the hole.

[52] At the TRC of Leiden a wonderful sheep-shaped spindle whorl was perfectly functional.

Figure 44 Different types of perforated sherds A 56432; A 41698

4.11.5 Spinning bowls

Traditional spinning bowls were not found at Hazor nor by Yadin, nor by Ben-Tor Excavations. Some bowls with a hole on the bottom have sometimes be considered as spinning bowls. However, they are quite the opposite than spinning bowls, since the latter were (possibly) used by liquid inside and a hole in the bottom would have compromised this function.

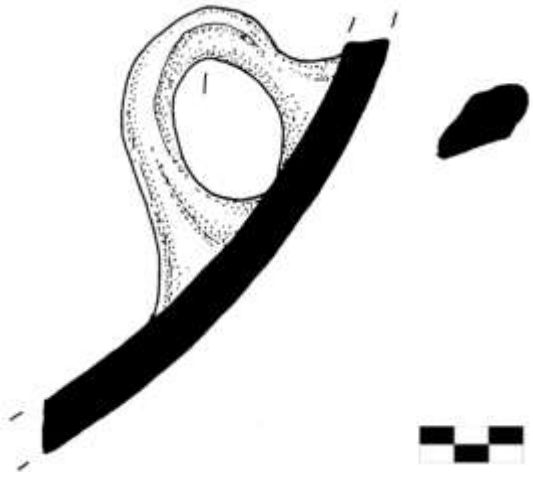


Figure 45 Peculiar loop inside the bowl (Bechar 2017, fig. 7.72)

A curious sherd with an internal loop was found in a public building in area A1 (Bechar 2017, 334). It is interesting to note the peculiar form of the loop, which closely resembles that of a handle. If the loop/handle had been found without the clear profile of the bowl, it would have been classified as an external handle, so the presence of spinning-bowls at Hazor would have been excluded.

4.11.6 Loom weights

As seen in the previous chapters, loom weights are objects made for keeping the warp of the loom in tension. Since it is not clear when the warp-weighted loom starts to be used in the Levant, all the

objects that can be used for this purpose are included and discussed in the catalogue, allowing to reject some of these specimens. As for the other sites, basalt rings will be discussed in the next chapter. Hazor has a peculiarity which other Levantine sites do not show. Besides the perforated pottery sherds and the clay loom weights easy to recognize, perforated ring bases are also present. They are much thicker than traditional perforated sherds and therefore were not included in that category. I was suggested that they might have been loom weights and for this reason they will be discussed in this paragraph, after the "traditional" loom weights and are listed in the catalogue as loom weights.

During the Early and Middle Bronze Age no loom weights were produced at Hazor and the object listed in the catalogue, was probably a counterweight. The conical loom weight, typical of the Middle Bronze Age period, is not present in this phase but it appear in the Late Bronze Age. Two of this objects have been excavated by Yadin in area BA (Yadin et al. 1989, fig. CCXXXVI: 24-5) and are dated to local phase 11, str. XV, which means LB I. These are the only two objects of this type known at Hazor, they are not known nor from earlier periods nor from later and it is a very intriguing fact, completely different from other Levantine sites. Other possible loom weights are known for the LBA, such as a flat trapezoidal weight, which is only partially preserved, and two (or more) spherical clay loom weights, one of them preserved in small fragments. A spherical stone weight might have been an unfinished spindle whorl but the conical hole makes it unsuitable to use it with a shaft. Finally, several perforated ring bases belong to this phase, but they will be discussed later.

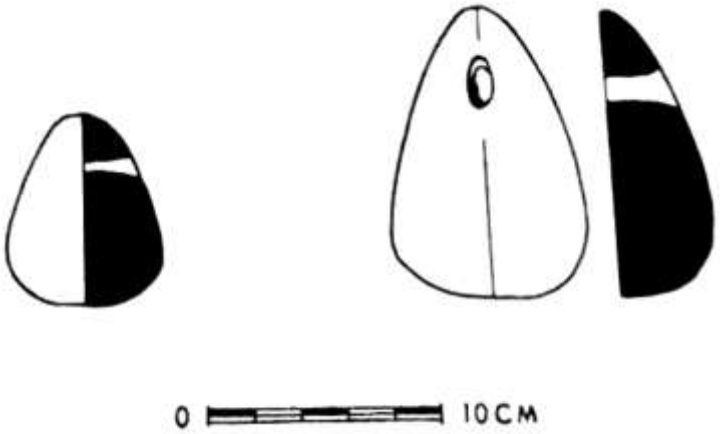


Figure 46 Conical loom weights from Hazor (Yadin 1989, fig. CCXXXXVI)

Only one loom weight was identified in levels of IA I, it is doughnut shaped and made of baked clay. The only other materials classified as weights are the perforated ring bases.

Iron Age II is the first period in Hazor in which the use of the warp-weighted loom can be recognized with certainty. Excluding the perforated ring bases, 103 loom weights are listed for the whole IA II, 29 for IA IIA-B and 74 for IA IIC. They are mostly produced in clay or baked clay, with several examples only poorly fired. Few objects are made of stone, but in these cases, they are not the common types of loom weight, even if they could have perfectly work as such. The large majority, 86 objects, has a rounded shape, spherical or doughnut. In some cases, it is difficult to separate between the two shapes, since most of the objects are broken, fragmented or partially squashed. 5

objects have a biconical shape, but in many cases their belonging to the category of loom weights and not to that of spindle whorls is far from being certain[53]. Only one object (M 75352) made of stone has a conical shape, but it is a very peculiar tool. 3 objects have a cylindrical shape, two of them made of stone and one has a discoidal shape. Unfortunately, most of the loom weights were only partially preserved when not completely disintegrated, so very few weights are available. The lightest weight measures 27 g, but it could have been a spindle whorl with failed perforation. Maximum weight is 571 g, but an incomplete weight arrives to measure 977 g. Most of the weight are around 200 g, and the average value is 206 g, which indicates a medium fine production.

It is interesting to note that not a single spool was present in the site[54].

Only few loom weights have been found together in context, while the large majority was found scattered through all the town, or in pairs. In L.3066 of area B, four loom weights are published but they were certainly more, at least 9 (Yadin et al. 1958, 31, 44). L. 1045 preserved 4 loom weights and a spindle whorl, while L. 9390 5 loom weights but no other objects used in connection with textile production. In area M, L. 10-306 two loom weights were excavated as well as two bone spatulae. L. 10-326, instead, preserved at least 17 clay loom weights, very crumbled when they were studied. No other textile tools were present in the locus, but spindle whorls were uncovered in other loci of the area.

Perforated ring bases are present in Hazor since the Late Bronze Age I, become more common in LB II and reach their peak in Iron Age II. As for the perforated sherds, they are characterized by a large difference between each piece, with generally smoothed and regular edges but with examples with irregular breaking points. Generally, however, they have hourglass or badly shaped holes, which prevent their use as spindle whorls. They have a height which can vary between 0.8 and 2.7 cm, with an average value of 1.8 cm. Diameter can range between 4.6 and 8.2 cm, with an average value of 0.75, while hole between 0.3 and 2 cm, with an average value of 0.75. Many of the objects under study were not complete, so a small number of weights is available. Their weight seems to fall within 32 and 138 g, but most of the objects should have had a weight greater than 50 g, which is much higher than perforated sherds. All considered, they appear as a category different from perforated sherds, but they show also many differences with loom weights. First of all, their weight is lighter (in general) than that of loom weights, but this does not constitute an obstacle, since they might have been employed to weave finer textiles. Secondly, their appearance in the LBA in such larger numbers is in contrast with loom weights, which are extremely rare in this phase.

[53] But see (Cimadevilla 2012, 559) for parallels.
[54] As already noted by Cimadevilla, pers. comm.

There is no proof that perforated ring bases were used in connection with textile production, but whatever their function was, a use as loom weights cannot be excluded *a priori*. Unfortunately, Hazor contexts do not provide more information, since they generally appear isolated or in pairs and are not associated with other textile tools.

4.11.7 Basalt rings

Basalt rings, as defined in previous chapters, are not present in EBA layers, and those of the MBA (47 according to Ebeling (2012, 554, fig. 11.8)) lack any detail about their dimensions, so they could not be recognised with certainty. However, Hazor has preserved some actual basalt rings, the problem is that they come from IA levels. In fact, these tools are typical of Early and Middle Bronze Age periods in the Levant, but they disappear after the end of the MBA. It would be convenient to say that those found in IA contexts are intrusive and originated from earlier strata, but since it is not possible to say with certainty that basalt rings have been found in earlier strata, it seems contradictory. Whether or not they share the same function of the older examples and whatever was the reason for their late appearing in Hazor, it seems clear that they share the same characteristic of other Levantine basalt rings. Beside shape and material, in fact, dimensions are perfectly comparable. They have a height ranging from 1.2 and 2.2 cm, with 1.6 cm as average value. Diameter falls between 3.2 and 4.6 cm, with an average value of 3.7 and weight seems quite light, between 20 and (probably) 30 g.

4.11.8 Bone spatulas and beaters

Bone spatulas are quite numerous at Hazor, although they are not equally spread in all periods, as for the other textile tools. The largest part come from IA II levels. As for the other sites, bone spatulas and points or beaters are listed together, since they had probably shared a similar function in textile production, as discussed in chapter 3.

Earliest objects are two points, and not actual spatulas, one from Intermediate Bronze Age period and the other from Middle Bronze Age II period. During the Late Bronze Age pointed objects appear besides actual spatulas. One of the spatulas preserves a triangular point, is very well shaped and is perfectly smoothed on both sides without showing traces of cancellous bone.

Iron Age I preserves only one point of bone, broken on one end. As said previously, the largest quantity of bone spatulas come from levels of Iron Age II. Specifically, 29 objects dated to IA IIA-B and 24 for IA IIC, for a total of 53 items.

Generally, they have one end make in shape of a point and the other rounded, more or less carefully. Most of the items are manufactured from cattle ribs and they follow the originally shape and convexity

of the bone. Point, when preserved, are generally short and triangular, but examples of long point and pen-nib points are also present. Most of the items appear smoothed on both sides, but when cancellous bone is still present it allows some consideration. First, it is evident that the spatulas were manufactured by cutting in half the bone longitudinally. Many of the objects under study were completely smoothed on the upper surface, as well as on the concave until all the traces of cancellous bone are disappeared.[55] However, several objects (A 1533, M 75009, M 78802) show that wear is mostly responsible for the disappearance of the matrix of the bone. In fact, they show both sides smoothed near the pointed end, while the cancellous bone start to appear towards the other tip, similarly to the examples from Gurob. It seems, then, that the flat end was the point of handling of the objects while the point was that used in contact with (probably) textiles.

Figure 47 Bone spatulae with different wear traces M 75009, M 78802, A 1533

One spatula, A 57619, is left unfinished. It has a triangular point and it is not smoothed at all. It was cut to expose the cancellous bone and it shows no traces of wear, nor in the matrix nor in the edges, which are crudely cut.

[55] A similar treatment was identified by Ariel (Ariel 1990, 129).

4.11.9 Needles

The category of needles, as for other sites, includes objects very similar to our modern concept of needles, although longer, as well as bodkins and some shafts, which use is not certain. 49 needles are listed in the catalogue, most of them belonging to Yadin's excavations. Unfortunately, I was not able to see Yadin's materials, except a small part. Some were lacking of identification number so I was not able to relate them with needles published by Yadin.

Before starting to describe needles from Hazor, it seems important to make a terminological disclaimer. Three types of objects are present at Hazor under the category of needle and loop-headed pin. Ben-Tor (2012, 534) considers the objects with a drilled eye as needles and bent or loop-headed objects as pins, but this distinction was not always followed in previous publications. The problem is that what is here considered as a bent or loop-headed object is not a needle, but an actual pin, and the bent part remains open (or folded) and not welded to close the eye (see as example (Yadin et al. 1989, fig. CCV: 12-13). What I generally refer as the object with the upper part bended on itself is always welded to close the eye (see for example (Yadin et al. 1989, fig. CCXXI: 12-13).

Only one object is dated to Middle Bronze Age and comes from a grave. 22 objects belong to Late Bronze Age layers and both types of needles are represented: eye obtained by perforating the shaft and by bending the upper part on itself. A very interesting object is a needle case made from a hollow bone, which contains five long and thin needles, all of them with the eye obtained by bending the upper part.

As usual, Iron Age I has preserved a small quantity of objects, which hardly can be defined as needles. Some, in fact, are complete but they do not show any traces of the eye.

Iron Age II has preserved a limited number of needles (12) and even in this case some objects had probably a different function from sewing. Those which can be recognized as needles preserve the eye bent on themselves.

Figure 48 Yadin 1989, pl. CCCXLIII

In Hazor, very few tombs have been so far excavated, so it is quite predictable that the large majority of textile tools come from domestic contexts. However, one needle was found in a grave, which appears consistent with traditions in other Levantine sites.

4.11.10 Conclusions: development of textile tools at Hazor

Textile tools from Hazor constitute a quite large corpus and a very interesting case study. Bone shafts are not very numerous in Hazor and are dated mostly to IA II, while the production of Southern Levant is particularly developed during the Late Bronze Age. However, Syrian bone shafts are particularly numerous in the IA, so Hazor shows closer connection with Northern Levant even in this field.

Spindle whorls are quite numerous in the site and are known since the Middle Bronze Age. In this period, a great homogeneity of materials and shapes characterize this production, with dome shaped bone spindle whorl as almost the unique type present in the site. More numerous are the objects dated to the Late Bronze Age and they show a larger differentiation. Beside bone spindle whorls, also stone and pottery whorls appear, and even if the dome shape is still prevalent, spherical, conical truncated, cylindrical and lenticular objects are also present.

Several texts allow to infer that Middle and Late Bronze Age Hazor should have been an important centre of textile production and redistribution. One of the most famous text is a letter in which a huge number of textiles and other goods have to be send to Mari and bring to Ekallatum, probably for the marriage between Yasmakh-Addu and Beltum (Ben-Tor 2016, 72–73). Furthermore, two Late Bronze age administrative documents deal with textile production and linen was also used (Ben-Tor 2016, 113, 195). A document from the Amarna archive mentions an Hazor-style garment, which should have been well renowned. However, archaeological traces found so far point to a very modest textile industry. Certainly, the impossibility to see the materials excavated by Yadin, and the focus of excavations on public buildings rather than on domestic structures might be good explanations for such a difference with textual sources. Other factors might also have reduced our chance of comprehension, the most important being the loss of organic materials, which were certainly employed to produce textile tools, as Jericho proves. Furthermore, it might also be possible that part of the textile production was not performed in the site but in small villages nearby. Hazor, therefore, would have functioned as centre of finishing or distribution of the textiles produced in the region.

In IA I, the site was abandoned and in fact only one spindle whorl was identified for this period. The largest number of whorls come from IA II layers, and it is possible to see a very different trend from the Bronze Age. Bone spindle whorls are still present but are far from being dominant, since the most common material is now stone, as is possible to see from other Levantine sites, such as Megiddo. Shapes appear to be quite varied, with dome and conical shapes as the most common types. The change in materials reflects probably a change in quality, since bone spindle whorls are lighter than the stone ones. IA II textile production was very likely of a lower quality than that of Bronze Age.

Perforated sherds must be considered with spindle whorls. As for other sites such as Megiddo, they are quite rare in EB-MB, while more common in later period. They reach their peak in IA II.
Spinning bowls were certainly not employed in spinning activities in Hazor, since so far only one fragment has been recognized. The fragment is very peculiar since it has a loop on the side of the bowl and not on the bottom, a typology that is rare but it is testified in other sites such as Amarna.
Loom weights are the most numerous item in Hazor, but they present some differences if compared to other sites. They were not in use during the EB-MB, while in other sites the MB sees the diffusion of the conical loom weights. However, this typology is not unknown in the site since a couple of conical loom weights appear in Late Bronze Age levels. Few other loom weights are known for this phase, including some spherical weights. With IA II, loom weights production increases and it is the only periods for which the presence and use of the warp weighted loom can be asserted with certainty. The vast majority is made of clay, baked or poorly baked and has a spherical or doughnut shape. No spools were recovered from the site. Batches are extremely rare and generally, loom weights appear scattered through the site, individually or in pairs. It is possible that to this corpus, perforated ring bases must be added and count as loom weights, even if there are not clear proofs from the site under study.
Basalt rings are not very common in Hazor and there are no examples for EBA, while some actual basalt rings might have been present during the MBA. Curiously, some basalt rings belong to IA II levels, while in the other Levantine sites they disappear after the end of the MBA.
A quite large corpus of bone spatulas was found at Hazor. They appear from levels of the Late Bronze Age, although some beaters/pointed objects might have been employed similarly in earlier periods. As usual, the largest quantity comes from IA II levels. They show a quite large variety of shapes, with triangular, pen-nib and long points. The other end is generally rounded. Surfaces are generally smoothed, but in some cases it is evident that the polishing was produced by use rather than by an intentional process.
Needles are known at Hazor since the Middle Bronze Age, but the largest number come from LBA contexts. For this period, both needles with eye obtained by perforating the shaft and by bending the upper part of the shaft on itself are present. Most of the objects listed as needles and deriving from IA levels had probably other purposes. The few objects which were certainly needles, all present the eye made by bending the upper part on itself.

4.12 Tell el-Far'ah (N)

4.12.1 Introduction

Tell el-Farʿah North (identified with the biblical Tirzah) is situated in the central part of the Samaria hills, on a limestone plateau, 11 km northeast of Shechem. Two perennial springs, the Ain Duleib and Ain Farʿah (one of the richest source of the country) made it attractive to ancient populations, which started to visit it since the Neolithic period. Furthermore, the conformation of the site provides natural defences on its south and northeast sides. It is well connected to the East, through the Wadi Farʿah, which joins to the Jordan River and the Middle Jordan Valley and towards the Transjordan. To the North and South, it is situated on the route from Beth Shean to the plain of Schechem. To the West, communications are more difficult, due to the Samaria hills (Chambon 1984, 9).

The tell has a quadrangular shape of 600 x 300 m, with a surface of 10 ha, but it was not fully occupied in all periods. First traces of occupation can be dated to the Pre-pottery Neolithic B, but the settlement was probably quite small with pit dwellings. Within the materials, bone spatulae and awls are quite frequent (de Miroschedji 1993, 34). The site was subsequently abandoned for a very long time, until a reoccupation during the Chalcolithic period. It is followed by a thin sterile layer and a similar architecture is detectable for the beginning of the Early Bronze period. Architecture and material culture show a radical change with the beginning of the EB II, which testify a continuous occupation until the end of the EB II, and an abandonment in EB III, since no pottery of that period could be identified. The site was resettled only in the Middle Bronze II, with two major phases of occupation, VA and VB.

The transition to the Late Bronze Age sees no major break, although the LB remains are quite poor and scanty, deeply damaged by later constructions. Iron Age phases I and II are well preserved and documented through all the site and divided in five successive periods (VIIa-e) (Chambon 1984, 11). This phase is marked by several layers of destruction: the destruction of the VIIb layer, which is generally attributed to the Omri's conquest, is followed by a period of abandonment. Layer VIId is characterized by public buildings and large houses which end with a violent fire, probably linked to the conquering of Samaria by the Assyrian king Sargon II in 721 B.C. The town was partially reoccupied and gradually abandoned between the VII and VI century B.C. (Chambon 1993, 440). No sherds of the Persian period have been detected, while some findings of the Roman and Byzantine Periods can be identified. A Medieval cemetery was excavated by R. de Vaux.

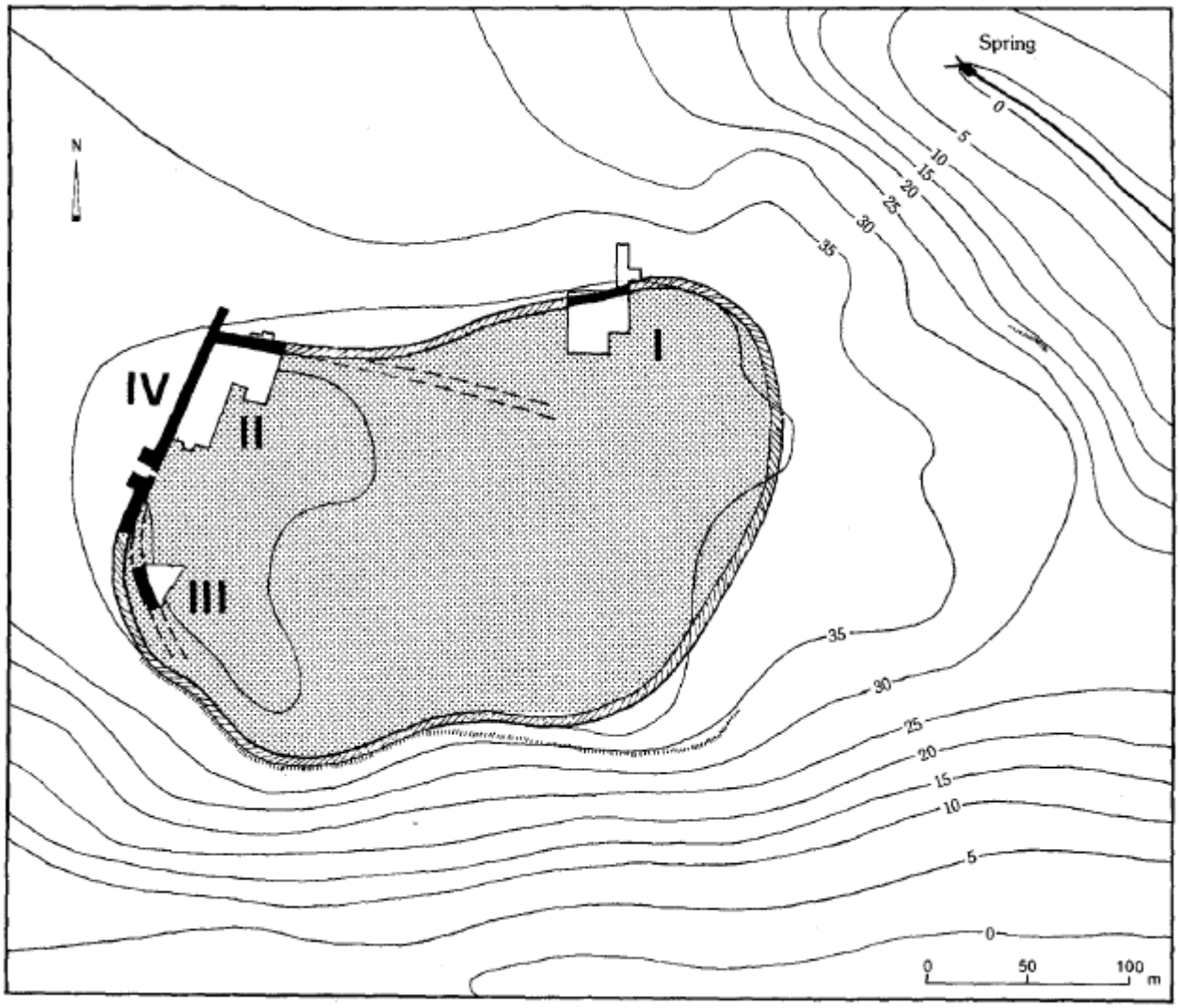


Figure 49 Plan of excavated areas of Tell el-Far'ah (de Miroschedji 1993, 433)

A first survey was conducted in 1930 by W.F. Albright, who was looking for the ancient biblical town of Tirzah. Excavations were launched by the École Française de Jerusalem, which were directed by R. de Vaux between 1946 and 1960, for a total of nine seasons. He published the preliminary results in the Revue Biblique (1947; 1947, 1948, 1951; 1952; 1955, 1957; 1961; 1962) but, unfortunately, he never published the final report, due to major works in Khirbet Qumran. Since 980's, some publications have contributed to shed light to the materials excavated by de Vaux, but, unfortunately, some important works have remained unpublished[56]. The subsequent publications have substantially revised the chronological scheme created by de Vaux and the terminology has been adapted to follow the new results of the international research. This creates some problems in recognizing how are considered different periods in different publications and, since the terminology used by da Vaux is needed to understand the preliminary reports, it cannot be abandoned. Therefore, a small chart which

[56] See for example the work of J. Balensi on the Late Bronze Age period and of P. de Miroschedji on the early periods.

compares different periods was needed. Still, LB layers give problems. It is clear that part of the structures originally ascribed by de Vaux to the Late Bronze Age should be dated to the Iron Age period (Chambon 1993, 439; Finkelstein 2012, 335, tab. 1), but part of them should be probably maintained in the frame of the Late Bronze period.

Table 7 Chronology of Tell el-Far'ah

De Vaux (1955)	Chambon (1984)	Mallet (1988)	Miroschedji (1993)	Charloux (2006)	Finkelstein (2012)
Néolithique	I		I PPNB		
Chalcolithique Moyen - Enéolithique Moyen	II		II Chalcolithique	Chalcolithique Récent	
Chalcolithique Supérieur - Enéolithique Supérieur	III		III EB I	Bronze Ancien Ia	
Chalcolithique Supérieur - Ancien Bronze I	IV		IV EBII	Bronze Ancien Ib	
Ancien Bronze I (périodes 1 et 2)				Bronze Ancien II	
Ancien Bronze II (périodes 3-5)					
Niveau 5 Moyen Bronze	V	V Phase A et B	V MB IIA MB IIB MB IIC		
Niveau 4 Récent Bronze (?)	VI		VI		
Niveau 4 Récent Bronze	VIIa (XII-XI siécle)				Late IA I-early IA IIA
Niveau 3 Fer I (XI-IX siècle)	VII b-c (IX-debùt IX)				Late IA IIA - Gap - IA IIB
Niveau 2 (IX siècle à 723)	VII d (IX-VIII)				
Niveau 1 (723 à 600)	VII e-e1 (VII-V siécle)				

A rather small quantity of textile tools was found in Tell el-Farʿah, due also to the small extent of the excavated areas. Much of the site, such as the Eastern area and the centre, was not investigated. However, they represent a very interesting corpus for comparison with the other chosen sites. Material

culture is generally local, with some imported items from other areas but generally locally produced, and therefore it constitute an interesting case study for the production of the inland central Palestine. Materials from the excavations of Tell el-Farʿah are mainly stored in Jerusalem, at the École Biblique, and partially at the Rockefeller Museum, to which I was granted full access. Only few materials, especially a box with spindle whorls, were not anymore traceable. Materials stored at the Louvre are not part of this study, since I never received answers to my requests.

To study the materials, of which only a small part is published, I was allowed to use the catalogue of objects (1946-1960) excavated by de Vaux and compiled by several scholars of the École Biblique. Furthermore, plans and notes stored at the École Biblique, and partially still available, were of great help. Nonetheless, some items are not dated since I was not able to trace back the chronology of all the loci. I hope that new studies, especially of the periods still lacking a full publications, might help to shed light on the precise chronology of these tools.

When possible, all the available data from publications are used to provide the largest possible picture of the textile production in Farʿah. This means that not only the objects I have personally measured are included in the catalogue (in blue), but also those published but not available to my research (in black). In this way, a larger number of shapes and materials of objects on which carrying out statistical analysis are available.

As for the other sites, the research includes bone shafts, which might have been spindles (with discussion on each object), spindle whorls, including those obtained from reworked and perforated sherds and loom weights. Ring shaped basalt weights are considered separately since it is not clear their precise function, even if probably related to textile production (see general discussion). Needles are included as a hint of textile finishing, even if they are not directly involved in the textile production. Bone spatulas and pin beaters are also examined to look for signs of wear compatible with their use with soft materials and to check possible connections with other textile tools.

4.12.2 Spindles

Tell el- Farʿah did not preserve any example of bone rods which could be related to spinning activities, like those from Megiddo. The items listed and discussed in the catalogue are very different from bone rods known from other Levantine sites, and were probably used for a different purpose, such as handles. It is interesting to note, however, that the surface decoration, such as the lattice pattern, is similar to the bone rods and therefore not linked to a function, but rather to the material.

4.12.3 Spindle whorls

Unfortunately, the box or drawer, where most of the spindle whorls from Tell el- Farʿah were stored, went lost and despite all the efforts to find it, it was not possible to retrace it during my stay in Jerusalem[57]. However, a small number of whorls were stored in other drawers and others have been published by A. Chambon (1984, figs 75, 77) and have been added to the catalogue.

A first example of a spindle whorl come from Chalcolithic layers and is the only specimen found for this period. It is made of pottery and has a biconical shape.

A small number of spindle whorl is known from EB I and EB II layers, all of them made of stone. It is interesting to note the difference with Megiddo, which in this period has almost all pottery spindle whorls, and a similar trend in Beth Shean. Shapes are quite varied, since spherical, conical, cylindrical and discoid type are all present. Diameters are quite wide, since the smallest are 4 cm and the biggest is 5.5 cm; heights are extremely different, from 0.7 to 3.4 cm. Unfortunately, most of the objects are broken so the weight can only be infer from the survived parts. Two objects, the lightest, were around 20 g, while other two are between 50 and 80 g. Only one object weighs more than 100 g (and another one very likely), but the choice of a very fine stone and the accurate polishing made it possible the identification as mace-heads rather than spindle whorls. The quality of yarn which could be produced with these objects seems a medium-coarse one.

The Middle Bronze Age shows a similar small quantity of spindle whorls, but as for the other Levantine sites, bone spindle whorls start to be produced. However, stone is still dominant (of the sample available) and a specimen made of pottery have been also found. Shapes appear less varied than the EBA, with almost all the objects having a cylindrical shape while dome shape is still relegated to bone. Measures are greatly varied, even between the same class of material. Diameters vary between 2 and 4.8 cm, while heights between 0.6 and 2.8 cm. Weights range between 2 (?)g and 87.21, with no clear patterns of distribution. However, since the majority of the spindle whorls are between 15 and 40 g, it is highly probable that the production was oriented to a medium quality yarn.

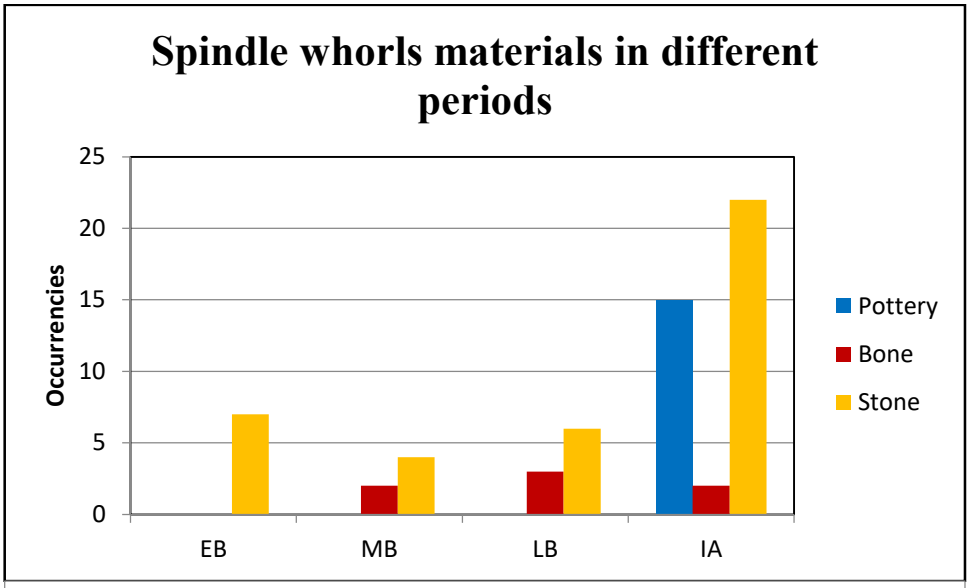
A small number of spindle whorls is available also for the Late Bronze Age period, even if it is a complicated phase for Farʿah. Stone is still the predominant material, and bone spindle whorls are present but definitely in smaller numbers. This is completely different from Megiddo, Beth Shean and Hazor, where bone is the most common material for the whole LBA. Shapes are quite varied, with dome as the most common, used for bone objects as well as for stone. Cylindrical, conical truncated, lenticular, biconical and conical examples are also present, similarly to the other sites.

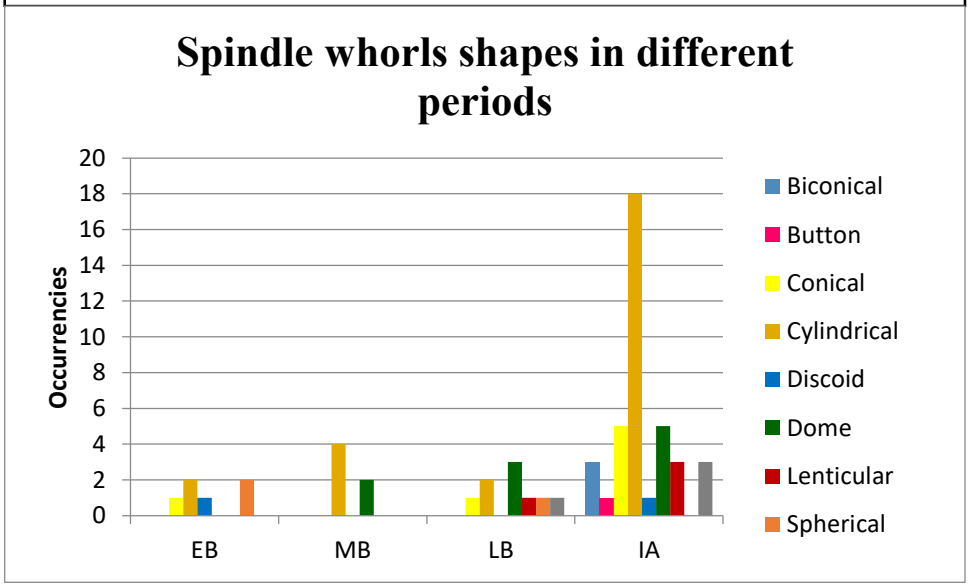
[57] I would like to thank frère J. Humbert for his kindness and for his tireless research of all the materials from Farʿah excavations.

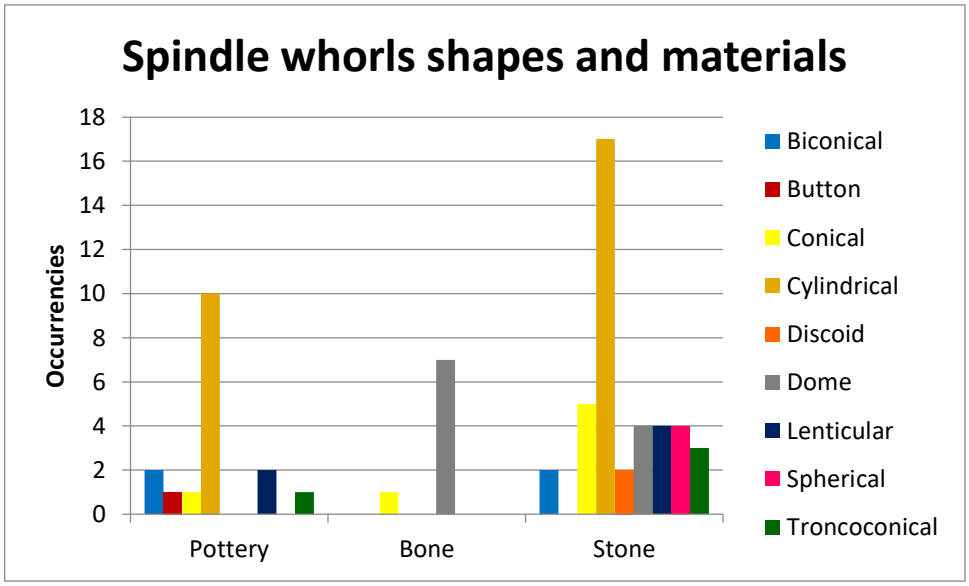
Dimensions are quite varied, but less than in the earlier periods. Heights range between 0.5 and 2.1 cm, but most of the objects have values around 1.1 cm. Diameters vary between 2 and 3.8 cm, and most of them are over 3 cm. Similarly, weights are varied but lesser than in other periods. The lightest whorl weighs 2.39 g, and the heaviest 33 g. Five spindle whorls, three made of bone and two made of stone are extremely light, from 2.39 g to 9.91 g. These objects are very similar to the very small items already discussed for the LBA spindle whorls from Megiddo. As in that case, perforations are very small, ranging from 0.2 to 0.4 mm. The other whorls are much more varied in weight, ranging between 15 and 33 g. If the very light objects have to be considered as spindle whorls, they indicate a very fine quality production, while the other whorls a medium, medium-fine quality.

Iron Age I was identified by De Vaux as Niveau 3 and by Chambon as period VIIa, but, according to I. Finkelstein, it is not possible to identify a layer safely attributable to IA I (Finkelstein 2012, 335). Since this is one of the latest work appeared on IA I-II in Tell el-Farʿah, I would consider this chronology as the most reliable and updated. Therefore, Chambon's period VIIa will be considered as belonging to late IA I and early IA IIA, as proposed by Finkelstein, and the relative objects will be processed together with the other IA II layers.

Spindle whorls from IA II layers appear in major quantities than in earlier periods, as it is for all settlements investigated in this research. However, joining together those still present and available at the École Biblique and those published by Chambon (Chambon 1984, fig. 75), only 39 specimens are recorded. Stone spindle whorls are the most common, as is the typical trend of IA II in the region. However, bone spindle whorls are not very common, since only a couple of examples are recorded. Instead, pottery spindle whorls appear quite frequently, almost as numerous as those made of stone. The most common shape is cylindrical, both for stone and pottery whorls, and again this data are in contrast with the regional trend. Only five examples of conical spindle whorls are listed as well as five dome shaped examples, made of both stone and bone. Many other shapes are recorded, mostly in very few specimens: conical truncated, lenticular, button, biconical, discoid. Not for all the objects measurements are available, so statistics are reliable only for diameters and heights. Heights vary between 0.5 and 2.7 cm, with an average value of 1 cm. Diameters ranges from 1.2 to 4.2 cm, with an average value of 2.5 cm. Very few weights are unfortunately available and most of them are between 2.2 and 5.2 g, so extremely light. One item weighs 32.26 g.


Spindle whorls materials in different periods
Occurrencies
25
20
15
10
5
0
EB
MB
LB
IA
Pottery
Bone
Stone


Spindle whorls shapes in different periods
Occurrencies
20
18
16
14
12
10
8
6
4
2
0
EB
MB
LB
IA
Biconical
Button
Conical
Cylindrical
Discoid
Dome
Lenticular
Spherical


Spindle whorls shapes and materials
Occurrencies
18
16
14
12
10
8
6
4
2
0
Pottery
Bone
Stone
Biconical
Button
Conical
Cylindrical
Discoid
Dome
Lenticular
Spherical
Troncoconical

4.12.4 Perforated sherds

Perforated sherds are quite rare in Farʿah, since only a few items have been recovered for all the periods under consideration. However, as for the other sites, they appear as quite rare in early periods and more common during the Iron Age. If we consider all of them as possible spindle whorls, it is interesting to note that they represent almost 40% of the whole spindle whorls dated to Early Bronze Age, 50% of the Middle Bronze Age assemblage, 44% of the Late Bronze Age and finally 28% of the Iron Age II assemblage.

They are characterised by a quite large diameter, 4 cm on average, and a rather small thickness, 1 cm on average. The largest objects has a diameter of 6.6 cm and the smallest 1.9 cm, which probably is not to consider in this category. Weights can measure between 2.9 and 48.9 with an average weight of 16 g, which is much more lighter than those, for example, of Megiddo.

In the catalogue are included all the perforated sherds with a single hole, even if the hole is hourglass or not perpendicularly perforated, making the fastening to the spindle more difficult but not impossible.

The context of findings of reworked sherds appears to be always domestic and never funerary, as in other sites. Some of these perforated sherds have been found in context with other tools, only rarely with other perforated sherds, and in very few instances in association with other textile tools, including spatulas and needles.

4.12.5 Spinning bowls

Not a single fragment of a spinning bowl has been recovered in Farʿah for all the periods under consideration.

4.12.6 Loom weights

As for the other sites, all the objects that can be used as weights on a warp-weighted loom are listed and discussed in the catalogue. Basalt rings, as usual, will be discussed in the next chapter.

In the Early Bronze Age, very few objects could be considered as weights. All of them are made of stone, with very different weights between each other. Two of them have an hourglass perforation but in one case, it is not finished. Because of their small number and the great difference in shape and size, it is difficult to recognize them as a uniform category and they probably had different purposes.

A new type of objects appear in the Middle Bronze Age, the conical clay loom weights. 7 examples are listed in the catalogue and all of them are pierced horizontally, differently from Megiddo where vertically perforated examples are also present. None of them shows a surface treatment, however they have been carefully modelled. One weight has a sort of groove on the top, possibly for attaching

to an additional element before fastening to the warp. Only one loom weight show the presence of a scarab impression, like those found in Megiddo. Only one object has a spherical shape, like those of the Iron Age. Three conical weight come from the same locus, L. 571, while a fourth one is indicated as coming from underneath the same locus.

Late Bronze Age period sees the disappearing of conical clay loom weights and a general paucity of objects, which can be considered as weights. As for the Early Bronze Age, it is not possible to consider them as loom weights, since they are very different between each other for material, dimension and shape.

The large majority of Farʿah loom weights come from IA II layers, with 97 objects recorded, but much more identified during the excavations. Probably, due to their fragile nature, they crumbled and were not kept in storage. Most of them are made of clay, and can occur in unfired, poorly fired or well fired clay. Seven weights are made of stone. They have a rounded shape, which can vary between spherical or more flattened and irregular doughnut shape, but in many cases the difference is not so marked. Some cylindrical examples are also present. Stone weights are very different between each other for shapes and measurements, with cylindrical, spherical and discoid shapes recorded. Weights can vary between 68 and 252 g.

Loom weight made of clay are in most cases incomplete, but a good number is enough preserved to provide reliable data. Measurements and weights are extremely variable. In fact, heights can vary between 2.4 and 7.6 cm, with an average value of 4.5 cm. Diameters can vary between 2.5 and 10 cm, with an average value of 6.3. Weights vary between 81 and 576 g, with an average value of 167 g, which is a quite light weight.

Contrary to the other sites under study, most of the loom weights were found in two large batches, and only a few come from scattered loci. These two batches were recovered in L. 150 and 430. Locus 150 is dated to level VIId and belongs to palace 148. Against wall W around one hundred of clay loom weights were found, together with a stone weight. The stratum where the loom weights where found appeared as mixture of burnt earth and wood (Chambon 1984, 108). Pottery as well was burnt (Chambon 1984, 80). Of the original one hundred loom weights, only 56 were stored at the École Biblique, as well as some small fragments. Only few objects are complete and it is possible to see that weights are slightly lighter than the average values. The minimum weight is 81 g, the maximum 391 g and the average value is 141 g.

The second batch comes from L. 430. In origin, 34 loom weights where found in a pile near a corner of the room (Chambon 1984, 134). They belong to layer VIIb. 32 out of 34 loom weights are still stored at the École Biblique and are in good condition of preservation. They appear much more

uniform than the other group, since weights vary between 116 and 127 g, with an average value of 158 g, which is slightly heavier than the preceding batch.

Figure 50 Box of loom weights F. 1510

4.12.7 Basalt rings

As discussed in previous chapters, stone rings of torus shape are spread in the Levant between the Early and Middle Bronze Age. After this period, they seem to disappear and not be used again. However, Hazor has provided objects which could perfectly fit the category for shape, materials and dimensions, but are dated also to the Iron Age. It seems that Farʿah provides a pattern similar to Hazor.

First basalt rings appear in Farʿah during the Early Bronze Age, and 10 objects are recorded for this period. They appeared quite different between each other for dimensions and weights. Heights ranges between 1.3 and 3.1 cm, with an average of 2 cm; diameters between 3.3 and 5.5 cm, with an average of 4.1 cm. Holes appear quite large, since they vary between 0.9 and 1.7 cm, 1.2 cm on average. Weights are extremely different, they vary between 28 and 116 g, with an average value of 48 g. However, most of them have a weight lighter than 50 g, and only one object is completely over. All the other examples perfectly fit in the category of basalt rings. If they have to be considered as spindle whorls, they would have a medium weight, while if they have to be considered loom weights their weight should be considered very light.

Only a single specimen is known for the Middle Bronze Age, while six example are listed for the Late Bronze Age. Unless their chronology will be reassessed in the future, this is a very unusual element. Measures and weights are similar to those of the EBA, with heights ranging from 1.5 to 2.6 cm, diameters from 3.6 to 4.7 cm, holes from 1.1 and 1.5 cm and weights from 31.53 to 73 g. All of them are made of basalt, as in the EBA.

Other six basalt rings are recorded for the Iron Age II, and they appear very similar to the earliest objects, although are slightly smaller and lighter. Heights vary between 1.5 and 2.3 cm, diameters between 2.6 and 4.6, holes between 0.8 and 1.2 and finally weights ranges between 13.6 and 49.9 g, with an average value of 34.5 g.

As in the other periods, all of them are made of basalt and holes are generally hourglass, but some specimens with more regular and cylindrical holes can appear. Surface treatments can vary between a very polished surface to roughly smoothed surfaces.

Figure 51 Basalt rings F. 4416, F. 4739

4.12.8 Bone spatulas and beaters

Several examples of what can be called spatulas and beaters have been found from all periods of Farʿah history.

Several bone spatulas come from EBA layers, 17 in total. Depending on the shape of the bone from which they are cut, mostly cattle and sheep/goat ribs, they have different width and thickness. Points are elongated or triangular, while the pen-nib type seems to be absent. The other end, when preserved is simply rounded or smoothed.

10 beaters or points have been selected. It must be said that several other pointed objects where rejected during the phase of study, because their shape or their surface treatment seemed not to be suitable in weaving activity or where simply points which could have been used in many other ways.

Figure 52 Pin beater F. 3699

Beaters are a very difficult category and, as seen in general discussion, their function is not clear and many purposes have been indicated as possible. Since their shape is suitable for weaving activity, their polishing seems to have been caused by rubbing with soft materials and an ethnographic parallel of their usage in weaving was found, they are included in the catalogue. Each of them is discussed and described, with attention to the shape of the point and to wear traces.

For the Middle Bronze Age only six spatulae were found, all of the complete examples have an elongated point. Beaters are eight, all of them with a polished surface and in many cases with wear traces.

Only one bone spatula was recovered in Late Bronze Age layers and has a triangular point. Beaters are more numerous, since six were found. They show a polished and smooth surface, when preserved, but in one case the point is too thin and sharp to have been used during weaving.

Only one beater is known for IA II while five spatulas are known for this period. Points appear of the triangular and elongated type, while the pen-nib point seems not very common in the site, only two examples are known (from undated contexts).

As for the case of Hazor, it is evident that the spatulas were manufactured by cutting in half the bone longitudinally. Many of the objects under study were completely smoothed on the upper surface, as well as on the concave until all the traces of cancellous bone are disappeared. They show both sides smoothed near the pointed end, while the cancellous bone start to appear towards the other tip. It seems, then, that the flat end was the place of handling of the objects while the point was that used in contact with (probably) textiles.

Figure 53 Bone spatula F. 4226

4.12.9 Needles

As seen for other sites, the category of needles includes actual needles and bodkins as it is impossible to be sure of their function.

37 needles and bodkins have been recorded from Farʿah, which is a good number if compared with the other tools. Furthermore, it must be considered that wooden bodkins were also certainly in use, as well as very thin bronze needles which might have not preserved.

Eight bone needles or bodkins are recorded for the EBA, and are characterized by a squared flattish head, with a rounded hole carved in the shaft. For the MBA both bronze and bone needles are preserved, although in a very limited number. Only five specimens are known for this phase, the bone needles are very similar to those of the earlier period. The bronze needle are long and thin and both show the eye made by bending the shaft on itself. Late Bronze Age needles are slightly more numerous, with 13 objects recorded. Almost all of them are made of bronze, only a single object is made of bone and it is incomplete. Several types of needles are represented, from the common needle with obtained by bending the upper part of the shaft on itself, to a type more similar to toggle pins. In fact, eye is made on the shaft of the object, which is enlarged to obtain a circular hole, near the end or slightly more centrally. However, differently from toggle pins, shaft is very thin and more similar to needles rather than to pins. Finally, a peculiar type see the creation of a very long and thin eye, melting the metal and with an irregular form. Only nine needles are known for IA II, both made of bone (one bodkin) or bronze. Bronze needles show the eye obtained by bending the upper part of the shaft on itself. The typology obtained by perforating the shaft from one side to the other seems completely absent from this site.

Figure 54 Needles F. 329; F. 2412

4.12.10 Conclusions: development of textile tools at Farʿah

Tell el-Farʿah (N) preserved a rather small but very interesting assemblage of textile tools. Bone spindles and shafts are not present for any period under consideration, showing that they were not uniformly distributed in the Levant.

Spindle whorls still available to study or published are not very numerous. Nonetheless, some remarks can be made. The first example of a spindle whorl belong the Chalcolithic layers, and is made of

pottery, while all the EBA specimens are made of stone. Shapes and dimensions are quite varied but whorls seem to be oriented toward a low quality production. During the MBA, stone is still the preferred material, even if bone begins to be employed, as is the common trend in the Southern Levant. Shapes and dimensions are still very varied, but seem to indicate a medium quality production. In contrast with the other Levantine sites under investigation, bone spindle whorl are not the predominant typology in LBA Farʿah, but stone is still prevailing. Some examples are very small, and the yarn production seems to have shifted to a fine or medium-fine quality product. Finally, IA II whorls are mostly made of stone, which follows the trend of the region, but bone remains rarely employed while pottery examples are much more numerous, again in contrast with the regional trend. Furthermore, dome and conical shapes are not the dominant type, but the most common shape is the cylindrical one. To spindle whorls perforated sherds must be added. They are quite rare during the EB-BM periods and they reach their peak of production during the IA II, as is common in all the other sites investigated.

Spinning bowls are not present at all in Farʿah.

Loom weights are certainly introduced during the MB I, while the EB examples might have been only counter weights. MB loom weight are conical and made of both baked and unbaked clay. All the specimens are horizontally perforated and they not present a surface treatment. One example has a scarab impression, like in the case of Megiddo. An example of spherical loom weight is also known. As for other Levantine sites, loom weights seem not to be known in the LBA, while are very numerous in the IA II and the most common shape is the spherical or doughnut. Most of them are made of clay, baked or unbaked, but a very small number of stone objects is also known. The large majority was found grouped in two large batches, one with all the weights still preserved, while the other with only half of the loom weights available to study.

Basalt rings can be considered either loom weights or spindle whorls. They are generally common in the EB and MB phases, and tend to disappear in later period, but Farʿah does not fit the general picture. In fact, first basalt ring appear in EBA levels, while only one object is known from MBA levels. They appear again in LBA layers and are definitely common in IA II levels. They present similar characteristics to those of the earlier periods, such as dimensions, weights, hourglass hole and diversification in surface polishing.

A quite large collection of bone spatulas and beaters are known from all levels of Farʿah excavations. They are made from cattle and sheep/goat ribs, while beaters from metacarpal or metatarsal bone of sheep/goats. The typical shape of the spatulas from Farʿah is elongated or with a triangular point, but one example of a pen-nib point is also present. Beaters are generally worked and polished only near

the point, while the other end is left unworked. These tools are more common in the earlier periods than in the IA, while bone spatulas are generally more frequent in IA layers of the region.

Needles and bodkins are quite numerous in the site and appear as early as the EBA with bone specimens characterized by a squared head. From the MBA onward, bronze needles are also present and show the characteristic Levantine eye obtained by bending the upper part of the shaft on itself. More examples are known for the LBA, almost all made of bronze, with several types of eye known. However, the eye obtained simply by perforating the shaft is not present in the site at any period. The IA II does not show a changing in the typologies of needles nor in the materials employed, since both bronze and bone are still employed. Strangely, quantity is quite modest.

4.13 Conclusions: Levantine textile tools

Textile tools are a quite common finding in Southern Levant excavations, especially for Iron Age levels. In fact, although almost all periods have preserved important quantities of objects linked to spinning and weaving, a remarkable displacement is visible in favour of the Iron Age period. This is due mainly to two reasons, completely different between each other. The first one is inherent to the documentation under study, since loom weights, which often constitute the largest evidence of textile production, become common and ubiquitous in Iron Age II. The second reason, instead, is due to choices of the excavators who, for a very long time, focused their attention mainly to layers possibly related to the Biblical text, and devoting less attention to later or previous periods. This produced an impressive amount of excavations of Iron Age sites and of pottery and other objects of this period, which has no comparison with other Levantine historical phases.

Spindles are a rare finding in the Near East and Southern Levant does not constitute an exception. Very few objects which could be considered as spindles were found and are very different between each other. It is not possible, from this very small evidence, to draw out any conclusion about shapes of spindles, but two implements from Megiddo are particularly interesting. First of all, they show that spindle whorls could be used in pairs and that could be mounted on pegs and not on shafts. Second, similar bone shafts are well known from other Mediterranean contexts (Syria, Anatolia, Cyprus, Greece and Italy) but they are generally found without spindle whorls. Even if the function of many of these rods can only be supposed, the Levantine tools add some more hints to the general picture.

The appearance of spindle whorls can be dated very early, since some stone spindle whorls were found in Pre-pottery Neolithic B levels. The production appears quite varied, but some trends are recognisable. In fact, stone whorls are quite common in early levels, especially made in discoid shapes but they are soon flanked by biconical pottery whorls. The Middle Bronze Age sees the appearance of the bone whorls, which are generally dome shaped, and which will be quite widespread during the Late Bronze Age, for decreasing in the Iron Age. In fact, Iron Age II sees a more frequent employ of stone spindle whorls to the detriment of other materials. Pottery spindle whorls appear always rarely used in Southern Levant. Besides these general trends, it has to be reminded that many local and regional pattern are present in the area, sometimes due to local resources (as gypsum in the Beth Shean Valley) or to specific necessity linked to the production (*e.g.* heavier whorls for production of thicker yarns).

Many of the whorls under consideration might actually have been beads or decorative elements and it appears very difficult to trace a clear line between each category. Furthermore, findings from

Levantine sites are often contradictory, with the same objects used as whorls as well as (probably) decorative elements (*e.g.* dome shaped whorls from Megiddo and Tel Dan).

Far from being conclusive are also the evidence about the position of the whorl on the shaft. If the findings of spindles from the Levantine area seem (but only seem) to point toward a high-whorl spindle, wear traces near the hole of spindle whorls seem to testify of dropping from a low-whorl position.

Besides traditional spindle whorls, some perforated sherds were likely used as whorls and in the Chalcolithic period they constitute a very high percentage of all the findings linked to spinning. However, it is important to check if the perforation is suitable for the insertion of a shaft, *i.e.* with a rounded and quite large hole and straight through and not diagonal. In fact, many objects in the catalogue are not to be considered as possible whorls and should had therefore another usage.

Spinning bowls are quite rare findings in southern Levant and appear casually distributed. Some sites preserve a large quantity of these bowls, some sites just one specimen, most of the sites not a single specimen. They were known since the Ghassulian period but they ceased to be produced after that period. They appear again in the Late Bronze Age and in few sites of the Iron Age. Even if produced in local pottery, they often resemble Egyptian artefacts and their rare usage might be linked to the presence of Egyptian families involved in textile production.

Other objects common both to the Levantine area and Egypt (as well as many cultures around the world) are small bone tools for beating the weft and keeping the warp in order: pin beaters and spatulae. They appear frequently in excavations since the Neolithic period and, even if their usage in connection with textile production is often difficult to be proven, it seems quite a reasonable explanation for many of them. Interestingly, they are quite rare during the Late Bronze Age and the Iron Age I and they become more widespread with the Iron Age II. It is possible that they were linked to specific weave, but probably not to a specific loom as it has been commonly stated.

Basalt rings appear as a clear and easy to recognise category, spread through all over the Levant and reaching sites in the Lower Egypt. However, much more problematic is defining their function. Some of them, probably the smallest and better refined, could have been used as spindle whorls, but the others were very unlikely have been used as loom weights. In fact, they appear very light, groups are generally not so numerous for allowing the creation of a textile and no other objects which could be used as loom weights are known for contemporaneous phases. It has to be remarked that they do not disappear after the Middle Bronze Age, but their number is certainly smaller than that of the Early Bronze Age.

Loom weights represent a well known category of objects for textile production. Excluding basalt rings, they seem not to appear before the Middle Bronze Age, when a conical typology becomes quite

common and spread in all the region. Late Bronze Age findings are much more limited and problematic, since they appear as mixed with later materials. From the Iron Age I and even more the Iron Age II, clay loom weights, spherical or doughnut shaped, appear as a common feature of the Levantine region. However, regional differences can be detected, as the more common usage of the spool type in sites connected with Philistines, while in the Beth Shean Valley pear shaped gypsum loom weights are quite common. While spools have been sometimes connected with different cultural traditions, gypsum loom weights seem linked to the exploitation of local resources. O. Shamir (2013, 9) recognize in this region and in the quite low weight of the loom weight a possible link with the production of linen textiles. In fact, the few findings of fibres in the region are made of flax, and archaeobotanical studies are proving the production of flax in that area. However, linen textiles are found also in regions were flax was certainly not cultivated and the low weight of loom weights has been recognised as more suitable for flax by O. Shamir and for wool by Ide Demant[58]. Therefore, it is probable that the Beth Shean valley produced linen (but there are no reason for completely excluding wool) but the connection of linen with specific types of loom weights seems quite problematic at the present state of our knowledge.

Needles and bodkins are quite rare findings in southern Levantine sites. They do not show any specific connection with other textile tools and they appear in all possible contexts. Even for this type of objects some trends can be identified. In fact, bone needles appear quite common in early phases, while they become rarer after the Middle Bronze Age. Two types of metal needles can be recognised: a first one with hole perforated through the shaft, and another one with hole obtained by bending the upper part of the shaft. This second type is quite specific of the Levant and is not found in Egypt.

An impressive feature of southern Levantine contexts is the homogeneity of the region in adopting typologies of textile tools. Even if there are differences between site to site and regional specificities, it is evident that the whole Southern Levant adopted the same textile technologies, *i.e.* bone shafts, stone spindle whorls in the Iron Age, conical loom weights in the Middle Bronze Age and doughnut shaped in the Iron Age, etc. This is impressive, especially if compared with nearby regions, where some of these trends will never be adopted.

[58] Pers. comm. Tests conducted in Lejre, Denmark.

5 Textile tools from Egypt

5.1 Spindles

Outside workers' villages related to funerary Pharaonic tombs or town, such as Amarna, Kahun, Gurob and Deir el-Medina, very few organic materials have preserved. Therefore, complete spindles are known almost exclusively from these contexts, which cover a very short period of Pharaonic history, meaning Middle and New Kingdom. One exception is represented by the Old Kingdom settlement of Elephantine, where a spindle whorl with a fragment of the shaft still present has preserved. Interestingly, the shaft is made of a different wood than the whorl (Kopp 2018, 73). A shaft without whorl but with a notch at the top was probably a spindle as well (Kopp 2018, 99, Abb. 42).

Despite the peculiar nature of workers' settlements, which only partially reflect the organization of actual Egyptian town, they offer in any case some interesting clues about how spindles were made and allow to see some elements of continuity and some elements quite distinctive.

All the preserved examples of spindle shafts are made of wood, no ivory, bone or metal rods seem to have been used for spinning. Almost all the shafts are slender shaft with one end pointed, the other flat or rounded but slightly thicker; the largest point is at around one third of the entire length. In some cases, this thickening is not present and it influences the shape of the hole of spindle whorls. At the top of the spindle, a groove for fastening fibres is incised. Not all the examples have it, but the large majority show its large usage. Two types of groove are known, one short, simple notch near the largest end of the spindle, or a long, spiral and deep groove which covers a long portion of the upper part of the shaft. In some cases, this groove can make a complete round on the shaft and arrive to measure 4-5 cm. In other cases, only a quarter or half of a round is incised, with a length of 2 cm.

Spindle shafts can differ a lot for length and thickness, even inside the same site. The longest, complete spindle from Lahun measures 38.3 cm, from Deir el-Medina 37. 2 cm, and 33.4 cm from Gurob. Several examples, which have the same, identical shape, measures between 20 and 25 cm. Three different types of shaft are therefore distinguishable. A first type with a quite large diameter and a length between 20 and 25 cm. A second type, with the same diameter of the first type, but much more longer, from 30 to 40 cm. Finally, the third type is completely different and is characterized by a very thin shaft and generally has a small notch incised and not the cylindrical groove. Shafts are of the short type, generally from 20 to 25 cm, but a couple of examples, almost complete, measures only 16 cm.

Diameters can vary a lot, from 0.77 to 1.4 in Kahun (measuring the thickest point of the shaft), from 0.4 to 1 cm in Gurob and from 0.5 to 1.2 in Deir el-Medina. The third type of shaft is known only in

Gurob and the thinnest shafts have an average diameter of three mm, and only in some points, they reach 4 mm, being very different from the other two types.

Gurob presents the largest variability of shafts, with all the three types present, while the other sites have only the first and second type. Shafts are generally preserved with the spindle whorl still attached (and it was not possible to remove it), so it is not possible to provide their exact weight.

Few examples of spindles are known also from Lisht North, mostly from the New Kingdom settlement. They have not been published with their measurements and the only available data are those present in the Metropolitan Museum online catalogue. Similarly to examples from Kahun, Amarna and Deir el-Medina, they present a wooden shaft tapering towards one end and groove for fastening fibres to the other. The extremely thin shaft known from Gurob seems not to be present.

Figure 55 Spindle shaft from Lisht 15.3.1101 @Metropolitan Museum of Art

Spindles are tools that never occur in ancient Egyptian tombs. In fact, Egyptians bring with them large sets of objects pertaining to daily life, from food to textiles, to writing sets, but spindles are not among them. A couple of exceptions can be found in Kahun (Quirke 2005, 115) and Gurob (Brunton and Engelbach 1927, fig. XIII.8), where some spindles were placed inside graves. In the case of Gurob, the example is quite famous due to the fact that it was interpreted as an evidence for the presence of foreign people[59]. In Deir el-Medina, instead, despite the impressive number of textile tools recovered, none comes from tombs. Even those of the eastern necropolis (Bruyère and Jourdain 1937, 63), which belonged to people less wealthy than the western necropolis and where a large number of women were interred, did not contain any spindle or whorl. This fact is very interesting since it seems that spindles never gain a symbolic meaning, neither for the afterlife nor for representing the female sphere, contrary to other cultures. In the Greek and Roman world, in fact, women are frequently represented while spinning and weaving, and spindles become symbols of femininity and of their domestic role[60]. A similar situation is known also for the Hittite and Syro-

[59] See chapter 5.10.2 for further discussion on the presence of foreigners in Gurob.
[60] See for example (Cottica 2007, 220)

hittite area, where spindles appear in rituals as symbols of femininity (Haas 1994, 364–65) as well as in funerary monuments (Cecchini 1992, 12; Bonatz 2000, C33, C51, C60-62, C68). In Egypt, instead, both women and men are represented while spinning and weaving, which suggest the reason why they were not associated only to the female sphere. Spindles can appear in funerary paintings and models but only in contexts of representations of daily life activities, performed probably by servants and not from the lady of the house. An Egyptian Penelope, represented in literature and art while working on textiles, would have been inconceivable. However, an Egyptian representation shows the unimaginable. A lady, Dirpu, Chantress of Amun during the 21th dynasty, is represented in a funerary papyrus while holding a spindle with a hand (Bruyère 1939, 230, fig. 120). However, the spindle may here be represented for its significance of repelling the evil forces, as is present in the hieroglyphic writing. It should be interpreted for its phonetic rather than ideographic value[61].

56 *Papyrus of Dirpu, 21th dynasty (Bruyère 1939, 230)*

[61] I would like to thank you prof. E. Ciampini for his advice.

5.2 Spindle whorls

Spindle whorls are known in Egypt at least from the Neolithic period, with a spherical limestone spindle whorl known from the excavations of the Fayyum (Caton-Thompson and Gardner 1934, 40, pl. XII:5). It is interesting to note that in early periods, wooden spindle whorls are rarely used or preserved. In fact, despite some whorls were present in graves, and had better chances to have preserved, very few examples of wooden implement was found. Stone spindle whorls are, instead, very common. The predominant material seems to be limestone and spherical shapes are preferred. However, a large number of perforated pottery sherds are also present (see next chapter). Unfortunately, objects which have been studied for this thesis were fragmentary and no weights can be measured. However, their large diameter and quite considerable thickness point to heavy tools for the production of thick yarns (which would be perfectly in line with textile fragments known from the site (Jones 2008, 107).

Early whorls - The Badarian and Predynastic periods cover more than a millennium of history and it would be very interesting to investigate how spindle whorls changed in this very long time, especially considering the impressive changing evident in the textile remains. Unfortunately, very few spindle whorls have been published and very rarely information about measures and shapes are provided. It is not possible, therefore, to pinpoint specific trends of development through time or even differences from Upper and Lower Egypt at the same time. Hopefully, if future publications will start to eventually publish mundane materials, a more clear pattern of development will be available.
Maadi represents a virtuous exception, since lots of useful information are present in the publications (Bajeot 2017, 317; Ulrich Hartung et al. 2003, 189, Abb. 19). An extremely large number of stone spindle whorls was identified in the settlement, while not a single specimen was found in tombs (Rizkana and Seeher 1988, 52). 314 objects are outlined in the publication, 299 made of limestone and 15 of basalt, but this last category is very likely to be the so called “basalt rings” and will be investigated separately. Several whorls are described as having part of the wooden shaft (burnt or unburnt) still placed in the hole (Rizkana and Seeher 1988, 52, pl. 96). One of this shaft still had plant fibres wound around it and used as padding to improve the cohesion of the shaft in the hole (Rizkana and Seeher 1988, 108). Limestone whorls present a surface quite rough and with parallel traces of scratching which (I suspect) were indications of the manufacture and polishing of the surface. Perforation is hourglass, started from both sides and leaving the hole slightly irregular, with striation of the drilling still visible on many examples. Diameter perforation varies between 0.5 to 1 cm, and weights can vary between 30 to 70 g, pointing to a medium-low quality of yarn production. Different shapes of whorls seem present, from discoid or cylindrical examples, to dome shaped and finally

spherical examples. Conical whorls seem not to be very common since only 8 objects are known (Rizkana and Seeher 1988, 52). Finally, surface decorations might appear in form of painted rows of dots (although different from those of the mace-heads models) and of incised lines.

In Hammamiah, spindle whorls are very rare in Badarian contexts, but they start to appear more frequently in Predynastic contexts (Brunton and Caton-Thompson 1928, 97–101, 103–4, 106–7, 109–11, pl. LXX, LXXII). However, a breccia spindle whorl from grave 5152 should be pointed out. As for Maadi, they are made of limestone and have dome or spherical shapes, although cylindrical objects are also known. Even in this case, they come from settlements and not from tombs. Those available for study and listed in the catalogue have a diameter of generally 3.5 cm and a height of 2.5 cm on average. Most of the items were only partially preserved, but those complete have a quite light weight, from 21.9 g to 31 g. An exception is represented by a complete different object, a ball of unbaked or roughly baked clay and with a very warped hole (7623). It is slightly larger and heavier than whorls.

Few spindle whorls are known from Naqada**,** both from graves and settlement. In this case too, they are described as rounded and made of white limestone, but a spindle whorl from a grave was made of pink and white limestone (W. M. Flinders Petrie, Quibell, and Spurrell 1896, 26, 54). Those available for study show several examples of spherical, conical and dome shaped whorls, but there is much more variety on materials. In fact, limestone is the prevalent material for whorls but not the only one. Some examples of chalk whorls are present, as well as a bone, a pottery and a wooden whorl. Spherical shape is not the most common but dome spindle whorls are much more frequent. Few examples of conical whorls are also present. Dimensions are very similar to those of Hammamiah, with an average diameter of 3.6 cm and a height of 2.7 cm but are slightly heavier, from 28 g to 50 g. The bone whorl have a much lighter weight of 9.5 g. One of the object (4543) has a hole which is not straight, at a certain point forms an angle, which prevents the use of the object as a spindle whorl.

Predynastic spindle whorls were also found in Balla**s** settlement (W. M. Flinders Petrie, Quibell, and Spurrell 1896, 2, 14) and graves (Podzorski 1994, 441). All the specimens listed in the catalogue are made of limestone and shapes are similar to those of other Predynastic sites: spherical, cylindrical and domed. Dimensions are slightly more variable, since diameters ranges between 2.7 and 3.8 cm, heights from 1.6 to 3.3 cm. Clearly, weights are more varied too, since the heaviest weight is 51 g and the lightest 11.9 g. One of the objects (4540) has an incised "X" mark on the surface. Podzorski (1994, 441) reports that also discoid stone spindle whorls are known from the site.

The site of Abydos has probably preserved a large quantity of spindle whorls, but it is very difficult to understand it from the several publications. In fact, many objects are defined as model mace heads (Naville et al. 1914, 15) but very few information is provided. Petrie (William M. Flinders. Petrie

1902, 25–26, pl. LII) recorded a very large number of spindle whorls of uncertain date, since mostly found in rubbish pits. However, they appear quite similar for shapes (almost all dome) and materials to those of the Predynastic period. Those listed in the catalogue are all made of limestone and dome or slightly spherical in shape. Diameters measure 3.3 cm on average, heights 2.5 and weights ranges between 23.8 and 40 g.

Other sites preserved small evidence of stone spindle whorl and are generally spherical and dome as in the other sites here listed, for example Adaima (Buchez and Midant-Reynes 2002, 448–49, pl. 4.13), Armant (Mond and Myers 1937, 165, 188) and Elephantine (Kopp 2006, 82, pl. 36).

A special section has to be dedicated to Hierakonpolis**,** because of the lower chronology of the materials (most of them belonging to the Early dynastic period) and because of the exceptional nature of the site. Despite the impressive quantity of publications devoted to this key site, spindle whorls have generally received little or no consideration at all. First mentions of whorls in the site are given by Quibell (Quibell and Green 1902, 2, 10, 17, 22 pl. LXIII-LXIV) but not many details are provided. However, these whorls are made of limestone, and from plates they appear mostly dome shaped or spherical and a lot of them have marks incised on the surface, some even hieroglyphic signs. They come mainly from the settlement but some are known also from graves. Those listed in the catalogue belong to these excavations. In Fairservis publication (Fairservis 1986) the same, dome shaped limestone objects are named mace heads in field registry, loom weights and spindle whorl in text (Fairservis 1986, 20, pl. 15:9, 15:10, 17:63, 90, 20:7, 23:202). All of them have a dome shape, with a quite high height and a pretty large diameter. In fact, diameters are around 4.4 cm and heights range between 2.8 and 3.4 cm, therefore are slightly larger than those discussed so far. However, one of the object have an incised mark on the side (Fairservis 1986, fig. 23:202), similarly to those found by Quibell. Other whorls (partially matching the same materials illustrated by Quibell and Green) are illustrated by B. Adams (Adams 1995, 161–63), all of them are made of limestone and are dome-shaped. Some of them are decorated by radial incisions and others have marks incised. They are stored in Liverpool, between Garstang and World Museum and are therefore included in the catalogue. Almost all the spindle whorls listed in the catalogue are made of limestone and have a domed shape. A peculiar object made of pottery, broken in two pieces, is conical, has the top completely abrased and a hollow base. Its usage is not sure. Excluding this object, all the other specimens are made of stone and are quite large and heavy. One object exceeds 150 g and is certainly to be excluded from being a whorl. Diameters range between 2.9 and 4.6 cm, with an average value of 3.9 cm. Heights vary between 1 and 3.7 cm, with an average value of 2.8 cm. Finally, weights range between 28.7 and 88.3 g, with an average value of 53 g. Hierakonpolis limestone whorls are therefore slightly larger and heavier than those from other sites. If they are to be considered as actual

spindle whorls, yarns produced with these tools were rather thick. It would be much interesting to compare them with textiles found in the site.

One of the biggest problems of Predynastic spindle whorls is the difficulty in recognizing a stone whorl from a stone mace head. Mace heads are generally larger and heavier than whorls and produced in stone more precious than simple limestone. However, limestone mace heads can be found as well as whorls made from other stones. Dimensions should help in recognizing the categories of objects, but, unfortunately, ancient Egyptians produced a large assemblage of models of mace heads to be placed in tombs. This second category is much more difficult to recognize from spindle whorls, especially when they are published without fully descriptions (including measurements and wear traces) and drawings or pictures. For examples, at el-Mahasna some models of mace heads are made of pottery and appear even in female tombs (Thomas 2004), as in el-Amrah (Hill and Herbich 2011, 131). In this case, it is very complicated to understand if all these items were actual mace heads or some of them could have been whorls. Even if in this case it is highly probable that they were actual models of mace heads, since other publications (E. Ayrton and Loat 1911; Eyckerman and Hendrickx 2011) report objects which can be interpret as mace head beyond doubts, in many other cases the difficulty remains. Between mace heads models one can found stone objects very similar to the larger implements as well as pottery and clay objects, sometimes painted to resemble stone mace heads. However, these objects have three major differences from spindle whorl:

1. Spindle whorls can occur in settlements and sometimes even in tombs while models of mace heads are generally found in funerary contexts.
2. Models of mace heads “copy” actual mace heads, not only in materials but especially in shapes. Piriform and conical with convex sides mace heads are very frequent and therefore these typologies are frequently represented in models. On the contrary, the dome shape is not usually employed for mace heads, so dome shaped objects are very likely to be spindle whorls.
3. A model is an object made for display and not for use. Some objects are easy to be recognized as models since their hole is not made to allow the insertion of a shaft. This does not mean that it is incomplete, but that some obstacles (an angle or a constriction) prevent its real use.

Furthermore, wear traces can be interesting since they should not be present on models, but it is very likely that they are present on spindle whorls.

Figure 57 UC73209, UC15413, AN 1896.1908 E.3641 Spindle whorls which show small chips near the upper hole not compatible with manufacture

Wear traces are frequently present on spindle whorls from the earliest periods. They are small chippings near the upper hole, which are not present on the part of the hole on the base (in case of dome or conical whorls). Sometimes, they are much more pronounced and can involve a quite extended part of the dome. Furthermore, they can be found on the external edge, again as small chippings or more substantial breakages. Similar traces were discussed during the "Tool Workshop" held at the Centre for Textile Research of Copenhagen on 17th December 2014. During the workshop, several spindle whorls used for years by spinners have been analysed, to understand what type of traces can be left on different materials. The traces visible on some of the materials here presented are compatible with repeated falls on the ground during the spinning process[62]. However, the spinning process which left these traces involves a low whorl spindle, while ancient Egypt is known for using high-whorl spindles during its whole dynastic history. This is only partially true. In fact, the position of the spindle whorl on the spindle is culturally determined, but recent analysis are providing evidence of use of high whorl spindles in contexts where it should be sure the presence of low whorl spindles[63]. Generally, it is explained as a technical choice. Low-whorl spindles would be used for spinning, while high-whorl spindles would be used for plying. In the Egyptian context, it should be the contrary, with high whorl spindles used for spinning and low whorl spindles used for plying. However, during experimental tests, trained spinners have indicated a preference in plying with high whorl spindles rather than with low whorl spindles. The temptation to connect the presence of low whorl spindles with other materials, such as wool, or with z-direction of spinning is very strong. Egyptian archaeological findings, nevertheless, prevent these explanations. In fact, during the Predynastic period, a shift from z- and s-twist, to exclusively s- (for textiles) occur, while with a low-whorl drop spindle spinning it would be more common to find z-spun threads. Furthermore, the few woollen textiles from Amarna present the same s-twist as those made of linen[64] and cannot be linked to the production with a low-whorl spindle. Finally, evidence from Deir el-Medina[65] show that z-spinning

[62] I am very much indebted to prof. E. Andersson Strand for having discussed with me traces evident on these Predynastic materials.
[63] Experimental sessions on large spindle whorls from Tiryns by M. Siennicka during the "Tool Workshop" held at the Centre for Textile Research of Copenhagen on 17th December 2014.
[64] See chapter 2.5.2.
[65] See chapter 5.11

and plying were made with the same identical spindles which were used for s-spinning, since on the same spindle it is possible to find threads representing both techniques. This evidence, even if not pertaining to the Predynastic period, shows how difficult it is to find a general rule, which can help explaining peculiar features.
Given all these considerations, it seems that wear traces on Predynastic spindle whorl (and of later periods) might be caused by their usage on a low whorl spindle, but the advantages of using the whorl in that way or the connection with specific materials or techniques are, so far, not clearly identifiable.

Old Kingdom - If traces of the textile industry are difficult to find for early periods, they appear completely evanescent in the Old Kingdom. Few settlements of this period have been extensively excavated and they lack information about how spinning and weaving activity was made[66]. One exception is represented by Heit el-Ghurab, in the Giza plateau. This village is famous because of its relationship with the Giza pyramids (Lehner 2016), but some textile tools have been published, even if without given details. Unfortunately, the site did not preserve organic materials, and wooden implements have disappeared. One pottery spindle whorl is all remains of the spinning industry of the village (Tavares 2004, 10). Another spindle whorl is recorded in dwellings in the area of the Valley Temple of Queen Khent-Kawes. It is made of limestone, with a large diameters measuring 6 cm and a height of 3 cm (Hassan 1943, 62).
A small group of spindle whorls is known from Elephantine and is dated between the 2nd and 6th dynasty. All the whorls are made of wood but have slightly different shapes between each other. The oldest one has a conical-truncated shape, with evident traces of manufacture and no attempts of polishing the surface. A second whorl has a flat dome shape. The other whorls, dated to the 5th and 6th dynasty have the cylindrical shape, so common in later periods (Kopp 2018, 73, Abb. 42).
Other information can be obtained from iconography. In fact, a fragment of a relief from Saqqara shows a man spinning whit a high-whorl spindle and the spindle whorl is conical. As is the case with all other representation of the spinning process of later periods, the whorl is always placed on top, whether the yarn is produced for nets or for cloths. No spinning bowl appears in this image but it might not have been present at all. This could depend on a real disuse of these bowls in the Old Kingdom, since no example is known from this period, or simply a less common use while preparing yarns for netting, as is visible in the first male spinner from left in the tomb of Baqt (see chapter 3, tab. 4).

[66] Publications for Abusir, Elkab, Tell Edfu, Kom el-Hisn have been investigated without success.

Middle Kingdom – Contrary to the Old Kingdom, a large quantity of textile tools were recovered for the Middle Kingdom. The site which has provided the largest collection is certainly Kahun (see chapter 5.9) Unfortunately, Petrie's excavations are very likely to have collected only specific materials, leaving aside other types of whorls as happened for Schiaparelli's excavations in Deir el-Medina. The 102 spindle whorl listed in the catalogue are made of wood and have a cylindrical shape. Having a larger diameter than height is a good requisite for spinning flax[67], even if it is possible to use many other shapes of whorls. Furthermore, a cylindrical object is the easiest one to obtain when cutting a branch to produce a whorl. The average diameter of spindle whorls from Kahun is 4.7 cm, height is 2.3 cm and weight is 16.6 g. As can be expected, these whorls are generally larger than Predynastic and Early Dynastic whorls, are slightly flatter and are definitely lighter. The weight of the whorl is not extremely light, and it allows to create a quite differentiates qualities of thread. In general, a medium-fine quality would be expected from these tools, not an extra-fine quality, nor a very low quality of yarns. Several whorls present identity marks. Only four limestone spindle whorls are known from the site, and are quite similar to those of earlier periods. They are much heavier than wooden whorls, ranging between 65 and 137 g. Their heavy weight is perfectly suitable for producing rough yarns as well as for plying and cabling. As for earlier whorls, wear traces appear near the upper hole of the whorl, pointing to a possible use on low-whorl spindles.

Another site where spindle whorls dated to the Middle Kingdom were found is Harageh (Engelbach and Gunn 1923, 10, pl. 11E). Five whorls are listed in the catalogue, four are made of wood and have a cylindrical shape while one is made of bone and is dome shaped. The cylindrical wooden whorls are very similar to those of Kahun and have diameters ranging between 3.1 and 4.9 cm, heights between 2.2 and 2.7 cm and weights between 13 and 21 g. One shows an incised mark on the side. The bone spindle whorl is completely different from the wooden examples. In fact, it has a very wide diameter (7.8 cm) and it is made of a very thick and dense bone, which makes it a very heavy object of 114 g.

[67] As seen in chapter 2.5.1 and 5.9.9, all woollen samples from Kahun are dated to the Medieval period.

58 Spindle whorl from Harageh with incised mark AN 1914.768

A limestone spindle whorl is known from the Middle Kingdom settlement of Ezbet Ruschdi (Czerny 2015, 376, Abb. T137). It is dome shaped and measures 4 cm of diameter and 1.6 of height. Hole measures 0.7 cm, which is perfectly suitable for spinning.

New Kingdom - The largest quantity of spindle whorls is certainly known from New Kingdom settlements. In fact, several workers' villages and settlements are known from this period and organic materials have been preserved.

Deir el-Medina preserved a very impressive collection of spindle and spindle whorls excavated by the Italian Archaeological Mission in Egypt led by Ernesto Schiaparelli and by IFAO excavations led by Bernard Bruyère (see chapter 5.11). Unfortunately, only tools excavated by Schiaparelli were available for study and are therefore included in the catalogue. The IFAO did not authorised access to its storerooms to see textile tools, but those published by Bruyère allowed to understand that they are similar to those found by Schiaparelli. 254 spindle whorls are stored in the Museo Egizio in Turin, all of them have a cylindrical shape and are made of wood. However, from Bruyère's publications, it is possible to infer that also bone and stone spindle whorls existed and that dome shaped whorls were used as well. The spindle whorls listed in the catalogue have a diameter with an average measure of 5.1 cm, a height of 1.5 cm, and an average weight of 13 g. They are, therefore, slightly larger than Kahun, less thick and somewhat lighter. The difference, however, is so small that they can be considered as the same tools seen in Kahun. This means that there is no changing in tools and techniques from the Middle Kingdom to the New Kingdom. As for Kahun, it is very likely that heavier stone spindle whorls were used for plying but since not a single one was available for study it is not possible to draw certain conclusions. Several spindle whorls present incised marks, similarly to Kahun, and some of them are painted.

Gurob presents the most interesting material of the whole corpus, since it is partially comparable to the other Egyptian contexts and partially shows a completely different set of textile tools. The reason for this difference might be searched in the different final consumer, which could be identified as the Royal Harem, and in the very likely presence of a workshop but not in the high presence of foreigners in the site, as it was asserted after Petrie's excavations (see chapter 5.9). In total 97 spindle whorls were collected for this study, 91 made of wood and 6 made of stone. Cylindrical spindle whorls is not the more common type in this site, but those found in Gurob resemble very much those analysed for Deir el-Medina. 52 spindle whorls have, instead, a dome/conical shape which is unknown in other sites. All measures of diameters and heights are present for this type of shape, even if they are generally smaller and lighter than cylindrical whorls. Some of these dome shaped whorls are astonishing for their extremely small measures and their very light weight. In fact, their weight can reaches 0.4 g, and in general is less than 10 g. The heaviest whorl weighs 15.6 g and the average value is 6.2 g. Combined with the very thin shafts discussed in previous chapter and in chapter 5.10.3 they are extremely light and delicate objects. Considering that experimental sessions with very small whorls have proven to be very difficult, that they require a very high concentration (Andersson Strand 2010, 13) and a very high quality and well prepared raw fibres, it seems reasonable that these tools belonged to a royal workshop to produce extra-fine linen threads. In fact, it seems difficult to work with these tools at home, while watching over children or attending other domestics tasks.

Six limestone whorls are listed in the catalogue and they are very similar to those examined for Kahun. Their diameters ranges between 4.51 cm to 7.63 cm and height between 2 and 3.78 cm. Weights are very close to those of Kahun, since they range between 57.7 g and 133.2 g, suitable for spinning low quality threads and for plying. As in the case of Kahun and of stone spindle whorls of earlier periods, they appear worn near the upper hole, which would be compatible with a usage on a low-whorl spindle. In the case of Gurob, there is an actual proof that they were placed on the bottom of the shaft and it is the famous spindle that Barber linked to the presence of Mycenaeans in the site (Barber 1991, 64–66). I would suggest that the presence of low whorl spindles should not be linked to different traditions of spinning due to the presence of foreigners, but rather to the specific usage of these heavy stone spindle whorls for plying or cabling. It is opposite of what is so far known for spinning and plying, meaning spinning with a low-whorl spindle and plying with a high-whorl spindle has some advantages, but tests were conducted mostly in northern Europe using woollen fibres. It is also contrary to ethnographical observations, which report that people used to spin with a high whorl spindle think it is impossible to spin with whorl on the opposite side of the shaft. Nonetheless, the presence of the same type of wear traces in Predynastic whorls as well as in those from Kahun and Gurob requires a stronger explanation than the presence of foreigners. I think that it should be a

technical explanation, and the chance that two different techniques were employed for spinning and plying might be a possible one.

Tell el-Amarna was not selected to be inserted in the corpus since it was perfectly published. Excavations carried out in the beginning of the century do not provide information about measurements, but some have been located in the museums and studied again. In the workers' village almost all the spindle whorls are made of wood and just one is made of limestone. On the contrary, in the Main City wood has rarely preserved and lots of stone whorls have been found. In total, 218 spindle whorls are part of the study, comprising wooden whorls (58), stone whorls (61) and 9 pottery whorls. Some perforated discs have also been counted (Kemp and Vogelsang-Eastwood 2001, 289). Interestingly a large number of whorls is dome shaped, some even made of wood. However, they are not as small as those of Gurob (Kemp and Vogelsang-Eastwood 2001, fig. 8.4, tab. 8.3). Many of the whorls present incised marks. Some are similar to identity marks seen in the other sites, others are actual figurative patterns such as palm leafs, rosettes and a fish (Kemp and Vogelsang-Eastwood 2001, 289, fig. 8.10). Interestingly, whorl distribution is not even, nor between houses in the village nor between the village and the main city.

Other New Kingdom sites have provided some evidence of spindle whorls, but in very low quantities. One example is Matmar, where several spindle whorls were found in the general rubbish or in the granaries near the temple area (Brunton 1948, 67)[68]. At least three wooden spindle whorls of cylindrical shape and four of limestone are listed in the text (Brunton 1948, 67, 71). One of the limestone whorls is conical and has a decoration made of a pink lotus pattern. Three of the wooden spindle whorls still have their shaft present, even if only partially preserved. A complete shaft with a groove is represented near the whorls and is very likely to be a shaft of a spindle (Brunton 1948, fig. LII).

It is very likely that a large quantity of spindle whorls were found in Lisht North, but very little is known from publications (Möller 2016, 360-1; Arnold 1996, 19; Mace 1921, 11). More information can be inferred by the Metropolitan Museum online catalogue. First of all, wooden spindle whorls very similar to those known from Kahun, Amarna and Deir el-Medina are well represented, with cylindrical and conical truncated examples. Even a specimen with double whorl is known. To these, somo stone whorls must be added. One (15.3.691) shows radial incised decorations. Of those with pictures available, two are dome shaped and two have a conical shape, but very large in size; one has the wooden shaft still attached, but unfortunately only a small part has preserved.

[68] For a rethinking of chronology of areas 900/1000/1100 to the 20th-21th dynasties see (Aston and Bader 1998).

Figure 59 Spindle from Lisht 11.651.681 @Metropolitan Museum of Art

Figure 60 Limestone whorls from Lisht 15.3.687, 15.3.691 @Metropolitan Museum of Art

Many other sites have provided only single specimens of spindle whorls, such as Tell el-Retaba, where a dome limestone whorl is known (Rzepka S. et al. 2012, 268, figs. 36–37) or such implements are simply indicated as present but no other information are available.

Post-Ramesside period – Very few textile tools are known from periods later than the New Kingdom and the beginning of the Third Intermediate Period. Even when these materials are present, they rarely are published. For examples, several spindle whorls (and a few spinning bowls and net weights) were present in Medinet Habu, but no further information are given (Hölscher 1954, 16, 74).

5.3 Perforated sherds

As discussed in chapter 3.2.3, perforated sherds are pottery fragments which were reworked to obtain a roughly circular object with a hole in the middle or slightly off-centre. It is very difficult to understand which one were actually possible spindle whorls and which not from publications, since they rarely reports information on the characteristics of the hole, the key element to understand how they were used. However, it seems probable that these simple tools were quite ubiquitous, even in sites where they are not mentioned.

Figure 61 Neolithic whorl from Fayyum UC2932

Earliest perforated sherds are known from the Fayyum A period (Caton-Thompson and Gardner 1934, 33). A couple of these sherds are listed in the catalogue and it has been possible to see that are completely different from one another. In fact, one has the hole pierced centrally and made perforating from both sides, even if it has been quite regularized. The other object has the hole not central and made from one side. Some of these rounded sherd with perforations are known also from Merimde-Benisalame (Eiwanger 1982, 80).

Badarian settlements have proven to know these tools as well, and some are present in the catalogue (Brunton and Caton-Thompson 1928, 5, 8, 34, pl. XXVII). In Badari, they are generally found in villages but at least one specimen comes from a tomb.

A quite large corpus is known from Maadi, where they are found in all levels of the settlements, (Rizkana and Seeher 1987; Rizkana et al. 1989). 104 discs are recorded, however some do not have a perforation (Rizkana et al. 1989, 12, pl. 2), therefore they can be ruled out from spinning activities. The perforation is made by drilling the object from both sides and has an hourglass shape. Diameters vary a lot, from 3 to 14 cm; two thirds of the discs have a diameter inferior to 8 cm, and can have been used as whorls, the other with a larger diameters are too big for the category of objects under consideration. A very interesting feature of Maadi is that a large number of unpierced sherd was found in situ, used as lid for jars, while pierced discs are not used as lids (Rizkana et al. 1989, 12). The exclusion of the usage as spindle whorls in the site, given the presence of many limestone spindle whorls has to be totally rejected. In fact, reworked sherds are much more lighter than large stone whorls and could have been used for spinning thinner threads. Other perforated sherds from Maadi are recorded in (Ulrich Hartung et al. 2003, 187, Abb. 19) and (Bajeot 2017, 161).

Several Predynastic sites have preserved perforated sherds but not always they have been recognised as such. For examples, in Tell el-Farkha they are considered among tokens (Kołodziejczyk 2015, 36). It is clear that some of them are actually too small to have been used as whorls, especially because the hole is too small. However, some of the "clay circles" are not perforated sherds but objects purposely made and are probably spindle whorls. Measurements would have helped to better understand these objects. Tell el-Farkha did not provide many spindle whorls, but a large collection of spinning bowls. However, it is possible that the number of whorls might increase if taking in considerations some of the "tokens".

The site of Hammamiya has preserved some perforated sherds from Predynastic levels (Brunton and Caton-Thompson 1928, 103, 107, 114, pl. LXVI, LXX, LXXI, LXXIV). Some of them are listed in the catalogue and have diameters ranging between 3.3 and 6.6 cm, and weights between 8.4 and 66.3 g. Almost all of them have an hourglass perforation, except one example which has a conical perforation. Two objects have the perforation unfinished.

A large number of perforated sherds come from the site of Adaima (Buchez and Midant-Reynes 2002, 443–45). 63 objects are recorded in the publication, almost all perforated and most of them come from the settlement. Their diameters ranges from 5 to 10 cm, with an average value of 4 cm; only one object has a diameter larger than 6.5 cm. Holes diameter ranges between 0.3 and 0.8 cm, which is a suitable measure for inserting the shaft.

Hierakonpolis provides another large set of perforated sherds, which have been recently recognized by A. Drewsen (2016, 13)[69]. 150 perforated sherds were stored in the site but were not yet studied. From a quick vision of the drawings, they seem very similar to those from other sites and present in the catalogue.

It is also interesting to highlight that the great majority of these tools come from settlements, but a small quantity come from tombs as well, as is the case of the sherd from Ballas (Podzorski 1994, 441, pl. 59).

Perforated sherds appear also in later dynastic periods in Egypt, but they are much more difficult to find. In fact, publications rarely mention mundane objects and if it is difficult to find spindle whorls, perforated sherds are almost impossible to locate.

Some pottery perforated sherds are mentioned in the the mastaba of Ptahshepses Abusir (Charvát 1981) and four were found in the *pr-šnᶜ* in Abydos South (even if two of them appear very small) in a context where textile production seems quite probable (Smith 2010, 254). A couple are known for the Old Kingdom settlement of Elephantine (Kopp 2018, 93).

[69] I want to really thank A. Drewsen for having shared with me her knowledge about perforated sherds from Hierakonpolis.

No perforated sherds come from Kahun, Gurob and Deir el-Medina but certainly it is not due to the lack of their presence, rather to a choice in recording and collecting materials. Even the complete publication of Tell el-Amarna excludes perforated sherds from the list. Only two of them are considered as possible spindle whorls but at least we are able to understand that they were a quite common find in the site (Kemp and Vogelsang-Eastwood 2001, 277, fig. 8.6).
A very interesting context is provided by Deir el-Ballas, where a domestic textile workshop was identified by Lacovara (1990, 7, 23). It was located in Room 5a of house E, situated in an area to the west of the North Palace enclosure. Together with a perforated sherds, several other objects were found, such as a spinning bowl, fragments of spun woollen thread, raw wool and possibly part of a loom.

5.4 Spinning bowls

As seen in chapter 4.4, spinning bowl is a bowl with a loop or an element to hold the prepared yarn during spinning and plying and controlling the provisioning of yarn. In Egypt, spinning-bowls are found in a great number of sites, both in Upper and Lower Egypt.
They have been recognised from iconographical representations and the first known examples were, until recently, dated to the Middle Kingdom. Spinning-bowls are known also from the Aegean world and the oldest one comes from Myrtos in Crete and is dated to the Early Minoan II (which corresponds to the last part of the Old Kingdom), which predate the Egyptian examples and has challenged the theory of an Egyptian origin of the artefact. Furthermore, as seen in chapter 4.4, possible Ghassulian spinning bowls were present in the Beersheba region and constitute the oldest specimens known so far.
A closer look to Predynastic materials from Egypt shows that some bowls which could have been used in relation to spinning are present in the site of Tell el-Farkha, in the eastern Nile Delta. They were dated to the first part of the Naqada III period (Early Bronze Age Ib). These bowls were found in various trenches from Eastern, Western and Central Koms. The excavators were not sure about their function because of various factors: first, the early chronology make these spinning bowls the earliest examples in Egypt and, excluding the Levantine specimens, in the Mediterranean area. Second, their appearance, with a diaphragm instead of loops inside, is quite different from all the other known specimens. Third, only thirty fragments of spinning-bowls were found, a quantity too small for the entire settlement over two hundred years. Finally, no textile tools were excavated except a very limited number of spindle whorls. The first two elements of doubts are not a matter of concern, since spinning-bowls vary a lot in morphology and scholar have indicated their invention in the

Middle Kingdom just because there was no other evidence in the preceding periods. There are not technical changes in weaving set nor in textiles at the beginning of the Middle Kingdom which could justify their invention right in that period. The small quantity (which is not the case for Farkha) seems actually a normal condition of these findings. The only actual problem could be the scarcity of other textile tools in the site, but they might simply not have been preserved or, as seen in the preceding chapter, been differently labelled.

Another Predynastic spinning bowl might be recognised in one (S. 4087) of the two bowls coming from Heliopolis and stored in the Museo Egizio in Turin (Spinazzi-Lucchesi 2018, 116–18). It is very similar to examples from Farkha, since it has a central diaphragms with four holes, instead of loops and does not show signs of potter's wheel. This bowl comes from Ernesto Schiaparelli excavations of the site of Heliopolis, 20 Km North-East of Cairo. The site was a very important religious centre and was occupied from the Predynastic Period until the Late Period. In the Manuscript inventory of Schiaparelli[70], it is clearly stated that the bowl comes from the strata below the temple of the Late Period, in trenches of the kom 5/6 metres under the modern level. The strata were filled by water, and the bowl was found with lithic tools and other vessels. Schiaparelli defined these materials as prehistoric and the bowl seems to be coherent with a Naqada III period. The other spinning bowl housed in Turin, should instead be dated to the New Kingdom, even if it belong to the same group of materials. Unfortunately, New Kingdom and Predynastic layers are superimposed in Heliopolis[71] and Schiaparelli might have missed the change of layer.

Not a single example of a spinning bowl is known from Old Kingdom settlements. It might not seem surprising, given difficulties in finding textile tools in publication for this period (as already seen for spindle whorls and perforated sherds), but it is an actual problem. In fact, spindles and spindle whorls might have been made of wood and therefore have not preserved. Instead, spinning bowls are very likely to have preserved and their total absence from settlements such as Giza or domestic and priestly contexts in Abusir is suspicious. It might depend by the difference in appearance from later examples and, as was the case of Farkha and Heliopolis, they were not recognised as spinning bowls until very recent years. On the other hand, they could have not been used in the Old Kingdom and other tools or other techniques might have been employed, as suggested by the Saqqara relief (see chapter 3, tab. 4).

With the beginning of the Middle Kingdom, evidence of spinning bowls becomes very frequent and spread all over Egypt. In iconography (see chapter 3 tab. 4), they appear in wooden funerary models

[70] Schiaparelli, E. Manuscript inventory, suppl. 4099-4188, stored at the State Archive.
[71] Ugliano pers. comm.

and in tomb scene inside weaving workshops and, in models, they are carved with two loops inside (for example UC 6665i).

Several archaeological contexts have preserved spinning bowls and probably the most famous is Kahun. Petrie reports to have found a large number of these bowls made of pottery or of limestone but he published just one bowl and only a single one was available for study. In this case, bowls were probably found inside houses, as is the case of Amarna and Deir el-Medina.

A very interesting context is Abydos South. Inside the funerary temple of Senwsret III were located some refuse pits, from where large quantities of pottery, mud jar-stoppers, rests of basketry, matting, cordage and linen textiles were found. In a refuse pit in the East block a spinning bowl was found (Wegner, Smith, and Rossell 2000, 108, fig. 16). Furthermore, a small number of fragments was found in temple deposits (Wegner 2007, 245–47, fig. 103:58). Over a dozens of fragments were found in *pr-šnᶜ*, on the north-eastern side of the temple (Smith 2010, 256), together with four perforated sherds, four net sinkers and nine copper needles. Unfortunately, wood has not preserved in this area. Not far from the temple and the shena, a workers' village was present but materials from this village has not yet been published. The presence of spinning bowls in the temple and in the production area, allows to presume that textile production occurred in the temple and for the temple itself, as is better known for the temple of Karnak and the Ramesseum[72].

Spinning bowls appear quite frequently in Tell el-Dabᶜa from Middle Kingdom and Second Intermediate Period contexts, contrary to the other textile tools (Czerny 2012, 59, fig. 7; Bader 2001, 99, Abb. 21a; Aston and Bietak 2004, 166, 243, fig. 110, pl. 177, 293). At least 17 fragments of spinning bowls are recorded (Czerny, Boessneck, and Driesch 1999, 59, 104–6, 199, pl. XIX), with a typology with flat base and almost straight side. It is similar to the object published for Kahun but very different from the one preserved in the museum. They have two loops in the inside, and possibly one example with a single loop is also present. All of them come from houses and just one example from a street. Other Middle Kingdom contexts are represented by Abu Ghalib (Larsen 1941, fig. 14), Karnak North (Allen 1997, 33) and Memphis (Bourriau et al. 2016, 190, fig. 102).

Spinning bowls continue to be produced during the New Kingdom and the largest assemblages are those of Tell el-Amarna and Deir el-Medina. Amarna preserved both stone and pottery bowls (Kemp and Vogelsang-Eastwood 2001, 291, fig. 8.15), generally made of marl clay, but silt can sometimes be employed. All the specimens have two loops on the bottom of the bowl, except one example which has two loops added to the inside rim (Kemp and Vogelsang-Eastwood 2001, 293, fig. 8.16).

[72] See the representation from the tomb of Neferrenpet, chief of the weavers of the Ramesseum and Neferhotep, as well as the presence of weavers associated to temples (Botti and Peet 1928, 24).

In Deir el-Medina, several spinning bowls were recognised, but they are not included in the pertaining chapter since not a single fragment was available for study. Several examples have been published by Nagel (Nagel 1938, 183–86, figs. 152–58) and can have two or three loops at the bottom of the bowl. In this case, as in Amarna, grooves caused by the friction of thread are clearly visible. A fragment of a limestone spinning bowl is also known.

Very interesting is the fact that they are absent from the site of Gurob, which has preserved a large amount of textile tools, as much as Kahun. Since they are reported by Petrie for Kahun, there is no reason for not having done the same for Gurob, so they might have been totally absent there. Furthermore, not even recent excavations have, so far, mentioned the findings of such tools.

An interesting context is the already cited textile workshop from Deir el-Ballas (Lacovara 1990, 7, 23) where a spinning bowl was found in the same context of a perforated sherds and some wool. Wool does not need to be spun with the aid of a spinning bowl, since fibres are too short for producing roves through splicing. This finding might point to the direction that they were used for plying rather than for spinning, as suggested by G. Vogelsang-Eastwood (1987, 85–87). Other New Kingdom contexts are Tell el-Retaba (Rzepka et al. 2017, 39), Pi-Ramses (Laemmel 2008, 178) and Tell el-Hebua (Allen 1997, 33).

A couple of spinning bowls are known from Medinet Habu and belong to New Kingdom strata (Hölscher, Anthes, and Seele 1939, 84, pl. 57) and to Post-Ramesside layers (22 dynasty) (Hölscher 1954, 74).

Their production continues in the Third Intermediate Period and in the Late Period and disappear with the Macedonian conquest. Some sites where these late bowls were found are Lisht North (Hayes 1959, 412; Allen 1997, 35), the already cited examples of Medinet Habu, Abu Imram and Mendes (Allen 1997, 36).

5.5 Bone spatulae and beaters

As seen in chapter 3.4.2 pin beaters are a wide and miscellaneous category of objects, some of which might have been used in textile production for beating threads and keeping warp in place. It is very difficult to understand which of these could have been used in weaving when handling them, it is practically impossible to see it by publications. In this chapter, principal evidence of these beaters will be introduced with the hope that in the future much more studies will be dedicated to this very difficult category.

Several objects which can have been used as beaters were found in the Fayyum Kom W and K. Some of them show a very sharp point which would be not suitable for the purpose here intended, but others

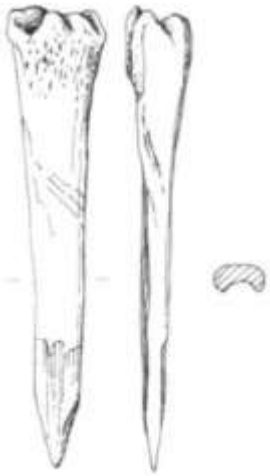
resemble specimens as those of Far'ah and the Peruvian bone (Caton-Thompson and Gardner 1934, 34, XII:8-9). One bone spatula with a rounded point is listed in the catalogue.

Some possible pin beaters were known also from excavations in Merimde-Benisalame, where they appear to have been longitudinally cut to obtain a thin, long point (Junker 1929, 237, Abb. 12, 1930, Taf. 11). To these, some fragments of bone spatulae with rounded or triangular point can be added (Junker 1929, 237, pl. XIIb). One of the spatulae with rounded point is almost complete. Another specimen is very short and has a long, thin pen-nib point and the other end is perfectly rounded (Junker 1930, Taf. XI).

Some possible beaters could have been found in Badarian contexts. Three come from male graves in Badari, but not many information can be extracted from the publication (Brunton and Caton-Thompson 1928, 14, 16, pls. XXVII:4, XX:16).

Predynastic contexts have preserved some of these tools, for example from the settlement of Badari (Brunton and Caton-Thompson 1928, 44, pl. LVIII), Maadi (Bajeot 2017, 158) and Abydos (Naville et al. 1914, 4, pl. IIIa)

In Adaima several pin beaters were found, all of them made from tibia or metapodial bones, of *Ovis capra*. Some preserve points which are very thin and sharpened and cannot have been used as the Peruvian examples, but could still have been used for beating parts of weft threads, although a usage as borers cannot be ruled out. However, others have more stronger and rounded points that would be perfect for keeping in order warp threads (Buchez and Midant-Reynes 2002, 436–37, pls. 4.4-6).



62 One of the possible pin beaters from Adaima (Buchez, Midant-Reynes 2002, pl. 4.4.5)

For the Old Kingdom, seven bone points (spatulae) were found in Giza, which are described as having a pen-nib point and fine striation on the surface, possibly due to the process of manufacture. However, from the only available picture, it seems that a rounded point is present and another object could be part of a pin beater (Tavares 2004, 11).

Figure 63 Bone spatula from Kafr Ammar (UC 37337)

From Kafr Ammar, three bone spatulae dated to the Old Kingdom are listed in the catalogue. One of them (UC 37337) is very well shaped and preserved, with a pen-nib

point and a rounded end. The other two examples are very similar to this one in shape, but one is thinner than the others. Several points and broken objects were also found in the site, and among them, pin beaters were possibly present.

From Kahun only four bone spatulae are known, all from reworked ribs. One of the objects was found inside a ball of thread, which is a very interesting link to its usage in connection with textile production. To these objects a wooden beater can be added, which is completely different from the examples here examined. In fact, its shape resembles those of bone spatulae, but it is much more larger and thicker. No bone pin beaters have been found. Traces of wear are well visible on some of the bone spatulae, showing that they were not used for their point, but rather from the side.

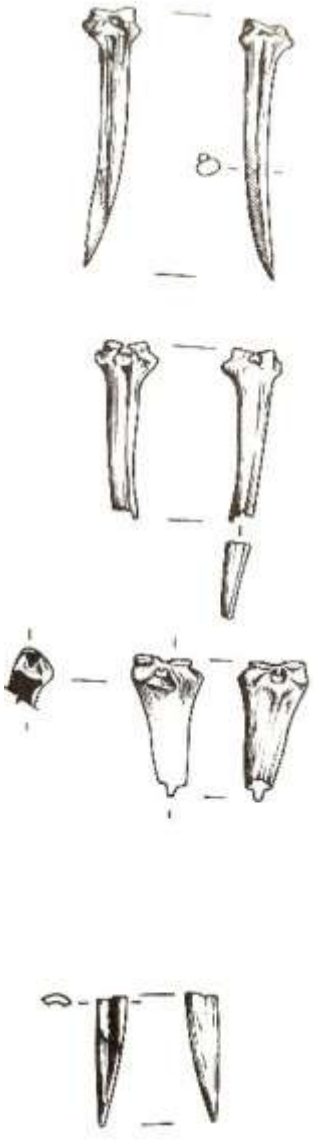


Figure 64 Pin beaters from Deir el-Ballas (Lacovara 1990, fig. 2.3)

New Kingdom evidence of bone spatulae are abundant. Gurob has preserved a very large collection of bone spatulae, with 95 examples present in the catalogue. Both triangular and pen-nib points are present as well as rounded ends. They are made from ribs and many examples have convex profiles, which influence traces of wear. In fact, in many cases traces of wear are not localised near the point, but rather in the middle of the spatula.

The objects called pin beaters in Amarna are here labelled as bone spatulae, to distinguish them from the metapodial bones cut to obtain a point. They have pen-nib points as well as triangular and rounded points, as in Gurob. Traces of wear have been analysed with a microscope, together with some specimens from Gurob, and the results show that the fine striation present on the surface are due to the process of polishing and manufacture rather than to the rubbing of threads (Kemp and Vogelsang-Eastwood 2001, 368–70). This is certainly true, or at least part of them, and the article of G. Radi (Cheval and Radi 2013) make a good point of the matter. However, wear traces are easily recognisable in Gurob and Kahun specimens, since entire areas of the spatulae have been polished and cancellous bone is no longer visible due to the contact with soft materials, presumably fibres.

Actual pin beaters are not known from these two sites, but they have been instead found in Deir el-Ballas, in the already cited textile workshop. Two are completed tools, while two are partially preserved (Lacovara 1990, 7, fig. 2.3). A pin beaters and fragments of other specimens are known

also from Abydos, where are labelled as “netting needles” (E. R. Ayrton, Currelly, and Weigall 1904, pl. LVII:25-27).

From level II and III of Kom Rabi’a, twenty bone spatulae were found. They are dated to Late 18th dynasty - Early Ramesside period. They were cut from bovine ribs, characterized by a large, flat and slightly concave shape. Evidence of manufacture are not visible anymore, since edges have been smoothed from wear. On the concave side, cancellous bone is sometimes visible (Giddy 1999, 162, pl. 35). All the complete specimens present a long triangular point and a rounded end, except one which has only a rounded end. No pen-nib examples are known from the site.

From this brief survey of Egyptian materials, it seems quite clear that bone spatulae and pin beaters were known and used since the Neolithic period and continued to be utilized for almost all the Pharaonic period, with very few changes in shape and material.

5.6 Basalt rings

Basalt rings have been widely discussed for the Levant (see chapter 4.6) and the considerations will not repeated here. Besides, it is a category of objects which seems almost absent in Egypt for the Early Bronze Age and also for later periods. However, few examples of basalt rings are known in one Egyptian site. Some basalt rings, considered as spindle whorls, have been published for Maadi (Rizkana and Seeher 1988, 53, pl. 95:17-22). 15 examples made of vescicular basalt are known from the site and their distribution is quite uneven. Analysis carried out on these tools have proven that they were not produced in Egypt, but that they have been imported from Palestine (Porat and Seeher 1988).

5.7 Loom weights and net weights

The category of net-weights includes a very broad typology of objects, which presents features that are suitable for attaching a thread, such as grooves or holes. Given the long-standing debate about what is a loom weight and what is a net weight, all the objects that can belong to one of the two categories will be considered. The aim is to understand which objects certainly cannot be recognised as loom weights and which objects could instead have been used as loom weights (but they may have had other purposes). This part of work has been done trying to not have a prejudice about the presence or absence of the warp-weighted loom in Egypt in certain periods. For this reason, all the objects are labelled simply as “weights”, without associating a preconceived function The comparison with Levantine loom weights has been crucial during the study to better understand objects from ancient Egypt.

First weights are known from the Fayyum K, where some stones, roughly rounded or ovoid, present a concavity in the middle, which goes around the whole diameter (Caton-Thompson and Gardner 1934, pl. XXIX:7-9). This sort of waist is suitable to wind a thread.

Stone weights are known from Merimde, where are defined net-weights and put in relation to the large collection of fishing tools such as harpoons, fishhooks and nets present in the site (Eiwanger 1982, 80).

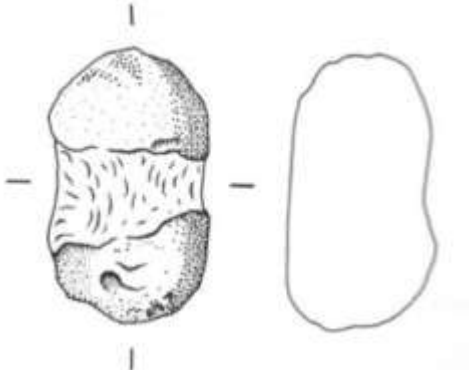


Figure 65 Stone weight from el-Omari (Debono, Mortensen 1990, pl. 32:4)

Similar to the stone weights from the Fayyum and Merimde are the "weights" from Omari. In this site, 19 specimens were collected, most of them made of limestone (Debono and Mortensen 1992, 59, 152, pl. 32). They were not grouped together but were found scattered around the site and none of them was found in context with the net also discovered in the site.

Three limestone objects found in Maadi are very likely to be weights (Rizkana and Seeher 1988, 50, 106, pl. 92:8, 9, 10). One has an ovoid shape, while the other two are smaller and almost spherical. All of them have a groove in the middle that goes around their diameter. Surface and groove are roughly worked.

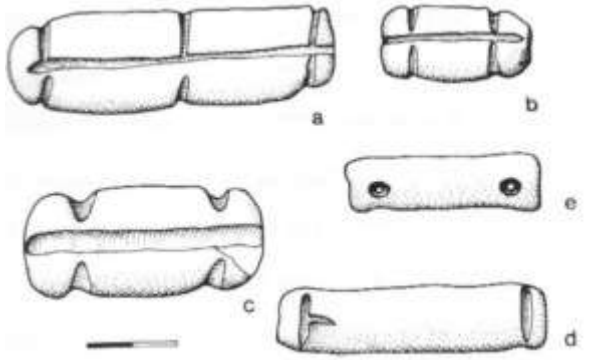


Figure 66 Weights from Hierakonpolis (Adams 1995, 167)

Some Early Dynastic weights are recorded in Hierakonpolis (Adams 1995, 166–69). They have a different shape from those of earlier periods, since they are almost cylindrical and they do not have a single central groove, but two or three grooves. In the examples with two grooves, these are placed almost at the end of the side. Furthermore, a longitudinal groove is present on the base. One example presents two holes. They are not made of stone but of Nile silt pottery.

Weights of similar shapes to those of Hierakonpolis are known also from Old Kingdom contexts, as is the case for Abusir and Kom el-Hisn (Wenke, Redding, and Wetterstrom 2016, 333, fig. 11.6), proving the continuity of their use.

Some objects which might be interpreted as weights have been found in the Middle Kingdom funerary temple of Senwosret III. Accordingly to J. Wegner (2007, 269) some loom weights were found in the deposits outside the temple, together with baskets and cords, but no spindle whorl was found in that

context. In the work of V. Smith (Smith 2010, 258, fig. 110), describing the productive area outside the temple, four loom weights are described. One is made of limestone, with several grooves carved on it and it may possibly resemble the objects seen for Hierakonpolis. Other three objects are made of baked pottery and have a lunate shape with two through holes on them.

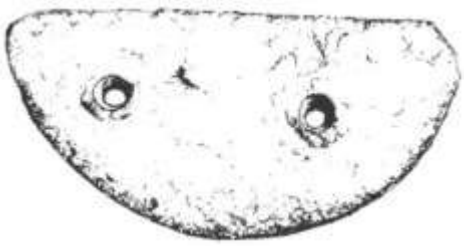


Figure 67 Lunate weight (Smith 2010, fig. 114)

The largest batch of weights known so far in Egypt comes from Middle Kingdom levels of the fortress of Buhen (Emery, Smith, and Millard 1979, 112–15, pls. 40–41). 70 of these weights are listed in the catalogue. They can be made of stone (limestone, sandstone and even serpentinite), baked clay and even of mud and unbaked clay. Shapes and measures vary a lot. Starting with the baked clay objects, which represent the majority of the objects, one can find a singular item, such as UC 21365, which is quite flattish, oval and with a hole at each end. Similar to more ancient types is UC 21263 which has an almost rectangular shape, with two grooves at the end. One example of discoid elliptical weight is UC 21286 but, differently from those studied by the CTR, it has a groove along its base. The most common category is represented by the "lunar" weights or semi-discoid weights of the CTR[73]. They have two holes, one near each corner, and a groove along the base.

Those made of stone are mostly carved in sandstone, but limestone is quite common too. Several shapes can be distinguished. A common shape (e.g. UC 21265, 21266) is a sort of trapezoidal object with a groove running in the centre, all along the longest side (see pl. 20). Similar to this, another type has crossing grooves through its surface, as in the example from Kahun and in UC 21278 and UC 21281. Finally, a discoid elliptical weight (UC 21282) is made of sandstone. Three objects are made of clay and mud and certainly cannot be considered as net sinkers (UC 21287, 21366, 21367). Two of them have a discoid elliptical shape, while one, fragmentary, a semi-discoid shape.

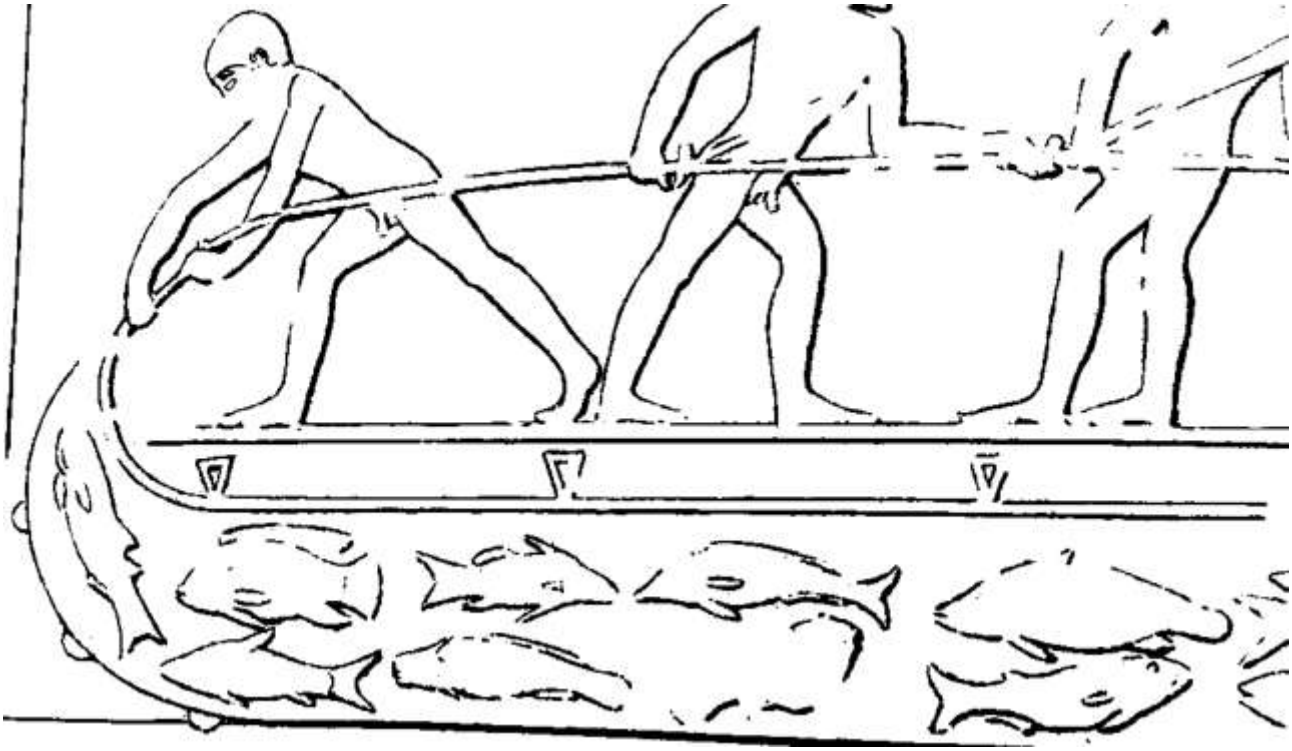
Similar to these weights are those found in Kahun, although in very small quantities. Also Tell el-Dab'a provided evidence for weights, but in this case shapes are reminiscent of the more ancient examples from Hierakonpolis. In fact, they are mostly ovoid, made of stone with a groove at each end (Czerny, Boessneck, and Driesch 1999, 114, Abb. 52), but an example of semi-discoid pottery weight is also present (Czerny 2015, 377, Taf. 137, 208).

Weights are quite frequent findings in New Kingdom sites, with examples at Abydos (pottery, semi-discoid and ovoid with lateral grooves) (E. R. Ayrton, Currelly, and Weigall 1904, 37, LVII); Elephantine, where several weights have been interpreted as net-weights given the total absence of

[73] See loom weights typology in chapter 3.

other evidence for textile production (Arnold 2015, 154); Matmar (Brunton 1948, LII, LXV) but probably of the Third Intermediate Period (Aston and Bader 1998); Amarna (Kemp and Vogelsang-Eastwood 2001, 394); Kom Rabi'a (Giddy 1999, 195–97, pls. 39–41).
Several weights are known from Tell el-Retaba in Wadi Tumilat and are mostly made of limestone, excluding one which is made of unbaked clay (Jarmuzek 2010).

As seen in this brief presentation of main evidence of "weights" from Egypt, several types of objects



are included in this large category. It has to be reminded that in Egypt small lead net sinkers existed as well, but they are not included in this work. A few examples are listed in the catalogue to give an idea of different measures and weights from the objects under consideration. Starting from stone examples, it is very likely that they were used as net weights. In fact, stone better resist in water than pottery and it would be natural to employ it. Furthermore, many of the types here discussed are represented in funerary paintings attached to nets. Finally, since their persistence since the Neolithic down to the Pharaonic period, in times when it is very difficult to imagine the existence of the warp-weighted loom for Egypt, it is highly probable that they were used as net sinkers.
Much more difficult is to understand the purpose of pottery weights. For the types similar to those of stone, it is more probable that they would have been used in the same way of their stone counterpart. The semi-discoid typology is more complicated. First of all, examples of these weights have been found in contexts where the textile production is very likely, such as Abydos South, making their use as loom weights quite probable. However, the groove on the base of these objects means that they

have to be attached to something longitudinally, meaning for their whole length, and not with their shortest side near the next weight. This implies that each weight occupy a large space and that, in a warp weighted loom, warp attached to these weights would be very open. Even if it is not impossible to use them in this way, it is very unlikely. It would have much more sense to attach them to an object that has no problems with limited space or packing of threads such as a net. In conclusion, it seems, from the evidence here collected, that no warp-weighted loom ever existed in Egypt (before the Greek conquest) and almost all the objects here studied has to be interpreted as net weights. It would not be a problem even for the context of Abydos South, since spinning implements were used for producing

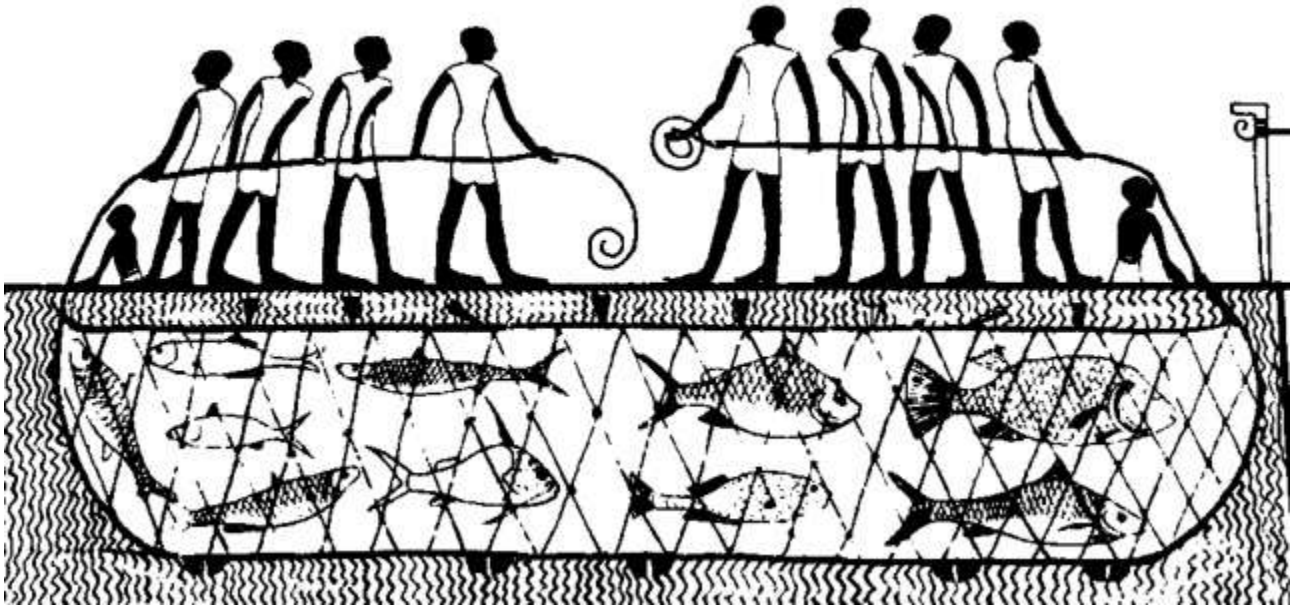


Figure 68 Two examples of fishing scenes from funerary paintings

textiles as well as for producing nets. The very few examples made of unbaked clay should be considered as counter weights, which could have been used for many purposes.

5.8 **Needles**

Under the category of needles, actual needles and bodkins are grouped together. The discerning factor is the presence of a hole where a thread can be inserted, even if threads can be made pass through premade holes with the use of pointed shafts. However, it is impossible to discern threading shafts from borers and therefore all the objects which do not present a hole have been excluded.

Needles, contrary to the other textile tools, are frequently found in excavations and quite well-published, so they seem to be present in almost every Egyptian context.

Several needles are known from Badarian sites. In Badari, a rounded bone needle comes from the settlement (Area 5400), while the large majority come from graves (5112, 5390, 5705, 5739, 5745, 5747) (Brunton and Caton-Thompson 1928, 5, 7, 11, 16, pl. XX, XXIII, XXIV, XXVII). All are made

of bone or ivory, have a rounded perforation and can be straight as well as bent or rounded. Measures can vary greatly, from 6 to 11 cm of length and 0.3 to 0.5 of thickness. They are very thick, very different from modern needles, and could have been used to sew rough textiles, joining pieces of leather or as bodkins and netting needles. There is no correlation between sex or age of the tomb owners and the presence of needles. Three needles come from the same grave.

Some needles are known from Badarian levels from Mostagedda, from settlement and from graves (Brunton 1937, 19, 21, 22, 46, 54, pl. XXII, XXV, XXXII).

Only one needle is known from Predynastic graves in Badari, while two needles were recovered from the village, one made of bone and one of copper, still attached to a textile (Brunton and Caton-Thompson 1928, 46). Only one bone needle comes from Hammamiyah (Brunton and Caton-Thompson 1928, 103, pl. LXXIIa:29), and five from Mostagedda, from settlement and graves (Brunton 1937, 88–89, pl. XXV). Few needles are known also from the settlement of Maadi but no further information are given, except that they are made of bone (Ulrich Hartung et al. 2003, 187).

Two of the Predynastic graves of el-Amrah contained a needle, in both cases made of copper. Both are male graves, and it also interesting to note that in this period fishing implements were placed inside female graves (Randall-MacIver, Griffith, and Mace 1902, 16, 17, 19).

In the catalogue, some Predynastic needles are listed and they come from Naqada, Tarkan and Koptos. They are all made of copper, except one specimen from Naqada, which is made of silver. It is extremely small and thin, similar to our modern sewing needles (W. M. Flinders Petrie, Quibell, and Spurrell 1896, 53, pl. LXV.). Most of the copper needles come from graves and in one case three were found in a sing tomb (W. M. Flinders Petrie, Quibell, and Spurrell 1896, 24, tomb 3). Measures can vary a lot, from 8.5 to 5.5 cm (except the one made of silver).

One of the most surprising finding is that needles were placed in the royal tombs of the first dynasties. Petrie found a quite large collection of needles inside Early Dynastic tombs in Abydos and Giza, some of them are listed in the catalogue. The two most impressive specimens are made of gold and the hole is made by piercing the shaft (W. M. Flinders Petrie and Griffith 1901, 6, pl. IV). They are very small and thin and now are wrapped in a coarse textile which probably has nothing to do with them. However, not only precious examples are found in these tombs, but also thick and long examples made of copper (see AN 1896-1908 E.1236) and bone/ivory bodkins (AN 1896-1908 E.1337). Several needles are also reported in Dreyer's reports on Umm el-Qaab (Dreyer et al. 1998, 1996, 2000, 2003) and in Helwan (Zaki Yusef Saad 1947, 27, pl. XVIIa; Saad 1951, 39, pl. LIIIa). Some bone needles were also present in tombs at Minshat Abu Omar (van der Brink 1992, 135).

The presence of needles in tombs continues in the following periods. Petrie reported the findings of 11 or more bronze needles and three thicker ones from a mastaba in Maidum which should be dated

to the 4th dynasty (W. M. Flinders Petrie et al. 1892, 18–19, pl. XXIX). A couple of examples of this long-lasting tradition may be found in Tell el-Dab'a, where they were found in graves dated to the Second Intermediate Period (Habachi et al. 2001, 175) and Qantir (Habachi et al. 2001, 179), and from the tomb of Kha in Deir el-Medina, where two needle cases were located (see chapter 5.11). Needles continue to be common also in settlements and several examples are known from Kahun, Gurob, Deir el-Medina[74]. All the metal examples share the same identical methodology of fabrication, which sees the hole made by simply perforating the shaft from one side to the other. This technique is spread in the Levant too. However, from the Middle Bronze Age onwards in that region another type of needle is common, with eye obtained by bending the upper part of the shaft on itself. This typology of needles is not present in Egypt, with exception of a few examples, which should be probably considered as an import from the Levantine region. One is known from Tell el-Dab'a (Philip 2006, 126, fig. 56; Czerny 2015, 390), one from Lisht (MET 22.1.984) and the other by Kom Rabi'a (Giddy 1999, 1355, pl. 38).

From this brief presentation of sewing tools from Egypt, three features may be noticed. The first one is the production of bone and metal needles from the earliest periods alongside to bodkins. To these, wooden implements were certainly to be added, as visible in Deir el-Medina findings. Second, the manufacture of metal needles does not change through times and holes continue to be produced simply by perforating the shaft from one side to the other. Finally, needles can be part of funerary equipment of poor and rich people, even kings. What is the significance of needles in tombs? What practical or symbolic meaning could they have? Certainly, rulers and wealthy people were not busy in sewing textiles[75] and some of these objects are too thin and small to be used for fastening garments. Additionally, needles are the only objects connected to textile production to be found in tombs after the Predynastic period. The presence of needles in tombs is frequently associated with the embalming practise[76], but it is obviously possible only from fully dynastic periods. It is impossible to be certain if the reason for which needles were placed in Predynastic graves remains the same for all the Egyptian history or if several different reasons caused this funerary practise. Certainly, sewing mummies was not an option in the 1st and 2nd dynasties and other explanations should be found. Furthermore, large sets of needles were found in the tombs of Kha and Merit, but neither of them

[74] See Odler for Old Kingdom needles and their distribution in sites (Odler et al. 2016, 194–95, fig. 197). Needles were found in seven Old Kingdom female graves (Odler 2015, 49).
[75] Embroidery was rarely practised in Egypt and certainly was not a hobby for ancient Egyptian noblewomen. Furthermore, many garments were not sewn at all, but were simply wrap-around.
[76] See (Gasperini 2018, 144, 296) for further bibliography.

have been eviscerated (Bianucci et al. 2015). Whatever the significance of displaying needles in tombs was in the different periods, seems hardly to be connected with embalming rituals.

5.9 Kahun

5.9.1 Introduction

The site of Kahun is located at the entrance of the Fayum oasis, in the nearby of a modern town called el-Lahun. The name is a misunderstanding of its excavator, W.M.F. Petrie, who asked to a local person the name of the place and he understood Kahun and always uses this name. Modern studies continue to use this name as well as the right name, Lahun. Petrie led two seasons of excavation in the site, in 1889 and 1890, and less extensive excavations on selected areas in 1911, 1914 and 1920. Recently, a mission led by Nicholas Millet on the behalf of the Royal Ontario Museum clear some already excavated areas and provided new documentation. Unfortunately, the early death of the excavator prevents the publication of the results of his work, which have been inherited by the Museum of Fine Arts of Budapest and which also started survey project of the region.

The Fayum oasis lays on the western side of the Nile and is the largest oasis of Egypt. The fertility of this area is due both to natural springs and to a canal, the Bahr Yusef, which flows from the Nile to the lake of Birket el-Qarun.

The area was used as a burial site in the Early Dynastic period while only scattered evidence remained for the Old Kingdom, when the site seems to be rarely used. The Middle Kingdom shows a rise of interest on the Fayum by several pharaohs, beginning with Amenemhat I and Senusret I, who chose Lisht as the new royal residence. Lisht is not in the Fayum oasis but at its north eastern limit, however it seems that Senusret I built a palace in the region (Quirke 2005, 8). The dyke and the system of artificial canalization for extending the agricultural land were begun under the reign of Senusret II and concluded under Amenemhat III.

Lahun/Kahun was chosen as the site for the erection of the funerary monuments of Senusret II, which include an enclosure with a mud-brick pyramid, several mastaba-tombs probably for the female members of his family and a satellite pyramid. East of the pyramid was the temple for the king's funerary cult, which is very poorly preserved. The temple was near the settlement, which housed the personnel of the temple and the officials and craftsmanship who worked in the pyramid construction (David 1986, 93). A similar situation can be identify at Abydos South, where in conjunction of the

funerary monument of Senusret III a village was found (Quirke 2005, 45).

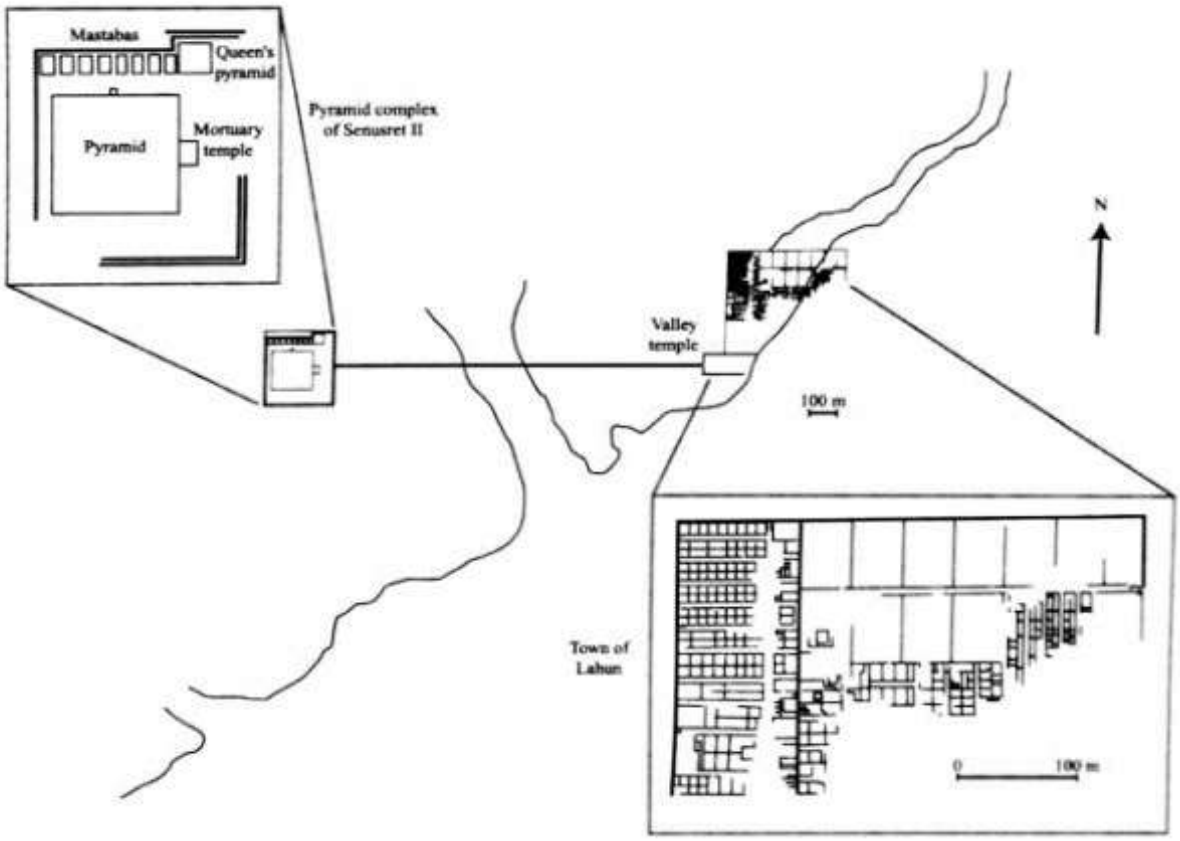


Figure 69Plan of Kahun (Szpakowska 2008)

The settlement was only partially exposed and only the northern part of its enclosure is known in its full length. It measures around 350 m (260 + 90 after the demarcation wall) while the west wall was exposed for around 290 m. The plan is orthogonal and the rooms are grouped in regular patterns. The settlement was divided in two by a thick demarcation wall which apparently preserved no gates to connect the two parts. The western part housed the smaller and poorer buildings, for the workers (David 1986, 96) or for the temple personnel (Quirke 2005, 44). The eastern part, which comprises most of the settlement, housed a large number of residencies, from large dwellings similar to palaces, to medium and small houses. The buildings were arranged in blocks separated by quite large streets, which forms a regular pattern. The entrance to the city was located at the north-eastern corner and it is the only access brought to light to date.

The northern section of the settlement housed the largest residential buildings or palaces, while southern medium and small-barracks houses are located. The largest and highest dwelling was placed in the north-western corner of the enclosure. Unfortunately, Petrie failed in recording the provenance of the objects, even the most precious, so there is no chance to establish from which type of buildings

the textile tools come from. This is mostly regrettable because Kahun was a perfect context to understand the social implication of the spinning and weaving activities, and it would have been important to discern if it was only a domestic production or areas of production could have been located near the temple as in Abydos South.

The town of Kahun was founded during the reign of Senusret II and continued to be in use during the reigns of his successors, Senusret III and Amenemhat III, according to the textual sources found in the temple (Quirke 2005, 32). During the New Kingdom the site appear almost completely abandoned, for a new site is flourishing at the South of Kahun dyke, Gurob. Only scattered evidence have been found which can be absolutely dated to the New Kingdom, and most of them come from houses reused as tombs. However, the northern part of the western block of houses might have been use for living even in the New Kingdom, since between object dated to this late period also hank of flax and balls of yarn were found (Quirke 2005, 115). In later periods, the tombs of the inhabitants of Kahun were plundered and reused for most of the 1st millennium BC, some Ptolemaic burials were located between the settlement and the pyramid and near the pyramid a tomb with a religious (?) building and a crocodile necropolis were dated to the Roman period (Quirke 2005, 128–29). Furthermore, the Valley Temple of Sesostry II was occupied by a Coptic cemetery and from these tombs the coptic assemblage of textile must come from (Hall 1982, 42).

Kahun has provided an abundant quantity of textile tools and fibres, most of them belonging to the Late Middle Kingdom, but some of them are later, dated to the New Kingdom and some even Medieval. Unfortunately, given the lack of context of findings it is not possible to distinguish what belongs to one phase and what to another. Only in a few instances, it is clearly stated.

For this research, it has been decided to study only materials which are in European museums, giving the difficulty to locate and get access to these type of materials in Egyptian museum. Several museums exhibit objects from Petrie's Kahun excavation and it was not possible to see them all. Only the institutions with larger collection have been selected. Most of the items are stored in the Petrie Museum in London, and secondary in the Manchester Museum. Other items have been studied in the Ashmolean Museum in Oxford, at the British Museum and in the World Museum in Liverpool.

Unfortunately, a complete catalogue of the objects excavated by Petrie has been done, so it is not possible to understand if the collected items represent only a small percentage of the textile tools from the site or are the largest part. However, given their homogeneity, they seem to form a reliable sample study. Hopefully, in the future this work might help to create a complete list of the textile implements from Kahun.

As for the other sites are included in the research spindles, spindle whorls, including those obtained from reworked and perforated sherds and possible loom weights. Spinning bowls and possible parts of loom are also comprised. Needles are included in this research as a hint of textile processing, even if not directly connected with textile production. Bone spatulas and pin beaters are also examined to look for signs of wear compatible with their use with soft materials and to check possible connections with other textile tools.

5.9.2 Spindles

Egyptian archaeology has the great advantage to work with perishable materials such as wood and fibres, so what could only be infer for other areas, in Egypt can be stated with more certainty. Kahun preserved several complete spindles, with both spindle and spindle whorl on it, as well as single spindle whorls and shaft, which could not be linked to each other. I studied 33 spindles from Kahun, all of them made of wood. Only a few items in the Manchester Museum were not available for study and they therefore are marked with a different colour in the catalogue.

A small number of these are preserved in their full length, 7 in total: 30.a, 30.b, 30.c.1, UC7306i, UC7306ii, UC59380b, UC7310a. Most of the other examples are broken for more than a half and some do not preserve any end. The longest spindle measures 38.3 cm and the shorter one 22.9 cm. It is interesting to note that most of the examples have a length very close to 23 cm, while just two examples exceed 30 cm, the already cited example and another one, which measures 34.3 cm. Shafts measure 1 cm on average (maximum diameter of the shaft), with most of the examples between 0.9 and 1.1 cm. The thinnest rod measures 0.77 cm and the thickest 1.46 cm.

Figure 70 Complete spindle 30.a

Shafts are generally not cylindrical but tend to be thicker in the middle and tapering towards a point in one end, while the other is slightly thinner but not so different from the middle. This means that in many cases spindle whorls have not a cylindrical hole because it is slightly larger on the lower side than the upper side, with a difference of 1 mm.

Table 8 Complete spindles from Kahun

Number	Length	Diameter	Weight (with whorl)
30.a	38,3	1.13	37
30.b	23.7	1.46	32

30.c.1	34.3	0.86	14+x
UC7306i	23.7	1.27	31
UC7306ii	22.9	0.8	28
UC59380b	24.6	1.08	21.5
UC7310a	23.7	0.97	9.34 (without whorl)

As seems clear from this data (and those of Deir el-Medina), it is clear that two types of spindles were used, although very similar in their appearance. A longer shaft, with length over 30 cm and which can arrive almost to 40 cm, and a smaller one between 20 and 25 cm. Their weight, however, can vary greatly according to the weight of the whorl, which is the decisive factor. A long and a short spindle can have, then, the same weight.

The upper tip of the spindle can be rounded or flattish and generally a groove to attach the fibres for spinning is present. In Kahun it is generally a long spiral groove, very well shaped, always with a s direction. The other end of the shaft, when preserved, tends to taper to a point, although not very sharp.

All the preserved examples with the spindle whorl attached to the shaft show that the position of the spindle whorl is immediately below the groove, and therefore are high-whorl spindles as is represent in tomb paintings, funerary models and in the hieroglyphs itself (see chapter…).

Only three spindles preserve thread wounded around the shaft and in all cases the thread is under the spindle whorl and already spun (UC7306ii has modern thread around it). In one case, AN 1889.1198A, different threads are wounded around the same shaft and mixed. Very fine thread is present, s-spun and not plied, and a thicker thread S-plied is also visible. Unfortunately, yarn is much worn on this object. A second spindle, 30.b, shows a thread which has been twisted several times around the shaft. The thread is slightly worn but is s-spun and S-plied. In the third case, 30.a, the thread is inside the hole of the spindle whorl and therefore not clearly visible.

Figure 71 Thread around spindle 30.b and its magnification (50x)

5.9.3 Spindle whorls

To the spindle whorls still attached to their spindles, which are 31, other 71 spindle whorls must be added, for a total of 102. Almost all of them are made of wood and are of cylindrical shape. Unfortunately, it is not possible to be sure that the sample here examined is representative of the actual spinning choices in Kahun. In fact, there is no chance at the moment to know how many were the spindle whorls collected in total and how many were made of materials other than wood. Furthermore, perforated pottery sherds are completely missing, even if some should have been used as in other sites, such as Amarna. It seems quite probable, however, that the wooden spindle whorls would have largely outnumber those made of other materials, as is the case of workers village of Amarna and seem the case of Gurob and Deir el-Medina. The choice of using wood rather than the more cheap pottery might have been dictated by the necessity of combining a long rotational movement of the spindle together with a light spindle whorl, which makes wood perfectly suitable for this task. Furthermore, pottery spindle whorls have the inconvenience of fracturing and breaking if fall on the ground, which happens quite frequently during the spinning process. Wooden spindle whorls are certainly more resistant but have the inconvenience that their hole tend to warp and enlarge during use, a problem that can easily solved with the addition of wedges and padding between the spindle shaft and the spindle whorl. It is interesting to note the complete absence of bone spindle whorls, which would perfectly fulfilled all these requirements.

The dominant shape of the wooden spindle whorls is the cylindrical one, which appear the easiest one to obtain from a branch or a log. Most of the whorls are worn or covered with substances which do not allow to understand the dimension of the log from which they were cut. However, it seems that most those under study were cut from small branches, as AN.1889.1198C shows, but other examples were cut from medium-large logs, as UC7308c and UC7310d.

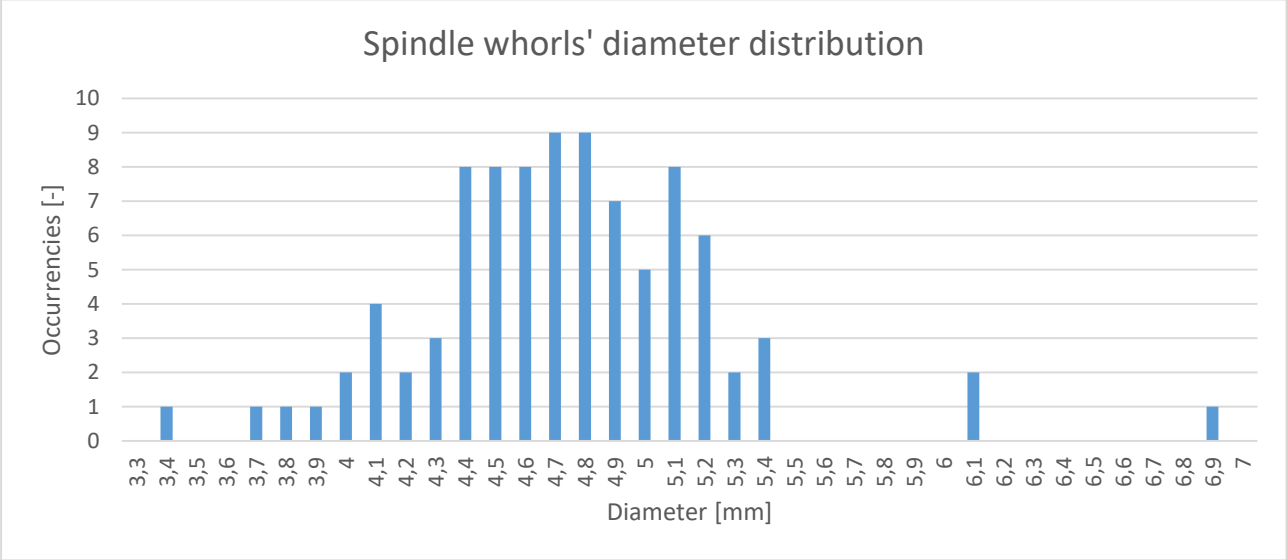
Figure 72 AN.1889.1198C and UC7310d detail

Wooden analysis carried out on examples stored in the British Museum proved that both local and non-local woods were in use, *Ficus sycomorus* being the most exploited material but with examples

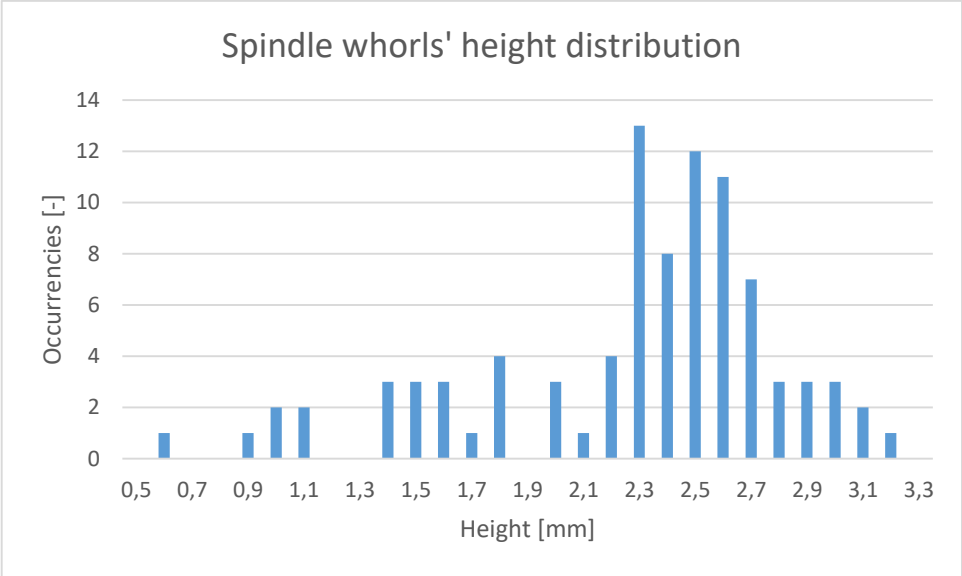
made of woods of the *Abies* species, which is typical of the European region (Cartwright, Granger-Taylor, and Quirke 1998, 98).

Other shapes are registered in the catalogue, which are dome and conical but are linked to object which probably were not spindle whorls, such as lids. However, a couple of whorls listed in the catalogue could be considered as conical truncated because they have a basis slightly larger than the top. In this case, the difference of shape with the cylindrical whorl should not be considered of importance because the difference in the inertia would be negligible.

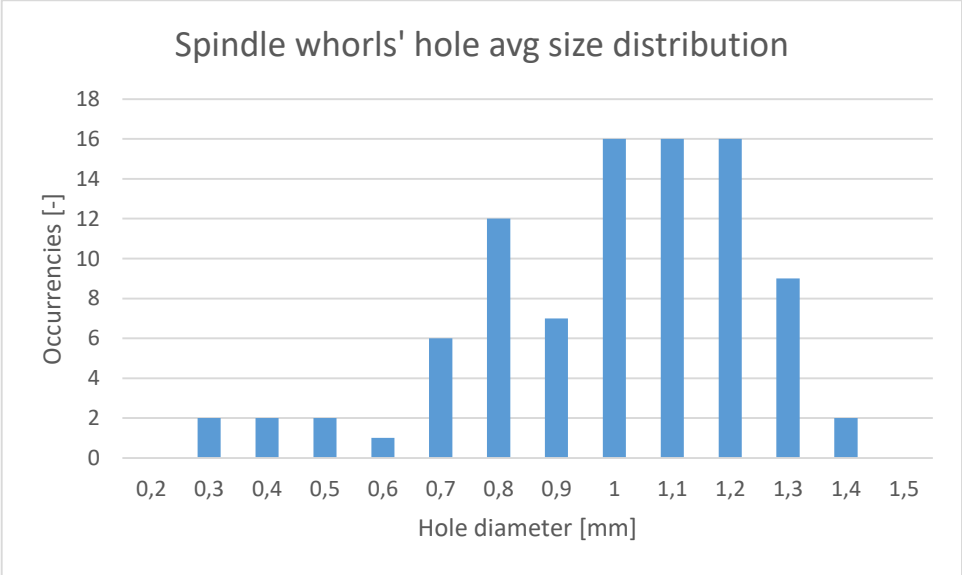
The diameter of spindle whorls is quietly large, as it is expected for cylindrical shapes. The minimum value is 3.4 cm, while the maximum is 6.9 cm (excluding the object with 8.3 cm of diameter because the function is unknown). Most of the items have a diameter, which spans from 4.4 cm and 5.4. The average value is 4.7 cm.



Height of the spindle whorl is quite relevant, since most of the examples under study are very thick, much more than the examples of other sites, such as Deir el-Medina. The minimum value is 0.68 cm and the maximum is 3 cm, with an average of 2.3 cm.



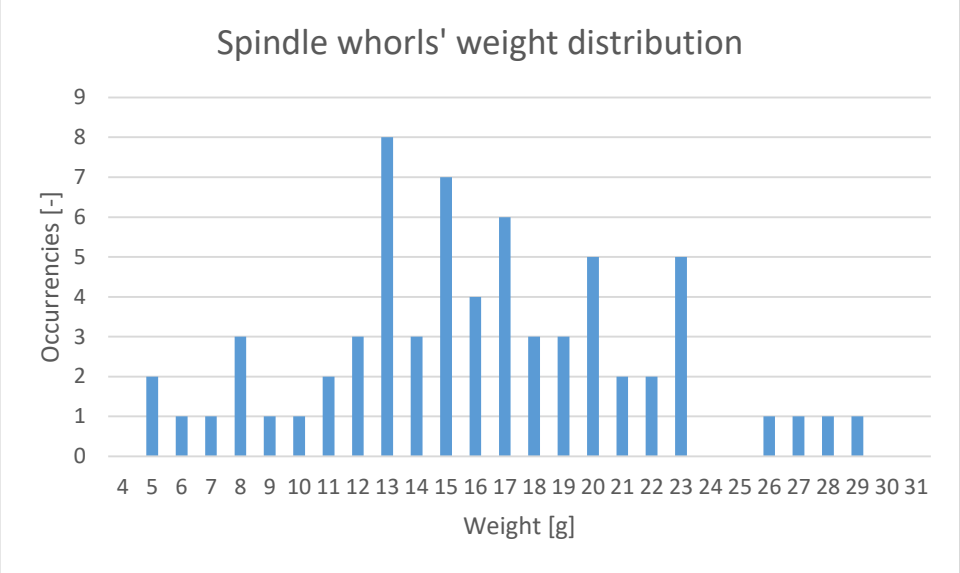
Hole where the shaft is inserted seems to be quite large in Kahun. The maximum value is 1.4 cm, while the minimum is 0.38 cm, but most of the objects have a perforation between 1 and 1.2 cm. The value which has been considered are related to the largest part of the hole. In fact, as said in the previous paragraph, most of the spindle whorls has a slightly conical hole to better fit with the tapering shaft. The difference between upper and lower part of the hole generally varies of 1 mm, and can be in both directions, meaning with the largest value on the upper part of the hole as well as its contrary. In many cases, holes appear very irregular, given the necessity to insert wedges and padding to fasten the whorl to the shaft, as can be seen in examples in Deir el-Medina[77].



Weight of the wooden spindle whorls have been measured only on items not attached to spindles, for obvious conservation reasons. Only the general weight (sum of spindle and spindle whorl) was

[77] See chapter 5.11

therefore available and it has been not considered in this chart. 66 weights of wooden spindle whorls have been recorded, with the lightest weight measuring 5.2 g, and the heaviest 29.6 g. Most of spindle whorls weight between 13 and 17 g, and in general are comprised between 10 and 25 g, with very few examples falling outside this range. The average value is 16.6 g. The two objects with a weight slightly havier than 5 g might have been something different from spindle whorls, given the very small hole they share. However, a hole of 0.38 cm is not impossible for a spindle whorl, as will be shown in the next chapter on Gurob.



Several spindle whorls show traces of encrustation, generally more visible on the upper surface of the whorl, but also on the side. In some cases, both sides are encrusted. The nature of this layer is not clear, since no analysis have been carried on it. A similar phenomenon is present on the whorl from Deir el-Medina, but is seems due to the condition of preservation and on the contact with the ground. However, David (David 1986, 234) supposes that it was made of mud or stucco intentionally placed on the whorls as a basis for further painted decoration. Painted decoration seems completely absent from the objects under study, but it is certainly present in those from Deir el-Medina, but not over the encrustation layer. Marks appear quite frequent and are almost always incised on the side of the whorl. In some cases, it might be possible that the encrustation on the upper or lower side of the whorls covers some incisions which might have been marks. All the signs are geometrical and no specific hieroglyph can be recognized. The most frequent signs are combination of crossed lines and appear quite similar one to another.

Only four spindle whorls made of limestone come from Kahun and are quite different one from another. Therefore, they will be treated separately from the homogeneous corpus of wooden spindle whorls. Two of them are dome-shaped, one is conical and the last one is cylindrical even if one of the

basis is slightly smaller. They are very different between each other for dimensions, weight and surface treatment. They have a large diameter, spanning from 4.4 to 6.6 cm and a height variable between 2.3 and 3.5 cm. Most of the holes share with the wooden whorls the feature of a slightly conical shape and their dimensions is similar to the wooden examples. Weights, obviously, are much more high than the wooden examples and range between 65 and 137 g. They have a polished surface, except AN.1889.1204, which shows the signs of production and was left unpolished. The high weight of UC7304 is quite suspicious, but it was not used for spinning it could have been utilized for plying cords.

There is a detail which appears problematic: the wear traces. In fact, excluding UC7305, the other examples show traces of wear near the upper hole, as well as chips on the larger side, which are perfectly compatible with droppings during the spinning process. However, they would be much more compatible with a drop from a low-whorl spindle rather than from a high-whorl spindle as it was in used in Egypt and always depicted in iconography (see chapter 5.2).

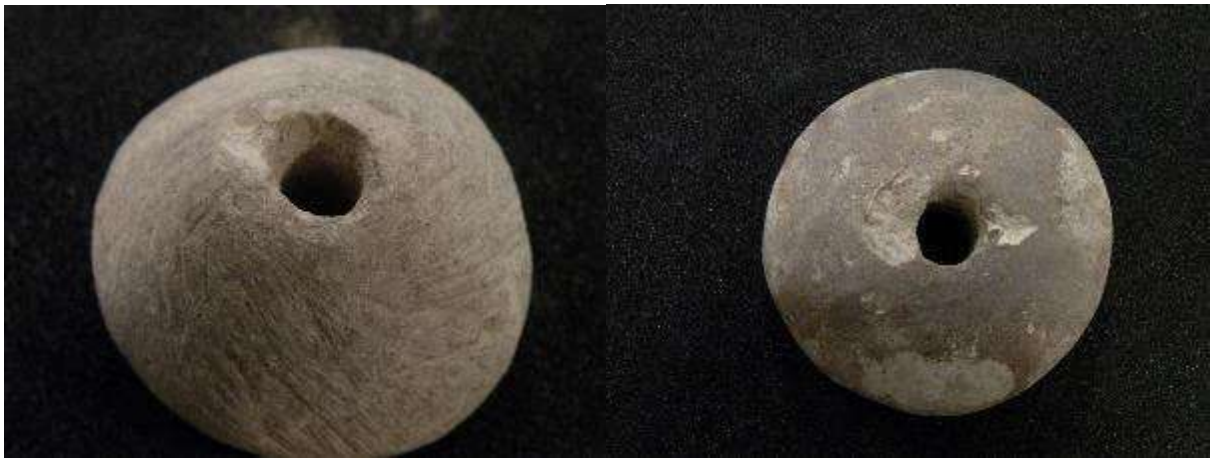


Figure 73 Spindle whorls with wear and chippings near the upper side of the hole AN.1889.1203, AN.1889.1204

5.9.4 Spinning bowls

During the research, only one spinning bowls from Kahun was traced and studied, n°431 in the Manchester Museum collection. It is made of pottery and should have straight sides (but Petrie drawings actually differ from this object), with two loops on the inside, which do not join together (Petrie 1890, 25, pl. XIII.58). On the inner part of the loops, which is not visible, grooves left by thread rubbing are perceptible by touch. Petrie found a large number of these items in his excavation on the site, as its publications allow to understand. In fact, he asserts that some crudely cut stone bowls similar to this, with one or two interior loops, were present in the site[78]. Unfortunately, he did not draw these objects nor give any other information about quantity or place of discovery.

[78] "The dishes with two loops in the bottom which are like large class of roughly cut stone objects, which have similarly two loops (or occasionally only one) in the bottom."(Petrie 1890, 25)

5.9.5 Weights

Only six objects from Kahun (of those included in this research) can be identify as weights. Not included in the study are plumb bob weights, lead weights for fishing and scale weights. Instead, all the items, which can be attached to the warp of a loom, have been considered. Of these six items, five are made of limestone and one of clay. One of the stone objects has a semi-discoid shape[79] with two through holes near the flat part of the weight. Alongside this flat part, a large groove is incised, which covers the whole length. In Egypt, where the warp-weighted loom seem not to be in use for the whole Pharaonic period these objects are considered as net-weights, and I tend to agree with this interpretation for two main reason. The first one is the presence of this long, horizontal groove, which could provide a good space for attaching a net, but it does not seem to find a satisfactory explanation on the warp-weighted loom (Alberti 2011, 29). Furthermore, this kind of loom would be particularly adapt to produce a twill, but it is not the best solution for a tabby-weave and no traces of twill has been so far recovered from Egypt. The second reason is their relative rarity. In fact, they tend to occur in small quantities in each site, Lisht being the most numerous group. If they were used on a warp-weighted loom, they should be found in dozens. Of course, it is possible that their small number depends on the selection of the items made by the excavator, as it has been done for the spinning bowls. I would therefore consider them as net weights until different and more ubiquitous evidence of their use will be found, as for Aegean sites (Firth 2015, 167). The other objects are pebbles with superficial grooves that can help to tie a thread or a cord. They can occur with a quite deep groove that runs all around the object in its longest or in its shortest side, but also with two or more grooves that cross themselves.

Finally, a clay weight with a single hole and a discoid elliptical shape has been recovered. This would be a perfect candidate as a loom weight, but again it is a single object and it can have been used for many purposes other than textile production.

[79] Semi-discoid is a different shape from the crescent shape of loom-weights which can be found in Anatolia. See (Wisti Lassen 2015, 127, fig. 4.4.1)

5.9.6 Needles

The catalogue of the present study list 58 copper and bronze needles from the site of Kahun. There is no possibility to ascribe them with certainty to the Middle Kingdom, however their homogeneity seems to indicate a similar chronology for each of them. Thickness can vary between 0.12 cm and 0.3 cm, while the maximal length preserved reaches 11.8 cm. They share the common feature of the technique of hole production, which has been carved out by punching the shaft from one side to another. This action results in a hole which is rounded on one side, while the other has a typical ogival shape.

Figure 74 Needle 233s

A needle case has been found in the site. It is made of a hollow bone closed in the upper part by various vegetable elements, which are fixed together by a textile, wrapped and knotted around the object. It contains a copper or bronze needle with a thread still inserted on it (Z-plied) and a wooden pin or bodkin.

5.9.7 Spatulae

Only four bone spatulae were traced back for the site of Kahun to which a wooden beater must be added. Two spatulas are made of thin ribs, and are therefore long and thin. One has a sort of protruding point, while the other has a triangular point, but very rounded. Given their raw material, they are not flat but very arcuate. Another bone spatula is plane, with a triangular point and the other end flat. One surface is smooth while the other partially exposes the cancellous bone. It is interesting that it has a

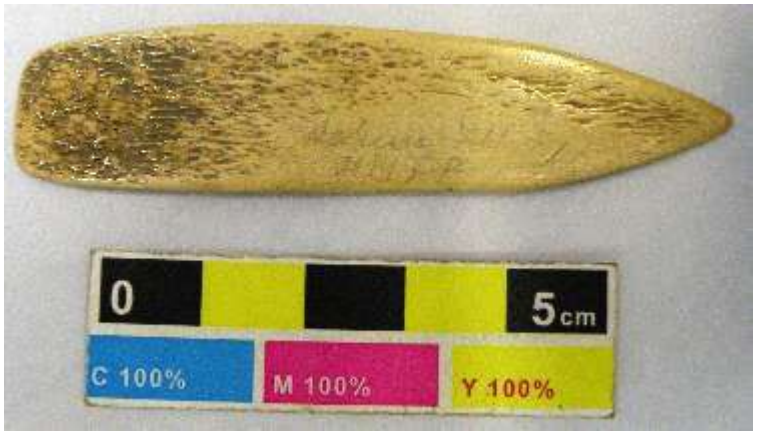


Figure 75 Bone spatula 56.21.361

different wear than those of Hazor. Wear is not located on the point, but rather to a lateral-central position. Point is quite smooth with very few traces of trabeculae, and the central part completely polished by use. The other, flat, end has the cancellous bone totally exposed. The fourth bone spatula is broken and only a part of a sharp pen-nib point is preserved. The upper surface is highly polished; the lower part has cancellous bone exposed, except for the final part of the point, where wear traces are clearly visible. Interestingly, it was found inside a ball of thread (695.a). The last object is the so-called weaver's slay, which I prefer to refer as a pin beater. It is a wooden object, slightly arcuate, with a rounded end and the other pointed. It is well-carved and no traces of wear are clearly visible. It is quite long, but in line with other spatulae. It is thicker, however, and it could suggest that it was used as a beater than as a spatula.

5.9.8 Heddle jacks

A heddle jack is a small pole with flat base and a notch and a "spoon shaped" upper part, as were described by H. Winlock (1922, 71). Their use was discussed in several articles and books, especially in the past (Roth and Crowfoot 1921, 97–101; Barber 1991, 86–88) and very little can be added. The task proposed by Winlock and derived by the examination of funerary models, was to support the heddle bar during the weaving operation, and were lowered or removed to open the counter shed. The other scholars were sceptical, because a similar solution is quite complicated and requires much energy. Another possible explanation was to use these tools to adjust the tension of the warp (Kemp and Vogelsang-Eastwood 2001, 330, fig. 9.17). However, this solution requires the use of cords which should left wear traces on the back side of the spoon part, which are not present. Instead, they appear extremely wear on the back of the pole, which can be a result of use, or of a reuse as mallet. Whatever their actual use was, a problem is still present. In the catalogue are listed 11 actual heddle jacks and 7 models. Actual heddle jacks have a height which ranges between 36.9 cm and 24.7 cm, while models between 11.9 and 6 cm. These small items were explained by R. David(David 1986, 236) as toys for children and I am not able to provide a better explanation. In fact, they do not come from funerary contexts and they do not show any trace of use and one of them could not be set upright. On one of this model tool (EA 70881) a proto-canaanite inscription is incised, which is generally interpreted as one of the many traces left by foreigners. Two problems arise from this inscription: the

first one, is that it is in the wrong side of use (Cartwright, Granger-Taylor, and Quirke 1998, 92), but as previously said it is possible that this model did not have a practical use. A major problem is given by their chronology, since the inscription should be dated to the New Kingdom (Quirke 2005, 95) while their use should be restricted to the New Kingdom. This is not entirely true, because even if major settlements of the New Kingdom did not show the use of heddle jacks, they were recovered in New Kingdom layers at Lisht (Hayes 1959, 218). Furthermore, there are plenty of evidence that people visited the site during the New Kingdom, so the inscription could be not linked to the use of the object.

5.9.9 Fibres

Textiles are quite rare findings in the settlement of Kahun, while are more likely to have preserved inside tombs. However, several examples of fibres and threads come from the town, mainly made of flax but also of wool. Wool from Kahun has long been debated[80], but radiocarbon dating has definitely prove that it is Medieval and intrusive (Cooke 1993, 15). The problem is that it was found mixed with other remains such as flax probably due to animal nests. The result is that many materials appear "contaminated" by wool, even if most of the flax examples should be dated to the Pharaonic period for the presence of splicing[81].

Furthermore, another chronological issue is given by the lacking of clear indication of provenance of each finding, which could be dated equally to the Middle Kingdom, New Kingdom or even later (but prior to the splicing demise. The chronology indicated in the catalogue is that used by the institutions which house each objects and which hopefully were able to check all the documents left by Petrie, as well as the connection with other materials.

Several steps of fibre preparation and of the spinning process can be identify in these materials. Some bunches of flax were, in fact, recovered from the site and have been certainly beaten to remove the bark and torn into strips of the required thickness. From the material recovered, it seems that no further preparation was required before splicing (i.e. like modern combing), as can be seen in 114.i.vii (and especially in 500.a from Gurob). It is a small ball of unspun fibres, with some spliced fibres and plied yarns[82].

[80] See Barber (1991, 49) for further reference.
[81] A technique which is not longer in use in Egypt after 600 BC (Cartwright, Granger-Taylor, and Quirke 1998, 106)
[82] For an in-depth analysis of this technique on the materials from Kahun see Cartwright, Granger-Taylor, and Quirke 1998, 104, fig. 1.

Figure 76 Ball of yarn 114.l.2

Most of the balls are already been spun or better, twisted, and can show different twist direction, from the normal S, 2S to S, 2z and Z, 2s and examples of cabled threads. Threads and fibres are generally quite degraded, which make the analysis more difficult, especially for thread diameter and angle of twist.

5.9.10 Textual references on textile activities

Some of the texts from Kahun deal with textile production, and prove therefore that it was a primary activity in the settlement. Two documents appear particularly meaningful for understanding the textile industry in this site. The first one is UC32203 (Collier and Quirke 2002, 114–17), where the lady of the house Irer address to a man of equal status and reports problems in the weaving production due to her absence for the service to the temple, which lasts a month.

Another text, UC32094A (Collier and Quirke 2006, 144–45), lists six women engaged with weaving, some of them with female relates. Some other texts are accountancy documents which provide

evidence of flax fibres, threads and textiles (Cartwright, Granger-Taylor, and Quirke 1998, 93–94). These texts show how the textile production was strictly connected with the female sphere, as only women are listed relating to weaving. As Quirke stresses (Quirke 2016, 251), weaving is the only activity completely carry out by women, as fishing appear always connected with men. This is certainly true at least for Middle Kingdom Kahun. However, I would like to stress my choice of using the term weaving and not a general term for textile production. In fact, net making requires thread production, which is accomplished by the use of spindles exactly as threads required for weaving. In funerary paintings[83], spinning thread for net making is an activity exclusively run by men. This means the men and women used the same tools and share the same know-how, even if the two extremely similar activities were performed by different people and probably in different places.

Weaving activity in the Fayum is sometimes linked to the presence of Asiatics. However, as for Kahun is concerned, there are no proofs of their involvement in textile production. In fact, they appear employed as servants in the households, dancers and porters in Senusret II temple, and can occupy police or military roles. Their role in textile production is suggested by a document concerning a Theban estate, where a large number of asiatics is listed in spinning and weaving activities[84]. The document is dated to the 13th dynasty and a similar situation could have been present in Kahun as well, but nor archaeological findings nor textual traces allow to assert it.

5.9.11 Conclusions

Textile tools from Kahun represent an interesting dataset for studying the textile production in the Middle Kingdom, and the lack of context is particularly regrettably for the importance of the site. Several wooden spindle and spindle whorls have been preserved by the dry climate of the area and have shown a great homogeneity. In fact, spindle are characterised by a cylindrical shape tapering to one point and a spiral groove near the other tip. Two different lengths of shafts can be identified: a longer one, between 30 and 40 cm, and a smaller one between 20 and 25 cm. No further decoration is present. Almost all the spindle whorls under study are made of wood and have a cylindrical shape. They have a quite large diameter, around 4.7 cm, are pretty thick, with an average height of 2.3 cm and a quite light weight, 16.6 g on average, which allows a medium-fine textile production. Holes are generally warped, probably because of the insertion of padding or wedges to secure the whorl on the shaft. Some of them show incised marks on the surface. No bone or pottery spindle whorls were found in the museums selected for the catalogue and there should have been very little or no evidence of their use. Only four spindle whorls are made of limestone and their dimensions are similar to wooden

[83] See for example the tomb of Khety in Beni Hasan (Newberry 1893 pl. XIII)
[84] Papyrus Brooklyn 35.1446 (David 1986, 190)

examples, although are much heavier. Wear traces near the upper hole are quite problematic, as discussed in chapter 5.2.

Pottery and stone spinning bowls were present at Kahun, but only a single pottery bowl was located. It has rounded sides and a flat base and a couple of loops on the inside, which do not join together. Grooves created by thread rubbing are recognizable on the lower side of the loop.

Net weights are present in Kahun in very small quantities and are mainly made of stone. Several shapes are present, from semi-discoid to grooved pebbles, and many fragments of nets have been found in the site, making their usage in connection with nets quite probable. A single clay weight has also been identified, but unfortunately its usage cannot be determined with certainty.

Needles are very homogeneous as for materials and typology, with the eye pierced through the shaft. Not a single example of the eye making by bending the upper part of the shaft on itself, as known in Megiddo and Beth Shean, was present. Only four bone spatulae and a wooden beater were located, proving the use of this category of object also in Kahun (with less certainty for their chronology).

Chronology is a big issue in Kahun, given the absence of safe contexts and the reoccupation of the site in later periods. All the objects under examination could be of New Kingdom date, even if it seems quite improbable. This was particularly evident with the wool samples found in the settlement that could be ascribed to a Medieval period only thanks to a radiocarbon date.

Heddle jacks were quite numerous in Kahun and, even if their specific function could still be debated, their connection with textile production appear quite clear. Much more uncertain is the role of the small models of heddle jacks.

All the textile tools seem to come from the village, except one case. Petrie reports that a tomb of the 20th dynasty contained: “a wooden rake of 12 teeth, and a spindle of the Ramesside type […]”(Petrie 1890, 32). This context is extremely interesting because it proves that, even if in rare cases, textile tools could be placed between funerary goods.

5.10 Gurob

5.10.1 Introduction

Gurob is situated in Middle Egypt, twenty-five km west of the Nile, at the entrance of the Fayum oasis. The Bahr Yusuf flows approximately 3 km east from the site, which was in antiquity connected to the Nile through a great canal, the Mr-Wr, from which the settlement took its ancient name. The Bahr Yusuf ends in the Birket el-Qarun lake, now much smaller than in antiquity. The area saw the flourishing of settlements and funerary monuments, like Kahun, and palaces and harem, for amusement activities of the royal court, like hunting and fishing.

Petrie excavated Gurob in the same period of Kahun, with two working season between 1888 and 1890 and results were published shortly after (Petrie 1890, 1891). During the second season of work, he was not able to supervise the works by himself and left the leadership to Hughes-Hughes, whose documentation, if ever existed, was never available to Petrie and now is irreparably lost (Gasperini 2018, 4). He worked in the town site, near the temple, and west of the town in a Ptolemaic and New Kingdom necropolis. After Petrie's excavations, the site was exposed to an intense activity of robbery, which compromised its comprehension. Brief surveys and excavations were conducted in the following years by E. Chassinat in 1900 and L. Borchardt in 1905 (Thomas 1981, 2–3). C. Currelly and T. Loat conducted a more extensive research in 1903-1904, with the necropolis as the main focus. They found several tombs of infants, a small Proto-dynastic cemetery, Ramesside tombs and animal burials, with fish, goats and oxen (Thomas 1981, 2).

Another excavation season was conducted by G. Brunton and R. Engelbach in 1920 and finally a plan was produced (Brunton and Engelbach 1927, fig. 1). They excavated new tombs, reopened much of the already dug tombs, but the illicit excavations by that time have made disappear many of the monuments.

From the 1930s to 1984 the presence of a military camp prevents further investigations, and archaeological prospections started again in 2005 under the direction of I. Shaw and F. Hagen for the Universities of Liverpool and Copenhagen and lasted until 2012. Finally, the works were resumed by the IFAO, under the guide of M. Yoyotte since 2015[85].

[85] For further references see (Gasperini 2018, 1; Hodgkinson 2018, 189-90).

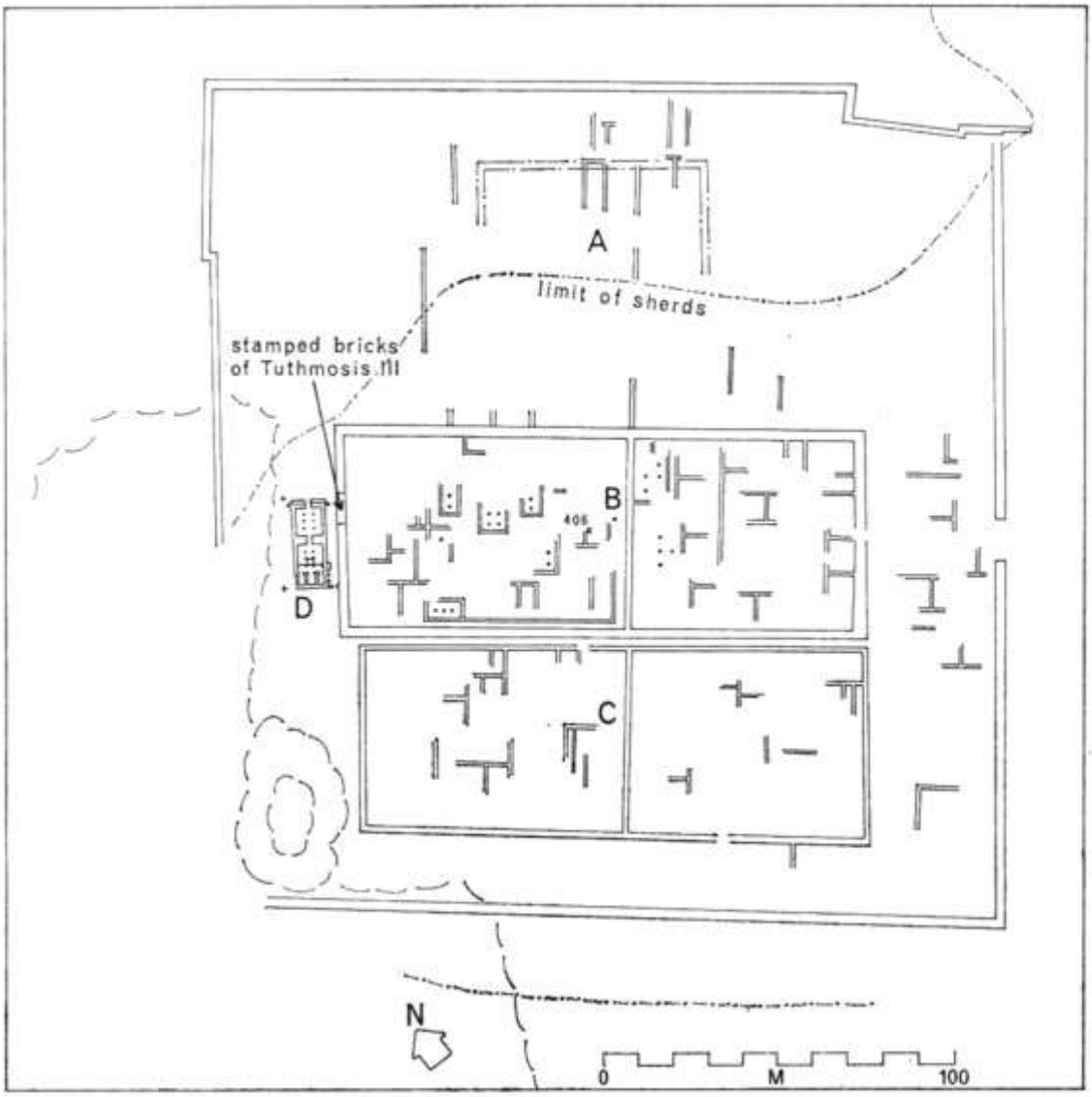


Figure 77 Plan from Kemp 1978, fig. 3.

The area was used as a necropolis for a very long time, from the Predynastic to the Roman Period but not extensively. The site was particularly exploited during the New Kingdom, from the reign of Thutmosis III to Ramses V (Wachsmann 2013, 95). It is not clear if a settlement was present during the first part of the 18th dynasty, but it was Thutmosis III who built the royal harem palace, and encouraged the flourishing of the site (Thomas 1981, 4; Hodgkinson 2018, 192). The settlement developed as a royal foundation, for housing the staff linked to the royal harem and to provide it with all the commodities. The harem palace was first identified by Petrie, who interpreted it as a large temple, and was subsequently recognized as a palace by Borchardt and more recently proved by Kemp (Kemp 1978, 131).

The structure comprehends two large twin buildings with columns and is surrounded by a brick enclosure wall. To the north, an area which might have been interpreted as a settlement can be identified (Hodgkinson 2018, 192). The site has also returned several necropoleis, which show social diversities, despite the massive looting activities conducted in modern and ancient times. A "fort", a mudbrick temple dedicated to Thutmosis III and an industrial area were also brought to light. This last feature was the subject of the recent excavations of the Liverpool and Copenhagen universities, and, interestingly, it shows evidence of some textile production (Hodgkinson 2018, 237)[86].

Gurob has provided a large number of textile tools and fibres, most of them belonging to the New Kingdom. Unfortunately, given the lack of context of findings, it is not possible to distinguish production areas for many of the objects nor to set a chronological frame to which connect the tools. For this project, it has been decided to see only materials which are stored in European collections, giving the large number of objects arrived in past times and the difficulty to locate and get access to these type of materials in Egyptian museums. Several museums exhibit objects from Petrie excavations to Gurob and, as for Kahun, it was not possible to see them all. Only the institutions with larger collections have been selected. Most of the items are stored in the Petrie Museum in London, and secondary in the Manchester Museum. Other items have been studied in the Ashmolean Museum in Oxford, at the British Museum and in the World Museum in Liverpool.
Unfortunately, a complete catalogue of the objects excavated by Petrie does not exist, so it is not possible to understand which percentage the collected items represent of the whole textile tools assemblage found in the site. Different types of objects and materials are represented in the catalogue, giving the idea of a much less homogeneity than that observed for Kahun.
As for the other sites, are included in the research spindles, spindle whorls and net weights. Not a single perforated sherd was collected by Petrie. Possible parts of loom are also comprised. Needles are included in this research as a hint of textile processing, even if not directly connected with the textile production. Bone spatulas and pin beaters are also examined to look for signs of wear compatible with their use with soft materials and to check possible connections with other textile tools.

5.10.2 Foreigners at Gurob and textual sources

Gurob is particularly famous for the long-debated presence of foreigners in the settlement. The first person to hypothesized the presence of a large community of foreigners in Gurob, probably of Aegean

[86] Another interesting element is the scarcity of textile tools found by I. Shaw's recent excavations (Hodgkinson 2018, 203).

origin, was Petrie (1890, 40–45). In his excavations, in fact, he found several objects of foreign provenience and a peculiar feature consisting in numerous pits under the floors filled with burnt objects and covered by ashes, named as "burnt groups" (Petrie 1891, 16–19). They were located under the floors of buildings he thought to be houses, but which should now be recognized as rooms of the palace.[87] Although the chronology proposed by Petrie has been demonstrated to be wrong, many theories have been proposed to explain the phenomenon.[88]

The burnt groups, however, are not the only evidence (if it could be taken as a piece of evidence) of the presence of foreigners at Gurob. Excluding the evidence presented by Petrie (1890, 39–41) on the basis of the bone materials and of blond hair, which is not nowadays considered reliable, some other clues point to the presence of non-Egyptian people in the settlement. This is not the place to discuss all the possible foreign materials found at Gurob, from the Mycenaean pottery (Gasperini 2014) to burials equipment, name of people or cooking pots[89], but two objects are relevant for this study: the first one is a spindle and the second a papyrus.

The spindle was found in tomb 11 (Brunton and Engelbach 1927, fig. XIII.8) and is now housed in the Museum of Archaeology and Anthropology of Cambridge[90]. It has a wooden shaft and a limestone spindle whorl decorated with patterns in form of y. The peculiarity of this spindle, already discussed by Barber (Barber 1991, 64–66), is that the top of the spindle preserves the groove where the thread was inserted but the spindle whorl is not placed immediately after the groove, but it is near the opposite point, which means it is a low-whorl spindle. That is opposite to all the Egyptian evidence so far investigated. Other two limestone spindle whorls were found in tombs 217 and 600. Another peculiar feature of this object is that the groove is not cut in s direction, as all the other Egyptian spindles, but instead it shows a z direction. I was not able to see this object for lacking of time and I am not able to determine from the picture of Brunton and Engelbach (1927, fig. XIII.8) if it is a spiral groove or if it is a notch and an identical incision is present on the other side[91]. However, it is not a decisive matter for this research. In fact, Barber connects the presence of the z-direction groove and the low-whorl to the presence of Aegean spinners. It is true that the z-groove appears different from other spindles of Egyptian tradition, which have generally an s-directed groove. However, Egyptian textiles are not always s-spun and s-plied, but can be s-spun Z-plied, or even z-spun and Z-plied. The groove direction, therefore, it is not a clear indication of a foreign spinner. Other three elements point,

[87] For a detailed and updated discussion of these assemblages, see (Gasperini 2018)

[88] For the Urnfield culture see (Wachsmann 2013, 178–99); for a Hittite tradition see (Politi 2001, 107–11); for a reassessment see (Gasperini 2018). More circumstantiated the hypothesis of Gasperini (2018, 301), who considers them as secondary depositions after robberies occurred in the 21th dynasty.

[89] For a detailed discussion see (Thomas 1981, 5–6; Wachsmann 2013, 178–99; Gasperini 2018)

[90] 1921.587 A. Weight given in the museum database is 103.9 g, while Barber reported 150 g (Barber 1991, 64).

[91] N. 526.n has a spiral groove which appears as s-direction from one side, z-direction from the other.

however, to the direction of a non-Egyptian spinner. The first one is the finding of the spindle in a grave, which is definitely alien to the Egyptian culture. Second, the position of the spindle whorl is generally culturally determined and there is no evidence, so far, that ancient Egyptians used a low-whorls spindle

Finally, the textual sources Papyrus Gurob III.1 (Wente 1990, 36, n. 34) preserves a letter from a lady of the harem to the king, which probably refers to some foreigners sent to her to learn spinning and weaving[92]. Furthermore, she says that it was happened another time in the past, so it was not an isolated episode, but probably a consolidated tradition. The document is dated to year two of Seti II and the first training happened during the reign of Ramesses II.

The letter, however, contains another clue that it is extremely interesting. Foreigner spinners and weavers which were employed in the royal harem, were not chosen because they were skilled in foreign crafts (e.g. Syrian women able to produce renowned Syrian textiles), but it is clearly stated that they have to learn to work in the Egyptian way. This means that the final products to be expected from Gurob palace must be completely Egyptian. The document, therefore, cannot be used to explain the peculiar spindle, since these foreign women had probably to use Egyptian tools to produce Egyptian textiles.

There are no traces that exotic textiles were produced in the harem palace, however they could have been present in the settlement if traded or produced for foreigners by other workshops or directly in their households. It is highly probable that exotic textiles were present in Gurob and used by foreigners living in Gurob, as it happened in Amarna. In the stela of Trr, the husband is portrayed while wearing a Syro-canaanite dress and his wife, also with a Semitic name, is dressed as an Egyptian woman (Wachsmann 2013, 164, fig. 4.1).

Other documents pertaining textile production were found in Gurob, and clearly this activity must have had a certain importance in the economy of the town.

One of this documents is a papyrus found in Gurob (UC32795) with a list of dresses for the Hittite spouse of Ramses II, Maat-hor-neferura, and some of her dresses were probably produced in Gurob (Gardiner 1948, 45; Wachsmann 2013, 197–98).

An ebony statuette, inscribed with the name of the lady Teye, was found in a tomb near Gurob. This lady bore the title of "chief of weavers" during the reign of Amenhotep III (Thomas 1981, 9, 16.). An headrest with the name of Hwy bears the title of "chief of spinners", giving the idea of a large and well organized textile industry (Thomas 1981, 16).

[92] Although weaving is not clearly stated it seems a likely interpretation.

5.10.3 Spindles

Gurob preserved several complete spindles, with both spindle and spindle whorl preserved, as well as single spindle whorls and shaft, which could not be linked to each other. In the catalogue are listed 30 spindles from Gurob, all of them made of wood. Only a few items in the Manchester Museum were not available for study and they therefore are marked with a different colour in the catalogue.

Figure 78 Complete spindle 523

A small number of these are preserved in their full length, 5 in total: UC7812c, UC7809, UC27873iiie, 526l, 526o. Most of the other examples are broken for more than a half and some do not preserve any end. The longest spindle measures 24.5 cm and the shorter one 21 cm, but within the broken objects there is a spindle which measures 33.4 cm (UC526m). Most of the objects under exam, however, must have had a length between 20 and 25 cm. The picture seems therefore very similar to Kahun and Deir el-Medina, with most of the shaft measuring less than 25 cm, but with few exceeding 30 cm. Shafts diameters measure 0.7 cm on average (maximum diameter of the shaft), with most of the items ranging between 0.5 and 0.9 cm. The thinnest rod measures 0.4 cm and the thickest 1.04 cm, with value largely lower than those seen in Kahun and Deir el-Medina.

As in Kahun, shafts are generally not cylindrical but tend to thicken in the middle and tapering towards a point, while the other end is slightly thinner but not so different from the middle. In many cases, therefore, spindle whorls have slightly conical hole because it is slightly larger on the lower side than the upper side, with a difference of 1 mm.

Number	Length	Diameter	Weight
UC7812c	23,8	0,46	2,24 (no whorl)
UC7809	24,5	0,41	5,04 (with whorl)
526l	23,3	0,54	8 (with whorl)
526o	21	0,57	22 (with whorl)

UC27873iii e	23,2	0,87	5,5 (no whorl)

Table 9 Complete spindles from Gurob

The upper tip of the spindle can be rounded or flattish and generally has a spiral groove or a notch to attach the fibres for spinning. The other end of the shaft, when preserved, tends to taper to a point, although not very sharp. All the preserved examples with the spindle whorl attached to the shaft show that the position of the spindle whorl is immediately below the groove, and therefore are high-whorl spindles, except the already cited example in the Cambridge museum.

Figure 79 Point of spindle UC7812a with a thick layer of

Only three spindles preserve fibres wounded around the shaft, in two objects are threads mixed to unspun fibres, while in one object are just unspun fibres preserved under a thick layer of encrustation (UC 7812a). 527 preserves a thread s-plied wounded around the shaft and placed under the spindle whorl, partially embedded in a layer of encrustation. 526.a has a large quantity of thread wounded around the shaft under the spindle whorl, most of it unspun. A thick yarn is Z-cabled and another thread, highly worn, near the end of the shaft, is z-spun or plied.

Figure 80 Spindle with thread 526.a

5.10.4 Spindle whorls

22 spindle whorls of the corpus are preserved attached to their original shaft, while 75 lack their spindle. The total is 97 spindle whorls, which is a sample[93] similar to that of Kahun. Almost all the spindle whorls are made of wood, while only six are made of limestone. No bone spindle whorls, which are so common in Late Bronze Age levels in the Levant, are present as well as reworked sherds are completely absent. However, the lacking of perforated pottery sherds might depend on the choices made by the excavator, as is the case for Kahun and Deir el-Medina. Wood seems to be in any case the preferred material, and almost the exclusive, a fact that is very astonishing given the paucity of wooden resources in Egypt. Nevertheless, the settlements under examination, Kahun, Gurob, Deir el-Medina and Amarna, are strictly related to the central administration and might have benefit of a major availability of this precious resource.

[93] See the consideration on the reliability of the sample faced for Kahun.

In the catalogue, four shapes of spindle whorls are listed: dome, conical, conical truncated and cylindrical. However, it is not always possible to clearly separate between each form, especially in the case of dome and conical objects and they should be probably considered as variant, rather than different categories. The conical/dome shape is the dominant form of spindle whorls known from Kahun, with 52 examples listed in the catalogue. The cylindrical shape, which is dominant in all other sites, is well represented in Gurob, with 34 objects, but far from being the most common type. Few spindle whorls has a conical truncated shape, only 5 out of 91.

No wooden analysis have been so far carried out on Gurob spinning tools and it was not possible to conduct tests for this thesis. However, it seems that spindle whorls made of soft wood, probably *Ficus sycomorus* were present, but certainly other species of wood, much more resistant, were also employed. As in the case of Kahun, small branches and larger logs were used to cut the spindle whorls, as can be seen in UC7814ii j and UC7814ii l.

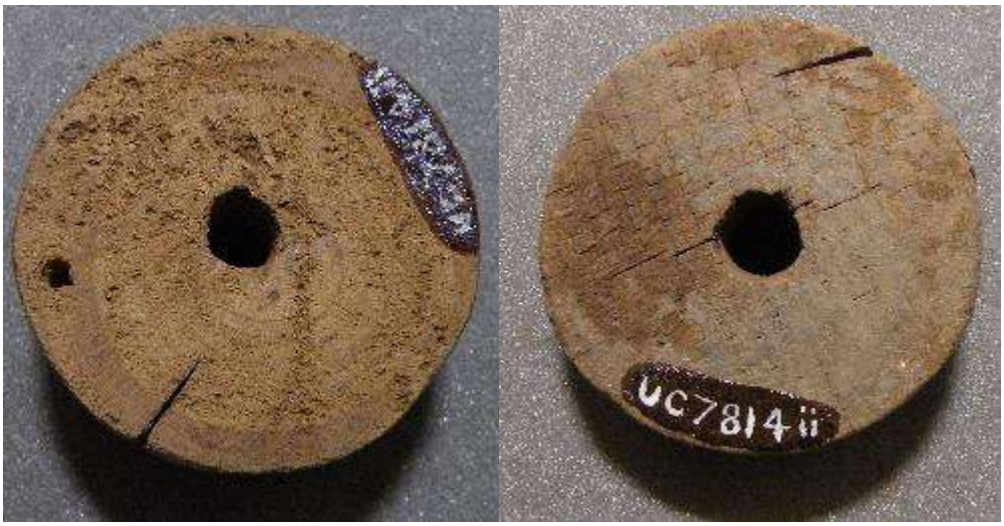
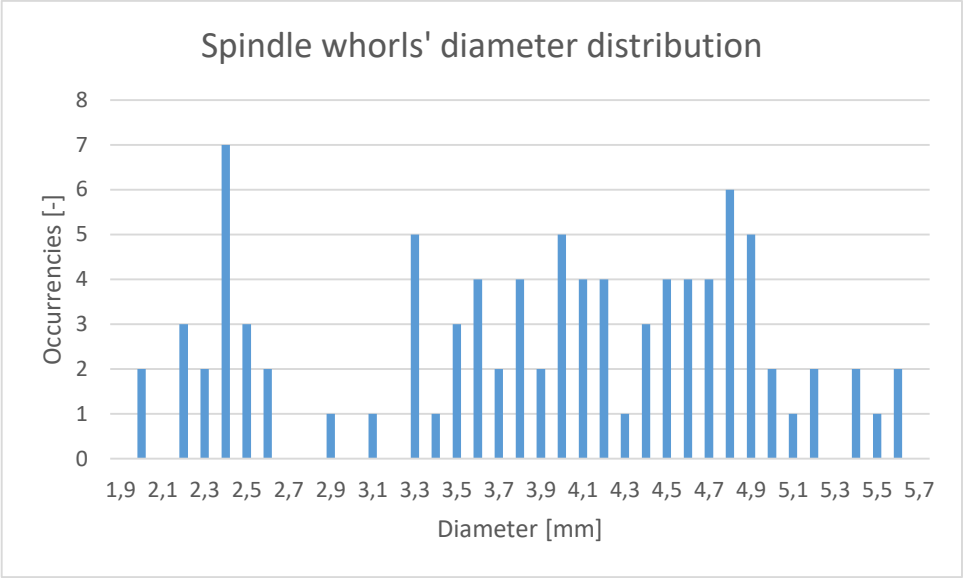
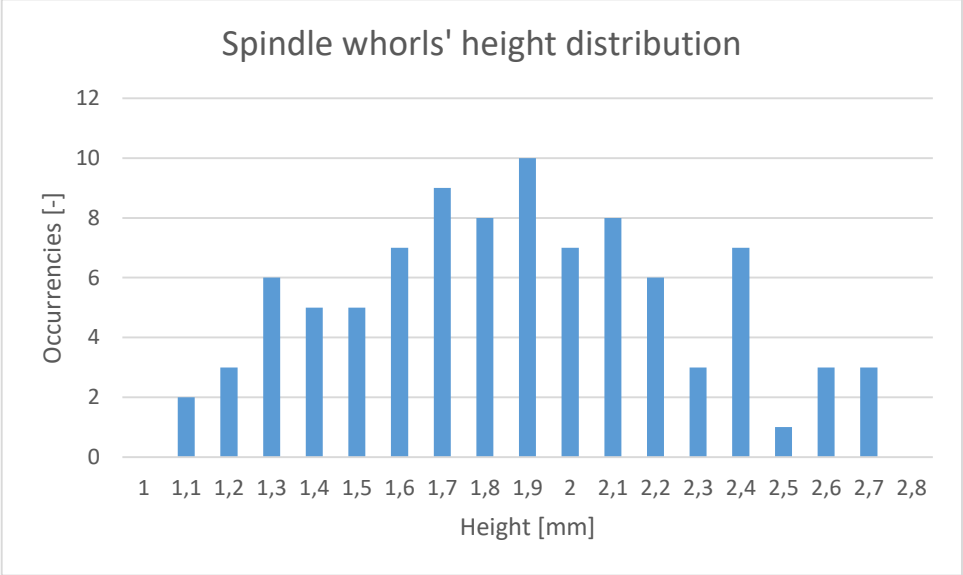


Figure 81 Spindle whorls UC 7814ii m; UC7814ii l

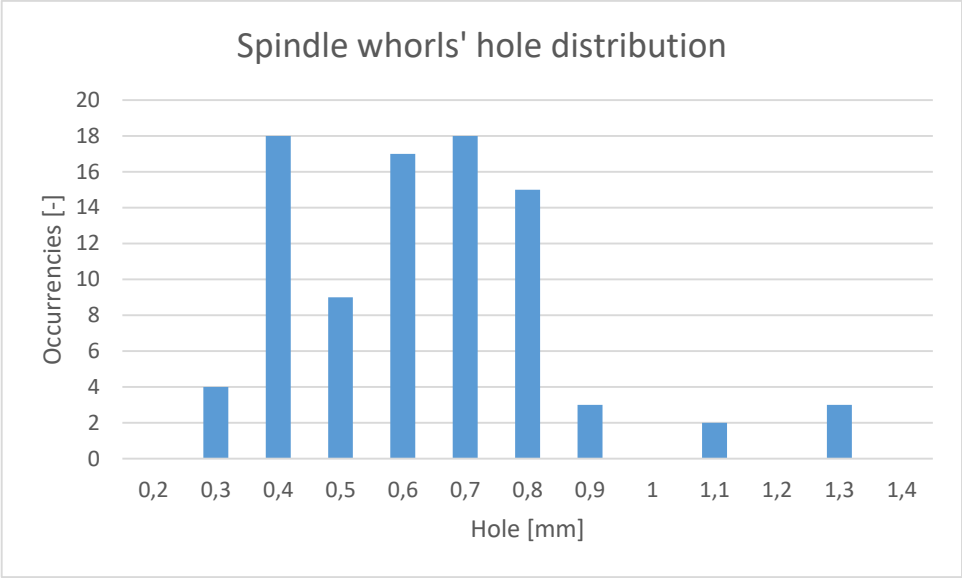
The diameter of spindle whorls can vary a lot, given the different types employed in this site. Many of the dome-shaped examples, in fact, have a small base and are quite high, with a completely different ratio then the cylindrical whorls, and a different inertia. The minimum value is 2.06 cm, while the maximum measures 5.6 cm. The average value is 3.9 cm.



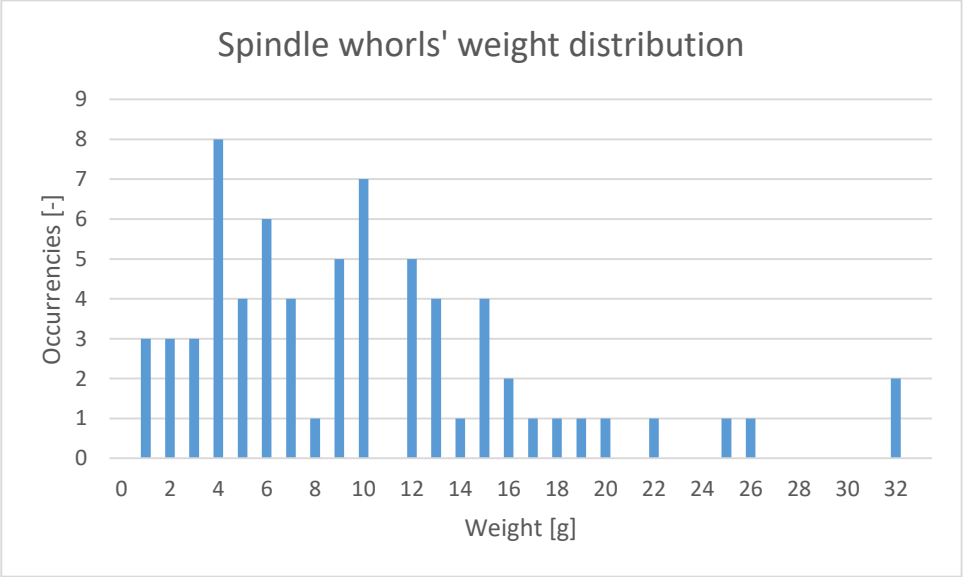
Height, instead, does not vary a lot, thanks to the fact that both cylindrical and conical/dome shape spindle whorl have a similar size. The minimum value is 1.19 and the maximum is 2.73, with an average value of 1.9 cm. Cylindrical spindle whorls are, in general, more similar to those of Deir el-Medina rather than those of Kahun, which are much more thicker than those of Gurob.



There is a huge difference in hole diameters, as in Kahun, since the smallest value measures just 0.3 cm and the maximum is 1.37 cm. The average value, however, is quite low, since it is just 0.66 cm, while in Kahun is 1 cm. The value which is under consideration is taken in the largest part of the hole, since many of the holes are slightly conical to allow a better adaptability to the shaft of the spindle, with a general variation of 1 mm. In at least one case, a wedge is preserved inside the hole of the spindle whorl.



Some of the spindle whorls are still attached to their shaft, and in this case, their weight is not considered in the charts, since it is the total weight of shaft and whorl. Only the whorls which were no longer attached to the shaft are therefore considered here. 66 weights of wooden spindle whorls have been measured, the lightest measuring 1.4 g and the heaviest 32.1 g. The average value is 10.1 g, which is definitely a light weight.



94

Some of the cylindrical and dome shaped spindle whorls show traces of a patina or an encrustation on one or both flat surfaces. As seen for Kahun, it might depend by the condition of preservation of the tools, given the fact that it does not seem to follow any precise pattern. Generally, it appears on one side of the whorl, sometimes on all sides and can be concentrated in few spots or can cover the

[94] Even separating cylindrical and conical whorls, it is not possible to observe a more regular weight distribution.

whole surface of the object. Fibres, when preserved, are constantly under the encrustation, and make to think to a post-depositional phenomenon. However, it seems peculiar that appear constantly in all sites under consideration.

No decoration seems to appear on wooden spindle whorls and marks seem to be quite rare in the site. Only six limestone spindle whorls are listed in the catalogue, but certainly a few others must have been present in the site, as for the already cited example in Cambridge. They are very different from the wooden one hence they are treated separately. Two of them have a dome shape, while the other four a conical shape. They are quite different from each other for dimensions and weight, but they share as a common feature a large diameter and a medium to heavy or very heavy weight. The diameters range between 4.51 cm to 7.63 cm and a height variable between 2 and 3.78 cm. As in the case of Kahun, most of the holes are slightly conical, with the largest value at the base and span between 0.79 and 1.2 cm. Weights are very close to those of Kahun, since they range between 57.7 g and 133.2 g. Limestone whorls are quite crude in their appearance, with surfaces barely polished and shapes slightly irregular. Most of them, however, are decorated on the surface with radial and circular incision, even though crudely cut.

As in the case of Kahun, they appear particularly worn near the "upper" hole, meaning the hole near the smallest part of the spindle whorl, a detail which is much more compatible with a usage on a low whorl spindle rather than on a high whorl one. In Gurob, there is a proof that low-whorl spindles were actually used, as seen in the case of the Cambridge example. Since all the other spindles with wooden whorl assembled on them are clearly high-whorl spindles, it might be possible that only limestone spindle whorl were used on the lower part of the shaft, probably with a different technique. Generally, small and light whorls are used on the bottom of the spindle while large and heavy whorls are more effective on the top of the spindle to ply yarns[95]. In Gurob, it appears that the situation is exactly the contrary.

Considering all these data, the textile industry of Gurob appears very similar to that of Kahun, but texts suggest a very different situation, with a large, industrial-scale, weaving activity. The number of objects (which is very small) are very similar for the two sites, but this might depend on several factors, spanning from different conditions of preservation of the site to deliberated choices of the excavators. There is, however, one element which clearly points to a completely different client for the Gurob production. Some of the spindle and spindle whorls, in fact, are much smaller and lighter than those found in Kahun, Deir el-Medina and Amarna. Furthermore, they have a different shape. Shafts are long and extremely thin, measuring 0.3-0.5 cm of diameter, which appear quite fragile if

[95] I have to thank again Eva Andersson Strand for having discussed with me this issue.

compared to the other type of spindles. Spindle whorls can be of dome/conical shape and even in this case be very small and light, but some examples of thin shaft and larger spindle whorls are also known. UC7809 is the lightest example, is complete and it weighs just 5 g, considering both shaft and whorl. A similar item, 526 l, weighs 8 g considering both shaft and whorl. Other broken examples are also known.

This means that the yarn produced by these items is different from that produced by other spindles, and must be much more fine and valuable. Considering that the site was focused around a royal harem, where textiles for queens and the royal court were produced, it seems highly reasonable to consider these thin spindles as tools for luxury production.

Figure 82 Spindle UC7809

Figure 83 Spindle 612 l

5.10.5 Spinning bowls

Textual sources provide a picture of an industrial-scale textile production in Gurob, but as for spindles, archaeological data contradict this view. Spinning bowls are not recorded from Petrie excavations, while he reported them in Kahun. Some have been found from I. Shaw's excavations, but in a limited amount[96]. Spinning bowls are generally considered a reliable indicator of spinning activities and they are well know and widespread in Egypt, with many examples from Amarna, Deir el-Medina, Kahun, South Abydos, etc.[97]. If a royal textile workshop was present in Gurob, one would have expected to find them in larger quantities.

5.10.6 Weights

Gurob has provided a few net sinkers, but those listed in the catalogue are just a small percentage, since they were clearly not interesting for this study. In fact, they are very small objects made of lead

[96] Gasperini pers. comm.
[97] See chapter 5.4 for a more complete list.

and the one I measured, weighs just 5.7 g. They are definitely net weights and there is no risk to confuse them with loom weights.

Only a limestone weight was recorded in the museum collections chosen for this research and, in some way, can be considered similar to the weights of Kahun. It is a rounded pebble with a deep groove, which crosses the surface of the object in its shortest side.

If Gurob had housed an Aegean community with foreign spinners and weavers free to work for themselves, we should have found some evidence of the usage of loom weights of the Aegean type. If the communities were Levantine, there would be no chance to see it from the weights, since they were rarely attested in the Late Bronze Age in the Levant.

5.10.7 Needles

A large number of bronze needles was found in Gurob by Petrie and is now preserved between the Petrie Museum and the Ashmolean. Of the 73 needles listed in the catalogue, only part of them preserves an eye, and can be defined with certainty as needles. It is, in any case, a much greater number than those found for the other sites under study.

Needles can be quite thick, with a maximum diameter of 0.3 cm, but most of the examples have a diameter that ranges between 0.15 and 0.25 cm. They are thicker and longer than needles used nowadays, but usable for sewing textiles.

They were probably found spread in the settlement, but in some cases Petrie reports the finding place, and we can therefore clearly state that they could be associated also to the burnt groups (Petrie 1891, 17–18, pl. XVIII). Interestingly, all the needles under study were made in the same way, with the hole pierced through one end of the shaft. Not a single example with the upper part of the shaft bent on itself is present, which is a typology widespread in the Levant since the Middle Bronze Age.

5.10.8 Spatulae

Bone spatulae are quite frequent in Gurob, since 95 examples are listed in the catalogue. They vary a lot for shape, length and width, therefore their usage might vary between one object and the other. Beside the classical shape with a triangular point, pen-nib examples are also quite common. Furthermore, tools with double flat and rounded point are present. Wear traces vary also a lot, with

objects only slightly used near the point and cancellous

bone completely exposed and coarse; other examples, instead, show a completely smoothened of the whole under surface of the spatula. Typically, wear traces are localized mostly near the point and slowly disappear going towards the other end, similarly to what seen in Hazor too.

Figure 84 Bone spatula with evident cancellous bone, obliterated by wear near the point (555.b.x)

However, some spatulae show a different pattern of wear which is typical of Gurob. In some cases, in fact, spatulae were used more intensively on the central or the rear part, probably due to their curved shape, which influenced the zones in which the objects had more contact. This means, that not only the point was inserted in the fabric (accepting that they were used during weaving) but most of the surface of the object came into contact with the yarns. A clear example is 555.xi from the Manchester collection.

Figure 85 Bone spatula with pen-nib point and central wear 555.xi

Completely different from any other spatula is 555.xiv, which was used on its short side, always in the same direction, and has one of the edge extremely consumed and sharp, while the other shows still traces of cancellous bone and is much more thicker.

Figure 86 555.xiv

5.10.9 Fibres

Very few textiles were recovered in Gurob, most of them from tombs, like the famous couple of sleeves for a child dress (Thomas 1981, 11) and the textiles examined by J. Picton (Picton, Johnston, and Pridden 2016). Much more consistent is the collection of balls of yarn and bundles of threads. In the catalogue are listed 33 items, which include fibres prepared for spinning, spun fibres (actual balls of yarn), textiles with fringes and nets and mixed materials. All of them are made of flax, as it appear by eye or under a light magnification. Coarse, thick fibres made of several plied yarns are present as well as extremely fine yarns, perfect for using in high quality textiles. This is not surprising given the presence of the royal palace, which certainly required luxury textiles. Only one item seem to bear traces of a blue pigment, while in all other cases colour is not visible. Most of the objects are worn, but some are better preserved, even than the examples from Kahun.

One of the most interesting objects is 500.a. It is a ball of unspun fibres, very well prepared and its stage of production come immediately before spinning. In fact, it is possible to clearly see that the fibres are attached together by splicing and plying, as perfectly explained by H. Granger-Taylor (Cartwright, Granger-Taylor, and Quirke 1998, 103–4), but not yet spun. Not a single sherd of a spinning bowl has been, so far, documented for Gurob, but splicing was certainly in use. Plying, on the contrary, appear quite rarely in the site and it might be the reason for a minor use of the spinning bowls, but not for their total absence.

Figure 87 Ball of yarn 500.a

5.10.10Other tools connected with textile production

Other objects found at Gurob might be linked to the textile production. In the Manchester collection a flax stripper or weaving comb is present. Although it appears similar to other examples of Roman and Byzantine period, it might belong to the New Kingdom and be an antecedent of the much more common objects of a later date.

One netting needle is stored in the Petrie Museum. Even if it not directly connected in the production of textiles, it should always be remembered that net production shared a lot of tools and techniques with textile production.

Certainly belonging to looms are the two warp spacers (one in Manchester the other in the Petrie Museum collection) listed in the catalogue, but they should be five in total (Kemp and Vogelsang-Eastwood 2001, 339–41). They were used to keep the warp in tension and yarns parallel.

Two weaver's slays from Gurob are stored in the Petrie museum. They were probably inserted between the warp threads to beat the weft. One is broken in three pieces and preserves traces of wear due to the rubbing with threads. The other one is only partially preserved and might have had a similar function.

Vertical looms were probably used in Gurob, as it was for Amarna. In fact, a squared pool for fixing the beam to the wall, very similar to those of Amarna (Kemp and Vogelsang-Eastwood 2001, 348–51) was found. Instead, no limestone supports are known.

5.10.11 Conclusions

Gurob is a key site to study textile production in Ancient Egypt and not having anymore the chance to study the primary contexts of findings of the tools is a great loss. In fact, it prevents the fully understanding of the *châine opératoire* of the textile activity. Spinning and weaving were performed in the same places, as seen in Middle Kingdom funerary models, or homespun threads were brought to weaving workshops? Which type of tools were used by the palace, which in the industrial area and which in the houses of the common people? Were they different at all? Unfortunately, we will never be able to answer these questions for the items excavated by Petrie, but new excavations might shed light to some of these aspects.

Spindles from Gurob share some aspects with similar items from Kahun, Deir el-Medina and Amarna, but, at the same time, they diverge significantly. As in Kahun, two lengths of spindles were probably in use, one measuring almost 25 cm, and the other longer than 30 cm. Most of the items show a groove or a short notch at the end where fibres were secured and the other end is generally pointed. Shafts are not decorated (while pins are) and, differently from Kahun, can vary between a maximum diameter of 1 cm to very thin shaft which measures only 0.4 cm of diameters. A similar picture can be seen also for spindle whorls. Most of the whorls are similar to those of Kahun, Amarna and Deir el-Medina, cylindrical with larger base than height, but some are completely different. These have a conical/dome shape, are small and very light. The combination of small whorls with thin shafts creates extremely light spindles which were used to produce very fine and expensive threads, as visible in the balls of yarns found in the site. Very few wooden spindle whorls show a mark incised on the surface and they are not decorated. On the contrary, the few limestone spindle whorls show incised decoration on the surfaces, even if crudely made. All the whorls, in the preserved examples, are placed in the upper part of the spindle, near the groove, except the famous spindle in Cambridge which has a limestone whorl at the bottom.

Few spinning bowls, so far, are known from Gurob and this is definitely unexpected. In a site where text indicate a strong textile production, we should expect to find dozens of spinning bowls, even if fragmentary. It might be depend on problems of identification in older excavations (since the second season was led by Hughes-Hughes and not by Petrie), or it is even possible that textile production was practised at very high levels but not at an industrial scale (which would explain the small quantity of tools in general). Given the peculiar modern history of the site, and the heavy damages due to

plunders, military bunker and erosion, a problem in the archaeological documentation is probably the most likely hypothesis.

Several nets were recovered from the site and many net weights have been recognised. Since they are very small, light, lead weights are not considered of interest for this research.

As for Kahun, all the needles are made by piercing the shaft from one side to the other and no examples of needles with eye bent on itself are known from the site.

Bone spatulae are quite numerous in Gurob and show different measures, shapes and traces of wear due to usage. The large sample of materials allows discerning different ways of using these simple tools, by exploiting only the point or using the whole surface of the tool.

The general picture, which arises from this overview of tools, is quite contradictory. Spinning implements are not very numerous by comparisons with other sites such as Deir el-Medina. It should be remembered, that it might depend on choices of the excavator and on the collections selected for this thesis. However, given the large quantity of fibres, balls of threads, bone spatulae, needles and parts of loom found in the site, it appears that the vocation of the site was more on weaving and finishing textiles than preparing fibres and spinning. These two tasks were certainly performed on the site, as 500.a proves, but apparently were less common.

5.11 Deir el-Medina

5.11.1 Introduction

The village of Deir el-Medina is located on the west bank opposite the modern town of Luxor, in a small desert valley behind the Qurnet Murai slope (Toivari-Viitala 2011, 1). The modern, Arabic, name means "Monastery of the Town", for the religious institutions which was located in the ruins of the Ptolemaic temple of Hathor. The village was established for housing the workers (and their families) responsible for the constructions of the royal and princely tombs in the Valley of the Kings and of the Queens. It was probably founded by Thutmosis I at the beginning of the 18th dynasty and subsequently enlarged under the kingdom of Thutmosis III, Horemheb and during the Ramesside period. The latter phase is the best known and the great majority of materials and texts belong to the 19th and 20th dynasties. It was abandoned during the reign of Ramses IX (1099-1069 BC), when the inhabitants refuged in Medinet Habu and never reoccupied it.

At both sides of the village are located tombs of the inhabitants, the western and eastern cemetery, while the northern part is occupied by votive chapels and temples, and this part was subsequently occupied by the Hathor temple in the Ptolemaic period. North-east of the temple enclosure is located the so called "Great Pit", a 52 m deep structure of uncertain function, which was used as a rubbish dump in two different phases of the village occupation.

The village is surrounded by an enclosure wall, which was firstly built by Thutmosis I, since his cartouche is stamped on the bricks of the wall. The village was rather small in this period, and only during the reign of Horemheb it reaches approximately 40 houses. Subsequently, more houses were added and a total of 68 houses were found inside the enclosure and some more outside it, and its maximum was reached during the ramesside period.

Some remains of the village of Deir el-Medina were known since the 18th century AD, but only at the beginning of the 19th century objects collected from the village begin to form consistent collections, especially those of Bernardino Drovetti and Henri Salt (Toivari-Viitala 2011, 10).

The first systematic excavations were led by Ernesto Schiaparelli in 1905, and continued in 1909 and 1920, followed by short missions led by Émile Baraize and Georg Möller. The work was resumed by the French Archaeological Institute in Cairo in 1917 and from 1922 to 1951, excavations were directed by Bernard Bruyère (Toivari-Viitala 2011, 10). Works continued in the following years, but most of the work is now focused on study and conservation projects.

Figure 1. The site of Deir el-Medina. 1 = Village; 2 = Western Cemetery; 3 = Eastern Cemetery; 4 = Votive Chapels; 5 = Ramesside Cemetery; 6 = Ptolemaic Hathor Temple; 7 = Hathor Chapel of Sety I; 8 = Great Pit; 9 = Tombs of the Saite Princesses.

The objects studied from Deir el-Medina come from the collection kept in the Museo Egizio in Turin and are, therefore, related to Schiaparelli's excavations.[98]

Before discussing the collection of the Museo Egizio, it seems useful to briefly introduced textile tools exposed by Bruyère's excavations and briefly mentioned in publications and excavation's diaries.

5.11.2 Tools from Bruyère's publications

Several tools linked to textile productions were excavated by Bernard Bruyère and in one of his cahiers[99] , he listed the textile tools between the publications he aimed to do. Unfortunately, this work never seen the light. In his excavations report, textile tools occur quite seldom, despite the large quantity that seems to have been recovered:

- Puit 1109, 18th dynasty :

[98] Despite numerous efforts to have access to the IFAO materials collected in Deir el-Medina, I never received answer to my requests, nor from the Louvre, nor from the IFAO itself. Therefore, materials collected from French excavations remain unknown and unpublished to date and cannot be included in this thesis.

[99] Cahier 3, 1934-35, p. 20: «utensiles de ménage. Balais, fusaïoles, navettes, poids»

«Une rondelle de bois de 0 m. 05 de diamètre et de 0 m. 012 d'épaisseur, perforée au centre d'un trou rond de 0 m. 01 de diamètre. Ce disque est marqué d'un côté du signe  gravé, et l'autre face est enduite de boue. Cet objet semble avoir servi et fait partie d'un instrument de travail de scribe ou de maçon : fil à plomb(?)» (fig. 77) (Bruyère 1928, 98).

- Excavations in the south-west part of the village:

  Wooden objects:

  «Pièges à oiseaux, fusaïoles, navettes, contrepoids pour le tissage; manche d'outils pour ciseaux, lames, poinçons de bronze; spatules et cuillers pour le délayage des couleurs; chevilles, boutons de coffrets, serrures et loquets» (Bruyère 1933, 6).

  Stone objects:

  «Poids, godets, fils à plombs, fusaïoles et contrepoids de filage, billes et rognons de silex marqués à la pointe» (Bruyère 1933, 7).

- Work organization in the village :

  «La population féminine ajoutait aux besognes ménagères des travaux de filage et de tissage du lin, comme en témoignent les fragments de métiers à tisser, les mouilloirs, les fusaïoles, les contrepoids tenseurs, les peignes à carder, les piquets d'amarrage, les aiguilles de bronze, les bobines de fil que nous avons pu retrouver en grande quantité. La plupart de ces outils et instruments portent des marques gravées qui sont des signes de propriété» (Bruyère 1939, 7).

- Objects found in the village :

  «Pour le tissage et le filage, travaux faits par les femmes, on retrouve de très nombreuses fusaïoles avec têtes en calcaire ou en ivoire de forme demi-sphérique, ou en bois de forme cylindrique plate. Beaucoup d'entre elles sont marquées. Les navettes en bois, les tenseurs de pierre ou de terre cuite en forme de datte on d'olive traversée dans leur longueur par le trou dans lequel le fil à tendre est passé; les peignes à carder ou à tisser, les coupes de filage en terre cuite, dans le fond desquelles sont fixées des sortes d'anses (de une à quatre anses) où s'attache le fil, se rencontrent aussi en très grand nombre ainsi que les bobines discoïdales en terre noire, contrepoids de tissage, échevaux de lin et de fibre de palmier» (Bruyère 1939, 214–15).

- House N.E. V: Wooden spindle whorls, hank of flax (Bruyère 1939, 250).

- In 1922 excavations, in the area of the last 5 houses of the N-W quarter and of the first three houses of the S-E quarter, several objects were found. Among these items some spinning bowls with two or three loops attached to the bottom were excavated (Bruyère 1939, 262).
- House S.E.IX: several objects among which spindle whorls (Bruyère 1939, 278).
- Tools found in the dumps around the village:

  «le nombre considérable de fusaïoles décèle chez les femmes une industrie de filage et de tissage du lin très développée. Le type le plus courant de fusaïole est composé: 1° d'une rondelle de bois tendre tranche cylindrique (rarement tronco-conique parfois hémisphérique aplatie, sciée dans une branche d'arbre ronde, le diamètre est de 0 m. 04 à 0 m. 06; l'épaisseur de 0 m. 01 à 0 m. 02; la face supérieure de cette rondelle est encrassée d'une couche de boue, la face inferieure est parfois marquée en gravure d'un signe de propriété (on y retrouve beaucoup de signes marqués sur les poteries et les outils); 2° d'une tige de bois tendre et léger longue de 0 m. 30 à 0 m. 35 ronde et de 0 m. 07 à 0 m 13 de diamètre, effilée en pointe à l'extrémité inférieure, arrondie et creusée d'un canal hélicoïdal pour le passage du fil à l'extrémité de la partie supérieure qui déborde de 0 m. 02 à 0 m. 04 au-dessus de la rondelle.

  Le canal fait un tour de spire complet dans le sens dextrogyre de bas en haut; il part de la rondelle et se termine au centre de l'extrémité supérieure. Souvent une ligature en fil de lin fin entoure la tige contre la face inférieure de la rondelle pour l'empêcher de glisser; une autre ligature, serrée par une brindille de bois est quelquefois placée au-dessus de la rondelle. Quelques rondelles hémisphérique en bois dur et en pierre sont décorées de pétales de fleurs» (Bruyère 1939, 345).
- Excavations 1946-1947, finds: two wooden discs of spindle whorl and a wooden shuttle (Bruyere 1952, 69).
- Excavations of the "Great Pit", between the finds wooden spindle whorls, weaving shuttles and other objects (Bruyère 1953, 66).
- Objects found on the hill of dump:

  «Bronze: deux aiguilles à coudre. Longueur: 0 m. 10.

  Filage et tissage: nombreuses fusaïoles eu bois, navettes, bobines de fil de lin et écheveaux de lin, contrepoids en calcaire de forme conique avec rainures pour attacher le fil, disques de terre noire de diamètres variés (0 m. 01 à 0 m. 04) et de 0 m. 15 d'épaisseur avec réa, utilisés sans doute pour le filage. Tenseurs en terre cuite» (Bruyère 1953, 83).

- Objects found north of the chapel of the Amon Ra temple: a cylindrical, wooden spindle whorl with a mark (), diameter 5.5 cm; weaving shuttles (Bruyère 1953, 88–89).

Bruyère found a very large quantity of textile tools, most of them spindles and spindle whorls made of wood, with also bone and stone examples. Furthermore, he found several spinning bowls, providing another interesting element to the knowledge of the textile production in the village. Other objects are more difficult to understand, such as the weaving shuttles, and are therefore excluded from this study. Another very interesting feature is that spinning and weaving tools (except needles) never occur in tombs, neither those of the eastern cemetery which are less rich of those in the northern and western part (Bruyère and Jourdain 1937, 59).

Finally, he found several objects linked to textile production pertaining to the Coptic period of occupation of the site (Bruyère 1948, 1:48, 92, 118). Therefore, it should always be kept in mind that tools without a secure context of findings need to be more securely dated, than what has been so far did on the basis of typological developments.

5.11.3 Tools of the Museo Egizio collection

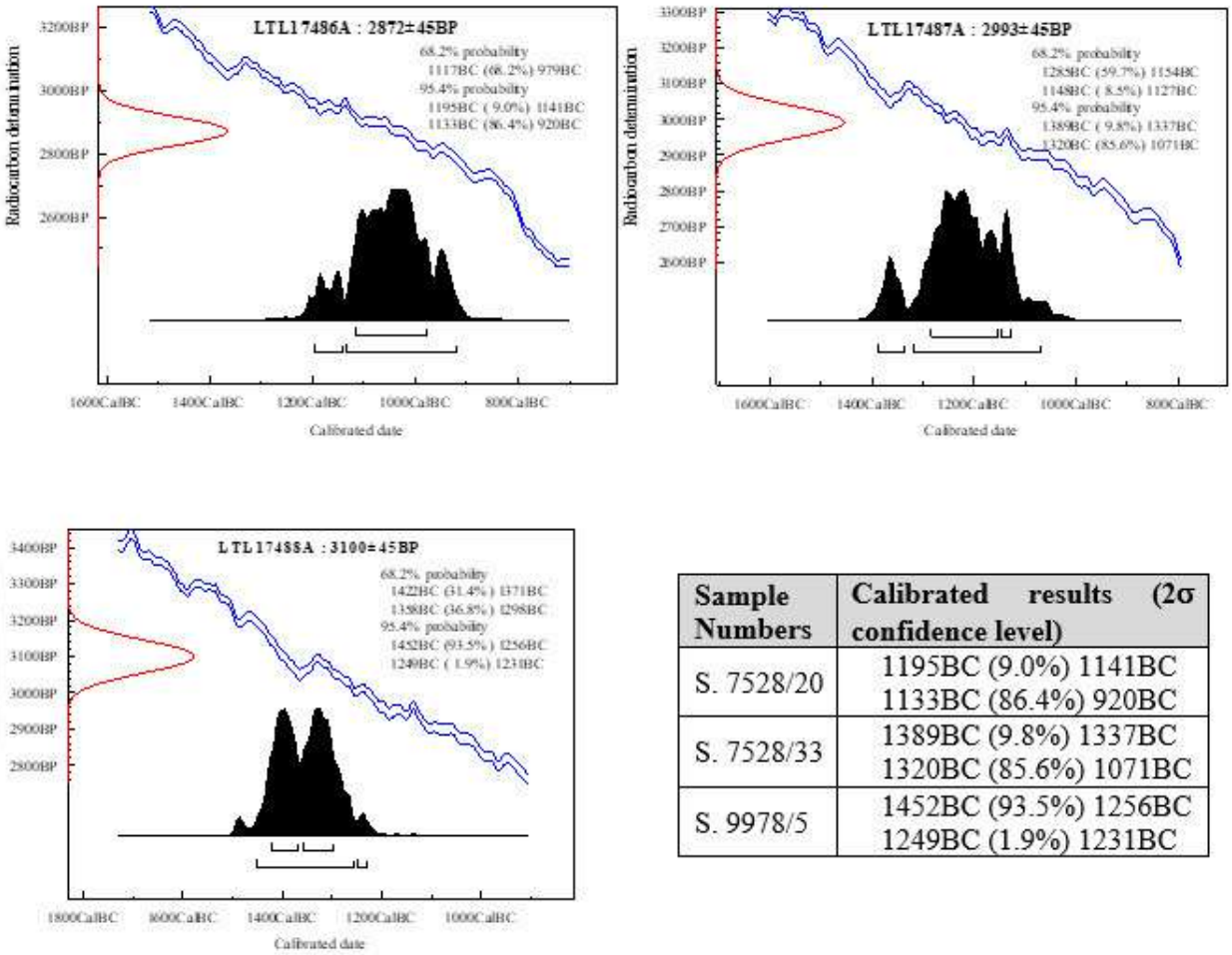
Several textile tools are stored in the collection of the Museo Egizio in Turin and they belong to Schiaparelli's excavations in Deir el-Medina[100]. Unfortunately, Schiaparelli did not recorded precise findspot of each finding. He certainly found in his excavations of 1905, 1906 and 1920, but the only information available in the Manuscript Inventory is "one spindle case", without further indication. However, in the inventory, spindles and whorls appear in the list of objects coming from the kom, a sort of rubbish hill in the southern outskirts of the village. He worked there in 1906 (Del Vesco and Poole 2018, 108). The only spindles which probably came from houses of the village are those listed as S. 9978, found by Schiaparelli in 1909, that is when he continued the excavation of the village.

A further problem with these materials is the lack of a reliable chronology. The Deir el-Medina Worker's Village has a very long period of occupation, since it was built under Pharaohs Amenhotep I or Thutmose I and was abandoned during the 20th Dynasty. Moreover, it was once again inhabited during the Ptolemaic age, when Ptolemy IV built a temple there and it was reused during the Coptic Period. Some of the objects under study could, therefore, belong to periods later than the New Kingdom. The typologies of spindles and spindle whorls point to a production in the Pharaonic period, although changing in shapes and materials through times are not reliable parameters of chronology. Three objects were sampled and ^{14}C analysis were carried out. They are spindles and spindle whorls,

[100] The study of the materials of the Museo Egizio began during a thesis for the Scuola Interateneo di Specializzazione in Beni Archeologici of Universities of Trieste, Udine and Venice. After the thesis, the materials were re-examined and some were sampled by an archaeobotanist, Mauro Rottoli, who also conducted the wood identification.

coming from different seasons of Schiaparelli excavations at Deir el-Medina, in order to arrive at a more certain date for these objects.

The results have provided a wide chronological range, spanning between the New Kingdom and the beginning of the Third Intermediate Period (1400-1000 BC), confirming the initial theory[101].



Sample Numbers	Calibrated results (2σ confidence level)
S. 7528/20	1195BC (9.0%) 1141BC 1133BC (86.4%) 920BC
S. 7528/33	1389BC (9.8%) 1337BC 1320BC (85.6%) 1071BC
S. 9978/5	1452BC (93.5%) 1256BC 1249BC (1.9%) 1231BC

Figure 88 Calibrated results of S. 07528/20, 33, S. 9978/5

5.11.3.1 Spindles

Schiaparelli brought to Turin from Deir el-Medina excavations 147 spindles with spindle whorls attached to the shafts and 2 spindles without whorls. Only few objects were complete, five out of the total (S. 07526/074, 07526/108, 09978/7, 09978/3bis, 09978/5bis) and two nearly complete (S. 07526/027 and 07526/047).

[101] The analysis of samples were conducted by the Centro di Datazione e Diagnostica (CEDAD) dell'Università del Salento and analysed with AMS Mass Spectrometry. The analysis have been possible thanks to the support of the Graduate School of Ca' Foscari University, Department of Antiquities, and to Professor Lucio Milano.

Most of the spindles have one or both ends broken, and several are preserved only for few cms inside the spindle whorl hole. Complete and nearly complete examples show that they measure between 20 and 30 cm, but occasionally they can reach up to 40 cm. Diameters can vary between 0.5 and 1.2 cm, but most of the rods have the a diameter between 0.8 and 1 cm, with an average value of 0.9 cm. The shape of the rod is not cylindrical, but tends to taper towards the lower end.

Number	Length	Diameter	Weight
S. 07526/74	22 cm	1 cm	18 g (spindle + whorl)
S. 07526/108	21.1 cm	1.1 cm	19 g (spindle + whorl)
S. 09978/7	35.8 cm	1.2 cm	27 g (spindle + whorl)
S. 09978/3 bis	32.4 cm	1.1 cm	37 g (spindle + 2 whorls)
S. 09978/5 bis	37.2 cm	1.1 cm	31 g (spindle + 2 whorls)

Table 10 Measures of complete spindles from Deir el-Medina

Figure 89 Spindle S. 9978/4 bis

Figure 90 Spindle S. 9978/7

As seen for Kahun and Gurob, two types of spindles must have existed: a longer type, which measured between 30 and 40 cm, and a shorter one, which measured between 20 and 25 cm. Weight and length differences certainly affected the final product and allowed to produce different qualities of thread. Spindle whorls related to these items are very few and do not provide a representative statistical sample.

Generally, spindles have a flat or rounded top, with an incision to fasten the thread. Both types with a spiral groove or a simple notch are represented (S. 07526/74 and S. 07526/97). Almost all the

preserved items tapers towards the other end, except in one example, S. 07526/23, which has a broad, rounded point.

When spindle whorl is present, it is always placed immediately below the groove, proving that only high-whorl spinning was performed. However, one example has the spindle whorl placed in the middle of the shaft (S. 09978/4) and some, incomplete objects show the whorl in the lower part of the shaft (S. 07526/02, 07526/03, 07526/07, 07526/08, 07526/09, 07526/13, 07526/23, 07526/76). All of them are characterized by a quite sharp point. Whorls fit very well on the shaft and they could be in their original position, but since not a single example is complete, it is impossible to state that they were actually used as low-whorl spindles.

In some cases, thread is still attached to the shaft and it is possible to observe the method of fastening. A first coil of thread is wound around the top of the shaft, and a small wooden peg is placed on it. Then, the thread is passed over the peg and the shaft and around the peg to throttle the binding. After this process is completed, spinning can begin.

Figure 92 Thread attached to a spindle through the insertion of a peg

Other spindles preserve coils of thread without the peg and traces of fibres, where it is not possible to distinguish single threads. In some cases only partial imprints of fibres have preserved. In he following list, some remarks on spindles with recognizable threads are given:

- S. 07526/001- At least two different threads preserved, one s-twisted and the other z-twisted.
- S. 07526/027 – One thread preserved in the spindle whorl hole, S-plied.
- S. 07526/032 – The spun yarn is preserved under the spindle whorl wrapped around the spindle shaft, it is S-plied, while the single twist is not visible. There are also some unspun fibres.

Figure 91 Thread attached with a peg S. 07526/032

- S. 07526/033 – On the upper part of the shaft a thread that attaches a wooden rod is preserved; the threads present are probably plied but this is not certain. It has a final Z-twist and its single twist is not visible.
- S. 07526/034 – On the upper part of the shaft, under the spindle whorl, a doubled thread with an s-twist is preserved; the single twist is not visible.

- S. 07526/035 – The upper edge of the spindle is broken and likely was also in ancient times because the fibres are wrapped around the broken part; a thread that attaches a wooden rod is preserved. The fibres are characterized by a S-plied yarn but the single twist is not visible. The thread itself is rather encrusted and is partially inserted into the spindle whorl hole.
- S. 07526/039 – A couple coils of yarn are preserved under the spindle whorl, but the fibres do not appear to have been twisted or spun.
- S. 07526/099 – Threads inserted into the spindle whorl hole and preserved on the spindle shaft. The thread appears S-plied.
- S. 09978/1 – S-plied threads are attached under the wedge rod which fixes the spindle whorl.

In most cases, it is difficult to distinguish whether the thread has one or more plied yarns. In some cases, it is clearly evident that the thread is doubled and S-twisted, but in at least two cases a final Z-twist can be seen.

5.11.3.2 Spindle whorls

Spindle whorls of Deir el-Medina are extremely homogenous as to their materials, their shapes and their dimensions. All of the spindle whorls of the Museo Egizio collection are made of wood, which is in contrast to what is known from other Egyptian contexts, such as Kahun and Gurob. Bruyère's excavations, however, seem to have recovered examples of bone and stone spindle whorl, apparently with a dome shape (Bruyère 1939, 214–15). In any case, wood is certainly the primary sources to produce whorls, as seen for the other Egyptian contexts. This choice is certainly to be attributed to availability of wood in the village, largely present in delivery records, and to technical reason. Although wood is less durable than other materials, the chance to create quite large whorls with a light weight makes it perfect for spinning flax.

Spindle whorls from Deir el-Medina appear extremely homogenous. All the 254 examples held in the Museo Egizio of Turin have a cylindrical shape. However, as seen before, some dome-shaped spindle whorls have been recovered by Bruyère.

The external diameters of these spindle whorls and can vary from a minimum of 3.9 cm to a maximum of 6.1 cm, with the majority between 4.9 cm and 5.6 cm in size.

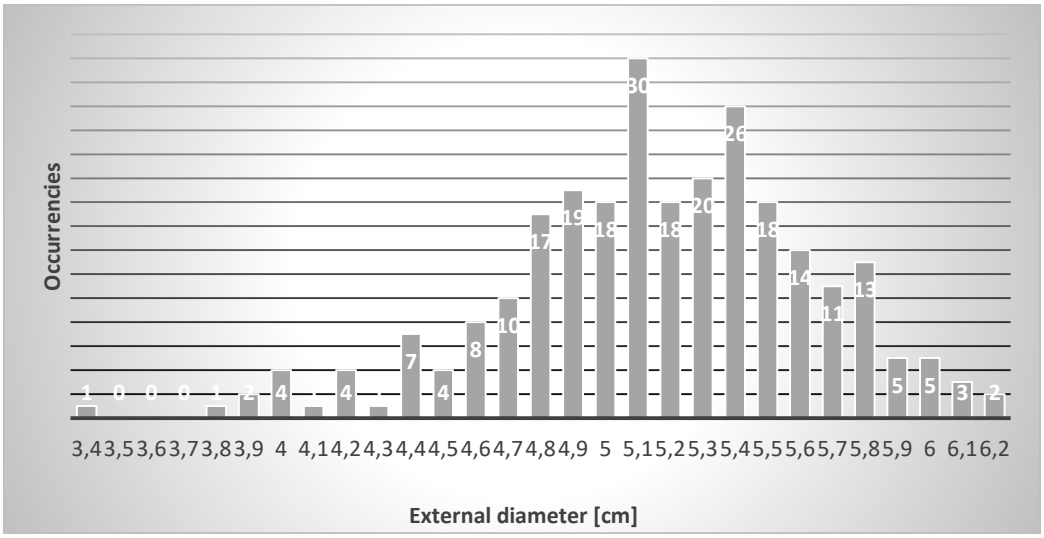


Figure 93 External diameters of spindle whorls

Figure 94 Spindle S. 9978/6 with wooden wedges inserted between shaft and whorl

Hole diameters vary between 0.3 cm and 1.4 cm, with the majority of the diameters ranging between 0.8 and 0.9 cm, as seen in the diagram. Most of the spindle whorls have hole diameters wider at their tops and smaller at their bottoms to better fit onto the shaft. This expedient does not seem to have been enough to ensure a tight fit however, as in certain examples vegetable fibres and small pegs have been used as wedges between the whorl and the spindle and are still present.

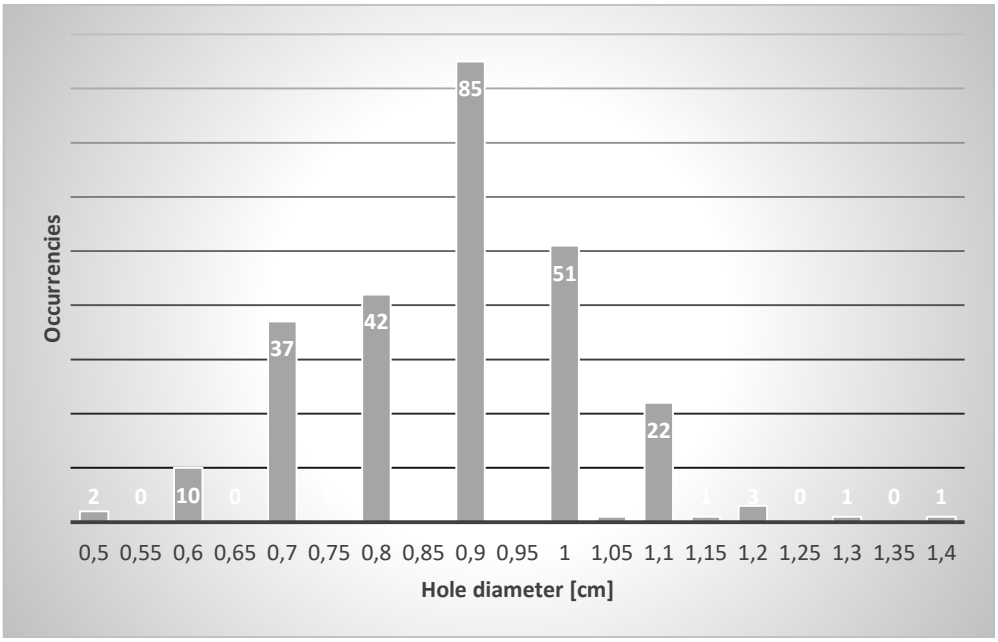


Figure 95 Spindle whorls hole diameters

As for the other sites, only the weight of complete spindle whorls is included, without the spindle shaft, although a weight is provided in the catalogue for all objects. Weights vary between 4 g and 19 g, with the average range between 11 g and 14 g.

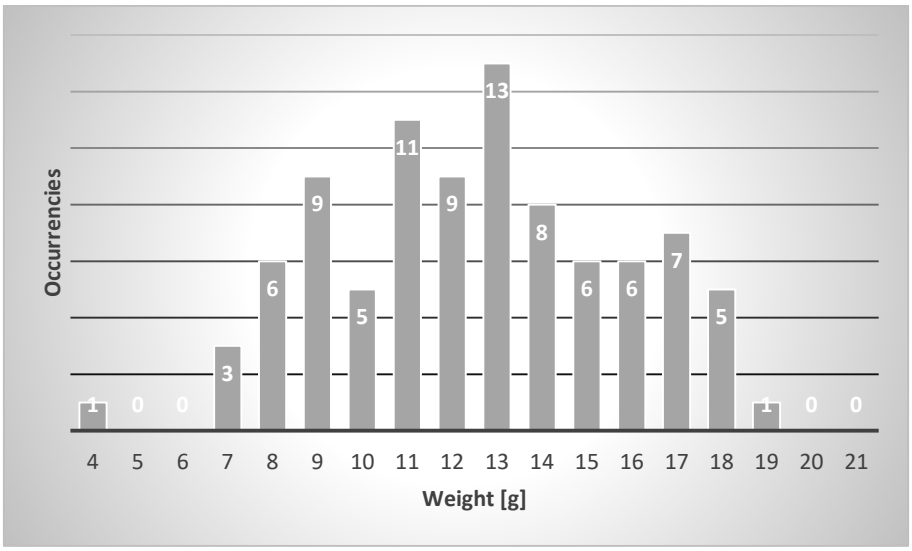


Figure 96 Weight of complete spindle whorls without shaft insert in their hole

On certain spindle whorls some repairs and ancient restoration activities have been executed, as on S. 07527/07, in which a small wooden rod has been inserted to fill a lateral hole. One spindle whorl (S. 07528/066) was never completed and is without a central hole. Its surface has been polished however, and some signs of preparation for the hole are visible.

A few spindle whorls are decorated by simple lines drawn with pinkish or black paint, as S. 07526/109, while others present incised marks, similar to identity marks known from pottery and tools of the village (*e.g.* S. 07526/110, 111, 112)[102]. Generally, these marks are considered as linked to the owner of the tool (Vogelsang-Eastwood 2000, 285) but they are known only for male activities and people. It would be interesting, in the future, to try to see if these marks could be used by women of the village as well.

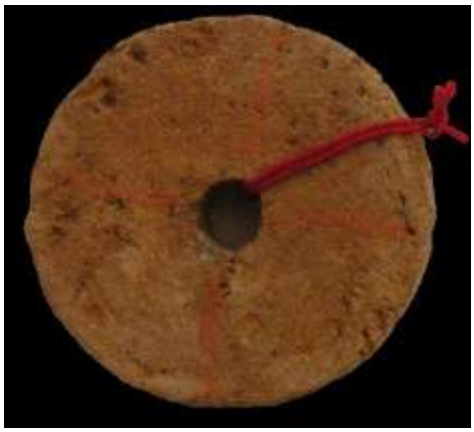


Figure 97 S. 07528/29 with painted decoration

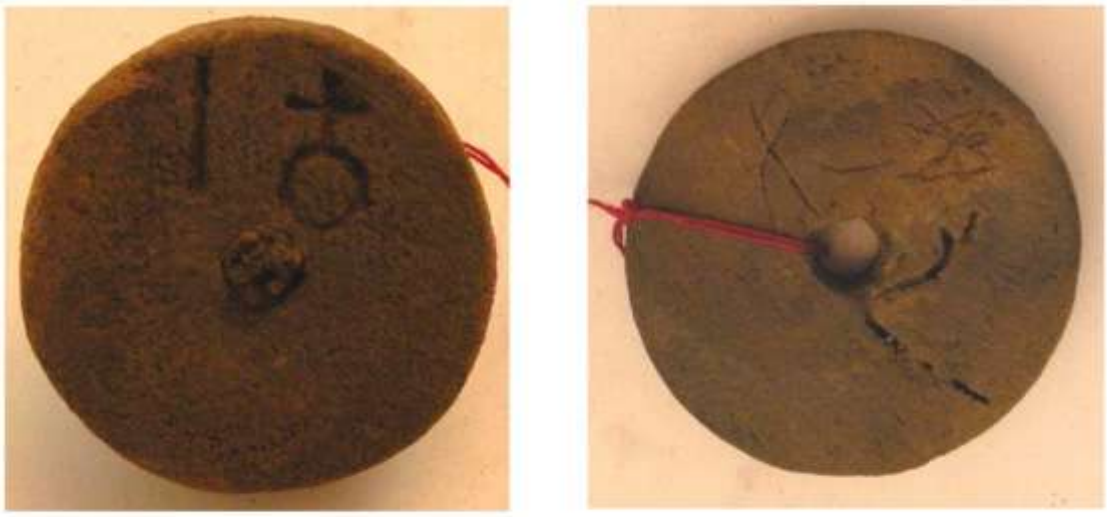


Figure 98 S. 07527/11 and S. 07527/12 with incised marks

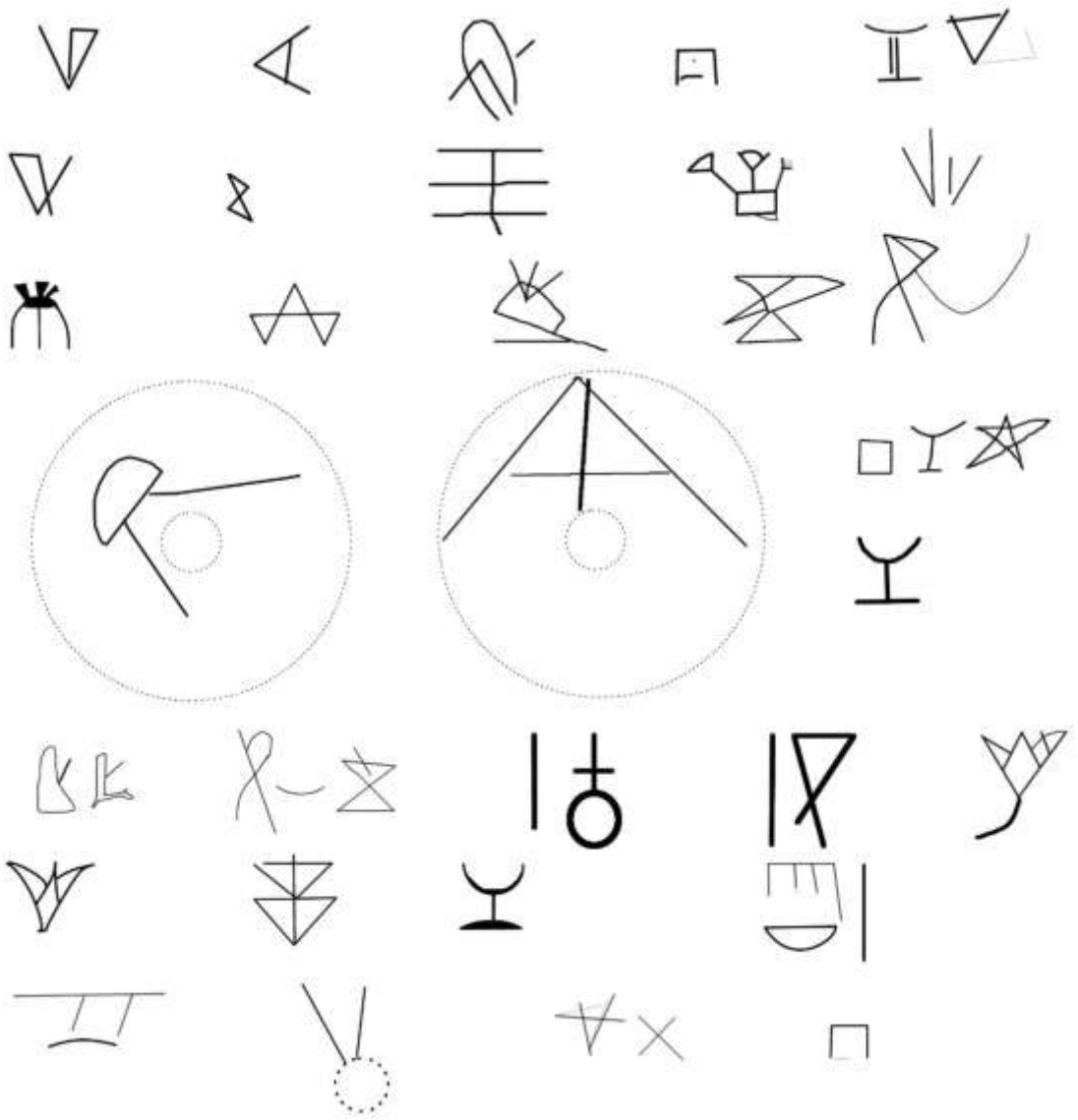
The painted decorations and incised marks are usually placed on one side or on the edge of the spindle whorl. It is perhaps notable that these decorations are not placed on the upper side of the spindle whorl, where they would have been visible to the spinner, but are placed on the lower side where the thread is wrapped. Whatever their functions were, it seems that aesthetic value was not one of the main concerns.

[102] This feature has been reported to D. Soliman, who is working on identity marks from Deir el-Medina. His preliminary results confirm that whorls' marks are similar to those found on other tools, except a couple of them which were previously unknown.

Figure 99 Thick layer of encrustation on S. 07526/27

Another typical feature of these whorls, seen also for Kahun materials, is the presence of a thick layer of encrustation on spindle whorls, which seem absent from other objects coming from Deir el-Medina.

The encrustation is generally located on the upper part of the spindle rod and the upper surface of the spindle whorl, leaving the other face clean or covered with only a slight patina. In some cases, upon this encrustation a very thin layer of a whitish substance is present, which does not seem to be paint or plaster.



100 Marks on spindle and spindle whorls From left to right:1) S. 07526/23, S. 07526/34, S. 07526/41, S. 07526/48, S. 07526/5; 2) S. 07526/62, S. 07526/63, S. 07526/75, S. 07526/96, S. 07526/10;3) S. 07527/05, S. 07527/01, S. 07527/02, S. 7527/03; 4) S. 07527/06, S. 07527/04, S. 07527/07, S. 07527/08; 5) S. 07527/10, S. 07527/11, S. 07527/12, S. 07527/13, S. 07527/14; S. 07527/15, S. 07528/19, S. 07528/84, S. 07528/94; 7) S. 07528/105, S. 07528/106 (with paintings), S. 07528/107, S. 07528/108. All are on spindle whorls except S. 07526/23 and S. 07526/41, which are on the shaft.

In one case, a small fragment of a fabric is still attached to a spindle whorl (S. 07526/108), perhaps due to the long contact between the two items in the archaeological layer. The fragment measures 1.72 cm x 1.91 cm and is a tabby weave with a sett of 13x10 threads per cm^2 (a low quality fabric), with the thread S-twisted in both warp and weft.

5.11.3.3 Wood identification

Taxonomic identification of spindles and spindle whorls wood has been accomplished, so far, for a small number of objects from Kahun and Tell el-Amarna. Samples of seventeen spindle whorls and a heddle jack from Kahun have been analysed as well as one spindle whorl dating to the New Kingdom from Thebes, and are shown in the cataglogue. Fourteen of these objects were produced using a non-local wood of the *Pinaceae* family, probably the *Abies* genus. The *Abies* species is not native to Egypt, but normally is localized to central European forests.

Its physical characteristics (fine texture, straight grain and a low tendency towards warping) make this wood particularly suitable for carpentry and building purposes; it is quite remarkable that this kind of wood has been chosen for the production of small spindle whorls (Cartwright et al. 1998, 96).

The other samples have been recognised as *Ficus sycomorus*,[103] of the *Moraceae* family, a local wood commonly used in Ancient Egypt. It is a light and soft timber, but it does not bear pressure, crushing or bending (Cartwright et al. 1998, 96). These characteristics do not prohibit its use for the making of spinning tools, especially spindle whorls.

Most of the spindle whorls analysed from Tell el-Amarna (Kemp/Vogelsang-Eastwood 2001: 267-268) show evidence of growth rings typical of coniferous wood, which are characteristic of *Ficus sycomorus* wood. The majority of the samples examined were obtained from sycomore wood but several were made of cedar wood (*Cedrus libani*). In all, 17 spindle whorls are recognised as being made of sycomore, 9 are made of cedar and the exact identity of 6 remain unknown, but these are known to belong to the class *Dicotyledonis* (to which *Ficus Sycomorus* belongs as well as a thousand other species) (Kemp/Vogelsang-Eastwood 2001: tab. 8.2).

Prof. Mauro Rottoli examined on two occasions some of the spinning tools, which are stored at the Museo Egizio, and the results are shown in Table 2. As seen before, the majority of the museum objects were covered by encrustation or patina, which has prevented their investigation. Therefore, only some items could be analysed. In almost all the cases under examination, the wood has been cut following the cross section, as was the case of the Amarna spindle whorls. In ten examples, growth rings were easily visible: most of these whorls were cut from the central portion of a branch or a small

[103] To not be confused with sycamore wood.

trunk (e.g. S. 07526/012, S. 07526/060), from half of a log (e.g. S. 07526/047, S. 07527/03) and in four examples from a trunk of larger dimensions (S. 07526/009, S. 07526/109, S. 07526/090 , 07526/095). Only two items were obtained by cutting the wood in a longitudinal direction (S. 07526/007, S. 07528/038). On one object, traces left from its manufacture were very clear because it was not polished.

Most of the spindle whorls have been examined by eye and seem to have the same anatomical characteristics: the cross section exhibits inter-vessel pits very often with coalescent apertures, which are disposed in a radial pattern (e.g. S. 07526/009, S. 07526/097, S. 07526/100, S. 07526/103, S. 07528/025). It is highly probable that they were obtained from the same wood species as the whorl samples, i.e., *Ficus sycomorus*. Only two examples appear completely different from the others: S. 07528/044 which is quite heavy and of a dark colour, and S. 07528/109 which has been extracted from a more sturdy wood.

Spindle shafts were more problematic, since the cross section was not wide enough for a clear examination. Even some of those examined by microscope left some doubt. Four out of the six samples of spindles shafts have proven to be cedar wood, one of the others was made of yew and one of a non-identified species of the class *Dicotyledonis*.

It is noticeable that all the sites under examination, Kahun, Amarna and Deir el-Medina, spindles and whorls were produced using local woods as well as foreign woods. The data obtained from Deir el-Medina clearly shows that the best wood was used to make spindle shafts and softer wood was employed for most of the spindle whorls. An example of an unfinished whorl suggest that spindle whorls were produced in the village, although they never appear in textual references.

Table 10 Mauro Rottoli: wood identification of spindles and spindle whorls of Museo Egizio, Turin

S.07526/027	Spindle	Partially charred wood	Taxales: Taxaceae	(conifer)	*Taxus baccata*	yew
S.07526/48	Spindle	Wood	Coniferales: Pinaceae	(conifer)	*Cedrus libani*	Cedar*
S.07526/093	Spindle	Wood	Coniferales: Pinaceae	(conifer)	*Cedrus libani*	Cedar
S.07526/106	Spindle	Wood	Coniferales: Pinaceae	(conifer)	*Cedrus libani*	Cedar
S.07526/109	Spindle	Wood	Coniferales: Pinaceae	(conifer)	*Cedrus libani*	Cedar*
S.07528/020	Spindle whorl	Wood	Dicotyledones: Moraceae	(angiosperm)	*Ficus sycomorus*	Sycomore
S.07528/033	Spindle whorl	Wood	Dicotyledones: Moraceae	(angiosperm)	*Ficus sycomorus*	Sycomore
S.09978/5	Spindle	Wood	Dicotyledones	(angiosperm)	??	??**

** The identification of these two samples retains a slight degree of uncertainty. It certainly is from some type of conifer, but not all typical characteristics of cedar wood are clearly visible. It might be possible, although extremely unlikely, that it is fir (Abies sp.).*

*** Sample S.09978/5 belongs to a broad-leaf tree (angiosperm). The impossibility of observing a cross-cut section makes the identification very difficult even as regards the family classification.*

5.11.3.4 Needles

Figure 102 S. 08379 @Museo Egizio, Torino

As seen for other sites, the category of needles includes actual needles and bodkins. Some needles are stored in the Museo Egizio collection, but only a part of them comes from Deir el-Medina. In total, 13 needles can be safely ascribed to the excavations at the site, but 6 of them come from the tomb of Kha. 10 needles are made of bronze and three are made of wood.

There is no possibility to ascribe them with certainty to the New Kingdom, however it seems quite reasonable that most of them belong to this phase. Thickness of bronze needles can vary between 0.2 cm and 0.3 cm, while the maximal length preserved reaches 12 cm. Unfortunately, needles preserved in the two needle cases cannot be extracted and measured individually. They share the common feature of the technique of hole production, which has been carved out by punching the shaft from one side to another. This action results in a hole which is rounded on one side, while the other has a typical ogival shape.

Two needle cases come from the tomb of Kha, with several bronze needle still inserted inside. One has two needles and a small razor, and one of the needles has a thread still preserved inside the hole. The thread is quite thick, closed by a knot and Z-cabled. A thread also closes the case, but is different

Figure 101 S. 07796 @Museo Egizio, Torino

from that of the needle, since it is s-spun, Z-cabled and finally S-plied. The second needle case has four needles inserted, all made of bronze and quite thin.
Three wooden bodkin are also part of the Deir el-Medina findings. All of them are thick, only partially polished and with a large, rounded hole carved on the large head. Two of them are not straight, but make an angle toward the middle of the shaft. One is straight and preserves a thread in the hole. Thread is very thick, s-spun, Z-cabled and finally S-plied.

5.11.3.5 Fibres

As for the other Egyptian contexts, textiles are quite rare findings in the settlement of Deir el-Medina, while they are more likely to have preserved inside tombs. However, several examples of flax fibres and threads come from the town. Several hanks of flax, skeins and balls of yarn are stored in the Museo Egizio collection, but only a part of them can be ascribed with certainty to Deir el-Medina excavations. The other objects are very likely to have been found in the site, but unfortunately some belong to the Drovetti collection, while for other provenance went lost and therefore a provisional number have been assigned. In the catalogue, only the items certainly found in Deir el-Medina are listed, and only these will be considered in the present study. Their belonging to the New Kingdom is far from being certain, since they could easily have been produced in the Ptolemaic or Coptic period (given the presence of Coptic looms). For some of them, splicing can be detected and they can therefore be assigned to a date preceding 600 B.C.E.[104]
No hanks of unprocessed or partially processed hanks of flax belong to the materials ascribable to Deir el-Medina. Three skeins and five balls of threads of spun linen are listed in the catalogue.
In most of these cases the thread, single or plied, is S-twisted, but in one hank has been found a thick thread, maybe not originally belonging to that hank, which shows a close Z-twist which tends to coil in on itself. The threads range in diameter from 0.03 cm at their thinnest and 0.11 cm for the thickest (the Z twist thread just described). The twist angle, when preserved, has an average of 45°. A similar situation can be found for the balls of yarn, which are all well preserved, but of very different and varied constitution. First, it must be noticed that there is only one real ball of yarn (S. 7791) according to our modern standard, and it is still perfectly preserved. It is not possible to distinguish the material over which it was wrapped because of the great amount of thread. The thread is strictly Z twisted and splicing is evident. Some big knots are also present at the end of the thread, as well as some other knots inside the ball of yarn. The thread diameter is about 0.04 cm and its twist between 35° and 40°. It is highly uniform and homogeneous and it might be considered as a final product, even if it was

[104] See similar issue for Kahun

only a medium quality thread, certainly not used for weaving fine clothes. The Z-twist might indicate that it would not have been used for weaving, but more probably for sewing, darning other textiles, or producing nets.

An interesting ball of yarn (S. 7788) is a small object with a tow core on which a small number of different threads have been wrapped. The threads are all S-twisted and the ply is rather evident (S, 2s). Some threads have a very close twist, in others it is difficult to see it at all, probably because of the state of preservation. The other balls of yarn in the Museum's collection present similar situations, with different threads wrapped around an object and seem to be, unlike the first two yarn balls discussed, a kind of makeshift solution, but one which nevertheless is frequently used. The threads are, in fact, wrapped around a ceramic rim fragment (S. 7789), under which some rough fibres are positioned to avoid the thread becoming ruined by rubbing against the core, or around some stones (S. 7790, 7793). In all of these last three cases, the thread is Z twisted, with two or four cables, in one case it is possible to distinguish the Z-ply and an s-twist and in at least another one case it is possible to distinguish the splicing point.

Lastly, a set of yarns have been wrapped around a circular stone (S. 7794) which was likely previously used as a stopper. The threads look different from each other, with two or three plies, with single s-spun and Z-plied yarns. Their diameter varies from 0.03 to 0.06 cm with small oscillations inside the same yarn, which can be followed only for small segments. The twist angle is varied and depends on the thread preservation conditions, it is attested between 35° and 40° but also reaches 50° in this example, which is a very wide twist.

5.11.4 Textual references on textile activities

Deir el-Medina is a special context of study for Egyptologist, not only for the rich archaeological evidence of daily life, but mostly because of the impressive quantity of texts and documents which has preserved. A large collection of papyri, ostraca and graffiti, in fact, constitute an astonishing corpus to know the social organization of the village, the relationship with the state and many other aspects of the daily life. However, some features are not perfectly clear and textile production is certainly one of that.

A massive quantity of documents, mainly ostraca, deal with textiles, from list of goods received as workers' wages e.g. (Grandet 2003, 44, n° 866), to list of personal goods (Grandet 2010, 111), laundry list e.g. (Grandet 2017, 48) and transactions involving textiles e.g. (Grandet 2006, 73–75, n° 10071,

94, n°10091). From this type of texts, it has been possible to understand the terminology of various kind of textiles as well as their prices, which is remarkable[105].

However, who produced these textiles, when, where and for who and in which relationship they were with those received as wages is less clear. Some texts can help to shed light on this aspects, even if not directly.

- The first one is an ostracon (O. Cairo CG 25725 + O. IFAO 00137 + O. Louvre E 03259) dated to end of 19th and beginning of the 20th dynasty where a father complains in front of the court, of his daughter. He sent her a dress when she was ill and she never returned it. Instead, she sent him some vegetables plants which he works and then wove them before giving them back to her (?).
- A second text (O. Nash 6 = O BM 65936) is a list of the items brought by a man to a woman to marry her but he was refused twice. He complains that "she did not even made a garment for his backside". It has to be certainly to be understand in a metaphorical sense, but it is suggestive (Allam 1973, 222–23).
- Another text (O. DM 117) sees a woman asking to her sister to send her a garment and to prepare some plants (Wente 1990, 156 no. 228).
- A similar text (O. DM 132) sees a woman asking to her sister to weave a garment for her (Allam 1973, 99–100).
- Another text (O. Brussels E 6311) sees a man receiving yarn for weaving a garment, and with a second delivery of yarns he weaves seven garments (Allam 1973, 53–54).
- Another text (O. DM 131) concern a list of items given to a man and the objects given in return. Between these the second man has woven and prepared some textiles (Allam 1973, 99).
- A legal dispute (O. Leipzig 03) before the court for producing and payment of some textiles. Here textiles are produced by women and seem to occur in a weaving shop (Allam 1973, 200).
- Finally, the famous papyrus of Paneb misconduct must be recall, since he made women of some workmen to weave clothes for him (Allam 1973, 281–87; Černý 1929).

5.11.5 Conclusions

Textile tools from Deir el-Medina represent an interesting corpus for studying the textile production in the New Kingdom, and the lack of precise contexts of findings is particularly regrettably for the importance of the site. Several wooden spindles and spindle whorls have been preserved by the dry

[105] See the publications of Janssen (1975, 2008) mainly focused on terminology.

climate of the area and have shown a great homogeneity. In fact, spindles are characterised by a cylindrical shape tapering to one point and a spiral groove near the other tip. Two different lengths of shafts can be identified: a longer one, between 30 and 40 cm, and a smaller one between 20 and 25 cm. No further decoration is present. Almost all the spindle whorls under study are made of wood and have a cylindrical shape. They have a quite large diameter, mostly between 4.9 cm and 5.6 cm in size, with an average weight between 11 g and 14 g, which allows a fine to medium textile production. Holes are generally warped for the insertion of wooden wedges, as seen on some examples still preserved. Some of them show incised marks on the surface. No bone or stone spindle whorls were found in the Museo Egizio, but they have been recorded from Bruyère's excavations. Needles are very homogeneous as for materials and typology, with the eye pierced through the shaft. Not a single example of the eye made by bending the upper part of the shaft on itself, as known in the Levant, was present, although an example is stored in the museum (of unknown provenance). Fibres found by Schiaparelli are all of vegetable origin, although some texts preserve (rare) indication of the presence of wool too (Janssen 1975, 292, 443). Interestingly, they appear quite rough in quality, suitable for making nets and coarse darning but not for weaving. It has to be considered, therefore, that a part of the tools here studied might have been used to produced nets rather than actual textiles and produce nets seem to be an activity exclusively performed by men.

All the textile tools seem to come from the village, except for bronze needles, which occur in some tombs.

The tools found by Bruyère seem to confirm the picture that emerges from the analysis of the tools found by Schiaparelli. Spindles are generally long shafts with a groove for the yarn, have a cylindrical spindle whorl but sometimes bone and stone dome shape whorls are also known. However, Schiaparelli did not found or failed to collect the spinning bowls, which instead were found by Bruyère.

As seen above in the chart, three examples of spindles have undergone radiocarbon dating and their results confirm a New Kingdom date for the sample which comes from the village (S. 9978 of Schiaparelli's Inventory). A slightly later date was provided for the two other samples from the kôm (S. 07528 of Schiaparelli's Inventory). These two contexts were certainly not contemporary, as the results do not show any possible overlap. This means that the spinning activities in evidence at Deir el-Medina were spread over most of the period of the exploitation of the site. However, the number of spindles and spindle whorls recovered, 263, is astonishing even considering the length of time during which they were produced (especially if compared with Kahun and Gurob). In addition to the spinning tools here discussed, it should be borne in mind that Bruyère also found a large number of spinning tools at this site, both from houses and from the Great Pit, perfectly comparable to those

stored in Turin. It seems from this data that spinning was a prevalent activity in the village; such a large number of spinning tools is usually expected from workshops or other areas devoted to thread production, rather than villages. Furthermore, they show a very high degree of homogeneity, both in shapes and in measures, that seem to point to a certain standardization of the tools and, therefore, of the final product. Finally, the presence of an unfinished spindle whorl, suggest that they were produced in the village, probably by the woodcutters known by the textual sources, given the quality of their manufacture. Wood was locally available in great quantity, even the precious cedar, thanks to the frequent deliveries, and obtaining small tools such as spindles and spindle whorls from leftover pieces was probably not a big issue.

However, if the textual evidence from Deir el-Medina is taken into account, it can be seen that workers received textiles and clothes (but not raw fibres) as a form of payment and therefore did not need to produce their textiles themselves. Furthermore, the few texts dealing with textile productions seem to point to a domestic activity, generally performed by women, but some men were also involved. The textual sources do not match the archaeological evidence, given the frequency of finding of spinning tools, their high quality and homogeneity, which suggest a large scale production performed by skilled craftsmen, who required standardized tools. A possible solution can be given by the frequent use of textiles as a mean of payment. Textiles were highly required and those include in wages appear not enough to satisfy the needs of the village population. Therefore, many families, if not every, processed fibres and produce yarns which could be employed for weaving textiles or producing nets. It is not clear, however, if weaving was a common activity too, or only certain families possessed the loom. In at least one case, text refer to a specific place in which textiles were woven. In any case, the surplus of yarns and textiles which families were able to produce could constitute a good income support, besides the wages for the construction of the royal tombs.

Completely absent from textual sources are the transactions for the acquiring of textile tools, from spindles to looms or part of them, as well as the raw fibres.

5.12 Conclusions about Egyptian textile tools

The textile industry has left many traces in archaeological contexts of Ancient Egypt, even if these are not evenly distributed in time and space. In fact, many items linked to spinning and weaving are known from settlements of Neolithic and Predynastic period, much less for the Dynastic periods. Leaving aside the workers villages of Kahun, Amarna, Gurob and Deir el-Medina, very few items are known from other contexts. Unfortunately, ancient Egyptian people did not use to place textile tools as funerary goods, even if some exceptions exist, and this has precluded the survival or the chance to find many of these items.

Spindles are known almost exclusively from workers villages and very few other contexts. All the known examples of spindle shafts are made of wood, while ivory, bone or metal rods seem not to have been employed for spinning. Three types of wooden shafts were in use: a short, thick shaft, with a length comprised between 20 and 25 cm; a long, thick shaft, with a length rangeing between 30 and 40 cm; a third type, with a short but very thin shaft, which is known, so far, only from Gurob. Almost all the shafts tend to tapers toward a pointed end, while the other could be rounded or flat. At the top of the spindle, a groove for fastening fibres is incised, which can be a simple notch or a long, spiral and deep groove. Spindles are never found in ancient Egyptian Dynastic tombs except in very few cases known from Kahun and Gurob.

First spindle whorls seem to appear in the Neolithic period, with Fayyum findings of a limestone spindle whorl. Also in the Predynastic period limestone spindle whorls seem to be predominant, generally with spherical or dome shapes, but other stones might be used as well. They were found both in graves and in settlements. It is noteworthy that only a single example of wooden whorl has preserved from this period, while several bone shafts have preserved in Maadi. It is therefore possible that they were not frequently used. Early Dynastic whorls from Hierakonpolis show a great continuity with earlier periods, since almost all of them are made of limestone and are dome shaped. They present incisions on the surface that could be early examples of identity marks. Predynastic and Early Dynastic spindle whorls present some difficulties in recognizing them, since they are quite large and heavy and could be confused with light mace heads and models of mace heads. Helping in the distinction of the two categories are the context of finding (settlement or burial) and traces of wear that are definitely not to be expected in models. Traces of wear on these stone whorls, however, are compatible with spinning with a low whorl spindle, a technique that it is not known from iconography. These stone whorls might be placed on the lower part of the shaft for plying or in relationship with other technical issues, but, for now, it is not possible to prove it.

Very few spindle whorls have been found in Old Kingdom contexts, while much more well documented is the Middle Kingdom. Many wooden spindle whorls are known from Kahun and all of them have a cylindrical shape, except four limestone whorls, which have a dome shape, as in earlier periods. Other sites show a similar situation to that of Kahun and it would be probably the common condition. New Kingdom spindle whorls did not show differences from Middle Kingdom ones regarding shapes and measures. Almost all of them are cylindrical and made of wood, with rare examples of dome shaped limestone whorls. One exception is Amarna, where stone and wooden whorls are present in almost equal quantity. Gurob stands aside, since a large part of its spindles and whorls are completely different from those known from the other sites. In fact, they are dome shaped and extremely small and light and were certainly used for the production of extra-fine, luxury yarns. Very few whorls are known for the first millennium (contrary to the Levantine situation) but they seem to continue the typologies known from the New Kingdom.

To spindle whorls, it is very probable that at least part of the perforated sherds found in Egypt must be added. The earliest examples are known, again, from the Fayyum A period, but they continue to be produced in Badarian and Predynastic periods as well. It is very likely that they were used to produce quite thin threads, while limestone whorls were used to produce thicker yarns or for plying. Although very few examples have been published for Pharaonic period, their sporadic occurrences in archaeological contexts prove that they continued to be used. Furthermore, two contexts which are very likely to have been textile workshops (templar and domestic) preserved evidence of the usage of perforated sherds.

Another tool for spinning, spinning bowl, is known in Egypt at least from the final phase of the Predynastic period and continued to be used until the Late period or even the Greek conquest. However, not a single fragment is known from Old Kingdom layers. This might depend from several factors, from a general lacking of evidence of textile activities in this period to a different shape of bowl, which prevented excavators from recognizing them. Finally, their abandonment in the Old Kingdom, although unlikely, cannot be ruled out. A very large quantity of spinning bowls is known from Middle Kingdom and New Kingdom layers, and all sites under consideration have provided examples of them.

Pin beaters appear for the first time in the Fayyum culture, while bone spatulae are attested from excavations in Merimde. These simply tools, which can been used for many different purposes, can present smooth surfaced which are the result of constant contact and rubbing with soft materials, possibly yarns. Similar objects continue to be found down in the Predynastic and Dynastic periods, with very few changes in shapes and measures.

Net weights/loom weights constitute a matter of discussion since Mace publication of Lisht material in 1922 (Mace 1922). Their simple shape is suitable both for weaving and for fishing. So far, no comprehensive study has been published on these materials and very little has changed since then. In this work, the most important findings of weights have been discussed and it has been tried to cover the largest period as possible. What has come to the surface is the presence of these very simple tools from Neolithic and Predynastic periods onwards, with little changes in shapes and materials. They have been found in contexts where other textile tools are known, but also where very little is known about spinning and weaving. They can be very small or quite large and heavy, and certainly, the lightest objects were not used for weaving. However, the presence of representations where some of these tools are recognizable and the length and shape of others, seem to point to a use connected to fishing rather than for weaving.

Bone needles are known at least from Badarian contexts, while copper needles start to be found slightly later. They are ubiquitous in settlements in all periods of the Egyptian history, but they are also present in tombs. This is a remarkable fact, since textile tools are generally not placed in graves after the Predynastic period. Needles (and bodkins), instead, are not only present in graves of poor or middle class people, but they can be found even in royal tombs. Furthermore, no distinction of sex can be made, since they appear both in male and female graves. They seem not to be used for fastening cloths and neither in connection to embalming. They can be made of bone, copper, bronze, silver or gold, so they seem not to be chosen for their material either. They probably had a symbolic or religious meaning, which however remains elusive.

Archaeological findings of textile tools from Ancient Egypt point to a domestic production, spread all over the country, which sees few changing in tools during its whole preclassic phase. One major changing is the introduction of wooden spindle whorl, which did not substitute stone spindle whorls, but rather complement them for producing finer yarns. Perforated sherds, however, continued to be produced and used probably with the same purpose of wooden whorls. Spinning bowls slightly change their shape but continue to be in used from the Predynastic to the Late period. Needles, beaters and spatulae did not change in the whole period under consideration, the difference in shapes and measures (especially in needles and bodkins) are probably to be linked to different purposes. Net weights show a quite large typology, which show differences from Prehistory and Pharaonic period, but show also elements of continuity. Very little is known of large workshops of textiles, which are instead well known from iconographic and textual sources. In fact, texts rarely mentions textile production and the few hints which are traceable show that large workshops were mainly attached to temples and palaces. Almost nothing is known of the domestic production, not even from Deir el-

Medina, where textual sources are very abundant. Very little information are available even for that context.

An idea of what an archaeological context of a textile workshop might have been is given by Abydos South and Gurob and they are completely different from each other. In the first context, no wooden implements have preserved and very few spindle whorls are therefore available. However, dozens of fragments of spinning bowls were found in the same context. In Gurob, wood has preserved and spindles and spindle whorls were found. They are not numerous as one could imagine, and in fact, the knowledge of the presence of a workshop linked to the palace is derived only from textual sources. However, the incredible lightness of some of the tools clearly points to a very fine production, probably the royal linen recorded in texts. Contrary to Abydos, not a single fragment of a spinning bowl was found.

In conclusion, the dominant feature of Egyptian textile tools can be traced in its continuity, even if this does not prevent major changes. No innovations are visible in the tools examined which could be put in relation with the introduction of the vertical two-beam loom. The transition from the Middle Kingdom to the New Kingdom seem to take place without transformations of the tools. It would be of greatest interest to investigate the passage from the Predynastic to the Old Kingdom, but so far, too little is known of the Old Kingdom textile production. Hopefully, in the future, more attention will be paid to these mundane tools by archaeologists and more information will be finally available.

6 Conclusions: two areas in comparison

Egypt and Southern Levant show evidence of close relationship since the early periods, although this is subjected to changing through times. How much political and commercial contacts influenced textile production and tools? Certainly, textiles and textile tools were part of diplomatic gifts, hence exotic and precious fabrics and tools were known and available in royal courts. As a matter of fact, among Tutankhamun's cloths, a tunic with non-Egyptian motifs has been found which could have been produced somewhere in the Levant, possibly linked to the Mitanni kingdom (Vogelsang-Eastwood 1999, 80–86). Spinning tools were also part of diplomatic gifts between the Mitannian court of Tushratta and the Egyptian king Amenhotep III since in one of the letter from Amarna, precious spindles made of gold and valuable stones, such as lapis lazuli, are listed among other goods (Adler 1976, 196–97, 346, Kn25; Wisti Lassen 2010, 276). However, no archaeological traces of these precious gifts have been found and the tunic of Tutankhamun has no comparison in any preserved textile. Several texts report the presence of Asiatics in Egyptian textile workshops (Cartwright, Granger-Taylor, and Quirke 1998, 92–94; Kemp and Vogelsang-Eastwood 2001, 433–34), as documented in Gurob and in the tomb of Rekhmira in Thebes. Should we aspect to see some differences in textiles, tools or techniques employed? According to the evidence here analysed the answer is no.

If spindles are taken into account, it is possible to see that all those found in Egypt during the entire period under consideration, are made of wood. No metal spindles, otherwise recorded in texts and in many Near Eastern contexts of the 3rd millennium, have been found. Furthermore, a new typology of bone and ivory spindles appears in the Levant. It has a characteristic incised lattice and bands decorations, but again, none of them was found in Egypt. Some possible wooden shafts with the same decoration were recovered in Gurob (Thomas 1981, 61–62, pl. 18), but no groove for attaching thread is found in these objects, and they should, consequently, be considered as pins. If no traces of a Levantine influence can be found in Egypt, even more complicated is to locate and distinguish Egyptian tools in the Levant. In fact, all the spindles found in Egypt were made of wood, a material that was not preserved (except in very rare cases) in the Levant, making it impossible to understand if an Egyptian influence have been ever present in Levantine spindles.

A similar picture is suggested by the case of spindle whorls. The beginning of the Egyptian textile industry is characterised by a large use of perforated sherds and dome-shaped or spherical spindle whorls, mainly made of limestone, but occasionally also of other stones. Levantine sites, instead, seem to prefer discoid stone spindle whorls or biconical pottery whorls, a typology which appears completely absent from Egypt. The beginning of the spinning industry in Egypt, although it develops

quite late compared with the Levant, seem to use a different set of tools for producing yarns than those known from the Levant. Taking into consideration fibres, instead, much more similarities can be found in fibres processing and spinning directions (Jones 2008, 114). This might not depend on mutual relationships between the two areas, but rather resulting from similar observations of a natural phenomenon (flax prefers an s-spinning direction). Far less can be said of later times, especially for the Egyptian Old Kingdom. In fact, very few objects associated with textile production are known from this period and it is hence impossible to draw any conclusion. Middle and New Kingdom settlements preserve, instead, large collections of spindle whorls, mostly made of wood, but alsofewer examples of stone and bone whorls can be found. During the Middle Bronze Age, the Levant sees the introduction of dome-shaped bone spindle whorls, which become extremely spread during the Late Bronze Age. This typology of whorls, which could function as a mark of technological transfer, seems to be completely absent from Egypt. In fact, only a small amount of bone spindle whorls are known from those contexts, mostly from Tell el-Amarna, and they seem not to share measures or decorations known from the Levant. It is a misfortune that only a few sites in Egypt preserved evidence of textile production in the first millennium BC, which corresponds (to our knowledge) to the period of maximum production of textile tools in the Levant. During this period, Southern Levant saw a flourishing of stone spindle whorls, quite small and light, usually made of steatite or limestone, but occasionally of harder stones. Again, this typology of whorls is apparently absent from Egypt, where spindle whorls appear quite similar to those of earlier periods. As for spindles, it is very complicated to trace Egyptian materials in the Levant, since the vast majority of whorls are made of wood. The rare Egyptian stone whorls generally present a dome shape and a heavy weight; the dome shape is very common in the Levant as well, in all possible weights, but are generally lighter than their Egyptian parallels.

The perforated sherd is a category common to both areas but, unfortunately, they appear to be used in many other areas of the world without linkages to those investigated here. In both areas, they appear quite common in early periods, to become much more rarer later on, when other materials and typologies of whorls grow predominant. However, Egyptian documentation is more elusive on the presence of these mundane objects. Their usage and presence can only be speculated from a few hints provided in publications. It is desirable that, in the future, excavation reports of Egyptian sites give some more information about these tools.

Basalt rings appear in the Levant during the Chalcolithic; they spread during the Early Bronze Age and, to a less extent, in the Middle Bronze Age and in the Iron Age. Two categories are possibly present inside this group, the smallest and better refined objects used as spindle whorls, while the second group has not found a final interpretation. It is impressive how large is the area where they

are found, which certainly originates in the southern Levant, but reaches almost some northern Levantine sites and Egypt. Basalt analyses have proven that they could be produced quite far from the site where they are excavated. With certainty examples found in Egypt at Maadi and, possibly, Tell el-Farkha (Mączyńska 2008), were Levantine imports. They remain quite few in numbers (but possibly in the future they will be recognised in other Egyptian sites) and apparently spread only in the Nile Delta and in Predynastic contexts. Whatever their function was, they seem never to be popular in Egypt.

Spinning bowls deserve a different consideration. They appear in Levantine Chalcolithic contexts well before first Egyptian examples, unknown before the Late Predynastic period. In both areas, they seem to disappear for a very long period to emerge again in Egypt but with completely different shapes during the Middle Kingdom. In the Levant, they appear again in the Late Bronze and during the Iron Age I, to nearly disappear in later layers. They are generally found in very small numbers, even in sites where textile production is well known. Their distribution appears quite erratical, since they are present in sites directly controlled by Egyptians, and in sites where the Egyptian presence was not so strong. They can even be absent in sites where the Egyptian control was tight. Still, their relative rarity and their clear link with the Egyptian garrison in Beth Shean allow speculating that they were produced for Egyptian families living in the Levant. They do not seem to become popular (except in Beth Shean), suggesting a use confined to a limited group of people. It is true that they are found in sites where only Levantine textile tools are present, but as we have been arguing so far, Egyptian spindles and spindle whorls were generally made of wood, and they certainly did not preserve. Another possible explanation for their general rarity as dspite their strong presence in the Beth Shean region is their usage in connection to flax preparation. This hypothesis requires that flax fibres were first spliced and only after spun, which is certainly what ancient Egyptian were doing, but not the inhabitants of Southern Levant. In fact, they seem to abandon splicing before the Late Bronze Age, and spinning bowls should, therefore, be used for plying threads. The interpretation of spinning bowls as plying bowls has been quite convincingly argued for Egypt too. If this is the case, they were used for flax as well as for wool and their connection with flax fields in Beth Shean valley appears to be doubtful. Whatever their function was, - probably both spinning after splicing and plying - their reintroduction in the Levantine region appears in any case linked with the Egyptian rule.

Another largely discussed category is that of loom weights and net-weights, and their implications on the adoption of the vertical two-beam loom and of the warp-weighted loom. It is possible that both in Egypt and the Levant horizontal ground looms were widely used in early periods; a practice that, certainly, continued to be used in Egypt during the Middle Kingdom. During the Middle Bronze Age, conical loom weights start to appear in Southern Levant, proving the adoption of a new typology of

loom, the warp-weighted loom. Given their rarity, there is a high chance that another type of loom was in employed at the same time, that is, the horizontal loom of previous periods. Furthermore, Middle Bronze Age conical loom weight should be considered as products linked to élite production, as suggested by the quality of their craft, and by a variety of findings related to palaces, as in Tel Kabri. These typical and easy to recognize loom weights are not known from contemporary Egyptian sites, and this points to a lack of knowledge of the warp-weighted loom in the country, as shown by the iconography as well.

At a certain moment, a new type of loom was invented: the vertical two-beam loom. We do not know when and where it happened, but several scholars have suggested that a southern Levantine origin should be preferred. This is because this loom is essentially a sum of two types, one horizontal with two beams and the vertical one, both known in the region, while in Egypt only the horizontal one was known. In any case, the vertical two-beam loom starts to appear in New Kingdom Egyptian iconography, while the quantity of loom weights decreases in Late Bronze Age period in the Levant. A possible inference is that the two areas share in this period the same weaving technology. Loom weights do not disappear completely from the Levant, but their number is so meagre that warp-weighted loom seem almost forgotten.

The fact that vertical two-beam loom was likely employed in the Levant is not linked to the Egyptian rule of the region. In fact, as seen for spinning bowls, spinning and weaving traditions are hard to change and Egyptian domination was not so widespread to involve involve an alteration at all social levels in the traditional habits. It is much more probable that the diffusion and popularity of the vertical two-beam loom was linked to practical reason, *i.e*. the possibility of use it in more limited space than the horizontal loom, as well as to technical reasons. It might be possible that Late Bronze Age fashion required specific textiles difficult to craft with a warp-weighted loom (*e.g.* dense tabby fabrics) for which the two-beam loom might have been more suitable. One should consider that the adoption of the new loom was probably not thoroughly spread in all social contexts and at all levels, and that domestic production continued to use older looms, both horizontal ground loom or warp-weighted loom either.

An actual revolution took place during the first millennium BC in the Levant, when thousands of poorly shaped clay loom weights were found. In this case, it is probable that the warp-weighted loom was adopted at all levels, from textile workshops linked to temples to household production, as the ubiquitous presence of loom weights suggests. As it happened for the two-beam loom, it is likely that the changing in tools was not caused by the withdrawal of the Egyptian control over Canaan. Rather, the warp-weighted loom allowed an easier production of the required quality of textiles. As far as

Egypt is considered, this revolution seem to begin after the Greek and Roman domination, when loom weights finally appear in large quantities.

Several Egyptian sites, however, have shown the presence of objects sometimes defined as loom weights or as net weights. By the examination of their contexts, chronology (their appearance in the archaeological milieu starts in Prehistoric phases), the shape of pottery types, and their representations on grave paintings and relieves, it seems possible to assume a usage as net weights for the large majority of these tools. The few objects made of mud and clay, which certainly could not be used in water, should be considered as counter weights with many possible usages.

Bone spatulae and pin beaters are common in both Egypt and the Levant since the Neolithic period. Although not all of them have to be linked to textile production, it is very likely that a substantial part of them was employed for beating weft and keeping warp in order. They are well known especially from Egyptian contexts of the New Kingdom and from Iron Age contexts in the Levant; so far, it has not been possible to link their use to specific looms or textiles. Furthermore, similar tools (as well as perforated sherds) are widespread in many regions of the world. They represent a very reasonable and cheap solution to challenges that weaving creates. It should be reminded that wooden spatulae and beaters were known and used as well, as in modern textile production.

Needles are the last category examined. Bone needles with large heads are widespread in early periods and are subsequently rolled back by metal needles. However, this could largely depend on the major diffusion and availability of metals and metal objects in general. Since the Middle Bronze Age, the Levantine region saw the introduction of a new typology of needle, with an eye realised by bending the upper part of the shaft on itself. This typology will never be introduced in Egypt. In fact, the latter will continue to produce its needles punching the shafts from one side to the other all throughout its history.

From the documentation here examined it seems clear that Egypt and Southern Levant, although close geographically and, in many periods, commercially and politically, did not allow a transfer of textile tools and of technologies from one area to the other. This is not surprising, since textile production is a deeply culturally rooted craft, which undergoes slow changes through times. Most of these changes are probably due to specific textile and fashion requirements, subject to neighbouring influences. Finished textiles are easy-to-trade products, can be exchanged as diplomatic gifts and when worn by rulers and élite they can push people to copy and imitate their style.

Lack of exchanges towards foreign traditions and techniques is particularly strong in Egypt, where basically no Levantine tools are recognizable. Even if textual sources provide evidence that a large number of Asiatics were employed in weaving workshops, we known that they were not allowed to use their specific skill or know-how but were rather instructed to work as the Egyptians, as is

documented by a papyrus from Gurob. Many foreigners who lived in Egypt appear sometimes with their traditional outfits, but several examples depict them wearing and following Egyptian dresses and customs. Although representations on funerary stela are probably distant from everyday life, it is extremely interesting that such tiny evidence of foreign objects and traditions reached us, even from archaeological contexts. It is therefore probable that Egyptian production was much more oriented on local style products; exotic dresses, on the other hand, could be traded and bought rather than produced.

To conclude, the two areas under examination underwent several changes in the textile production during periods under consideration, but very little is shared between then. More than cultural or political influence, it seems that changing in tools reflects specific technological needs, and that is not taken directly from one area to the other.

7 Bibliography

Adams, Barbara. 1995. *Ancient Nekhen : Garstang in the City of Hierakonpolis*. New Malden: SIA.

Adler, Hans-Peter. 1976. *Das Akkadische des Königs Tusratta von Mitanni*. Kevelaer: Butzon & Bercker.

Adovasio, James M. 1975. 'The Textile and Basketry Impressions from Jarmo'. *Paléorient*, 223–30.

Alberti, Maria Emanuela. 2011. 'Textile Industry Indicators in Minoan Work Areas: Problems of Typology and Interpretation'. *Purpureae Vestes I. Textiles y Tintes Del Mediterráneo En Época Romana*, 25.

Albright, William F. 1938. *The Excavation of Tell Beit Mirsim in Palestina : (Joint Expedition of the Pittsburgh-Xenia Theological Seminary and the American School of Oriental Research in Jerusalem) Vol. II*. New Haven: American Schools of Oriental Research.

Allam, Safiq. 1973. *Hieratische Ostraka und Papyri aus der Ramessidenzeit.* Tübingen: Selbstverl. d. Hrsg.

Allen, Susan J. 1997. 'Spinning Bowls: Representation and Reality'. *Ancient Egypt, the Aegean, and the Near East: Studies in Honour of Martha Rhoads Bell, San Antonio*, 17–38.

Andersson Strand, Eva. 2010. 'The Basics of Textile Tools and Textile Technology'. In *Textile Terminologies in the Ancient Near East and Mediterranean from the Third to the First Millennia BC*, edited by Marie-Louise Nosch and Cécile Michel, 10–22. Oxford: Oxbow Books.

Andersson Strand, Eva. 2015. 'The Basics of Textile Tools and Textile Technology - from Fibre to Fabric'. In *Tools, Textiles and Contexts: Investigating Textile Production in the Aegean and Eastern Mediterranean Bronze Age*, edited by Eva Andersson Strand and Marie-Louise Nosch. Oxford: Oxbow books.

Ariel, Donald T. 1990. *Excavations at the City of David 1978-1985. 2. Imported Stamped Amphora Handles, Coins, Worked Bone and Ivory, and Glass*. Qedem 30. Jerusalem: Hebrew University.

Arnold, Dieter. 1981. *Der Tempel Des Königs Mentuhotep von Deir El-Bahari : 3. Die Königlichen Beigaben*. Mainz am Rhein: Von Zabern.

Arnold, Felix. 2015. 'Clean and Unclean Space: Domestic Waste Management at Elephantine'. In *Household Studies in Complex Societies : (Micro) Archaeological and Textual Approaches :*

Papers from the Oriental Institute Seminar Household Studies in Complex Societies, Held at the Oriental Institute of the University of Chicago, 15-16 March 2013, edited by Miriam Müller, 151–68. Chicago: The University of Chicago Press.

Ashton, Sally-Ann. 2011. 'Egyptian Hair Combs in the Fitzwilliam Museum'. In *Under the Potter's Tree : Studies on Ancient Egypt Presented to Janine Bourriau on the Occasion of Her 70th Birthday*, edited by David. Aston, Bettina. Bader, Carla. Gallorini, Paul. Nicholson, Sarah. Buckingham, and Janine Bourriau, 19–44. Leuven: Peeters.

Aston, David A., Bader, Bettina. 1998. 'Einige Bemerkungen zum späten Neuen Reich in Matmar'. *Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo* 54: 19–48.

Aston, David A., Bietak, Manfred. 2004. *Tell El-Dab'a XII. A Corpus of Late Middle Kingdom and Second Intermediate Period Pottery*. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

Ayrton, Edward, Loat, William L. S.. 1911. *Pre-Dynastic Cemetery of El Mahasna*. London: Egypt Exploration, Fund.

Ayrton, Edward, Currelly Charles. T., Weigall, Arthur E.P.B. 1904. *Abydos III*. London: Egypt Exploration Fund.

Bader, Bettina. 2001. *Tell el-Dab'a XIII : Typologie und Chronologie der Mergel C-Ton Keramik : Materialien zum Binnenhandel des Mittleren Reiches und der Zweiten Zwischenzeit*. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

Baines, Patricia. 1989. *Linen: Handspinning and Weaving*. BT Batsford Ltd.

Bajeot, Jade. 2017. *Predynastic Maadi in Context: The Research of the Italian Expedition Revisited (1977-1986)*. Studi di Preistoria Orientale, 4. Roma: Università La Sapienza.

Balfanz, Kathrin. 1995. 'Bronzezeitliche Spinnwirtel Aus Troia'. *Studia Troica* 5 (11): 7–44.

Bar-Adon, Pesaḥ. 1980. *The Cave of the Treasure: The Finds from the Caves in Naḥal Mishmar*. Israel Exploration Society.

Barber, Elizabeth W. 1991. *Prehistoric Textiles: The Development of Cloth in the Neolithic and Bronze Ages with Special Reference to the Aegean*. Princeton, N.J.; Chichester: Princeton University Press.

Bar-Oz, Guy, Yeshurun, Reuven. 2014. 'The Bone Tools from the Cave of the Treasure at Nahal Mishmar'. *Journal of the Israel Prehistoric Society* 44: 240–47.

Bar-Yosef, Ofer, Alon, David. 1988. Nahal Hemar Cave. *Atiqot,* XVIII. Jersusalem: Israel Exploration Society.

Bechar, Shlomit. 2017. 'The Middle and Late Bronze Age Pottery'. In *Hazor VII*, edited by Amnon Ben-Tor, Sharon Zuckerman, Shlomit Bechar, and Debora Sandhaus, 190–470. Jerusalem: Israel Exploration Society.

Ben-Arieh, Sara, Edelstein, Gershon. 1977. 'Tombs near the Persian Garden'. *Atiqot.* 12: 1–88.

Ben-Dov, Rachel, Gershuny Lilly. 2011. *Dan III : Avraham Biran Excavations 1966-1999 : The Late Bronze Age.* Jerusalem: Nelson Glueck School of Biblical Archaeology, Hebrew Union College-Jewish Institute of Religion.

Ben-Tor, Amnon. 2012. 'Tools and Weapons'. In *Hazor VI : The 1990-2009 Excavations : The Iron Age*, edited by Amnon. Ben-Tor, Doron. Ben-Ami, Débora. Sandhaus, Shlomit. Bechar, and Tsipi. Kuper-Blau, 530–41. Jersualem: Israel Exploration Society.

Ben-Tor, Amnon. 2016. *Hazor: Canaanite Metropolis, Israelite City*. Jerusalem: Israel Exploration Society.

Bianucci, Raffaella, Habicht Michael E., Buckley Stephen, et al. 2015. 'Shedding New Light on the 18th Dynasty Mummies of the Royal Architect Kha and His Spouse Merit'. *PloS One* 10 (7): e0131916.

Biran, Avraham, Ben-Dov, Rachel, Arensburg, Baruk. 2002. *Dan II A Chronicle of the Excavations and the Late Bronze Age 'Mycenaean' Tomb*. Jerusalem: Nelson Glueck School of Biblical Archaeology, Hebrew Union College-Jewish Institute of Religion.

Bonatz, Dominik. 2000. '*Das syro-hethitische Grabdenkmal : Untersuchungen zur Entstehung einer neuen Bildgattung in der Eisenzeit im nordsyrisch-südostanatolischen Raum'*. Mainz: Philipp von Zabern.

Bonn, AG, H Moyer, and MR Notis. 1993. 'The Typology and Archaeometallurgy of the Copper-Base Artifacts'. In *The Late Bronze Egyptian Garrison at Beth Shan: A Study of Levels VII and VIII*, edited by Frances, W. James, McGovern, Patrick E. 1:203–20. Philadelphia: University of Pennsylvania Museum of Archaeology and Anthropology.

Borgna, Elisabetta. 2003. 'Attrezzi per filare nella tarda età del bronzo italiana: connessioni con l'Egeo e con Cipro'. *Rivista di Scienze Preistoriche*, 519–48.

Botti, Giuseppe, Peet, T. Eric. 1928. *Il Giornale della necropoli di Tebe*. Torino: Bocca.

Bourriau, Janine, Gallorini, Carla, Bader Bettina, et al. 2016. *The Survey of Memphis VIII Kom Rabia : The Middle Kingdom and Second Intermediate Period Pottery*. London: Egypt Exploration Society.

Brandl, Baruch. 2009. 'Scarabs, Seals, Sealings and Seal Impressions'. In *Excavations at Tel Beth-Shean 1989-1996. Vol. III. The 13th - 11th Century BCE Strata in Areas N and S.*, edited by Nava Panitz-Cohen, Mazar, Amihai, 636–84. Beth-Shean Valley Archaological Project. Jerusalem: Israel Exploration Society.

Braun, Eliot, Ilan, David, Marder, Ofer, Shalev, Sariel, Braun, Yael. 2013. *Early Megiddo on the East Slope (the 'Megiddo Stages'): A Report on the Early Occupation of the East Slope of Megiddo; Results of the Oriental Institute's Excavations, 1925-1933*. Chicago: The University of Chicago Press.

Braun, Eliot. 2004. *Early Beth Shan (Strata XIX-XIII): G.M. Fitzgerald's Deep Cut on the Tell*. University Museum Monograph 121. Philadelphia: University of Pennsylvania Museum of Archaeology and Anthropology.

Breasted, James H. 1976. *Egyptian Servant Statues*. New York: Pantheon Books.

Breniquet, Catherine. 2010. 'Weaving in Mesopotamia during the Bronze Age. In *Textile Terminologies in the Ancient Near East and the Mediterranean from the 3rd to the 1st Millennia BC*, edited by Michel, Cécile, Nosch, Marie-Louise, 52–67. Oxford: Oxbow Books.

Briend, Jacques, Humbert, Jean-Baptiste, Puech, Émile (eds.). 1980. *Tell Keisan : 1971-1976, Une Cité Phénicienne En Galilée.* Fribourg; Göttingen; Paris: Éditions universitaires ; Vandenhoeck et Ruprecht ; J. Gabalda.

Brink, Edwin C. van der. 1992. 'Tombs of the Elite in Minshat Abu Omar'. In *The Nile Delta in Transition; 4th-3rd Millenium B.C. : Proceedings of the Seminar Held in Cairo, 21-24 Oct. 1990, at the Netherlands Institute of Archaeology and Arabic Studies*, 127–50. Tel Aviv: Pinkhas.

Brink, Edward van den, Levy, Thomas E. 2002. 'Interaction Models, Egypt and the Levantine Periphery'. In *Egypt and the Levant : Interrelations from the 4th through the Early 3rd Millennium BCE*, edited by Edward van den Brink and Thomas Evan Levy, 3–38. London: Leicester University Press.

Brunton, Guy, Caton-Thompson, Gertrude. 1928. *The Badarian Civilisation and Predynastic Remains near Badari*. London: Bernard Quaritch.

Brunton, Guy, Engelbach Reginald. 1927. *Gurob*. London: British School of Archaeology in Egypt.

Brunton, Guy. 1937. *Mostagedda and the Tasian Culture : British Museum Expedition to Middle Egypt, Years 1/2*. London: Quaritch.

Brunton, Guy. 1948. *Matmar*. London: B. Quaritch.

Bruyère, Bernard, Jourdain, Geneviève. 1937. *La nécropole de l'est, 1934-35.* Le Caire: Imprimerie de l'Institut Français d'archéologie orientale.

Bruyère, Bernard. 1928. *Rapport Sur Les Fouilles de Deir El Médineh (V; 1927)(Fouilles de l'Institut Français d'Archéologie Orientale Du Caire 5, 2)*. FIFAO, 5.2. Le Caire: Imprimerie de l'Institut Français d'archéologie orientale.

Bruyère, Bernard. 1933. *Rapport sur les fouilles de Deir el Médineh (V; 1930)(Fouilles de l'Institut Français d'Archéologie Orientale du Caire 8, 3)*. FIFAO, 8.3. Le Caire: Imprimerie de l'Institut Français d'archéologie orientale.

Bruyère, Bernard. 1939. *Rapport sur les fouilles de Deir el Médineh 1934-1935, Le village, les décharges publiques, la station de repos du col de la vallée des rois*. FIFAO 16. Le Caire: Imprimerie de l'Institut Français d'archéologie orientale.

Bruyère, Bernard. 1948. *Les fouilles et les découvertes de constructions (1935-1940)*. Vol. 1. FIFAO 20. Le Caire: Imprimerie de l'Institut Français d'archéologie orientale.

Bruyère, Bernard. 1952. *Rapport sur les fouilles de Deir el Médineh (annees 1945-1946 et 1946-1947)*. FIFAO 21. Le Caire: Imprimerie de l'Institut Français d'archéologie orientale.

Bruyère, Bernard. 1953. *Rapport sur les fouilles de Deir el Médineh (années 1948 à 1951)*. FIFAO 26. Le Caire: Imprimerie de l'Institut Français d'archéologie orientale.

Buchez, Nathalie, Midant-Reynes, Béatrix. 2002. *Adaïma 1*. Le Caire: Institut Français d'Archéologie Orientale.

Bunimovitz, Shlomo, Lederman, Zvi. 2016. 'Iron Age Artifacts'. In *Tel Beth-Shemesh: A Border Community in Judah. Renewed Excavations 1990-2000: The Iron Age,* 560–602. Tel Aviv; Winona Lake, Indiana: Emery and Claire Yass publications in archaeology ; Eisenbrauns.

Burnham, Harold B. 1965. 'Çatal Hüyük—The Textiles and Twined Fabrics'. *Anatolian Studies* 15: 169–174.

Cahill, Jane M. 2006. 'The Excavations at Tell El-Hammah: A Prelude to Amihai Mazar's Beth-Shean Valley Regional Project'. In '*I Will Speak the Riddles of Ancient Times' : Archaeological and Historical Studies in Honor of Amihai Mazar on the Occasion of His Sixtieth Birthday*, edited by Aren M. Maeir, Pierre R. de. Miroschedji, and Amihai. Mazar, 429–59. Winona Lake, Ind.: Eisenbrauns.

Capel, Anne K., Markoe, Glenn, Bryan, Betsy M. 1996. *Mistress of the House, Mistress of Heaven: Women in Ancient Egypt*. New York: Hudson Hills.

Carington Smith, Jill. 1976. '*Spinning, Weaving and Textile Manufacture in Prehistoric Greece: From the Beginning of the Neolithic to the End of the Mycenaean Ages ; with Particular Reference to the Evidence Found on Archaeological Excavations'*. Hobart: University of Tasmania. Ph.D. Thesis

Cartwright, Caroline, Granger-Taylor, Hero, Quirke, Stephen. 1998. 'Lahun Textile Evidence in London'. In *Lahun Studies*, edited by Stephen Quirke, 92–111. Reigate: SIA Publications. http://discovery.ucl.ac.uk/72761/.

Cassuto, Deborah, Nakhai, Beth Alpert. 2008. 'Bringing Home the Artifacts: A Social Interpretation of Loom Weights in Context'. In *The World of Women in the Ancient and Classical Near East*, edited by Beth Alpert Nakai, 63–77. Newcastle-upon-Tyne: Cambridge scholars publishing.

Cassuto, Deborah. 2017. 'Modes of Textile Production in Cultic Contexts in the Iron Age Southern Levant: The Finds from Tell Es-Safi/Gath'. In *Textiles and Cult in the Ancient Mediterranean*, edited by Cecilie. Brons and Marie Louise. Nosch, 189–98. Oxford; Philadelphia: Oxbow Books.

Cassuto, Deborah. 2018. 'Textile Production at Iron Age Tell Eṣ-Ṣâfi/Gath'. *Near Eastern Archaeology 81* (1): 55–58.

Caton-Thompson, Gertrude, Gardner, Elinor W. 1934. *The Desert Fayum*. London: The Royal anthropological institute of Great Britain and Ireland.

Cecchini, Serena Maria. 1992. 'Gli Avori e Gli Ossi. Appunti Sull'attività Tessile in Siria Del Nord Durante l'Età Del Ferro'. *Tell Afis e L'Età Del Ferro* 2: 3–27.

Cecchini, Serena Maria. 2000. 'The Textile Industry in Northern Syria during the Iron Age According to the Evidence of the Tell Afis Excavations'. In *Essays on Syria in the Iron Age. Ancient Near Eastern Studies Supplements*, edited by Guy Bunnens, 7:211–33. Leuven: Peeters.

Černý, Jaroslav. 1929. 'Papyrus Salt 124 (Brit. Mus. 10055)'. *The Journal of Egyptian Archaeology* 15 (1): 243–58.

Chambon, Alain. 1984. *Tell El-Far'ah I : L'age du Fer*. Paris: Editions Recherche sur les Civilisations.

Chambon, Alain. 1993. 'Far'ah, Tell El- (North)'. In *The New Encyclopedia of Archaeological Excavations in the Holy Land*, edited by Ephraim Stern, 2:439–40. Jerusalem: IES et Carta.

Charloux, Guillaume. 2006. *Artisanat et Urbanisation de La Palestine à l'âge Du Bronze Ancien : Apport de l'étude Des Céramiques à La Structure Sociale [Thèse]*. Université Panthéon-Sorbonne - Paris I.

Charvát, Petr. 1981. *The Pottery : The Mastaba of Ptahshepses*. Praha: Universita Karlova.

Cheval, Carole, Radi, Giovanna. 2013. 'Les Lames de Tissage, Critères de Détermination et Perspectives de Recherche'. In *Regards Croisés Sur Les Outils Liés Au Travail Des Végétaux : Actes Des Rencontres 23-25 Octobre 2012 : XXXIII Rencontres Internationales d'Archéologie et d'Histoire d'Antibes = An Interdisciplinary Focus on Plant-Working Tool*, 323–40. Antibes: APDCA.

Cimadevilla, Manuel. 2012. 'Loom Weights and Spindle Whorls'. In *Hazor VI : The 1990-2009 Excavations : The Iron Age*, edited by Amnon. Ben-Tor, Doron. Ben-Ami, Débora. Sandhaus, Shlomit. Bechar, and Tsipi. Kuper-Blau, 559–63. Jerusalem: Israel Exploration Society.

Collier, Mark, Quirke, Stephen. 2002. *The UCL Lahun Papyri: Letters*. Oxford: British Archaeological Reports.

Collier, Mark, Quirke, Stephen. 2006. *The UCL Lahun Papyri: Accounts*. Oxford: Archaeopress.

Cooke, W. D. 1993. 'W.F. Petrie and the Weavers Waste'. *Archaeological Textile Newsletter. No. 17 (November 1993)*, 14–15.

Cortes, Emilia. 2011. 'An Early Weaving Scene'. In *Dawn of Egyptian Art. Catalogue of Exhibition (Metropolitan Museum of Art, New York, April 10 - August 5, 2012)*, edited by Diana Craig Patch, 94–95. New York: Metropolitan Museum of Art.

Cottica, Daniela. 2007. 'Spinning in the Roman World: From Everyday Craft to Metaphor of Destiny'. In *Ancient Textiles, Production, Craft and Society, Proceedings of the First International Conference on Ancient Textiles, Held at Lund, Sweden, and Copenhagen, Denmark, on March 19-23, 2003*. Oxford: Oxbow Books.

Cristiani, Emanuela. 2008. 'Notes on Bone Tools for Textile Production'. In *Tell Abu Al-Kharaz in the Jordan Valley 1. The Early Bronze Age*, by Peter M. Fischer, 401–3. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

Crowfoot, Grace M. 1921. 'Spinning and Weaving in the Sudan'. *Sudan Notes and Records* 4 (1): 20–38.

Crowfoot, Grace M. 1931. *Methods of Hand Spinning in Egypt and Sudan*. Halifax: F. King & Sons Printers.

Crowfoot, Grace M. 1958. 'Textiles, Basketry and Mats'. In *A History of Technology*, edited by Charles Singer, 1: 413–47.

Czerny, Ernst, Boessneck, J., Driesch von den, A. 1999. *Tell el-Dab`a IX : eine Plansiedlung des frühen Mittleren Reiches*. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

Czerny, Ernst. 2012. 'F/1, Str.e: An Early Middle Kingdom Settlement Site'. In *Handbook of the Pottery of the Egyptian Middle Kingdom, Vol. II: The Regional Volume.*, edited by Robert. Schiestl and Anne. Seiler. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

Czerny, Ernst. 2015. *Tell el-Dab'a XXII; 'Der Mund der beiden Wege' : die Siedlung und der Tempelbezirk des Mittleren Reiches von Ezbet Ruschdi*. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

Dagan, Amit, Cassuto, Deborah R. 2016. 'Horvat Shimon: A Small-Scale 8th Century BCE Workshop for Textiles in the Southern Coastal Plain'. *Israel Exploration Journal* 66: 34–54.

Daviau, P. M. Michèle. 2002. '*Excavations at Tall Jawa, Jordan, 2. The Iron Age Artefacts'*. Leiden; Boston: Brill.

David, A. Rosalie. 1986. *The Pyramid Builders of Ancient Egypt: A Modern Investigation of Pharaoh's Workforce*. London; New York: Routledge.

Davies, Graham I. 1986. *Megiddo*. Cities of the Biblical World. Cambridge: Lutterworth Press.

Davies, Norman de Garis. 1913. *Five Theban Tombs : (Being Those of Mentuherkhepeshef, User, Daga, Nehemaway and Tati)*. Archaeological Survey of Egypt Memoir. London: Egypt Exploration Fund.

Davies, Norman de Garis. 1948. *Seven Private Tombs at Kurnah*. London: Egypt Exploration Society.

Davies, Norman de Garis, Davies, Nina de Garis. 1933. *The Tomb of Nefer-Hotep at Thebes*. New York: Metropolitan museum of art.

Davies, Norman de Garis. 1929. 'The Town House in Ancient Egypt'. Metropolitan Museum Studies 1 (2): 233–55.

De Vaux, Roland. 1947. 'La Premiére Campagne De Fouilles A Tell el-Farʿah, Près Naplouse'. *Revue Biblique* 54 (3): 394–433.

De Vaux, Roland. 1947. 'La Première Campagne de Fouilles à Tell el-Far'ah, Près Naplouse: Rapport Préliminaire (Suite)'. *Revue Biblique* 54 (4): 573–89.

De Vaux, Roland. 1948. 'La Seconde Campagne de Fouilles a Tell el-Far'ah, Près Naplouse'. *Revue Biblique* 55 (4): 544–80.

De Vaux, Roland. 1951. 'La Troisième Campagne De Fouilles A Tell el-Far'ah Près Naplouse: Rapport Préliminaire (Suite)'. *Revue Biblique* 58 (4): 566–90.

De Vaux, Roland. 1952. 'La Quatrieme Campagne de Fouilles a Tell El-Far'ah, Pres Naplouse'. *Revue Biblique,* 59 (4): 551–83.

De Vaux, Roland. 1955. 'Les Fouilles de Tell el-Far'ah, Près Naplouse'. *Revue Biblique* 62 (4): 541–89.

De Vaux, Roland. 1957. 'Les Fouilles de Tell el-Far'ah Près Naplouse: Sixieme Campagne'. *Revue Biblique,* 64 (4): 552–80.

De Vaux, Roland. 1961. 'Les Fouilles De Tell el-Far'ah: Rapport Préliminaire sur ses 7e, 8e, 9e Campagnes, 1958-1960'. *Revue Biblique* 68 (4): 557–92.

De Vaux, Roland. 1962. 'Les Fouilles de Tell el-Far'ah: Rapport Préliminaire Sur Les 7e, 8e, 9e Campagnes, 1958-1960 (Suite), 212–53.

Debono, Fernand, Mortensen, Bodil. 1992. *El Omari : A Neolithic Settlement and Other Sites in the Vicinity of Wadi Hof, Helwan*. Mainz am Rhein: Von Zabern.

Del Vesco, Paolo, Poole, Federico. 2018. 'Deir El-Medina in the Egyptian Museum of Turin. An Overview, and the Way Forward'. In *Out of the Box. Selected Papers from the Confer- Ence "Deir El-Medina and the Theban Necropolis in Contact" (Liège, 27-29 October 2014)*, edited by Andreas Dorn and Stéphane Polis. Liège: Presses Universitaires.

Desrosiers, Sophie. 2010. 'Textile Terminologies and Classifications: Some Methodological and Chronological Aspects'. In *Textile Terminologies in the Ancient Near East and Mediterranean from the Third to the First Millennia BC*, edited by Marie-Louise Nosch and Cécile Michel. Oxford: Oxbow Books.

Dothan, Moshe. 1971. *Ashdod II-III : The Second and Third Seasons of Excavations, 1963, 1965, Soundings in 1967*. Jerusalem: Israel Exploration Society.

Dothan, Trude. 1963. 'Spinning-Bowls'. *Israel Exploration Journal* 13 (2): 97–112.

Doyen, Jean-Marc. 1986. 'L'outillage en Os des Sites de Tell Abou Danné et d'Oumm el-Marra (Campagnes 1975-1983): Quelques Aspects de l'artisanat en Syrie du Nord du III au I Millénaire'. *Akkadica*, no. 47: 30–74.

Drewsen, Anne. 2016. 'Twirling the Whorl'. *Nekhen News* 28: 13–14.

Dreyer, Günter, Driesch, Angela von den, Engel, Eva-Maria, et al. 2000. 'Umm El-Qaab. Nachuntersuchungen Im Frühzeitlichen Königsfriedhof 11./12. Vorbericht'. *Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo* 56: 44–129.

Dreyer, Günter, Engel E.-M., Hartung Ulrich, et al. 1996. 'Umm El-Qaab. Nachuntersuchungen Im Frühzeitlichen Königsfriedhof 7./8. Vorbericht'. *Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo*: 11–81.

Dreyer, Günter, Rita Hartmann, Ulrich Hartung, et al. 2003. 'Umm El-Qaab. Nachuntersuchungen Im Frühzeitlichen Königsfriedhof: I3./I4./I5. Vorbericht'. *Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo* 59: 67–138.

Dreyer, Günter, Ulrich Hartung, Thomas Hikade, et al. 1998. 'Umm El-Qaab. Nachuntersuchungen Im Frühzeitlichen Königsfriedhof-9./10. Vorbericht'. *Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo* 54: 77–167.

Ebeling, Jennie. 2012. 'Ground Stone Artifacts'. In *Hazor VI : The 1990-2009 Excavations : The Iron Age*, edited by Amnon. Ben-Tor, Doron. Ben-Ami, Débora. Sandhaus, Shlomit. Bechar, and Tsipi. Kuper-Blau, 542–58. Jersualem: Israel Exploration Society.

Eiwanger, Josef. 1982. ‘Die neolithische Siedlung von Merimde-Benisalâme: vierter Bericht.’ *Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo* 38: 67–82.

Emery, Walter B., H. S. Smith, Millard, Anne. 1979. *The Fortress of Buhen: The Archaeological Report*. London: Egypt Exploration Society.

Engelbach, Reginald, Gunn Battiscombe G.. 1923. *Harageh*. London: Quaritch.

Eyckerman, Merel, Hendrickx, Stan. 2011. ‘The Naqada I Tombs H17 and H41 at El-Mahasna, a Visual Reconstruction’. In *Egypt at Its Origins 3 : Proceedings of the Third International Conference ‘Origin of the State : Predynastic and Early Dynastic Egypt’, London, 27th July-1st August 2008*, edited by Renée F. Friedman and Peter N. Fiske, 379–429. Leuven: Peeters.

Fairservis, Walter A. 1986. *The Hierakonpolis Project Season January to May 1981: Excavation on the Kom el-Gemuwia*. Poughkeepsie, NY: Vassar College.

Finkelstein, Israel, Ussishkin, David, Halpern, Baruch. 2000. ‘Introduction: The Megiddo Expedition’. In *Megiddo III: The 1992-1996 Seasons*, 1–13. Tel Aviv: Emery and Claire Yass Publications in Archaeology.

Finkelstein, Israel, Ussishkin, David, Cline, Eric C.. 2013. ‘The 2004-2008 Seasons’. In *Megiddo V: The 2004-2008 Seasons*, 3–19. Tel Aviv: Emery and Claire Yass Publications in Archaeology.

Finkelstein, Israel, Arie, Eran, Martin ,Mario A.S., Piasetzky, Eli. 2017. ‘New Evidence on the Late Bronze/Iron I Transition at Megiddo: Implications for the End of the Egyptian Rule and the Appearance of Philistine Pottery’. *Ägypten und Levante* 27: 261–80.

Finkelstein, Israel. 2012. ‘Tell El-Far’ah (Tirzah) and the Early Days of the Northern Kingdom’. *Revue Biblique*, 331–46.

Firth, Cecil M., Gunn, Battiscombe G. 1926. *Excavations at Saqqara: Teti Pyramid Cemeteries*. Le Caire: Imprimerie de l’Institut français d’archéologie orientale.

Firth, Richard. 2015. ‘Mathematical Analysis of the Spindle Whorl and Loom Weight Data in the CTR Database’. In *Tools, Textiles and Contexts: Investigating Textile Production in the Aegean and Eastern Mediterranean Bronze Age*, edited by Eva B. Andersson Strand and Marie-Louise Nosch, 153–95. Oxford: Oxbow books.

Fischer, Peter M. 2008. *Tell Abu Al-Kharaz in the Jordan Valley 1. The Early Bronze Age*. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

Fischer, Peter M. 2009. ‘Textile Production at Tell’Abū Al-Kharāz, Jordan Valley’. In *A Timeless Vale: Archaeological and Related Essays on the Jordan Valley in Honour of Gerrit van Der Kooij on the Occasion of His Sixty-Fifth Birthday*, Archaeological Studies Leiden University, edited by Eva Kaptijn, Lucas P Petit, and Gerrit van der Kooij, 19:109–17. Leiden: Leiden University Press.

Fischer, Peter M. 2014. *Tell Abu Al-Kharaz in the Jordan Valley 3 The Iron Age*. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

Fitzgerald, G. M, Bache, Charles. 1935. *Beth-Shan: Earliest Pottery / Tell Billa : First Assyrian Level*. Philadelphia: University Museum, University of Pennsylvania.

Fitzgerald, Gerald M. 1930. *The Four Canaanite Temples of Beth-Shan : Part II. The Pottery*. Philadelphia: University Press for the University of Pennsylvania Museum.

Forbes, Robert. 1956. *Studies in Ancient Technology, Fibres and Fabrics of Antiquity*. Vol. 4. Leiden: Brill.

Fuller, D., Bogaard, Amy, Charles, Mike, Filipovic, D. 2014. ‘Macro-and Micro-Botanical Remains from the 2013 and 2014 Seasons’. In *Çatalhöyük 2014 Archive Report*, edited by Scott Haddow, 118.

Gachet-Bizollon, Jacqueline. 2007. *Les Ivoires d’Ougarit et l’art Des Ivoiriers Du Levant Au Bronze Récent*. Vol. 16. Etudes et Recherche sur les Civilisations.

Gardiner, Alan H. 1948. *The Wilbour Papyrus: 2 : Commentary*. London: Oxford University Press.

Garfinkel, Yosef. 1999. *The Yarmukians : Neolithic Art from Sha`ar Hagolan*. Jerusalem: Bible Lands Museum Jerusalem.

Garstang, John. 1907. *The Burial Customs of Ancient Egypt as Illustrated by Tombs of the Middle Kingdom: Being a Report of Excavations Made in the Necropolis of Beni Hassan during 1902-3-4*. Archibald Constable & Co.: London.

Gaspa, Salvatore. 2017. ‘Textiles in Assyrian and Babylonian Temples from the 1st Millennium BCE’. In *Textiles and Cult in the Ancient Mediterranean*, edited by Cecilie Brøns and Marie-Louise Nosch. Oxford: Oxbow Books.

Gasperini, Valentina. 2014. ‘Mycenaean and Cypriot Pottery from Gurob in the Manchester Museum Collection: A Test of Trade Network Theories for the New Kingdom Fayum’. Journal of Ancient Egyptian Interconnections 6 (2): 10–22.

Gasperini, Valentina. 2018. *Tomb Robberies at the End of the New Kingdom: The Fayum Case - The Gurob Burnt Groups Reinterpreted*. Oxford: Oxford University Press.

Getsov, Nimrod, Bazilai, Omry. 2009. 'Nahal Betzet II and Ard El Samra: Two Late Prehistoric Sites and Settlement Patterns in the Akko Plain'. *Journal of The Israel Prehistoric Society*, 81–158.

Gibbs, Kevin T. 2008. 'Pierced clay disks and Late Neolithic textile production'. In *Proceedings of the 5th International Congress on the Archaeology of the Ancient Near East : Madrid, April 3-8 2006. Vol. 3 Vol. 3*, edited by Joaquín Córdoba, Miquel Molist, Carmen Peréz, Isabel Rubio, Sergio Martínez, and Universidad Autónoma de Madrid, 89–96. Madrid: UAM Ediciones.

Giddy, Lisa L. 1999. *Kom Rabi`a : The New Kingdom and Post-New Kingdom Objects : The Survey of Memphis II*. Egypt Exploration Society.

Gleba, Margarita, Griffiths, Dafydd. 2011. 'Textile Remains From A Middle Bronze Age Burial in Sidon'. *Archaeology & History in Lebanon*, no. 34–35: 285–96.

Gleba, Margarita, Harris, Susanna. 2018. 'The First Plant Bast Fibre Technology: Identifying Splicing in Archaeological Textiles'. *Archaeological and Anthropological Sciences*, July, 1–18.

Gleba, Margarita. 2008. *Textile Production in Pre-Roman Italy*. Oxford: Oxbow Books.

Gleba, Margarita. 2012. 'From Textiles to Sheep: Investigating Wool Fibre Development in Pre-Roman Italy Using Scanning Electron Microscopy (SEM)'. *Journal of Archaeological Science* 39 (12): 3643–61. https://doi.org/10.1016/j.jas.2012.06.021.

Goshen, Nurith, Yasur-Landau, Assaf, Cline, Eric C.. 2013. 'Textile Production in Palatial and Non-Palatial Contexts: The Case of Tel Kabri'. In *Textile Production and Consumption in the Ancient Near East: Archaeology, Epigraphy, Iconography,* edited by Marie-Louise Nosch, Henriette Koefoed, and Eva Andersson Strand, 45–53. Oxford: Oxbow Books.

Götze, Alfred. 1902. 'Die Kleingeräte Aus Metall, Stein, Thon Und Ähnliche Stoffen'. In *Troia Und Ilion: Ergebnisse Der Ausgrabungen in Den Vorhistorischen Und Historischen Schichten von Ilion*. Athens, by Wilhelm Dörpfeld, 320–423.

Grandet, Pierre. 2003. *Catalogue des ostraca hiératiques non littéraires de Deîr el-Médîn'eh, Vol. IX, Nos. 831-1000*. Le Caire: Imprimerie de l'Institut Français d'archéologie orientale.

Grandet, Pierre. 2006. *Catalogue des ostraca hiératiques non littéraires de Deîr el-Médîneh, Vol. X, Nos 10001-10123*. Le Caire: Imprimerie de l'Institut Français d'archéologie orientale.

Grandet, Pierre. 2010. *Catalogue des ostraca hiératiques non-littéraires de Deir el-Médîneh, vol. XI, Nos 10124-10275.* Le Caire: Imprimerie de l'Institut Français d'archéologie orientale.

Grandet, Pierre. 2017. *Catalogue des ostraca hiératiques non littéraires de Deîr el-Médîneh, Vol. XII, Nos. Nos 10276-10405*. Le Caire: Imprimerie de l'Institut Français d'archéologie orientale.

Grant, Elihu. 1932. *Ain Shems Excavations : (1928-1929-1930-1931),* 2. Haverford: College Press.

Griffith, Agnes S. 1910. Catalogue of Egyptian Antiquities of the XII and XVIII Dynasties from Kahun, Illahun and Gurob. Manchester: Sherratt & Hughes.

Guy, Philip Langstaffe Ord., and Robert Martin. Engberg. 1938. *Megiddo Tombs*. Chicago: The University of Chicago Press.

Haas, Volkert. 1994. *Geschichte der hethitischen Religion*. Leiden: Brill.

Habachi, Ladib, Eva-Maria Engel, Peter Jánosi, Christa. Mlinar, and Ernst Czerny. 2001. *Tell El-Dab'a. I*. Wien: Österreichischen Akademie der Wissenschaften.

Hall, Rosalind M. 1982. 'Garments in the Petrie Museum of Egyptian Archaeology'. *Textile History* 13 (1): 27–45. doi:10.1179/004049682793690922.

Harrison, Timothy P. 2004. *Megiddo 3: Final Report on the Stratum VI Excavations*. Chicago: The University of Chicago Press.

Hartung, Ulrich, el-Gelil, M. A., Driesch A. von den, et al. 2003. 'Vorbericht uber neue Untersuchungen in der pradynastischen Siedlung von Maadi'. *Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo* 59: 149–98.

Hassan, Selim. 1943. *Excavations at Gîza 4*. Cairo: Faculty of Arts of the Egyptian University.

Hayes, William. 1953. *The Scepter of Egypt 1: A Background for the Study of the Egyptian Antiquities in The Metropolitan Museum of Art: From the Earliest Times to the End of the Middle Kingdom*. Cambridge, Mass: Harvard Univ. Press.

Hayes, William. 1959. *The Scepter of Egypt 2: A Background for the Study of the Egyptian Antiquities in the Metropolitan Museum of Art.* Cambridge, Mass.: Harvard Univ. Press.

Helbaek, Hans. 1963. 'Textiles from Çatal Höyük'. *Archaeology*, 39–46.

Hill, Jane A., Herbich, Thomasz. 2011. 'Life in the Cemetery: Late Predynastic Settlement at El-Amra'. In *Egypt at Its Origins 3: Proceedings of the Third International Conference 'Origin of*

the State: Predynastic and Early Dynastic Egypt', London, 27th July - 1st August 2008, edited by Renée Friedman and Peter N. Fiske, 109–35. Leuven: Peeters.

Hodgkinson, Anna K. 2018. *Technology and Urbanism in Late Bronze Age Egypt*. Oxford: Oxford University Press.

Hoffmann, Marta. 1964. *The Warp-Weighted Loom: Studies in the History and Technology of an Ancient Implement*. Kragero: Maper.

Hölscher, Uvo, Anthes, Rudolf, Seele, Keith C. 1939. *The Excavations of Medinet Habu II. The Temples of the Eighteenth Dynasty*. Chicago: The University of Chicago Press.

Hölscher, Uvo. 1954. *The Excavations of Medinet Habu, V*. Chicago: The University of Chicago Press.

Hornung Erik, Krauss, Rolf, Warburton, David A. (eds.). 2006. *Ancient Egyptian Chronology*. Leiden: Brill.

James, Frances W., McGovern, Patrick E. 1993. *The Late Bronze Egyptian Garrison at Beth Shan: A Study of Levels VII and VIII*. Philadelphia: University of Pennsylvania Museum of Archaeology and Anthropology.

James, Frances W. 1966. *The Iron Age at Beth Shan: A Study of Levels VI -IV*. Philadelphia: University of Pennsylvania Museum of Archaeology and Anthropology.

Janssen, Jac J. 1975. *Commodity Prices from the Ramessid Period: An Economic Study of the Village of Necropolis Workmen at Thebes*. Leiden: Brill.

Janssen, Jac J. 2008. *Daily Dress at Deir El-Medîna: Words for Clothing*. London: Golden House Publications.

Jarmuzek, Lukasz. 2010. 'Loom-Weights or Net-Weights?' *Göttinger Miszellen: Beiträge Zur Ägyptologischen Diskussion*, 226: 17–24.

Johl, Carl H. 1924. *Altägyptische Webestühle und Brettchenweberei in Altägypten*. Leipzig: Hinrichs.

Jones, Jana, Oldfield, Ron. 2007. 'Egypt's Earliest Linen'. *Egyptian Archaeology* 29: 33–35.

Jones, Jana. 2008. 'Pre-and Early Dynastic Textiles: Technology, Specialisation and Administration during the Process of State Formation'. In *Egypt at Its Origin 2. Proceedings of the International Conference 'Origin of the State. Predynastic and Early Dynastic Egypt', Toulouse (France), 5th - 8th September 2005*, edited by Béatrix Midant-Reynes, Yann Tristant,

Joanne Rowland, and Stan Hendrickx, 99–132. Orientalia Lovaniensia Analecta 172. Leuven: Peeters.

Junker, Hermann. 1929. 'Vorläufiger Bericht über die Grabung der Akademie der Wissenschaften in Wien auf der neolithischen Siedelung von Merimde-Benisalame (Westdelta): vom 1. bis 30. März 1929.' *Anzeiger der Akademie der Wissenschaften in Wien* (16–18): 156–248.

Junker, Hermann. 1930. 'Vorläufiger Bericht über die zweite Grabung der Akademie der Wissenschaften in Wien auf der vorgeschichtlichen Siedlung Merimde-Benisalâme : vom 7. Februar bis 8. April 1930.' *Anzeiger der Akademie der Wissenschaften in Wien*, (5–13): 21–82.

Kemp, Barry J. 1978. 'The Harim-Palace at Medinet El-Ghurab'. *Zeitschrift Für Ägyptische Sprache Und Altertumskunde* 105 (1): 122–33.

Kemp, Barry J., Vogelsang-Eastwood, Gillian. 2001. *The Ancient Textile Industry at Amarna*. London: Egypt Exploration Society.

Kenyon, Kathleen M. 1960. *Excavations at Jericho: The Tombs Excavated in 1952-4*. Jerusalem: British School of Archaeology.

Kenyon, Kathleen M., Holland T. A. 1965. *Excavations at Jericho: The Tombs Excavated in 1955-6*. Jerusalem: British School of Archaeology in Jerusalem.

Kołodziejczyk, Piotr. 2015. 'Egyptian Predynastic Tokens: Traces of Magic or Economic Activity?: The Beginnings of Abstract Writing and Calculating System or a Relic of Early Magical Practices'. In *The Wisdom of Thot: Magical Texts in Ancient Mediterranean Civilisations*, edited by Grażyna Bąkowska-Czerner, Alessandro Roccati, and Agata Świerzowska, 27–42. Oxford: Archaeopress.

Kopp, Peter. 2006. *Die Siedlung der Naqadazeit*, Elephantine 32. Mainz am Rhein: von Zabern.

Kopp, Peter. 2018. *Funde und Befunde aus der Umgebung des Satettempels : Grabungen von 2006-2009*, Elephantine 24. Wiesbaden: Harrassowitz.

Kvavadze, Eliso, Bar-Yosef, Ofer, Belfer-Cohen, Anna, et al. 2009. '30,000-Year-Old Wild Flax Fibers'. *Science (New York, N.Y.)* 325 (October): 1359. https://doi.org/10.1126/science.1175404.

Lacovara, Peter. 1990. *Deir El-Ballas : Preliminary Report on the Deir El-Ballas Expedition, 1980-1986*. Winona Lake, Ind.: Eisenbrauns.

Laemmel, Sabine. 2008. ‘Preliminary Report on the Pottery from Area Q IV at Qantir/Pi-Ramesse: Excavations of the Roemer-Pelizaeus Museum, Hildesheim’. *Ägypten und Levante* 18: 173–202.

Langgut, Dafna, Yahalom-Mack, Naama, Lev-Yadun Simcha, et al. 2016. ‘The Earliest Near Eastern Wooden Spinning Implements’. *Antiquity* 90 (352): 973–90.

Larsen, Hjalmar. 1941. *Vorbericht über die schwedischen Grabungen in Abu Ghâlib, 1936/37*. Augsburg: Filser.

Laurito, Romina, Lemorini, Cristina, Perilli, Assunta. 2014. ‘Making Textiles at Arslantepe, Turkey, in the 4th and 3rd Millennia BC. Archaeological Data and Experimental Archaeology’. In *Wool Economy in the Ancient Near East*, edited by Catherine Breniquet and Cécile Michel, 151–68. Oxford: Oxbow Books.

Lehner, Mark. 2016. ‘The Name and Nature of the Heit El-Ghurab Old Kingdom Site: Workers Town, Pyramid Town, and the Port Hypothesis’. In *The Pyramids: Between Life and Death: Proceedings of the Workshop Held at Uppsala University, Uppsala, May 31st to June 1st, 2012*, edited by Irmgard Hein, Neils Billing, and Erika Meyer-Dietrich, 99–162. Uppsala: Uppsala University.

Lernau, Omri. 2006. ‘Fish Remains’. In *Megiddo IV: The 1998-2002 Seasons*, edited by Israel Finkelstein, David Ussishkin, and Baruch Halpern, 474–97. Tel Aviv: Emery and Claire Yass Publications in Archaeology.

Leuzinger, Urs, Rast-Eicher, Antoinette. 2011. ‘Flax Processing in the Neolithic and Bronze Age Pile-Dwelling Settlements of Eastern Switzerland’. *Vegetation History and Archaeobotany* 20 (6): 535–42. https://doi.org/10.1007/S00334-011-0286-2.

Levy, Janet, Gilead, Isaac. 2012. ‘Spinning in the 5th Millennium in the Southern Levant: Aspects of the Textile Economy’. Paléorient, 127–39.

Levy, Janet, Gilead, Isaac. 2013. ‘The Emergence of the Ghassulian Textile Industry in the Southern Levant Chalcolithic Period (c. 4,500-4,000 BCE)’. In *Textile Production and Consumption in the Ancient Near East*, edited by Marie-Louise Nosch, Henriette Koefoed, and Eva Andersson Strand, 26–44. Oxford: Oxbow Books.

Liu, Robert K. 1978. ‘Spindle Whorls. Part I: Some Comments and Speculations’. *The Bead Journal* 3: 87–103.

Loud, Gordon. 1948. *Megiddo II Seasons of 1935-39*. Oriental Institute Publications 52. Chicago: The University of Chicago Press.

Macalister, Robert A. S. 1912. The Excavation of Gezer : 1902-1905 and 1907-1909. London: Murray.

Mace, A. C. 1922. 'Loom Weights in Egypt'. *Ancient Egypt*, 75–76.

Mączyńska, Agnieszka. 2008. 'Some Remarks on Egyptian-Southern Levantine Interrelations in the First Half of the 4th Millennium BC'. In *Egypt at Its Origin 2. Proceedings of the International Conference 'Origin of the State. Predynastic and Early Dynastic Egypt', Toulouse (France), 5th - 8th September 2005*, edited by Béatrix Midant-Reynes, Yann Tristant, Joanne Rowland, and Stan Hendrickx, 763–81. Orientalia Lovaniensia Analecta 172. Leuven : Peeters.

Maeir, Aren M., Panitz-Cohen, Nava. 2004. *Bronze and Iron Age Tombs at Tel Gezer, Israel : Finds from Raymond-Charles Weill's Excavations in 1914 and 1921*. Oxford: Archaeopress.

Mallet, Joël. 1988. *Tell el-Far'ah 2. Stratigraphie des vestiges du bronze moyen.* Paris: Editions Recherche sur les Civilisations.

Mårtensson, Linda, Nosch, Marie-Louise, Andersson Strand, Eva. 2009. 'Shape of Things: Understanding a Loom Weight'. *Oxford Journal of Archaeology* 28 (4): 373–98.

Martin, Mario A. S. 2009. 'The Egyptian Assemblage'. In *Excavations at Tel Beth-Shean 1989-1996. Vol. III. The 13th - 11th Century BCE Strata in Areas N and S.*, edited by Nava Panitz-Cohen and Amihai Mazar, 434–77. Beth-Shean Valley Archaeological Project. Jerusalem: Israel Exploration Society.

Mazar, Amihai, Sumaka'i Fink, Amir. 2006. 'Area P: Stratigraphy and Architecture'. In *Excavations at Tel Beth-Shean, 1989-1996. Vol. I. From the Late Bronze Age IIB to the Medieval Period*, edited by Amihai Mazar. Beth-Shean Valley Archaeological Project. Jerusalem: Israel Exploration Society.

Mazar, Amihai, Mullins, Robert A. 2006. 'Introduction'. In *Excavations at Tel Beth-Shean, 1989-1996. Vol. I. From the Late Bronze Age IIB to the Medieval Period*, edited by Amihai Mazar, 3–25. Jerusalem: Israel Exploration Society .

Mazar, Amihai, Panitz-Cohen, Nava. 2001. *Timnah (Tel Batash) II: The Finds from the First Millennium BCE.* Institute of Archaeology, the Hebrew University of Jerusalem.

Mazar, Amihai, Panitz-Cohen, Nava. 2006. 'Area S: The Stratigraphy and Architecture of the Iron Age IIA and Later Structures'. In *Excavations at Tel Beth-Shean, 1989-1996. Vol. I. From the Late Bronze Age IIB to the Medieval Period.*, edited by Amihai Mazar, 173–201. Beth-Shean Valley Archaeological Project. Jerusalem: Israel Exploration Society.

Mazar, Amihai, Rotem, Yael. 2012. 'The Small Finds from the Early Bronze and Intermediate Bronze Ages'. In *Excavations at Tel Beth-Shean: 1989-1996. Vo. IV. The 4th and 3rd Millennia BCE*, edited by Amihai Mazar, 350–99. Beth-Shean Valley Archaeological Project. Jerusalem: Israel Exploration Society.

Mazar, Amihai. 2006. 'Beth Shean from the Late Bronze Age IIB to the Medieval Period: A Summary'. In *Excavations at Tel Beth-Shean, 1989-1996. Vol. I. From the Late Bronze Age IIB to the Medieval Period*, edited by Amihai Mazar, 26–47. Beth-Shean Valley Archaeological Project. Jerusalem: Israel Exploration Society.

Mazar, Amihai. 2007. *Excavations at Tel Beth-Shean: 1989-1996. Vo. II. The Middle and Late Bronze Age Strata in Area R*. Beth-Shean Valley Archaeological Project. Jerusalem: Israel Exploration Society.

Mazar, Amihai. 2009. 'Introduction'. In *Excavations at Tel Beth-Shean 1989-1996. Vol. III. The 13th - 11th Century BCE Strata in Areas N and S.*, edited by Nava Panitz-Cohen and Amihai Mazar, 1–32. Beth-Shean Valley Archaeological Project. Jerusalem: Israel Exploration Society.

Mazar, Amihai. 2010. 'Tel Beth-Shean: History and Archaeology'. In *One God, one cult, one nation: archaeological and biblical perspectives*, edited by Reinhard Gregor Kratz, Björn Corzilius, Hermann Spieckermann, and Tanja Pilger. Beihefte zur Zeitschrift für die Alttestamentliche Wissenschaft 405. Berlin: Walter de Gruyter.

Mazar, Amihai. 2012. 'Area R (EB III-IBA): The Stratigraphy and Architecture'. In *Excavations at Tel Beth-Shean: 1989-1996. Vo. IV. The 4th and 3rd Millennia BCE*, 86–122. Beth-Shean Valley Archaeological Project. Jerusalem: Israel Exploration Society.

Mellink, Machteld J. 1969. 'Excavations at Karataş-Semayük in Lycia, 1968'. *American Journal of Archaeology* 73 (3): 319–31. https://doi.org/10.2307/503513.

Midant Reynes, Béatrix., Guilaine Jean, Grimal, Nicolas. 2003. *Aux origines de l'Egypte : du néolithique à l'émergence de l'état*. Paris: Fayard.

Miroschedji, Pierre de. 1988. *Rapport sur les trois premières campagnes de fouilles à Tel Yarmouth (Israël) : (1980-1982).* Paris: Éd. Recherche sur les Civilisations.

Miroschedji, Pierre de. 1993. 'Far'ah, Tell El- (North)'. In *The New Encyclopedia of Archaeological Excavations in the Holy Land*, edited by Ephraim Stern, 2:433–38. Jerusalem: IES et Carta.

Mond, Robert L., Myers Oliver H. 1937. *Cemeteries of Armant I*. London: Egypt Exploration Fund.

Moorey, Peter R.S. 1980. *Cemeteries of the First Millennium BC at Deve Hüyük, Near Carchemish: Salvaged by TE Lawrence and CL Woolley in 1913*. Oxford: BAR international series.

Moulhérat, Christophe, Spantidaki, Giouli. 2009. 'Cloth from Kastelli, Chania'. *Arachne. Occasional Publication for the History of Costume and Textiles in the Aegean and Eastern Mediterranean* 3: 8–15.

Müller, Hans W. 1940. *Die Felsengräber der Fürsten von Elephantine : aus der Zeit d. mittleren Reiches*. Glückstadt: Augustin.

Nagel, Georges. 1938. *La céramique du Nouvel Empire à Deir el Médineh*. Le Caire: Imprimerie de l'Institut Français d'archéologie orientale.

Naville, Edouard, Peet, T. Eric, Hall, H. R., Haddon Kathleen. 1914. *The cemeteries of Abydos : Pt. 1: 1909-1910. The mixed cemetery and Umm el-Ga'ab*. London: Egypt Exploration Fund.

Negahban, Ezat O. 1996. *Marlik: The Complete Excavation Report*. Philadelphia: University Museum, University of Pennsylvania.

Newberry, Percy E., Griffith, Francis L. 1894. *El-Bersheh*. Archaeological Survey of Egypt, Memoir 3-4. London: Egypt Exploration Fund.

Newberry, Percy E., Griffith, Francis L. 1893. *Beni Hasan*. London: Egypt Exploration Fund.

Newberry, Percy E. 1893. *Beni Hasan 2*. London: Egypt Explor. Fund.

Nodet, Émile. 1980. 'Fusaïoles et Pesons'. In *Tell Keisan : 1971-1976, Une Cité Phénicienne En Galilée*, edited by Jacques. Briend, Jean-Baptiste Humbert, and Émile Puech, 316–21. Fribourg; Göttingen; Paris: Éditions universitaires ; Vandenhoeck et Ruprecht ; J. Gabalda.

Odler, Martin, Kmosek, Jirí, Dupej, Ján. 2016. *Old Kingdom Copper Tools and Model Tools*. Oxford: Archaeopress

Odler, Martin. 2015. ‘Copper Model Tools in Old Kingdom Female Burials’. In *Current Research in Egyptology 2014 : Proceedings of the Fifteenth Annual Symposium, University College, London, 2014*, edited by Massimiliano S. Pinarello, 39–58.

Olofsson, Linda, Andersson Strand, Eva, Nosch, Marie-Louise. 2015. ‘Experimental Testing of Bronze Age Textile Tools’. In *Tools, Textiles and Contexts: Investigating Textile Production in the Aegean and Eastern Mediterranean Bronze Age*, edited by Eva B. Andersson Strand and Marie-Louise Nosch, 75–100. Oxford: Oxbow books.

Oren, Eliezer D. 1973. *The Northern Cemetery of Beth Shan*. Leiden: Brill.

Oren, Ronit. 2002. ‘Loom Weights and Spindle Whorls’. In *Tel Kabri : The 1986-1993 Excavation Season*, edited by Aharon. Kempinski, 363–72. Tel Aviv: Emery and Claire Yass publications in archaeology.

Orrelle, Estelle, Eyal, Ruth, Gopher, Avi. 2012. ‘Spindle Whorls and Their Blanks’. In *Village Communities of the Pottery Neolithic Period in the Menashe Hills, Israel : Archaeological Invesigations at Hte Sites of Nahal Zehora. 2,* edited by Ran. Barkai and Avi Gopher, 632–56. Tel Aviv: Inst. of Archaeology, Tel Aviv Univ.

Paice, Patricia. 2004. ‘Chapter Six: The Small Finds’. In *Megiddo 3: Final Report on the Stratum VI Excavations*, edited by Timothy P. Harrison, 59–104. Oriental Institute Publications 127. Chicago: The University of Chicago Press.

Panitz-Cohen, Nava, Mazar, Amihai. 2009. ‘Area S: Stratigraphy and Architecture’. In *Excavations at Tel Beth-Shean 1989-1996. Vol. III. The 13th - 11th Century BCE Strata in Areas N and S.*, edited by Nava Panitz-Cohen and Amihai Mazar, 94–194. Beth-Shean Valley Archaological Project. Jerusalem: Israel Exploration Society.

Panitz-Cohen, Nava, Yahalom-Mack, Naama. 2009. ‘Textile-Related Objects and a Basket Imprint’. In *Excavations at Tel Beth-Shean 1989-1996. Vol. III. The 13th - 11th Century BCE Strata in Areas N and S.*, edited by Nava Panitz-Cohen and Amihai Mazar, 737–41. Beth-Shean Valley Archaeological Project. Jerusalem: Israel Exploration Society.

Panitz-Cohen, Nava. 2012. ‘Complementary Material to Tel Beth-Shean Volumes II–III’. In *Excavations at Tel Beth-Shean: 1989-1996. Vol. IV. The 4th and 3rd Millennia BCE*, edited by Amihai Mazar, 435–37. Beth-Shean Valley Archaeological Project. Jerusalem: Israel Exploration Society.

Perrot, Jean, Zori, Nehemiah, Reich Y.. 1967. ‘Neve Ur, Un Nouvel Aspect Du Ghassoulien’. *Israel Exploration Journal*, 201–32.

Petrie, Flinders, Brunton, Guy. 1924. *Sedment 1*. London: British School of Archaeology in Egypt, U. College.

Petrie, W. M. Flinders, Brunton, Guy, Murray, Margaret A. 1923. *Lahun II*. London: Bernard Quaritch.

Petrie, W. M. Flinders, Griffith, Francis L. 1901. *The Royal Tombs of the Earliest Dynasties. 1901 Part 2*. London: Egypt Exploration Fund.

Petrie, W. M. Flinders, Quibell, James E., Spurrell, F. C. J. 1896. *Naqada and Ballas*. London: B. Quaritch.

Petrie, W. M. Flinders, Murray, Margaret A., Mackay, E. J. H.. 1931. *Ancient Gaza : Tell el-Ajjūl*. London: British School of Archaeology in Egypt.

Petrie, W. M. Flinders, Mackay, Ernest J. H., Murray, Margaret A. 1952. *City of Shepherd Kings and Ancient Gaza V*. London: British School of Egyptian Archaeology : B. Quaritch.

Petrie, W. M. Flinders. 1890. *Kahun, Gurob and Hawara*. London: K. Paul, Trench, Trübner and Co.

Petrie, W. M. Flinders. 1891. *Illahun, Kahun and Gurob, 1889-90*. London: Nutt.

Petrie, W. M. Flinders. 1892. *Medum.* London: Nutt.

Petrie, W. M. Flinders. 1901. Diospolis Parva. The Cemeteries of Abadiyeh and Hu. 1898-9. London: Egypt Exploration Fund.

Petrie, W. M. Flinders. 1902. *Abydos 1*. London: Egypt Exploration Fund.

Petrie, W. M. Flinders. 1907. *Gizeh and Rifeh*. London: British School of Archaeology in Egypt, U. College.

Petrie, W. M. Flinders. 1920. *Prehistoric Egypt.* London: British School of Archaeology in Egypt, U. College.

Petrie, W. M. Flinders. 1925. *Tombs of the courtiers and Oxyrhynkhos*. London: British School of Archaeology in Egypt, U. College.

Petrie, W. M. Flinders. 1928. *Gerar.* London: British School of Archaeology in Egypt, U. College.

Petrie, W. M. Flinders. 1932. *Ancient Gaza II. Tell El Ajjul*. London: British School of Archaeology in Egypt, B. Quaritch.

Peyronel, Luca. 2004. *Gli Strumenti Di Tessitura Dall'età Del Bronzo All'epoca Persiana*. Roma: Università degli studi di Roma La Sapienza.

Philip, Graham. 2006. *Tell El-Dab'a XV : Metalwork and Metalworking Evidence of the Late Middle Kingdom and the Second Intermediate Period*. Wien: Verlag der Österreichischen Akademie der Wissenschaft.

Piankoff, Alexandre. 1957. *Mythological Papyri*. New York: Pantheon Books.

Picton, Janet, Johnston, Janet, Pridden, Ivor. 2016. 'Report to the Ministry of Antiquities on a Study Season on the Gurob Textiles'.

Podzorski, Patricia V. 1994. '*The Northern Cemetery at Ballâs, Upper Egypt : A Study of the Middle and Late Predynastic Remains'*. Salinas, CA: Coyote Press.

Politi, Janet. 2001. 'The Papyri and the'Burnt Groups''. *Göttinger Miszellen: Beiträge Zur Ägyptologischen Diskussion*, 182: 107–11.

Poppa, Rudolf. 1978. *Kamid El-Loz 2*. Bonn: Rudolf Habelt.

Porada, Edith. 1965. *Ancient Iran; the Art of Pre-Islamic Times*. London: Methuen.

Porat, N., Seeher J. 1988. 'Petrographic Analysis of Pottery and Basalt from Predynastic Maadi'. *Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo* 44: 215–28.

Postgate, J. Nicholas, Moon, Jane A. 1982. 'Excavations at Abu Salabikh, 1981'. *Iraq* 44 (2): 103–36.

Quibell, James E., Green, Frederick W. 1902. *Hierakonpolis 2*. London: Quaritch.

Quirke, Stephen. 2005. *Lahun: A Town in Egypt 1800 BC, and the History of Its Landscape*. London: Golden House Publications.

Quirke, Stephen. 2016. 'Women of Lahun 1850-1700BC: An Exercise in Historical Archaeology'. In *Archaeology and Women: Ancient and Modern Issues*, edited by Sue Hamilton, Ruth Whitehouse, and Katherine I. Wright, 246–62. Left Coast Press: Walnut Creek, CA.

Rahmstorf, Lorenz, Siennicka, Małgorzata, Andersson Strand, Eva, et al. 2015. 'Textile Tools from Tiryns'. In *Tools, Textiles and Contexts. Investigations of Textile Production in the Bronze Age*

Eastern Mediterranean, edited by Eva Andersson Strand and Marie-Louise Nosch, 267–78. Oxford: Oxbow Books.

Rahmstorf, Lorenz. 2005. 'Ethnicity and Changes in Weaving Technology in Cyprus and the Eastern Mediterranean during the 12th Cent. BC'. In *Cyprus: Religion and Society from the Late Bronze Age to the End of the Archaic Period: Proceedings of an International Symposium on Cypriote Archaeology, Erlangen, 23-24 July 2004*, edited by Vassos Karageorghis, Hartmut Matthaus, and Sabine Rogge, 143–169. Mohnesee-Wamel: Bibliopolis.

Randall-MacIver, David, Griffith Francis. L., Mace Arthur C. 1902. *El Amrah and Abydos, 1899-1901*. London: Egypt Exploration Fund.

Rast-Eischer, Antoinette. 2008. *Textilien, Wolle, Schafe der Eisenzeit in der Schweiz*. Basel: Archaologie Schweiz :

Rizkana, Ibrahim, Seeher, Jürgen. 1987. *Maadi 1: The Pottery of the Predynastic Settlement*. Mainz am Rhein: Von Zabern.

Rizkana, Ibrahim, Seeher, Jürgen. 1988. *Maadi 2. The Lithic Industries of the Predynastic Settlement*. Mainz am Rhein: Von Zabern.

Rizkana, Ibrahim, Boessneck, Joachim, Pernicka, Ernst, et al. 1989. *Maadi III. The Non-Lithic Small Finds and the Structural Remains of the Predynastic Settlement*. Mainz am Rhein: Von Zabern.

Roth, H. Ling, Crowfoot, Grace M.. 1921. 'Models of Egyptian Looms'. *Ancient Egypt* 4: 96–101.

Ryder, Michael L. 1965. 'Report of Textiles from Çatal Hüyük'. *Anatolian Studies* 15: 175–176.

Ryder, Michael L., Gabra-Sanders, Thea. 1987. 'A Microscopic Study of Remains of Textiles Made from Plant Fibres'. *Oxford Journal of Archaeology* 6 (1): 91–108. https://doi.org/10.1111/j.1468-0092.1987.tb00143.x.

Rzepka, Slawomir, El-Din M.N., Wodzinska Anna, Jarmuzek, Lukasz. 2012. 'Egyptian Mission Rescue Excavations in Tell El-Retaba. Part 1: New Kingdom Remains'. *Ägypten und Levante* 22: 253–87.

Rzepka, Slawomir, Hudec, Jozef, Jarmuzek, Lukasz, et al. 2017. 'From Hyksos Tombs to Late Period Tower Houses. Tell el-Retaba Seasons 2015-2016'. *Ägypten und Levante* 27: 19–86.

Saad, Zaki Yusef. 1951. *Royal Excavations at Saqqara and Helwan (1945-1947)*. Le Caire: Imprimerie de l'institut français d'archéologie orientale.

Sass, Benjamin. 2000. ‘The Small Finds’. In *Megiddo III: The 1992-1996 Seasons*, edited by Israel Finkelstein, David Ussishkin, and Baruch Halpern, 349–423. Tel Aviv: Emery and Claire Yass Publications in Archaeology.

Sauvage, Caroline. 2013. ‘Spinning from Old Threads: The Whorls from Ugarit at the Musée d’Archéologie Nationale (Saint-Germain-En-Laye) and at the Louvre’. In *Textile Production and Consumption in the Ancient Near East: Archaeology, Epigraphy, Iconography*, edited by Marie-Louise Nosch, Henriette Koefoed, and Eva Andersson Strand, 189–214. Oxford: Oxbow Books.

Sauvage, Caroline. 2014. ‘Spindles and Distaffs: Late Bronze and Early Iron Age Eastern Mediterranean Use of Solid and Tapered Ivory/Bone Shafts’. In *Prehistoric, Ancient Near Eastern & Aegean Textiles and Dresses*, edited by Marie-Louise Nosch, Cécile Michel, and Mary Harlow, 184–226. Oxford: Oxbow Books.

Savage, Stephen. 2011. ‘From Maadi to the Plain of Antioch: What Can Basalt Spindle Whorls Tell Us About Overland Trade in the Southern Levant During the Early Bronze Age?’ In *Daily Life, Materiality, and Complexity in Early Urban Communities of the Southern Levant : Papers in Honor of Walter E. Rast and R. Thomas Schaub*, edited by Meredith S. Chesson, Walter Emanuel Aufrecht, Ian. Kuijt, Walter E. Rast, and R. Thomas Schaub, 119–38. Winona Lake, Ind.: Eisenbrauns.

Schick, Tamar. 1988. ‘Nahal Hemar Cave: Cordage, Basketry and Fabrics’. *Atiqot* 18: 31–43.

Schick, Tamar. 1995. ‘A 10,000 Year Old Comb from Wadi Murabba’at in the Judean Desert’. *’Atiqot* 27: 199–202.

Schick, Tamar. 2002. ‘The Early Basketry and Textiles from Caves in the Northern Judean Desert’. *’Atiqot,* 223–39.

Schmidt, Erich F. 1937. *Excavations at Tepe Hissar, Damghan*. Philadelphia: University of Pennsylvania Press.

Sebbane, Michael. 2014. ‘The Hoard from the Nahal Mishmar, and the Metal-Working Industry in Israel in the Chalcolithic Period’. In *Masters of Fire: Copper Age Art from Israel,* edited by Michael Sebbane, 114–38. Tel Aviv.

Shamir, Orit. 1996. ‘Loomweights and Whorls’. In *Excavations at the City of David : Monographs of the Institute of Archaeology, the Hebrew University of Jerusalem, 4. 1978-1985 : Various Reports.*, edited by Yigal Shiloh, Donald T. Ariel, and Alon de Groot, 1985:135–70.

Shamir, Orit. 2004. ‘The Spindle Whorls from Ashqelon, Afridar–Area E. ‘*Atiqot* 45: 97–100.

Shamir, Orit. 2007a. ‘Loomweights and Textile Production at Tel Miqne-Ekron: A Preliminary Report’. *Up to the Gates of Ekron”: Essays on the Archaeology and History of the Eastern Mediterranean in Honor of Seymour Gitin*, edited by Seymour Gitin, Sidnie W. Crawford and Amnon Ben-Tor, 43–49. Jerusalem: Israel Exploration Society.

Shamir, Orit. 2007b. ‘Textiles, Loom Weights and Spindle Whorls’. In *Excavations at Kadesh Barnea (Tell El-Qudeirat) 1976-1982*, edited by Rudolph Cohen and Hannah Bernick-Greenberg, 255–68. Jerusalem: Israel Antiquities Authorities.

Shamir, Orit. 2009. ‘Appendix: A Linen Textile Fragment’. In *Excavations at Tel Beth-Shean 1989-1996. Vol. III. The 13th - 11th Century BCE Strata in Areas N and S.*, edited by Amihai Mazar and Nava Panitz-Cohen, 608. Beth-Shean Valley Archaological Project. Jerusalem: Israel Exploration Society.

Shamir, Orit. 2013. ‘Tel ’Amal: Loomweights’. *Hadashot Arkheologiyot Excavations and Surveys in Israel* 125. http://www.hadashot-esi.org.il/images//Tel-Amal-English.pdf.

Shamir, Orit. 2014. ‘Textiles, Basketry and Other Organic Artifacts of the Chalcolithic Period in the Southern Levant’. In *Masters of Fire: Copper Age Art from Israel*, edited by Michael Sebbane, 139–52. Tel Aviv.

Shamir, Orit. 2015. ‘Textiles from the Chalcolithic Period, Early and Middle Bronze Age in the Southern Levant’. *Archaeological Textiles Review* 57: 12–25.

Shaw, Ian. 2003. *The Oxford History of Ancient Egypt*. Oxford: Oxford University Press.

Smith, Joanna S. 2013. ‘Tapestries in the Bronze and Early Iron Ages of the Ancient Near East’. In *Textile Production and Consumption in the Ancient Near East: Archaeology, Epigraphy, Iconography*, edited by Marie-Louise Nosch, Henriette Koefoed, and Eva Andersson Strand, 161–88. Oxford: Oxbow Books.

Smith, Vanessa E. 2010. ‘*Modeling the Mechanics of Temple Production in the Middle Kingdom an Investigation of the Shena of Divine Offerings Adjacent to the Mortuary Temple of Senwosret III at Abydos, Egypt*’. Ann Arbor (Mich.): UMI.

Spinazzi-Lucchesi, Chiara. 2018. *The Unwound Yarn. Birth and Development of Textile Tools between Levant and Egypt*. Venezia: Edizioni Ca' Foscari.

Stevenson, Alice. 2016. 'The Egyptian Predynastic and State Formation'. *Journal of Archaeological Research* 24 (4): 421–68.

Szpakowska, Kasia Maria. 2008. *Daily Life in Ancient Egypt: Recreating Lahun*. Wiley-Blackwell.

Tata, Giovanni. 1995. 'The Development of the Egyptian Textile Industry'. Ann Arbor: U.M.I.

Tavares, Ana. 2004. 'The Hidden Industry. Weaving at the Workers' Settlement'. *AERAGRAM Newsletter of Ancient Egypt Research Associates* 7(2): 10–11.

Thomas, Angela P. 1981. *Gurob: A New Kingdom Town. Introduction and Catalogue of Objects in the Petrie Collection*. Warminster: Aris & Phillips.

Thomas, Angela P. 2004. 'Some comments on the Predynastic cemetery at el Mahasna'. In *Egypt at its origins : studies in memory of Barbara Adams : proceedings of the international conference 'Origin of the State, Predynastic and Early Dynastic Egypt', Kraków, 28th August-1st September 2002*, edited by Stan Hendrickx, Renée Friedman, Krysztof Cialowicz, and Marek Chlodnicki. Peeters en Departement Oosterse Studies.

Toivari-Viitala, Jaana. 2011. 'Deir El-Medina (Development)'. *UCLA Encyclopedia of Egyptology* 1. https://escholarship.org/uc/item/6kt9m29r.

Tufnell, Olga, Charles H. Inge, and Lankester Harding. 1940. *Lachish II: The Fosse Temple*. Oxford: Oxford University Press.

Tufnell, Olga. 1958. *Lachish IV: The Bronze Age.* Oxford University Press.

Vandier d'Abbadie, Jeanne. 1937. *Catalogue Des Ostraca Figurés de Deir El Médineh : Vol. 1 (Fasc. 1-2)*. Le Caire: Institut français d'archéologie orientale.

Vila, Emmanuelle, Helmer, Daniel. 2014. 'The Expansion of Sheep Herding and the Development of Wool Production in the Ancient Near East: An Archaeozoological and Iconographical Approach'. In *Wool Economy in the Ancient Near East and the Aegean: From the Beginnings of Sheep Husbandry to Institutional Textile Industry*, edited by Catherine Breniquet and Cécile Michel, 22–40. Oxford: Oxbow books.

Vogelsang-Eastwood, Gillian M. 1987. 'A Note on the So-Called «Spinning Bowls»'. *Ex Oriente Lux. Jaarbericht van Het Vooraziatisch-Egyptisch Genootschap* 30: 78–88.

Vogelsang-Eastwood, Gillian M. 1999. *Tutankhamun's Wardrobe : Garments from the Tomb of Tutankhamun*. Rotterdam: Barjesteh van Waalwijk van Doorn.

Völling, Elisabeth. 2008. *Textiltechnik Im Alten Orient: Rohstoffe Und Herstellung*. Würzburg: Ergon.

Wachsmann, Shelley. 2013. *The Gurob Ship-Cart Model and Its Mediterranean Context*. College Station: Texas A & M University Press.

Waetzoldt, Hartmut. 1972. *Untersuchungen Zur Neusumerischen Textilindustrie*. Roma: Centro per le Anctichità e la Storia dell'Arte del Vicino Oriente.

Wegner, Josef, Smith, Vanessa, Rossell, Stine. 2000. 'The Organization of The Temple Nfr-KA of Senwosret III at Abydos'. *Ägypten und Levante* 10: 83–125.

Wegner, Josef. 2007. *The Mortuary Temple of Senwosret III at Abydos*. New Haven, Conn.; Oxford: Yale Egyptological Seminar; Oxbow books.

Wendrich, Willeke, Holdaway, Simon J., Phillipps, Rebecca, Emmitt, Joshua. J. 2017. 'The Desert Fayum Reinvestigated. The Early to Mid-Holocene Landscape Archaeology of the Fayum North Shore, Egypt'. In *The K Basin Archaeological Record*, edited by Simon J. Holdaway and Willeke Wendrich. Los Angeles: Cotsen Institute Press, University of California Los Angeles, CA.

Wenke, Robert J., Redding, Richard W., Wetterstrom, Wilma. 2016. *Kom el-Hisn (ca. 2500-1900 BC). An Ancient Settlement in the Nile Delta.* Bristol: Lockwood Press.

Wente, Edward Frank. 1990. *Letters from Ancient Egypt*. Edited by Edmund S Meltzer. Atlanta: Scholar Press.

Wheeler, Margaret. 1982. 'Loomweights and Spindle Whorls'. In *Excavations at Jericho IV: The Pottery Type Series and Other Finds*, by Kathleen M. Kenyon and T. A. Holland, 623–37. London: British School of Archaeology in Jerusalem.

Winlock, Herbert E. 1922. 'Heddle-Jacks of Middle Kingdom Looms'. *Ancient Egypt* 22: 71.

Winlock, Herbert E. 1955. *Models of Daily Life in Ancient Egypt : From the Tomb of Meket-Rē' at Thebes*. New York: Metropolitan Museum of Art.

Wisti Lassen, Agnete. 2010. 'Tools, Procedures and Professions: A Review of the Akkadian Textile Terminology'. In *Textile Terminologies in the Ancient Near East and Mediterranean from the*

Third to the First Millennia BC, edited by Marie-Louise Nosch and Cécile Michel, 272–82. Oxford: Oxbow Books.

Wisti Lassen, Agnete. 2015. 'Weaving with Crescent Shaped Loom Weights. An Investigation of a Special Kind of Loom Weight'. In *Tools, Textiles and Contexts: Investigating Textile Production in the Aegean and Eastern Mediterranean Bronze Age*, edited by Eva B. Andersson Strand and Marie-Louise Nosch, 127–35. Oxford: Oxbow books.

Yadin, Yigael, Aharoni, Yohanan, Dunayevski, Emanuel, et al. 1958. *Hazor I: An account of the first season of excavations, 1955*. The James A. de Rothschild Expedition at Hazor. Jerusalem: Magnes Press, the Hebrew University.

Yadin, Yigael, Aharoni, Yohanan, Amiran Ruth, et al. 1989. *Hazor III-IV: An Account of the Third and Fourth Seasons of Excavations, 1957-1958*. Edited by Amnon Ben-Tor. Jerusalem: Hebrew University.

Yahalom-Mack, Naama, Mazar, Amihai. 2006. 'Various Finds Form Iron Age II Strata in Area P and S'. In *Excavations at Tel Beth-Shean, 1989-1996. Vol. I. From the Late Bronze Age IIB to the Medieval Period*, edited by Amihai Mazar, 468–504. Beth-Shean Valley Archaeological Project. Jerusalem: Israel Exploration Society.

Yasur-Landau, Assaf, Goshen, Assaf, Andersson Strand, Eva, et al. 2015. 'Textile Tools from Tel Kabri, Israel'. In *Tools, Textiles and Contexts: Investigating Textile Production in the Aegean and Eastern Mediterranean Bronze Age,* edited by Eva B. Andersson Strand and Marie-Louise Nosch, 346–49. Oxford: Oxbow books.

Zaki, Yusef Saad. 1947. *Royal Excavations at Saqqara and Helwan, 1941-1945.* Le Caire: Imprimerie de l'Institut français d'archéologie orientale.

Zeist, W. van, Roller G. J. de. 1991. 'The Plant Husbandry of Aceramic Çayönü, SE Turkey'. *Palaeohistoria* 33/34: 65–96.

8 Catalogue

In the catalogue, objects seen during the study are listed in blue. Those known only from publications have a black colour. Peculiarities and problems have a red colour. Sites are listed in the same order as in text – Megiddo, Beth Shean, Hazor, Tell el-Far'ah (N), Kahun, Gurob and Deir el-Medina - plus a section of objects coming from other sites.

All measures are expressed in centimetre, except where it is differently stated (especially for yarn thickness).

8.1 MEGIDDO

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
Spindles														
1	b 137		Bone						E 2032	Loud 1948: pl. 197.1		Bone stick, broken at both ends and with ring incisions near one of the broken end.	MB III/LB I (Str. X)	
1	M 3530		Bone						Locus 1140	Lamon/Shipton 1939: pl. 95.38		Bone spindle composed of three joining elements and tapering towards one of the end. Both ends are flat. Between one of the joining points two dome spindle whorls are inserted, with the flat part attached to that of the other.	LB I	
1	b 433 a		Bone						T.3018 F	Loud 1948: pl. 197.2	From the same context also spindle whorl b 433b, similar to pl. 171.17 (dome with 4 dotted rings).	Spindle composed by a series of decorated bone rings. Core disintegrated. Discoid spindle whorl with lateral decorative incisions.	LB I (Str. IX)	
1	M 2374		Bone						Tomb 856	Guy/Engberg 1938: 172, pl. 142		Small fragment of a polished shaft.	LB I	
1	M 3568		Bone						Tomb 1122 upper	Guy/Engberg 1938: 170, fig. 175:6, pl. 84		Shaft composed of two joining parts. One end is flat and the other is missing but probably was pointed. Richly decorated by lattice and incised strips. Two spindle whorls were mounted on the shaft on the basis of M3530.	LB II	
1	M 3569a		Bone						Tomb 1122 upper	Guy/Engberg 1938: 170 pl. 84		Fragment of a shaft with a lattice decoration.	LB II	
1	M 3569b		Bone						Tomb 1122 upper	Guy/Engberg 1938: 170 pl. 84		Fragment of a shaft with parallel incised strips.	LB II	
1	M 3569c		Bone						Tomb 1122 upper	Guy/Engberg 1938: 170 pl. 84		Shaft, probably complete, with parallel incised strips at both ends	LB II	
1	M 2435		Bone	3,8	0,6			1,8	Tomb 877 B1	Guy/Engberg 1938: 33-36, 170, pl. 95		Fragment of a bone shaft with bands decorated by parallel incised strips and oblique incisions. Both ends missing.	LB II	1934-1620 ?
1	M 2433		Bone						Tomb 877 B1	Guy/Engberg 1938: 33-36, 170, pl. 95		Bone shaft, complete. One end is flat and the other pointed. It is decorated by thread bands of an incised lattice pattern.	LB II	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 2852		Bone	2,4	1,2			1,4	Tomb 989 C 1	Guy/Engberg 1938: 170, pl. 100:26.		Element carved in the form of a pomegranate to insert on top of a bone shaft.	LB II	1934-2113 ?
1	M 2853		Bone	21,6	0,6			10,2	Tomb 989 C 1	Guy/Engberg 1938: 170, pl. 100.30		Complete bone shaft with both ends flattened. Decorated by several groups of incised parallel strips.	LB II	1934-2116 ?
1	M 2856		Ivory						Tomb 989 C 1	Guy/Engberg 1938: 170, pl. 100.29		Broken bone shaft, which tends to taper towards the preserved end, which is flat. Decorated by several groups of incised parallel strips.	LB II	
1	x 748		Bone						Tomb 40	Guy/Engberg 1938: fig. 175, pl. 156.13		Complete bone shaft, with a flat end and the other which ends with a tenon. Decorated by bands of incised lattice pattern. Composed by two pieces.	LB II	
1	x 632		Bone						Tomb 40	Guy/Engberg 1938: fig. 175, pl. 156.12		Fragment of a bone shaft, with one flat end and the the broken.	LB II	
1	x 1977		Bone						Tomb 59A	Guy/Engberg 1938: fig. 175, pl. 157		Shaft broken at one end, the other is flat with a deep rounded groove.	LB II	
1	3826		Bone						Tomb 63 E	Guy/Engberg 1938: fig. 175, pl. 158.7		Bone fragment of shaft, broken at both ends and decorated by incised parallel strips.	LB II	
1	a 944		Bone						N 15	Loud 1948: pl. 197.3		Broken bone shaft, both ends missing. Decorated with a lattice band and some parallel and circular incised lines.	LB II	
1	M 6054		Bone						E 1831	Loud 1948: pl. 197.4		Broken bone shaft, one preserved end is decorated by a lattice pattern.	LB II	
1	M 6028		Bone						1831	Loud 1948: pl. 197.5		Completed bone shaft with mortise at both ends. Decorated by diagonal incision closed by parallel incised strips.	LB II	
1	M 6130		Bone						N 1835	Loud 1948: pl. 197.6		Completed bone shat with mortise at both ends. Decorated by parallel incised strips.	LB II	
1	M 6083		Bone						1814	Loud 1948: pl. 197.7		Large shaft with one end flat and the other is hollow. Decorated by an incised lattice pattern and several parallel incised strips resembling rings.	LB III (Str. VIIA)	
1	M 5963		Bone						1814	Loud 1948: pl. 197.8		Bone shaft with one end flat and the other is hollow. Decorated by an incised pattern of diagonal lines and several parallel incised strips resembling rings.	LB III (Str. VIIA)	
1	M 5985		Bone						S 1825	Loud 1948: pl. 197.9		Bone shaft with one end flat and the other is hollow. Decorated by an incised	LB III (Str. VIIA)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
												pattern of diagonal lines and several parallel incised strips resembling rings.		
1	M 5673 a		Bone						N 1771	Loud 1948: pl. 197.10		Shaft broken in two pieces but complete. Surface decorated by lattice pattern and groups of parallel incised lines.	LB III (Str. VIIA)	
1	M 5673 b		Bone						N 1771	Loud 1948: pl. 197.11		Shaft broken at one end while the other is flat. Partially decorated by parallel and diagonal incised lines.	LB III (Str. VIIA)	
1	M 5776		Bone						1769	Loud 1948: pl. 197.13. Paice 2004: pl. 125.	Found with two bone whorls and spindle M 5777	Bone shaft, complete. Both ends are flat. Partially decorated with a attice pattern and two carved strips parallel to the ends.	IA I (Str. VI)	
1	00/K/100/AR 7		Bone	7,3	0,9	0,7		5,21	K-5(?)	Sass/Cinamon 2006: 395, fig. 18.30.		Bone shaft, one end flat but hollow and the other broken but full. Almost complete covered by an incised lattice pattern.	IA I	
1	M 1274		Ivory						Locus 404	Lamon/Shipton 1939: pl. 96:12	Stratum IV	Bone shaft, one end is flat and the other is broken. Decorated by incised lattice patterns.	IA II (Str. IV)	
1	M 5176								Locus 1482	Lamon/Shipton 1939: pl. 96:21	Stratum IV filling	Bone shaft with one end broken end the other carved in a pomegranate shape.	IA II (Str. IV)	
1	M 4519		Bone						Locus 1478	Lamon/Shipton 1939: pl. 100:10	Stratum IV	Pomegranate element vertically pierced	IA II (Str. IV)	
1	M 4835		Ivory						Locus 1486	Lamon/Shipton 1939: pl. 96:10	Stratum III	Bone shaft, one end missing and the other is flat decorated with two simple circular lines.	IA IIB (Str. III)	
1	M 4505		Ivory						Locus 4505	Lamon/Shipton 1939: pl. 96:11	Stratum III	Ivory shaft broken at one end while the other is flat and decorated by two deep grooves.	IA IIB (Str. III)	
1	M 4484		Ivory						Locus 1414	Lamon/Shipton 1939: pl. 96:20	Stratum III	Ivory shaft broken at one end and the other is carved in pomegranate shaped.	IA IIB (Str. III)	
Unknown context														
1	06/M/19/AR 9		Bone							Blockman/Sass 2013: 888, fig. 23.8.		Hollow shaft with both ends flat and decorated by a lattice pattern. Probably not a spindle.		
1	08/H/18/AR1		Bone	2,6	1,1			3,7		Unpublished		Fragment of a bone/ivory shaft, cylindrical, with one flat end preserved, the other missing. Incised decoration is made of a chevron pattern closed by three horizontal incisions on both sides.		

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	08/Q/87/AR7		Bone	1,5	1		0,3			Unpublished		Small fragment of a bone shaft, cylindrical with one flat end preserved, the other missing. Decorated bay incised parallel lines.		
1	10/H/16/AR11		Bone	2	0,8					Unpublished		Small fragment of a bone/ivory rod, darkened.		
1	10/Q/107/AR10		Bone	2,2	0,7					Unpublished		Small fragment of a bone/ivory rod, darkened.		
1	10/J/151/AR1		Bone	12,5	1x0,8		0,45	14,1		Unpublished		Bone shaft broken at one end but probably almost complete. Decorated by three parallel lines near the preserved end, and traces of the same decoration at the other end. Slightly tapering toward the preserved end. Hole but not pierced through.		
1	10/K/44/AR5		Bone	12,7	0,8			5,7		Unpublished	(Spindle with the same number)	Bone shaft with large incised decoration, complete. One end is pointed, the other flat with a cross-shaped incision. Decoration made of chevron pattern alternated to parallel lines.		
1	12/H/53/AR2		Bone	4,8	1			5,8		Unpublished		Fragment of a bone/ivory shaft, cylindrical, with one flat end preserved, the other missing. Incised decoration is made of a lattice pattern closed by horizontal incisions on both sides. Small through perforation on the shaft.		
1	14/Q/117/AR1		Bone	5,2	0,7			3,3		Unpublished		Bone shaft with one preserved end crudely decorated by two parallel grooves and the other end missing. Shaft is smooth but not perfectly rounded.		

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
SPINDLE WHORLS														
Early Bronze Age														
1	00/J/75/AR1	Lenticular	Pottery	2	3,7		nn	10,55+x	Level J-4	Sass/Cinamon 2006: 385, fig. 18.22.	Original weight 35 g.	Fragment of a pottery spindle whorl, lenticular shape. Well crafted.	EB Ib	670001
1	98/J/21/AR1	Discoid	Pottery	1				3,8+x	Level J-4	Sass/Cinamon 2006: 385, fig. 18.22.		Discoid pottery spindle whorl, only a small part preserved. Hole not preserved.	EB Ib	
1	98/J/89/AR1	Discoid	Pottery	1,3	nn		nn	11,05+x	Level J-4	Sass/Cinamon 2006: 385, fig. 18.22.	Original weight 27 g.	Discoid pottery whorl, partially preserved. Quite irregular, with flat base degrading toward the hole.	EB Ib	669998
1	98/J/152/AR1		Pottery						Level J-4	Sass/Cinamon 2006: 385.	Preserved about 35%	Specially made	EB Ib	
1	96/J/86/AR2	Dome	Basalt	1,6	3,2		0,8	18+x	Level J-4 (F)	Sass 2000: 374, fig. 12.17:2	Original weight 33 g.	Dome (?) spindle whorl made of basalt, partially preserved. Flat base and irregular dome. Cylindrical hole.	EB Ib	530999
1	00/J/008/AR2	Biconical	Pottery	2,5	3,6		nn	16,64+x	Level J-5	Sass/Cinamon 2006: 385, fig. 18.22.	Original weight 33,5 g.	Biconical pottery spindle whorl, broken with just a small part of hole preserved. Smoothed surface.	EB III	670006
1	06/J/114/AR1	Cylindrical	Pottery						J-5, F	Blockman/Sass 2013: 882, fig. 23.4.	Original weight 50,2 g.	Cylindrical pottery spindle whorl, fragmentary.	EB III	
1	98/J/50/AR1	Discoid	stone	1,7	4,3			35,8 +x	J-6	Sass/Cinamon 2006: 385, fig. 18.23.		Pebble broken during perforation.	EB III	6702850
1	96/J/88/AR1	Discoid	Pottery					24+x	Level J-6 (F?);	Sass 2000: 377, fig. 12.19:5.	Original weight 48 g.	Discoid pottery spindle whorl, half preserved. Specially made.	EB III	
1	04/J/89/AR3	Dome	Pottery					28,89	J-6b, F	Blockman/Sass 2013: 881, fig. 23.3.		Dome pottery spindle whorl, complete. Well shaped.	EB III	
1	06/J/64/AR2	Dome	Pottery					39,15 +x	J-5, F	Blockman/Sass 2013: 881, fig. 23.3.		Small pottery spindle whorl, complete.	EB III	
Middle Bronze Age														
1	2796		stone	0,6	6,9x5,7		1,6x2,1	24,8+x				Flat ovoidal object with quite large hole in central position.	MB I	(I-3301)
1	08/J/201/AR1	Biconical	Pottery					12,05+x	J-9, F	Blockman/Sass 2013: 881.	Original weight 24,1 g.	Biconical pottery spindle whorl, fragmentary.	MB I	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	242	Discoid	stone	1	4,3		0,6	30,2				Stone discoid spindle whorl, complete. Quite well shaped, with regular, cylindrical hole.	MB I	I-2850
1	d 298	Dome	Grey stone	2					5093	Loud 1948: pl. 171		Peculiar whorl made of stone, complete. Flat base, sides sloping and slightly convex top. Very large hole.	MB I (Str. XIIIb)	
1	d 480	Dome	Bone	2,2					5155	Loud 1948: pl. 171		Dome bone spindle whorl, complete. Well shaped.	MB I (Str. XIV)	
1	d 368	Dome	Bone	2,4					5126	Loud 1948: pl. 171		Dome bone spindle whorl, chipped on the side. Well shaped.	MB I (Str. XIV)	
1	288	Spherical	Pottery	3	3,4		0,5	34,92				Spherical pottery whorl, complete. Hole not perfectly central. Wear traces near both sides of hole.	MB I	I-1565
1	x 960	Biconical	Pottery						tomb 43	Guy/Engberg 1938: 170, fig. 175:2, pl. 110.15		Biconical pottery spindle whorl, complete. Shape quite irregular.	MB II	
1	x 891	Biconical	Pottery						tomb 44	Guy/Engberg 1938: 170, fig. 175:3, pl. 110		Biconical pottery spindle whorl, complete. Well shaped.	MB II	
1	00/F/95/AR1	Biconical	Pottery	1,7	2,8		0,3	8,95+x	Level F-11	Sass/Cinamon 2006: 385, fig. 18.22.	Original weight 12 g.	Pottery biconical spindle whorl, partially preserved. One third missing. Highly worn near a side of the hole, less near the other side.	MB II	09-277
1	00/M/17/AR2	Biconical	Pottery					27,75+x	M-9, F	Blockman/Sass 2013: 881, fig. 23.4.		Biconical pottery spindle whorl, half preserved. Not perfectly specular.	MB II	
1	14/K/100/AR1	Biconical	Clay					12+x	K-11		Unpublished	Completely broken spindle whorl, made of unbaked or slightly baked clay. Apparent shape was biconical.	MB II	
1	x 892	Cylindrical	Pottery						tomb 44	Guy/Engberg 1938: 170, fig. 175:1, pl. 110		Cylindrical pottery spindle whorl, complete. Shape quite irregular.	MB II	
1	96/F/26/AR4	Discoid	Limestone	0,9	5,2	0,6		30+x	Level F-12(A)	Sass 2000: 374, fig. 12.17:10.	Original weight 43 g.	Limestone discoid spindle whorl, chipped on two sides. Quite well shaped.	MB II (mixed with EB materials)	01-2933
1	d 79	Dome	Bone			1,2			5031	Loud 1948: pl. 171		Dome bone spindle whorl, complete. Well shaped. Decorated by a series of concentric incision.	MB II (Str. XI)	
1	x1969	Spherical	Pottery						tomb 49	Guy/Engberg 1938: 170, fig. 175:4, pl. 112		Spherical pottery spindle whorl, complete. Well shaped.	MB II	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	10/K/33/AR1	Spherical	basalt	2,6	nn		nn	12,7+x	K-11		Unpublished	Spherical basalt spindle whorl, broken. Well polished surface.	MB II	
1	08/K/126/AR2	Conical	Bone	0,7	2,8		0,3	4,6	K-10		Unpublished	Conical bone spindle whorl, complete. Hole slightly larger at the base. (0,35 cm). On the base, long and superficial crossing incisions, signs of manufacture.	MB III/LB I	
1	08/K/126/AR4	Conical	Pottery	0,6	1,9		0,3	1,4	K-10		Unpublished	Conical pottery spindle whrol, complete but highly worn. Hole slightly larger at the base.	MB III/LB I	
1	12/K/5/AR5	Conical	Bone	0,7	2		0,25	2,4	K-10		Unpublished	Bone conical spindle whorl, complete. Well smoothed dome, less well finished on the flat base.	MB III/LB I	
1	98/M/28/AR26	Cylindrical	Stone					15,3+x	M-7, F	Blockman/Sass 2013: 880, fig. 23.1.	Original weight 46 g.	Cylindrical stone spindle whorl, small part preserved. Hour glass hole.	MB III/LB I	
1	10/K/73/AR3	Discoid	Stone	1,4	4,5		0,7	22	K-10		Unpublished	Stone discoid whorl, chalky surface. Shape not perfectly rounded and hole slightly oblique.	MB III/LB I	
1	08/K/125/AR1	Dome	Bone	0,8	2,8		0,3	4,8	K-10		Unpublished	Dome bone spindle whorl, complete. Well preserved. Hole slightly conical, larger at the base (0,35 cm). Surface of the base was probably polished, now is worn and cancellous bone is exposed.	MB III/LB I	
1	10/K/25/AR10	Dome	Bone	0,5	1,5		0,2	1	K-10		Unpublished	Bone dome spindle whorl (?), complete. Extremely small. Hole slightly larger towards the base (0,2). Round concentrical lines due to manufacture are visible on the bone, crossing parallel lines on the base. Upper part of the hole slightly chipped.	MB III/LB I	
1	10/K/73/AR6	Dome	Bone	0,6	2,2		0,3	2,6	K-10		Unpublished	Bone dome spindle whorl, complete. Hole slighly larger toward the flat base (0,4 cm). Well smoothed dome, while the base is rough with evident signs of manufacture. Hole well shaped with very small and thin wear traces.	MB III/LB I	
1	14/K/33/AR1	Dome	Ivory	0,8	2,8		0,3	5,5	K-10		Unpublished	Ivory dome spindle whorl, complete. Well polished on the dome, lesser on the base where traces of manufacture are visible. Lower part of the hole more irregular than the other and with small traces of wear.	MB III/LB I	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	14/K/51/AR2	Dome	Ivory	0,7	2,5		0,3	4,3	K-10		Unpublished	Dome, ivory spindle whorl, complete. Well polished on the surface. Hole slightly larger on the base (0,4). Well polished on the dome, lesser on the base, where traces of manufacture, with crossing lines, are evident. Wear traces near both sides of the hole.	MB III/LB I	
1	d 668	Dome	Bone			0,5			5225	Loud 1948: pl. 171		Dome bone spindle whorl, complete. Decorated by groups of incised radial lines.	MB III/LB I (Str. X)	
1	c 110	Dome	Bone			1			4021	Loud 1948: pl. 171		Dome bone spindle whorl, complete. Decorated by four incised circles with a dot in the middle.	MB III/LB I (Str. X)	
1	06/M/48/AR3	Dome	Bone					1,72	M-7, F?	Blockman/Sass 2013: 880, fig. 23.2.		Extremely light spindle whorl, complete. Dome shaped and made of bone.	MBIII/LB I	
1	06/M/56/AR1	Dome	Bone					5,77	M-7, F	Blockman/Sass 2013: 880, fig. 23.2.		Bone dome spindle whorl, complete.	MBIII/LB I	
1	08/K/119/AR4	Spherical	Limestone	3,4	4,6		1	130	K-10	Unpublished		Spherical limestone whorl (?), complete. Perforation not finished. Well dressed surface and regular hole.	MB III/LB I	
Late Bronze Age														
1	94/F/88/AR1	Discoid	Limestone		5,8		0,8	35 +x	Level F-11/F-I0	Sass 2000: 374, fig. 12.17:11.	Original weight 64 g.	Discoid, limestone spindle whorl, broken in half. Irregular on the edges, with evident marks of chipping. Possibly not finished?	MB-LB mixed context	531009
1	98/F/72/AR6	Discoid	Ivory	0,3	3,4		0,4	3,84	F-10	Sass/Cinamon 2006: 412, fig. 18.42		Discoid, ivory spindle whorl, complete. Very thin, decorated with a petal pattern on one surface. Scratches on both surfaces.	LB I	
1	d 199	Discoid	Bone			0,2			5056	Loud 1948: pl. 172		Discoid, bone spindle whorl, complete. Very thin.	LB I (Str. IX)	
1	00/F/36/AR4	Dome	Bone	1,5	4,2		0,5	15,05 +x	Level F-10b	Sass/Cinamon 2006: 384, fig. 18.21.	Original weight 16,5 g.	Dome, bone spindle whorl, chipped on one side and near the hole. Quite large.	LB I	
1	98/F/70/AR1	Dome	Bone	0,8	2,4		0,3	4,3	Level F-10a	Sass/Cinamon 2006: 384, fig. 18.21.	Bone or ivory	Dome, bone spindle whorl, almost complete. On the dome an incised decoration of four circles with a dot in the middle. Wheel's signs on the dome and of polishing on the base, but very light.	LB I	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	98/F/94/AR1	Dome	serpentinite	0,5	1,6		0,2	1,7	F-10b	Sass/Cinamon 2006: 393, fig. 18.28.		Dome, serpentinite spindle whorl, complete. Apparently too small for using as a spindle whorl. On the bases, traces of polishing are visible.	LB I	
1	d 31	Dome	Bone			0,8			T.5013 A	Loud 1948: pl. 172		Dome, bone spindle whorl, complete. One incised circular line near the external diameter.	LB I (Str. IX)	
1	b 723	Dome	Bone			0,6			T.3018 F	Loud 1948: pl. 172		Dome, bone spindle whorl, complete. Decorated with radial incisions which branches near the edge.	LB I (Str. IX)	
1	b 174	Dome	Bone			0,9			T.3018 C	Loud 1948: pl. 172		Dome, bone spindle whorl, complete.	LB I (Str. IX)	
1	b 75	Dome	Bone			1			T.3013	Loud 1948: pl. 172		Dome, bone spindle whorl, complete. On the dome an incised decoration of four circles with a dot in the middle.	LB I (Str. IX)	
1	a 113	Dome	Bone			0,6			T.2015	Loud 1948: pl. 172		Dome, bone spindle whorl, complete.	LB I (Str. IX)	
1	M 6030		Bone						Locus E 1831, S8, Area CC	Paice 2004: 167			LB II (Str. VII)	
1	08/K/105/AR1		Bone	0,7	4x2		0,5	6	Level K-9	Unpublished		Peculiar object with an oval shape, with central hole.	LB IIA	
1	M2437	Biconical	Ivory	1,5	2,1		0,4	2,78	tomb 877 B1	Guy/Engberg 1938: 170 pl. 95		Small biconical ivory spindle whorl, broken in three pieces.	LB II	1934-1622
1	M2838	Biconical	Bone	1	2,6		0,4	3,39 +x	tomb 989 C 1	Guy/Engberg 1938: 170, pl. 100		Biconical bone/ivory spindle whorl, fragmentary. Surface highly worn.	LB II	1934-2103
1	10/K/61/AR18	Biconical	Pottery	2,2	3,8		0,6	29,4	K-9	Unpublished		Biconical spindle whorl, complete. Made of pottery, specially made, with hourglass hole.	LB IIA	
1	12/H/81/AR4	Biconical	Bone		2,2	1,1	0,3	4	Sq. E8, H-14, A	Unpublished		Biconical bone spindle whorl, complete but with tiny chips. Extremely polished.	LB IIB	
1	M2436	Button	Bone	0,7	2		0,3	1,22	tomb 877 B1	Guy/Engberg 1938: 170 pl. 95, 175.		Small bone button, with highly worn surface.	LB II	1934-1621
1	M2881	Button	Bone	0,5	3,1		0,3	2,68	tomb 989 C 1	Guy/Engberg 1938: 170, pl. 100		Small bone button, small crack on the side. Well polished dome, while base very worn. Circular incision near the edge on the dome.	LB II	1934-2125
1	M2807	Button	Bone	0,5	1,9		0,25	1,17	tomb 911 B	Guy/Engberg 1938: 170, fig. 175:15, pl. 119		Small bone button, complete. Surface well polished, decorated by a circular incision near the outer rim. Polishing traces on the base.	LB II	1934-1812

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M2806	Button	Bone	0,6	2,2		0,3	1,53	tomb 911 B	Guy/Engberg 1938: 170, fig. 175:17, pl. 119		Small bone button, broken in two pieces. Well polished surface, decorated by a double circular incision near the outer rim.	LB II	1934-1811
1	M2805	Button	Bone	1	2,5		0,3	2,35 +x	tomb 911 B	Guy/Engberg 1938: 170, fig. 175:18, pl. 119		Bone button, broken. Upper surface decorated by circular incisions and base with traces of a second hole left unfinished.	LB II	1934-1810
1	M2808	Button	Bone	0,6	1,8		0,2	1,13	tomb 911 B	Guy/Engberg 1938: 170, fig. 175:16, pl. 119		Piccolissima fusaiola in Bone. Ricomposta da diversi frammenti. Troppo piccola per essere una fusaiola. Superficie molto rovinata. Alla base visibili i segni di levigatura	LB II	1934-1813
1	M3127	Button	Bone	0,5	1,1		0,2	0,26	tomb 912 B	Guy/Engberg 1938: 170, pl. 132		Very small bone button.	LB II	1934-2004
1	M3124	Button	Bone	0,4	1,3		0,25	0,39	tomb 912 B	Guy/Engberg 1938: 170, pl. 132		Very small bone button.	LB II	1934-2003
1	M3123	Button	Bone	0,6	1,7		0,2	0,84	tomb 912 B	Guy/Engberg 1938: 170, pl. 132		Very small bone button.	LB II	1934-2002
1	08/K/57/AR1	Button	Bone	0,9	2,5		0,3	4,3	Level K-9	Unpublished		Bone button, slightly chipped. Dark colour. Light signs of circular polishing on the dome, parallel on the base. Some signs are more evident.	LB IIA	
1	06/K/43/AR5	Button	Bone					0,75	K-8, F	Blockman/Sass 2013: 881, fig. 23.2.		Small bone button, complete. Extremely light.	LB IIB	
1	M2438	Conical	Bone	0,8	2		0,25	1,3	tomb 877 B1	Guy/Engberg 1938: 170 pl. 95		Very small conical spindle whorl made of bone, almost complete but made of two joining pieces.	LB II	1934-1623
1	M2440	Conical	Bone	0,8	1,6		0,2	0,93	tomb 877 B1	Guy/Engberg 1938: 170 pl. 95, 175.		Very small conical spindle whorl made of bone, almost complete but made of two joining pieces.	LB II	1934-1625
1	1302	Conical	Bone						tomb 56	Guy/Engberg 1938: 170, pl. 114		Conical, bone spindle whorl, complete. Not perfectly symmetrical.	LB II	
1	x 98	Conical	Bone						tomb 1	Guy/Engberg 1938: 170, pl. 153		Conical, bone spindle whorl, complete. Well shaped.	LB II	
1	x473	Conical	Slate						tomb 13	Guy/Engberg 1938: 170, pl. 154		Conical, slate spindle whorl, complete.	LB II?	
1	12/H/60/AR4	Conical	Black stone	1,3	2,9		3,5	12	Sq. F9, earth debris	unpublished		Conical spindle whorl, complete, made of black stone. Wear traces near the upper hole. Traces of polishing on the	LB IIA	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
												base and hole not perfectly round. Hole slightly larger at the base (0,4).		
1	06/K/5/AR3	Conical	stone	1,9	4,7		0,4	29	Level K-9	unpublished		Conical spindle whorl, complete, made of a whitish stone. Highly whorn and covered by encrustation.	LB IIA	
1	08/K/11/AR1	conical	Bone	1,5	3,8		0,4	8,6	Level K-8	Unpublished		Conical bone spindle whorl, fragmentary, at least 1/3 missing. Cancellous bone largely exposed.	LB IIB	
1	10/K/14/AR4	conical	Bone	0,9	2,7		0,25	4,2	Level K-8	Unpublished		Conical bone spindle whorl, complete. Hole slightly larger at the base (0,3). Parallel lines due to polishing visible on the base, while the upper side does not show any traces of manufacture. Hole sharply cut but not perfectly round.	LB IIB	
1	10/K/62/AR2	Conical truncated	Basalt	1	2		0,45	8	K-9	Unpublished		Conical truncated spindle whorl, complete. Made of basalt or another black stone. Upper side not regular. Well polished and lower base shows usual parallel lines. Wear traces neat the upper side of the hole.	LB IIA	
1	d 8	Cylindrical	Bone	1	2,1		0,5	4,55	Locus 5002, K11, Area DD	Paice 2004: 167. Loud 1948: pl. 172.		Cylindrical, bone spindle whorl, complete. Deeply circular lines incised on the side, forming superimposing rings.	LB II (Str. VII)	39487
1	a 562	Cylindrical	Bone			1,5			2041	Loud 1948: pl. 172		Cylindrical, bone spindle whorl, complete. Deeply circular lines incised on the side, forming superimposing rings.	LB II (Str. VII)	
1	10/K/53/AR8	Cylindrical	Bone	1,4x 1.2	2		nn	15	K-9	Unpublished		Cylindrical object made of limestone, with sloping base. Eviden signs of holes manufactures.	LB IIA	
1	06/K/87/AR4	Cylindrical	Bone						K-8, F	Blockman/Sass 2013: 881, fig. 23.2.		Cylindrical bone object, made by a fish vertebra with a hole in the middle.	LB IIB	
1	06/K/117/AR5	Discoid	Limestone					15,06	K-8?	Blockman/Sass 2013: 880, fig. 23.1.		Discoid, limestone spindle whorl, almost complete. Chipped on one side.	LB II	
1	10/K/60/AR3	Discoid	Bone	0,4	3,4		0,3	2,7	K-9	Unpublished		Discoid or very flat dome spindle whorl, made of bone and highly ruined. Cancellous bone visible. Near the edge a band decorated with overlapping semicircles.	LB IIA	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	06/K/96/AR6	Discoid	Bone					5,13	K-8, F	Blockman/Sass 2013: 881, fig. 23.2.		Discoid, dome spindle whorl, almost complete. Chipped on one side. Traces of manual polishing on the surface.	LB IIB	
1	12/H/49/AR1	Discoid	Pottery	1,5	6		nn	33+ x	Sq. E8, H-13, F?	Unpublished		Discoid pottery spindle whorl, broken in half. Well shaped but not perfectly straight surfaces.	LB IIB	
4	M3574	Dome	Bone			0,6			tomb 1122 upper	Guy/Engberg 1938: 170 pl. 84		Three dome spindle whorls made of bone, complete.	LB II	
1	M3584	Dome	Bone			1,1			tomb 1122 upper	Guy/Engberg 1938: 170 pl. 84		Dome, bone spindle whorl, complete but slightly chipped near the edge.	LB II	
1	M3585	Dome	Bone			1			tomb 1122 upper	Guy/Engberg 1938: 170 pl. 84		Dome, bone spindle whorl, complete. Decorated with radial lines.	LB II	
1	M3587	Dome	Bone			0,8			tomb 1122 upper	Guy/Engberg 1938: 170 pl. 84		Dome, bone spindle whorl, complete. Decorated with radial incisions which branches near the edge.	LB II	
1	M3588	Dome	Steatite						tomb 1122 upper	Guy/Engberg 1938: 170 pl. 84		Dome, steatite spindle whorl, complete. Well shaped.	LB II	
1	M2597	Dome	Ivory	0,6	2,6		0,3	3,67	tomb 877 B1	Guy/Engberg 1938: 170 pl. 95		Dome, ivory spindle whorl, complete. Perfectly polished dome, while base shows traces of polishing. Circular incision on the base.	LB II	1934-1639
1	M2429	Dome	Ivory	0,7	2,5		0,3	3,07	tomb 877 B1	Guy/Engberg 1938: 170 pl. 95		Dome, ivory spindle whorl, almost complete. Only a small fragment missing. Not wheel polished, but manually polished both on base and dome, which is not perfectly rounded.	LB II	1934-1615
1	M2439	Dome	Bone	0,9	1,8		0,2	2	tomb 877 B1	Guy/Engberg 1938: 170 pl. 95, 175		Dome, bone spindle whorl, complete. Very small. Traces of wheel's polishing on the dome, manually polished on the base. Hole slightly conical (0,3).	LB II	1934-1624
1	M2893	Dome	Bone	0,4					tomb 989 A 1	Guy/Engberg 1938: 170 pl. 98		Dome, bone spindle whorl, complete.	LB II	
1	M2894	Dome	Bone						tomb 989 A 1	Guy/Engberg 1938: 170.		Dome, bone spindle whorl, complete.	LB II	
1	M2892	Dome	Bone	0,7					tomb 989 A 1	Guy/Engberg 1938: 170 pl. 98		Dome, bone spindle whorl, complete.	LB II	
1	M2895	Dome	Steatite	0,7					tomb 989 A 1	Guy/Engberg 1938: 170 pl. 98		Dome, steatite spindle whorl, complete. Well shaped.	LB II	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M2877	Dome	Steatite	0,7	2		0,3	4	tomb 989 C 1	Guy/Engberg 1938: 170 pl. 100		Small dome steatite whorl, complete. Evident signs of wheel's polishing on the dome, manual polishing on the base. On the base small circular incision. Hole tends to slightly enlarge toward the base (0,35).	LB II	1934-2121
1	M2859	Dome	Bone	0,7	3x2,7		0,3	3,94	tomb 989 C 1	Guy/Engberg 1938: 170, pl. 100		Dome, bone/ivory spindle whorl, complete. Dome perfectly smoothed, base with evident signs of polishing. Hole tends to enlarge near the base.	LB II	1934-2119
1	M2836	Dome	Bone	0,5	2,3		0,25	2,6	tomb 989 C 1	Guy/Engberg 1938: 170, pl. 100		Dome, bone spindle whorl, complete. Dome highly worn, base with traces of polishing and a circular incision. Cylindrical hole without wear traces.	LB II	1934-2101
1	M2837	Dome	Bone	0,5	1,5		0,25	0,98	tomb 989 C 1	Guy/Engberg 1938: 170, pl. 100		Very small bone spindle whorl, dome shaped and complete. Hole slightly conical, larger at the base (0,3).	LB II	1934-2102
1	M2834	Dome	Bone	0,7	1,1		0,2	0,39	tomb 989 C 1	Guy/Engberg 1938: 170, pl. 100		Very small bone button, complete. Piccolissimo Button in Bone.	LB II	1934-2100
1	M2809	Dome	Bone	0,4	0,6		0,2	0,84	tomb 911 B	Guy/Engberg 1938: 170, pl. 119		Very small bone spindle whorl, dome shaped and complete. Worn surface and traces of polishing on the base.	LB II	1934-1814
1	M2810	Dome	Steatite			0,5			tomb 911 B	Guy/Engberg 1938: 170, pl. 119:16		Dome, steatite spindle whorl, complete. Well shaped.	LB II	
1	M3154	Dome	Steatite	0,5	1,2		0,2	1,24	tomb 912 B	Guy/Engberg 1938: 170, pl. 132		Very small dome spindle whorl, made of steatite. Complete. Signs of polishing visible on the base and a circular incision near the edge.	LB II	1934-2023
1	M3061	Dome	Bone	0,4	2,2		0,2	1,8	tomb 912 B	Guy/Engberg 1938: 170, pl. 132		Dome, bone spindle whorl, complete. Very small. Traces of polishing very evident on the base.	LB II	1934-1949
1	00/F/22/AR5	Dome	Bone	0,7	2,4		0,3	3,4	Level F-9	Sass/Cinamon 2006: 384, fig. 18.21.		Dome, bone spindle whorl, complete. No decoration. Hole slightly larger toward the base.	LB II	
1	98/F/20/AR1	Dome	Ivory	0,5	2,4		0,3	2,9	Level F-7	Sass/Cinamon 2006: 384, fig. 18.21.		Dome, ivory spindle whorl, complete. Chipped near the upper hole. Very flat dome. Hole slightly hourglass.	LB II	
1	a 250	Dome	Bone			0,5			2048	Loud 1948: pl. 172		Irregular spindl whorl, probably originally dome.	LB II (Str. VII)	
1	d 796	Dome	Bone			0,6			5262	Loud 1948: pl. 172		Dome, bone spindle whorl, complete. Circular incision on the dome.	LB II (Str. VIII)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	d 132	Dome	Bone			0,8			5020	Loud 1948: pl. 172		Dome, bone spindle whorl, complete.	LB II (Str. VIII)	
1	d 25	Dome	Black stone			0,9			5005	Loud 1948: pl. 172		Large, dome spindle whorl made of black stone. Complete. Traces of wheel's polishing on the surface.	LB II (Str. VIII)	
1	08/K/89/AR6	Dome	Ivory	0,7	2,7		0,3	4,6	Level K-9	Unpublished		Dome, ivory/bone spindle whorl, complete. Beautiful example. Cylindrical hole, upper surface extremely smoothed with four incised holes with dot in the middle. Base polished but not shiny, with a circular incision near the external edge. Other light circular incisions are visible, made after the manual polishing which left parallel lines. Wear traces near the upper side of the hole.	LB IIA	
1	08/K/33/AR7	Dome	Bone	0,4	2,2		0,45	2	Level K-9?	Unpublished		Dome, bone spindle whorl, complete and well-preserved. On the dome traces of circular wheel polishing, very light. On the base, evident signs of manual polishing. Wear traces near the upper side if the hole.	LB IIA	
1	08/K/65/AR10	Dome	Bone	0,6	2,5		0,25	3,1	Level K-9	Unpublished		Dome, bone spindle whorl, complete and well-preserved. Slightly chipped on the dome, no signs of wheel's polishing are visible. Base covered by parallel signs of manual polishing.	LB IIA	
1	08/K/72/AR5	Dome	Bone	0,6	2,3		0,25	3	Level K-9	Unpublished		Dome, bone spindle whorl, complete and well-preserved. Hole slightly larger at the base. Upper side of the hole very worn, inferior side well cut. On the dome circular wheel's incisions are visible, on the base parallel signs of polishing.	LB IIA	
1	10/K/7/AR2	Dome	Bone	0,7	2,6		0,3	5	K-9	Unpublished		Dome, bone spindle whorl, complete and well preserved. Hole slightly larger at the base (0,4). Small chip on one side. Circular incisions due to wheel's polishing evident on the dome, paralles signs on the base. Hole is not perfectly round, small wear traces on the upper side, perfectly cut on the base.	LB IIA	
1	10/K/45/AR1	Dome	Bone	0,6	2		0,3	2	K-9	Unpublished		Dome, bone spindle whorl, complete. Highly ruined. Upper side of the hole chipped (wear traces?).	LB IIA	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	10/K/45/AR2	Dome	Limestone	0,9	4,4		1	22	K-9	Unpublished		Dome, limestone spindle whorl, chipped. Very large hole, slightly larger at the base (1,15). Wear traces near the upper side of the hole, clear at the base.	LB IIA	
1	10/K/53/AR5	Dome	Limestone	0,7	2,3		0,25	3	K-9	Unpublished		Dome, bone spindle spindle whorl, complete and well-preserved. Very light traces of circular wheel's polishing on the dome, paralle on the base. Some scratches on the surface. Wear traces near the upper side of the hole.	LB IIA	
1	06/K/44/AR9	Dome	Bone					3,87	K-8, F	Blockman/Sass 2013: 881, fig. 23.2.		Dome, bone spindle whorl, complete. Surface with incised concentric circles made by wheel.	LB IIB	
1	12/H/40/AR5	Dome	Bone	0,8	2,9		0,4	5	sq. F9, brick debris	Unpublished		Dome, bone spindle whorl, complete. Several encrustations on the surface and inside the hole.	LB IIB	
1	12/H/40/AR8	Dome	stone	0,7	2,8		0,3	8+x	sq. F9, brick debris	Unpublished		Dome spindle whorl, almost complete. Made of black stone. Circular wheel's signs visible on the dome, parallel signs on the base. Wear traces and chips near the upper side of the hole.	LB IIB	
5	M3576	Dome/Button	Bone			0,7 e 0,8			tomb 1122 upper	Guy/Engberg 1938: 170 pl. 84		Five bone spindle whorls, button shaped. Completed, exceptone which is slightly chipped.	LB II	
1	M2828	Lenticular	Ivory	0,9	2,6		0,4	4,35	tomb 877 B1	Guy/Engberg 1938: 170 pl. 95		Lenticular bone spindle whorl, almost complete. Surface highly worn. Hole perfectly cut on both sides, without wear traces.	LB II	1934-1647
1	M 6029	Lenticular?	Bone			1,1			Locus E 1831, S8, Area CC	Loud 1948: pl. 172.29. Paice 2004: 167		Lenticular, bone spindle whorl. Complete. Incised decoration made of radial and circular lines forming triangles.	LB II (Str. VII)	
1	06/K/30b/AR1	Spherical	Pottery						K-8	Blockman/Sass 2013: 881, fig. 23.4.	Original weight 17,14 g.	Spherical, pottery spindle whorl, complete (restored). Specially made. Quite well shaped.	LB II	
1	06/K/59/AR7	Spherical	Pottery						K-8?, F?	Blockman/Sass 2013: 881, fig. 23.4.		Spherical, pottery spindle whorl, broken. Specially made. Hole slightly off-centre.	LB II	
1	12/H/67/AR2	Spherical	Pottery	2,5	2,3		0,6	11,4	Sq. F8, H-13, A	Unpublished		Spherical (ovoidal) spindle whorl, complete. Made of pottery, specially made. Surfaces are not regular and finger prints are visible. Several cracks.	LB IIB	
1	14/H/17/AR2	Spherical	Pottery	2,1	2,2		0,5	12	Sq. E9, H-14, F?	Unpublished		Small spherical spindle whorl, roughly shaped. Made of pottery, specially made.	LB IIB	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	04/K/65/AR4				4				K-6, F	Blockman/Sass 2013: 883.	Unfinished perforation	No drawings	LB III	
1	06/K/79/AR1	Biconical	Pottery					19,01	K-6, A	Blockman/Sass 2013: 881, fig. 23.4.		Biconical, pottery spindle whorl, very worn ot the upper part.	LB III	
1	06/M/29/AR6	Button	Bone					1,59	M-6	Blockman/Sass 2013: 880, fig. 23.2.		Bone button, small and complete. Very light.	LB III	
1	12/H/14/AR2	Button	Bone	0,4	1,9		0,2	2	H-12, F	Unpublished	Accumulation on pavement	Bone butto, broken in half and missing the upper part. Signs of wheel's manufacture on the upper surface. Parallel light incision on the base. Hole too small for being a spindle whorl.	LB III	
1	b 2235	Button	Ivory	0,5	0,9		0,2	0,69	Exc. 1936/7 Level VII A	Loud 1939: 101, pl. 15.		Ivory button, too small for being a spindle whorl. Traces of polishing on the base.	LB III (Str. VIIA)	38858
1	b 2137	Button	Ivory	0,9	1,5		0,15	0,83	Exc. 1936/7 Level VII A	Loud 1939: 100 pl. 15.		Ivory, tall button, complete. Not perfectly rounded. Too small for being a spindle whorl. On the whole surface traces of polishing.	LB III (Str. VIIA)	38830
1	13/H/2/AR1	Conical	Limestone	1,9	3,9		0,7	27	Sq. F7/E7	Unpublished		Conical, limestone spindle whorl, complete. Hole slightly off-centre. Surface highly worn. Brownish concretion inside the hole.	LB III	
1	04/K/43a/AR5	Conical?	Pottery					12,06+x	K-6, F	Blockman/Sass 2013: 881, fig. 23.4.		Broken spindle whorl, only one third preserved.	LB III	
1	06/M/38/AR4	Cylindrical	stone					61,55	M-6?	Blockman/Sass 2013: 880, fig. 23.1.		Cylindrical, stone spindle whorl, complete.	LB III	
1	06/M/8/AR2	Cylindrical	Pottery					17,55	M-6, F?	Blockman/Sass 2013: 882, fig. 23.4.		Cylindrical, pottery spindle whorl, very worn ot the upper part.	LB III	
1	12/H/11/AR1	Cylindrical	stone	1,3	2,8x3			9,9	H-12, F	Unpublished	Accumulation on floor	Cylindrical object made of a chalky, white stone. Beginning of perforation on both side.	LB III	
1	04/M/53/AR1	Discoid	stone					29,84	M-6	Blockman/Sass 2013: 880, fig. 23.1.		Cylindrical, stone spindle whorl, complete.	LB III	
1	04/M/75/AR1	Dome	Bone					3,41	M-6	Blockman/Sass 2013: 880, fig. 23.2.		Dome, bone spindle whorl, complete. Very small and light.	LB III	
1	04/K/11/AR2	Dome	Bone					11,74	K-6, F	Blockman/Sass 2013: 881, fig. 23.2.		Dome, bone spindle whorl, very worn on the upper part.	LB III	
1	04/K/19/AR1	Dome	Bone					3,14	K-6, F	Blockman/Sass 2013: 881, fig. 23.2.		Dome, bone spindle whorl, complete. Asymmetrical	LB III	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	04/K/44/AR9	Dome	Bone					1,52	K-6, F	Blockman/Sass 2013: 881, fig. 23.2.		Dome, bone spindle whorl, complete. Quite flat and very light.	LB III	
1	M 5972	Dome	Bone			0,6			Locus 1817, S10, Area CC	Loud 1948: pl. 172. Paice 2004: 167		Dome, bone spindle whorl, complete. Decorated with radial incisions which branches near the edge.	LB III (Str. VIIA)	
1	M 5761	Dome	Bone			0,6			Locus 1787, S9, Area CC	Loud 1948: pl. 172. Paice 2004: 167		Dome (or button?) bone spindle whorl. Small and complete.	LB III (Str. VIIA)	
1	M 6059 b	Dome	Bone			0,5			Locus 1794, S9, Area CC	Loud 1948: pl. 172. Paice 2004: 167		Dome, bone spindle whorl, chipped. Decorated by a circular band of superimposed circles, and half circles in the inside side.	LB III (Str. VIIA)	
1	M 6059 a	Lenticular?	Bone			1,2			Locus N 1835, S10, Area CC	Loud 1948: pl. 172. Paice 2004: 167		Lenticular, bone spindle whorl. Complete. Incised decoration made of radial and circular lines forming triangles.	LB III (Str. VIIA)	
1	06/M/29/AR1	Spherical	Pottery					21,03	M-6?, F?	Blockman/Sass 2013: 881, fig. 23.4.		Spherical, pottery spindle whorl, very worn ot the upper part.	LB III	
1	04/K/75/AR2	Spherical	Pottery					20,17	K-6, F	Blockman/Sass 2013: 882, fig. 23.4.		Spherical, pottery spindle whorl, very worn ot the upper part.	LB III	
1	98/M/12/AR3	Spherical	Pottery						M-6, F?	Blockman/Sass 2013: 882, fig. 23.4.	Original weight 50 g.	Spherical, pottery spindle whorl, fragmentary. Only one third preserved.	LB III	
1	10/H/64/AR2	Spherical	Pottery	2,6	2,7		0,3	18	H-12, F	Unpublished	Accumulation on flagstone floor.	Spherical, pottery spindle whorl, complete. Not perfectly modeled. No traces of wear near hole.	LB III	
Iron I														
1	M 5731								Locus S=1745, R10, Area CC	Paice 2004: 166. Loud 1948: 151.			IA I (Str. VI)	
1	M 5747								Locus - 1740, R9, Area CC	Paice 2004: 166.			IA I (Str. VI)	
1	M 5784								Locus S=1802, R10, Area CC	Paice 2004: 166.			IA I (Str. VI)	
1	M 5785								Locus S=1802, R10, Area CC	Paice 2004: 166.			IA I (Str. VI)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 5793								Locus 1792	Paice 2004: 166.			IA I (Str. VI)	
1	M 5831								Locus E=1804, R8, Area CC	Paice 2004: 167.			IA I (Str. VI)	
1	M 5860								Locus 1813, R9, Area CC	Paice 2004: 167. Loud 1948: 154.			IA I (Str. VI)	
1	M 5878								Locus S=1813, S8, Area CC	Paice 2004: 167. Loud 1948: 154.			IA I (Str. VI)	
1	M 5881								Locus W=1793, R9, Area CC	Paice 2004: 167. Loud 1948: 153.			IA I (Str. VI)	
1	M 5885								Locus W=1797, R10, Area CC	Paice 2004: 167. Loud 1948: 154.			IA I (Str. VI)	
1	M 5947								Locus W=1794, S9, Area CC	Paice 2004: 167. Loud 1948: 153.			IA I (Str. VI)	
1	M 5976								Locus E=1820, R9, Area CC	Paice 2004: 167. Loud 1948: 155.			IA I (Str. VI)	
1	M 5983								Locus 1823, R10, Area CC	Paice 2004: 167,			IA I (Str. VI)	
1	M 5987								Locus S=1825, Q9, Area CC	Paice 2004: 167. Loud 1948: 155.			IA I (Str. VI)	
1	M 6033								Locus E=1831, S8, Area CC	Paice 2004: 167. Loud 1948: 156.			IA I (Str. VI)	
1	M 6089								Locus W=1817,	Paice 2004: 167. Loud 1948: 155.			IA I (Str. VI)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
									S10, Area CC					
1	M 6101								Locus N=1843, R8, Area CC	Paice 2004: 167.			IA I (Str. VI)	
1	M 6105								Locus S=1820, R9, Area CC	Paice 2004: 167. Loud 1948: 155.			IA I (Str. VI)	
1	M 6148								Locus 1803, S8, Area CC	Paice 2004: 167.			IA I (Str. VI)	
1	M 6184								Locus S=1825, Q9, Area CC	Paice 2004: 167. Loud 1948: 155.			IA I (Str. VI)	
1	a 561		Alabaster						Locus 2071, K8, Area AA	Paice 2004: 167. Loud 1948: 161.			IA I (Str. VI)	
1	M 5610		Bone						Locus +1754, R8-9, Area CC	Paice 2004: 167.			IA I (Str. VI)	
1	M 5615		Bone						Locus 1757, S9, Area CC	Paice 2004: 167. Loud 1948: 152.			IA I (Str. VI)	
1	M 5678		Bone						Locus E=1729, Q10, Area CC	Paice 2004: 167. Loud 1948: 149.			IA I (Str. VI)	
1	M 5752		Bone						Locus N=1727, Q10, Area CC	Paice 2004: 167. Loud 1948: 149.			IA I (Str. VI)	
1	M 5772		Bone	1,9	1,9				Locus - 1769, S10, Area CC	Paice 2004: 167. Loud 1948: 152.			IA I (Str. VI)	
1	M 5773		Bone						Locus - 1769, S10, Area CC	Paice 2004: 167. Loud 1948: 152.			IA I (Str. VI)	
1	M 5835		Bone						Locus S=1804,	Paice 2004: 167.			IA I (Str. VI)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
									R8, Area CC					
1	M 5850		Bone						Locus 1813, R9, Area CC	Paice 2004: 167. Loud 1948: 154.			IA I (Str. VI)	
1	M 5931		Bone						Locus 1820, R9, Area CC	Paice 2004: 167. Loud 1948: 155.			IA I (Str. VI)	
1	M 5932		Bone						Locus 1820, R9, Area CC	Paice 2004: 167. Loud 1948: 155.			IA I (Str. VI)	
1	M 5954		Bone						Locus S=1799, R10, Area CC	Paice 2004: 167.			IA I (Str. VI)	
1	M 5964		Bone						Locus N=1815, S9, Area CC	Paice 2004: 167.			IA I (Str. VI)	
1	M 6051		Bone						Locus W=1817, S10, Area CC	Paice 2004: 167. Loud 1948: 155.			IA I (Str. VI)	
1	M 6102		Bone						Locus W=1820, R9, Area CC	Paice 2004: 167. Loud 1948: 155.			IA I (Str. VI)	
1	M 6108		Bone						Locus E= 1812, Q9, Area CC	Paice 2004: 167.			IA I (Str. VI)	
1	M 6136		Bone						Locus N=1838, S10, Area CC	Paice 2004: 167.			IA I (Str. VI)	
1	M 6152		Bone						Locus E=1825, Q9, Area CC	Paice 2004: 168. Loud 1948: 155.			IA I (Str. VI)	
1	M 5714		Pottery						Locus N=1779, S9-10, Area CC	Paice 2004: 168. Loud 1948: 153.			IA I (Str. VI)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 5717		Pottery						Locus W=1779, S9-10, Area CC	Paice 2004: 168. Loud 1948: 153.			IA I (Str. VI)	
1	M 5730		Pottery						Locus S=1745, R10, Area CC	Paice 2004: 168. Loud 1948: 151.			IA I (Str. VI)	
1	M 5939		Pottery						Locus E=1743, Q10, Area CC	Paice 2004: 168. Loud 1948: 151.			IA I (Str. VI)	
1	M 5940		Pottery						Locus E=1743, Q10, Area CC	Paice 2004: 168. Loud 1948: 151.			IA I (Str. VI)	
1	M 5942		Pottery						Locus E=1751, R8, Area CC	Paice 2004: 168. Loud 1948: 152.			IA I (Str. VI)	
1	M 6075		Pottery						Locus E=1793, R9, Area CC	Paice 2004: 168. Loud 1948: 153.			IA I (Str. VI)	
1	M 6077		Pottery						Locus W=1797, R10, Area CC	Paice 2004: 168. Loud 1948: 153.			IA I (Str. VI)	
1	M 6079		Pottery						Locus S=1799, R10, Area CC	Paice 2004: 168.			IA I (Str. VI)	
1	M 6147		Pottery						Locus S=1803, S8, Area CC	Paice 2004: 168.			IA I (Str. VI)	
1	M 6182		Pottery						Locus E=1820, R9, Area CC	Paice 2004: 168. Loud 1948: 155.			IA I (Str. VI)	
1	M 6224		Pottery						Locus 1829, R9, Area CC	Paice 2004: 168. Loud 1948: 156.			IA I (Str. VI)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 6228		Pottery						Locus E=1830, R10, Area CC	Paice 2004: 168.			IA I (Str. VI)	
1	M 6236		Pottery						Locus N=1833, R9, Area Cc	Paice 2004: 168. Loud 1948: 156.			IA I (Str. VI)	
1	M 5851		Hematite						Locus 1813, R9, Area CC	Paice 2004: 168. Loud 1948: 154.			IA I (Str. VI)	
1	M 5856		Hematite						Locus 1813, R9, Area CC	Paice 2004: 168. Loud 1948: 154.			IA I (Str. VI)	
1	M 5875		Hematite						Locus 1787, S9, Area CC	Paice 2004: 168. Loud 1948: 153.			IA I (Str. VI)	
1	M 5705		Limestone						Locus 1733, R9, Area CC	Paice 2004: 168. Loud 1948: 150.			IA I (Str. VI)	
1	M 6032		Limestone						Locus E=1831, S8, Area CC	Paice 2004: 168. Loud 1948: 156.			IA I (Str. VI)	
1	M 5945		Steatite						Locus W=1793, R9, Area CC	Paice 2004: 168. Loud 1948: 153.			IA I (Str. VI)	
1	M 6052		Steatite						Locus W=1817, S10, Area CC	Paice 2004: 168. Loud 1948: 155.			IA I (Str. VI)	
1	M 6110		Steatite						Locus S=1827, Q10, Area CC	Paice 2004: 168. Loud 1948: 155.			IA I (Str. VI)	
1	M 6119		Steatite						Locus N=1833, R9, Area Cc	Paice 2004: 168. Loud 1948: 156.			IA I (Str. VI)	
1	M 6131		Steatite						Locus N=1835,	Paice 2004: 168. Loud 1948: 156.			IA I (Str. VI)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
									S10, Area CC					
1	M 5805		stone						Locus N=1794, S9, Area CC	Paice 2004: 169. Loud 1948: 153.			IA I (Str. VI)	
1	M 5806		stone						Locus N=1794, S9, Area CC	Paice 2004: 169. Loud 1948: 153.			IA I (Str. VI)	
1	06/H/56/AR1	???	Bone					4,37	H-9, F	Blockman/Sass 2013: 881.		Bone spindle whorl.	Late IA I	
1	x 655	Biconical	Serpentinite	1,6	3		0,6		tomb 39	Guy/Engberg 1938: fig 175:24, pl. 166. Paice 2004: 92, 168, pl. 30: 17		Biconical, serpentinite spindle whorl, very worn on the upper part.	EIA I	
1	96/K/73/AR3	Biconical	Grey stone					9	Level K-4 (F)	Sass 2000: 374, fig. 12.17:9.		Biconical spindle whorl, complete. Made of grey stone. Large hole in comparison with external diameter.	Late IA I	
1	04/K/13/AR2	Biconical	Alabaster					28,84	K-5	Blockman/Sass 2013: 880, fig. 23.1		Biconical, alabaster spindle whorl, complete.	Early IA I	
1	02/K/71/AR2	Biconical	Limestone	2,3	4,2		1,1	46,87		Sass/Cinamon 2006: 382, fig. 18.20.		Biconical, limestone spindle whorl, complete. Perfectly shaped and with large, cylindrical hole.	IA	09-255
1	x 675	Button	Bone	0,5	2		0,25		tomb 39	Guy/Engberg 1938: fig 175:20, pl. 166. Paice 2004: 82, 167, pl. 30:12.		Button, bone spindle whorl, very worn on the upper part.	EIA I	
1	x 676	Button	Bone	0,4	3		0,3		tomb 39	Guy/Engberg 1938: fig 175:19, pl. 166. Paice 2004: 82, 167, pl. 30:13.		Button, bone spindle whorl, very worn on the upper part. Almost broken in half.	EIA I (with intrusions)	
1	x 696	Conical	Serpentinite	0,8	2		0,3		tomb 39	Guy/Engberg 1938: fig 175:22. pl. 166. Paice 2004: 92, 168, pl. 30:19.		Conical, serpentinite spindle whorl, very worn er the upper part.	EIA I (with intrusions)	
1	x 656	Conical	Serpentinite	1,3	1,9		0,3		tomb 39	Guy/Engberg 1938: fig 175:23. pl. 166. Paice 2004: 92, 168, pl. 30:18.		Conical, serpentinite spindle whorl, very worn er the upper part.	EIA I (with intrusions)	
1	b 176	Conical	Bone	1,1	2,9		0,5		Locus 3023,K7-	Loud 1948: pl. 172. Paice 2004: 81, pl. 30:5.		Conical, bone spindle whorl, traces of wear/chipping near the hole.	Late IA I (Str. VI a)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
									8, Area AA					
1	b 177	Conical	Bone	0,7	2,5		0,3		Locus 3023, K7-8, Area AA	Loud 1948: pl. 172. Paice 2004: 81, pl. 30:6.		Conical, bone spindle whorl, complete.	Late IA I (Str. VI a)	
1	b 178	Conical	Bone		0,9				Locus 3023, K7-8, Area AA	Loud 1948: pl. 172. Paice 2004: 167, pl. 30:7.		Conical, bone spindle whorl, complete.	Late IA I (Str. VI a)	
1	a 9	Conical	Bone		3				Quad N 14 - 401 (IV)	Loud 1948: pl. 172		Conical, bone spindle whorl, with convex sides. On the base concentric incisions.	IA IIA (Str. V)	
1	98/K/31/AR1	Conical	Serpentinite					4,4	K-4	Sass/Cinamon 2006: 381, fig. 18.20.		Conical, serpentinite spindle whorl, complete. Very small	Late IA I	
1	00/K/10/AR1	Conical	Serpentinite					8,3	K-4	Sass/Cinamon 2006: 381, fig. 18.20.		Conical, serpentinite spindle whorl, complete. Thickening edge.	Late IA I	
1	00/K/25/AR3	Conical	Serpentinite	1,3	2,5		0,35	8,5	K-4	Sass/Cinamon 2006: 381.	Complete.	Conical spindle whorl, complete. Made of serpentinite. Well crafted, well polished surface but covered by scratches. Hole slightly larger at the base. Upper hole with wear traces.	Late IA I	09-582
1	10/H/52/AR1	Conical	Bone	1,5	3,8		0,5	14	Sq. E7, H-11, A	unpublished	Robbers trench	Conical, bone spindle whorl, complete but broken in two pieces. On the upper surface traces of polishing and scratchings, not visible on the base. Wear traces near the upper hole.	Early IA I	
1	x 726	Conical truncated	Bone	0,8	2,7		0,5		tomb 39	Guy/Engberg 1938: fig 175:21. pl. 166. Paice 2004: 167, pl. 30:14.		Conical truncated, bone spindle whorl, very worn on the upper part.	EIA I (with intrusions)	
1	a 190	Conical truncated	Limestone	3	6		0,7		Locus N=2043, L8, Area AA	Loud 1948: pl. 172. Paice 2004: 96, 168, pl. 30:20.		Conical truncated, limestone spindle whorl, very worn im the upper part.	EIA I (Str. VIb)	
1	M 5551	Cylindrical	Bone	3,1	1,5		1,1		Locus 1745,R10, Area CC	Loud 1948: pl. 172. Paice 2004: 82, 167, pl. 30:10.		Cylindrical, bone spindle whorl, complete. Decorated by four radial lines and small cuts near the edge.	EIA I (Str. VIb)	
1	d 462	Cylindrical	Bone	1,4	2,4		0,5		Locus 5153, K12, Area DD	Loud 1948: pl. 172. Paice 2004: 81, 168, pl. 30:8.		Cylindrical, bone object, complete.	Late IA I (Str. VI a)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	a 81	Discoid	Alabaster	2	3,6		1,2		Locus 2012, K8, area AA	Loud 1948: pl. 172. Paice 2004: 96, pl. 30:21.		Discoid, alabaster object. Complete. Very large hole. Probably not a spindle whorl.	Late IA I (Str. VI a)	
1	96/F/48/AR5	Discoid	Grey stone	1,4	4,1		0,8	34	Level F-5 (F)	Sass 2000: 374, fig. 12.17:8. Da 34 di peso		Discoid spindle whorl, made of grey limestone. Perforated from one side to the other, slightly conical (0,7).	Late IA I	01-2931
1	96/K/101/AR6	Discoid	Limestone	0,8	nn		nn	3+x	LeveIK-4(F)	Sass 2000: 374, fig. 12.17:13	Original weight 7.5 g.	Discoid, alabaster object, broken. Very large hole. Probably not a spindle whorl.	Late IA I	531011
1	00/K/103/AR8	Discoid	stone	1,4	4,4x 3,8		nn	36	K-4	Sass/Cinamon 2006: 385, fig. 18.23.	Unfinished perforation	Discoid, oval pebble with central hole, started from both sides but left unfinished.	Late IA I	09-271
1	02/M/40/AR1	Discoid	Limestone					30,9	M-4	Blockman/Sass 2013: 880, fig. 23.1		Discoid, limestone spindle whorl, complete. Well shaped.	Late IA I	
1	04/K/14/AR1	Discoid	Bone					2,15	K-5, F?	Blockman/Sass 2013: 880, fig. 23.2		Discoid, bone spindle whorl, complete. Very light.	Early IA I	
1	98/L/10/AR1	Discoid	Limestone	1	nn	l4, 3x 3	0,6			Sass/Cinamon 2006: 382, fig. 18.20.	Original weight 28,5 g.	Discoid, limestone spindle whorl, fragmentary. Hourglass hole.	IA	670020
1	10/H/16/AR5	Discoid	stone	0,5	3	0, 5	0,3	4,5	Sq. E7, H-11, F	unpublished	Destruction debris and accumulation on floor. From the same locus a loomweight 10/H/16 003 and fr. rod 10/H/16 011.	Discoid spindle whorl made of a white stone, very coarse surface with encrustations. Slightly oval.	Early IA I	
1	10/H/62/AR7	Discoid	stone	2,2	6,4		0,8	82	Sq. E7/8, H-11, F	unpublished	Accumulation on flagstone floor.	Discoid, stone spindle whorl, quite worn. Chalky white stone.	Early IA I	
1	x 420	Dome	Bone	0,5	3				tomb 14	Guy/Engberg 1938: 116, pl. 164. Paice 2004: 82, 167, pl. 30:11.		Dome, bone spindle whorl, very worn on the upper part.	EI I (mixed with earlier materials)	
1	a 494	Dome	Bone	0,7	3,1		1,1		Locus 2079, O14, Area BB	Loud 1948: pl. 172. Paice 2004: 81, 167, pl. 29:17.		Dome, bone spindle whorl, complete. Decorated by radial lines in pairs.	EIA I (Str. VIb)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 5968	Dome	Alabaster	1,2	4,2		1,7		Locus 1760, Area CC	Loud 1948: pl. 172. Paice 2004: 96, 166, pl. 30:22.		Dome, alabaster objects, complete. Very large hole, probably not a spindle whorl.	EIA I (Str. VIb)	
1	d 636	Dome	Grey stone	1,3	2,7		0,4		Locus 5213, L11, Area DD	Loud 1948: pl. 172. Paice 2004: 96, 167, pl. 30:16		Dome, grey stone spindle whorl, very worn on the upper part.	Late IA I (Str. VI a)	
1	d 635	Dome	Black stone	0,6	1,8		0,3		Locus 5216, L11, Area DD	Loud 1948: pl. 172. Paice 2004: 96, 168, pl. 30:15.		Dome spindle whorl, almost complete. Made of black stone. Chipped on the side. Decorated by two concentric lines.	EIA I (Str. VIb)	
1	00/K/87/AR1	Dome	Serpentinite					6,5	K-4	Sass/Cinamon 2006: 381, fig. 18.20.		Dome, serpentinite spindle whorl, complete.	Late IA I	
1	98/K/23/AR6	Dome	Ivory					0,75 +x	K-4	Sass/Cinamon 2006: 384, fig. 18.21.	Original weight 3g.	Dome, ivory spindle whorl, very worn vo the upper part.	Late IA I	
1	00/K/29/AR7	Dome	Bone	0,6	2,8		0,3	4,2	K-4	Sass/Cinamon 2006: 384, fig. 18.21.		Dome, bone spindle whorl with a small incision on the flat base. Signs of wheel's manufacture on the surface.	Late IA I	
1	00/K/75/AR1	Dome	Bone	0,5	3,4		0,3	5,7	k-4	Sass/Cinamon 2006: 384, fig. 18.21.		Dome, bone spindle whorl, complete. Left undecorated.	Late IA I	
1	08/H/34/AR3	Dome	Limestone					32,9	H-9	Blockman/Sass 2013: 880, fig. 23.1		Dome, limestone spindle whorl, chipped. Hourglass hole and not perfectly centred.	Late IA I	
1	04/K/61/AR1	Dome	Bone					2,11	K-5, A	Blockman/Sass 2013: 880, fig. 23.2		Dome, bone spindle whorl, complete. Decorated by four incised circles with central dot. Very light.	Early IA I	
1	04/K/69/AR1	Dome	Bone					2,66	K-5, A	Blockman/Sass 2013: 880, fig. 23.2		Dome, bone spindle whorl with flat top. Complete and very light.	Early IA I	
1	02/M/33/AR2	Dome	Bone					2,7	M-4, F?	Blockman/Sass 2013: 880, fig. 23.3		Dome, bone spindle whorl, complete. Something wrong on weight measuring.	Late IA I	
1	08/H/5/AR2	Dome	Bone					12,4 +x	H-9, F	Blockman/Sass 2013: 881, fig. 23.3.	Original weight 15,5 g.	Dome, bone spindle whorl, complete. Decorated by an incision similar to a star.	Late IA I	
1	08/H/20/AR2	Dome	Bone					6,5	H-9, F	Blockman/Sass 2013: 881, fig. 23.3.		Dome, bone spindle whorl, complete. Chipped near the upper hole	Late IA I	
1	08/H/77/AR1	Dome	Bone	0,7	2,4		0,3	2,7	Sq. E7, H-11, F	unpublished	Floor, living surface. Tracce di tabun	Dome, bone spindle whorl, complete. Traces of wheel's manufacture well visible on the dome. No traces of polishing on the base. Wear traces near the upper hole. Slightly conical hole, larger on the base (0,4).	Early IA I	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	10/H/82/5	Dome	Ivory	0,6	2,9		0,4	3,5	Sq. F7/8, H11, F	unpublished		Dome, ivory spindle whorl, very dark. Almost complete but chipped and worn near the edge. Lots of scratches on both surfaces.	Early IA I	
1	08/H/31/AR1	Lenticular	Bone					4,15	H-9, F	Blockman/Sass 2013: 881, fig. 23.3.		Lenticular, bone spindle whorl, chipped on one sides. Crossing lines on the surface, probably due to manufacture.	Late IA I	
1	98/K/24/AR2	Spherical	Stone	3,1	2,4	1,6		13,95+x	K-4	Sass/Cinamon 2006: 381.	Original weight 70 g.	Small fragment of stone (?) spindle whorl, probably spherical in origin.	Late IA I	671762
1	02/K/47/AR26	Spherical	Pottery	2,2	2,5		0,6	10+x	K-5	Sass/Cinamon 2006: 385, fig. 18.22.		Spherical, pottery spindle whorl, broken on one side. Well shaped but not perfectly manufactured.	Early IA I	
1	00/K/97/AR3	Spherical	Pottery	2,1	3,1		0,6	19,45	K-5	Sass/Cinamon 2006: 385, fig. 18.22.		Spherical pottery spindle whorl, broken in two pieces. Irregular, with two finger prints on the surface and conical hole which is larger on one side (0,8).	Early IA I	09-278
1	00/K/77/AR10	Spherical	Pottery	1,8	2,6		nn	5,3+x	K-4	Sass/Cinamon 2006: 385, fig. 18.22.	Fragmentary ,original weight 11 g.	Spherical, pottery spindle whorl, half missing. Quite well shaped.	Late IA I	670002
1	10/H/92/AR4	Spherical	Pottery	2,5	2,5		0,5	11,7	H-11, F	unpublished	Accumulation of floors	Spherical, pottery spindle whorl, roughly shaped. Hole very irregular.	Early IA I	
Iron II														
1	08/Q/78/AR24		Pottery	1,4x 0,9	4,1x 3,7		0,4	18	Q-4	unpublished		Broken spindle whorl, made of pottery.	Late IA IIA	
1	M 1010	Biconical	Pottery						locus 283	Lamon/Shipton 1939: pl. 94:59	Found with whorl M 1012 and spatula M 5158.	Biconical pottery spindle whorl, complete. Very irregular.	IA II (Str. IV)	
1	M 302	Biconical	Pottery						Quad Q 13	Lamon/Shipton 1939: pl. 95.16.		Biconical, pottery spindle whorl, very worn and irregular.	IA II (Str. V)	
1	12/Q/82/AR7	Biconical	Stone	1,3	2,9		1,6	14,2	Q-2?	unpublished		Biconical, stone spindle whorl, complete. Hole slightly irregular with wear traces. Well dressed.	IA IIB	
1	M 5047	Biconical	Pottery						locus 1582	Lamon/Shipton 1939: pl. 94.19.		Biconical, pottery spindle whorl, complete. Well shaped.	IA IIB (Str. III)	
1	M 4296	Biconical	Pottery						locus 1324	Lamon/Shipton 1939: pl. 94.20		Biconical, pottery spindle whorl, complete or partially chipped.	IA IIB (Str. III)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 801	Biconical	Pottery						locus 261	Lamon/Shipton 1939: pl. 95.14		Biconical, pottery spindle whorl, complete. Roughly made.	IA IIB (Str. III)	
1	M 909	Biconical	Pottery						Quadrato R10	Lamon/Shipton 1939: pl. 93.26.		Biconical, pottery spindle whorl, complete.	IA IIC (Str. II)	
1	M 4688	Biconical	Pottery						Locus 996	Lamon/Shipton 1939: pl. 93.27		Biconical, pottery spindle whorl, complete. Large and flattened.	IA IIC (Str. II)	
1	M 3359	Biconical	Pottery						locus 1063	Lamon/Shipton 1939: pl. 93.53		Biconical, pottery spindle whorl, complete but irregular.	IA IIC (Str. II)	
1	98/L/44/AR1	Biconical	Pottery	3,2				5,8+ x	Level L-3	Sass/Cinamon 2006: 385, fig. 18.22.	Probably bead	Very elongated biconical object, probably a bead. Preserved for 1/4.	Late IA IIA	670000
1	M 5345	Button	Bone						Locus S 1682	Lamon/Shipton 1939: pl. 95.34.		Button, bone spindle whorl, complete. Extremely small.	IA II (Str. V)	
1	12/Q/18/AR1	Button	Stone	0,8	2,2		0,3	3,5	Q-2?	unpublished		Button in black stone. Polished surfaces but full of scratches.	IA IIB	
1	M 1930	Button	Steatite						locus 566	Lamon/Shipton 1939: pl. 93.45		Steatite button, very small.	IA IIC (Str. II)	
1	00/H/19/AR1	Button	Bone	0,5	1,4		0,2	0,55 +x	H-5	Sass/Cinamon 2006: 405, fig. 18.35.	Original weight 0,7 g.	Too small to be a spindle whorl.	Late IA IIA	
1	14/Q/88/AR2	Conical	Bone	2,4	3,9		0,7	17	Q-6	unpublished		Conical, bone spindle whorl, complete. Well shaped. Cancellous bone partially exposed. Wear traces near the upper side of the hole.	Early IA IIA	
1	x 465	Conical	Bone						tomb 27	Guy/Engberg: fig 175:26, pl. 171		Conical, bone spindle whorl, complete.	IA II	
1	92/H/I0/AR30	Conical	Black stone	1	2,8		0,6	11,5	Locus lO	Sass 2000: 376, fig. 12.17:15	Locus lO is a probe at the NW of the tell inside the city wall, with post-Stratum IV remains	Small conical spindle whorl made of black stone (serpentinite?). Hole slightly larger at the base.	IA II	
1	M 978	Conical	Limestone						locus W 72	Lamon/Shipton 1939: pl. 94:61		Conical, limestone spindle whorl, complete.	IA II (Str. IV)	
1	M 157	Conical	Limestone						quad Q 13	Lamon/Shipton 1939: pl. 94:62		Conical, limestone spindle whorl, complete.	IA II (Str. IV)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 968	Conical	Limestone						Locus 282	Lamon/Shipton 1939: pl. 94:63	Found with two spatulas M 972, 973	Conical, limestone spindle whorl, complete.	IA II (Str. IV)	
1	M 5184	Conical	Steatite						locus 1613	Lamon/Shipton 1939: pl. 94:71		Conical, steatite spindle whorl, complete.	IA II (Str. IV)	
1	M 5090	Conical	Steatite						Locus 1612	Lamon/Shipton 1939: pl. 94:75		Conical, steatite spindle whorl, complete.	IA II (Str. IV)	
1	M 271	Conical	Steatite						Quad Q 12	Lamon/Shipton 1939: pl. 94:77		Conical, steatite spindle whorl, complete.	IA II (Str. IV)	
1	M 5186	Conical	Steatite						locus 1613	Lamon/Shipton 1939: pl. 94:78		Conical, steatite spindle whorl, complete.	IA II (Str. IV)	
1	M 1176	Conical	Steatite						locus 351	Lamon/Shipton 1939: pl. 94:79		Conical, steatite spindle whorl, complete. Extremely small.	IA II (Str. IV)	
1	M 4521	Conical	Steatite						locus 1482	Lamon/Shipton 1939: pl. 94:80		Conical, steatite spindle whorl, complete. Quite flat.	IA II (Str. IV)	
1	M 5394	Conical	Bone						locus 1672	Lamon/Shipton 1939: pl. 95.4		Conical, bone spindle whorl, complete. Very small and flat.	IA II (Str. IV)	
1	M 5209	Conical	Bone						locus 1672	Lamon/Shipton 1939: pl. 95.6.		Conical, bone spindle whorl, complete. Very small.	IA II (Str. IV)	
1	M 5282	Conical	Bone						locus 1672	Lamon/Shipton 1939: 145.		Conical, bone spindle whorl.	IA II (Str. IV)	
1	M 5235	Conical	Steatite						locus 1674	Lamon/Shipton 1939: pl. 95.20.		Conical, steatite spindle whorl, complete.	IA II (Str. IV)	
1	M 5221	Conical	Steatite						locus 1674	Lamon/Shipton 1939: pl. 95.21.		Conical, steatite spindle whorl, complete. Quite flat.	IA II (Str. IV)	
1	M 5328	Conical	Bone						locus 1674	Lamon/Shipton 1939: pl. 95.22.		Conical, bone spindle whorl, complete. Quite flat.	IA II (Str. IV)	
1	M 5298	Conical	Bone						locus 1674	Lamon/Shipton 1939: pl. 95.26.		Conical, bone spindle whorl, decorated.	IA II (Str. IV)	
1	M 5395	Conical	Limestone						locus 1621	Lamon/Shipton 1939: pl. 95.29.		Conical, limestone spindle whorl, complete.	IA II (Str. V)	
1	M 5396	Conical	Limestone						locus 1621	Lamon/Shipton 1939: 151.	Found with a bone spatula	Conical, limestone spindle whorl.	IA II (Str. V)	
1	M 5191	Conical	Steatite						Locus 1636	Lamon/Shipton 1939: pl. 95.36.		Conical, steatite spindle whorl, complete. Very small.	IA II (Str. V)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	94/H/12/AR1	Conical	Black stone	1,3	2,4		0,3	10	Level H-3? (F)	Sass 2000: 376, fig. 12.17:16.		Small conical spindle whorl made of black stone (serpentinite?). Hole slightly larger at the base (0,35). Small wear traces near the upper hole.	IA IIB	01-2936
1	98/H/34/AR1	Conical	Serpentinite	0,7	1,5		0,25	2,1	H-4	Sass/Cinamon 2006: 405, fig. 18.35.		Too small to be a spindle whorl.	IA IIB	
1	M 4839	Conical	Limestone						locus 1455	Lamon/Shipton 1939: pl. 94.22.		Conical, limestone spindle whorl, complete. Crudely worked and surface left rough.	IA IIB	
1	M 4815	Conical	Limestone						Locus 1004	Lamon/Shipton 1939: pl. 93.56		Conical, limestone spindle whorl, complete.	IA IIB (Str. III)	
1	M 4887	Conical	Limestone						Locus 1023	Lamon/Shipton 1939: pl. 93.57		Conical, limestone spindle whorl, complete.	IA IIB (Str. III)	
1	M 4572	Conical	Steatite						locus 1316	Lamon/Shipton 1939: pl. 93		Conical, steatite spindle whorl, complete.	IA IIB (Str. III)	
1	M 4572	Conical	Steatite						locus 1316	Lamon/Shipton 1939: 127.		Conical, steatite spindle whorl.	IA IIB (Str. III)	
1	M 779	Conical	Steatite						quad N 14	Lamon/Shipton 1939: pl. 93.58		Conical, steatite spindle whorl, complete and well-shaped.	IA IIB (Str. III)	
1	M 4886	Conical	Steatite						locus 1251	Lamon/Shipton 1939: pl. 93.59		Conical, steatite spindle whorl, quite large and tall.	IA IIB (Str. III)	
1	M 4979	Conical	Steatite						locus 1540	Lamon/Shipton 1939: pl. 94.10		Conical, steatite spindle whorl, complete.	IA IIB (Str. III)	
1	M 4772	Conical	Steatite						locus 1586	Lamon/Shipton 1939: pl. 94.8.		Conical, steatite spindle whorl, complete. Incised decoration on the base.	IA IIB (Str. III)	
1	M 4766	Conical	Steatite						locus 1587	Lamon/Shipton 1939: pl. 94.9.		Conical, steatite spindle whorl, complete.	IA IIB (Str. III)	
1	M 5006	Conical	Steatite						locus N 1568 (P 9)	Lamon/Shipton 1939: pl. 94.13.		Conical, steatite spindle whorl, complete. Slightly bent.	IA IIB (Str. III)	
1	M 4307	Conical	Limestone						locus 1400	Lamon/Shipton 1939: 129.		Conical, limestone spindle whorl.	IA IIB (Str. III)	
1	M 4579	Conical	Limestone						locus 1489	Lamon/Shipton 1939: pl. 94.26		Conical, limestone spindle whorl, complete. Flattened and very small hole.	IA IIB (Str. III)	
1	M 4901	Conical	Steatite						locus S 1529	Lamon/Shipton 1939: pl. 94.31.		Conical, steatite spindle whorl, complete.	IA IIB (Str. III)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 4607	Conical	Steatite						Locus 1534	Lamon/Shipton 1939: 135.	Found with bone spatula M 4609	Conical, steatite spindle whorl.	IA IIB (Str. III)	
1	M 5111	Conical	Steatite						locus N 1584	Lamon/Shipton 1939: 138.		Conical, steatite spindle whorl.	IA IIB (Str. III)	
1	M 4958	Conical	Basalt						locus E=1561	Lamon/Shipton 1939: 137.		Conical, basalt spindle whorl.	IA IIB (Str. III)	
1	M 5001	Conical	Steatite						locus 1565	Lamon/Shipton 1939: 137.		Conical, steatite spindle whorl, complete.	IA IIB (Str. III)	
1	M 4656	Conical	Steatite						locus 1548	Lamon/Shipton 1939: pl. 94.32	Found with spatula M 4655	Conical, steatite spindle whorl, complete.	IA IIB (Str. III)	
1	M 4822	Conical	Steatite						locus 1487	Lamon/Shipton 1939: pl. 94.33		Conical, steatite spindle whorl, complete.	IA IIB (Str. III)	
1	M 4648	Conical	Steatite						locus 1542	Lamon/Shipton 1939: pl. 94.36		Conical, steatite spindle whorl, complete.	IA IIB (Str. III)	
1	M 4749	Conical	Bone						locus 1591	Lamon/Shipton 1939: pl. 94.43.	Found with spatula M 4746	Conical, bone spindle whorl, complete. Very small.	IA IIB (Str. III)	
1	M 1812	Conical	Limestone						locus 507	Lamon/Shipton 1939: pl. 94		Conical, limestone spindle whorl.	IA IIB (Str. III)	
1	M 1902	Conical	Limestone						locus 539	Lamon/Shipton 1939: 125.		Conical, limestone spindle whorl.	IA IIB (Str. III)	
1	M 1907	Conical	Limestone						locus 552	Lamon/Shipton 1939: 125.		Conical, limestone spindle whorl.	IA IIB (Str. III)	
1	M 1955	Conical	Limestone						locus 553	Lamon/Shipton 1939: 125.		Conical, limestone spindle whorl.	IA IIB (Str. III)	
1	M 4597	Conical	Limestone						locus 559	Lamon/Shipton 1939: 125.		Conical, limestone spindle whorl.	IA IIB (Str. III)	
1	M 4613	Conical	Steatite						locus 1507	Lamon/Shipton 1939: pl. 94.55		Conical, steatite spindle whorl, complete.	IA IIB (Str. III)	
1	M 4956	Conical	Limestone						locus 1527	Lamon/Shipton 1939: 133.		Conical, limestone spindle whorl.	IA IIB (Str. III)	
1	M 4828	Conical	Steatite						locus 1484	Lamon/Shipton 1939: pl. 94.57.		Conical, steatite spindle whorl, complete.	IA IIB (Str. III)	
1	M 4526	Conical	Steatite						locus 1485	Lamon/Shipton 1939: 133.		Conical, steatite spindle whorl.	IA IIB (Str. III)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 921	Conical	Limestone						locus 300	Lamon/Shipton 1939: 123.		Conical, limestone spindle whorl.	IA IIB (Str. III)	
1	M 918	Conical	Steatite						locus 297	Lamon/Shipton 1939: pl. 94.76		Conical, steatite spindle whorl,	IA IIB (Str. III)	
1	M 925	Conical	Bone						locus 300	Lamon/Shipton 1939: pl. 95.5		Conical, bone spindle whorl, complete. Flattened.	IA IIB (Str. III)	
1	M 1826	Conical	Steatite						locus 500	Lamon/Shipton 1939: 124.		Conical, steatite spindle whorl.	IA IIB (Str. III)	
1	M 1573	Conical	Steatite						locus 494	Lamon/Shipton 1939: 124.		Conical, steatite spindle whorl.	IA IIB (Str. III)	
1	M 4367	Conical	Limestone						locus 1405	Lamon/Shipton 1939: pl. 93.35		Conical, limestone spindle whorl, complete. Well shaped.	IA IIC (Str. II)	
1	M 4884	Conical	Steatite						locus 1446	Lamon/Shipton 1939: pl. 93.39		Conical, steatite spindle whorl, complete.	IA IIC (Str. II)	
1	M 4411	Conical	Steatite						locus 1441	Lamon/Shipton 1939: pl. 93.41		Conical, steatite spindle whorl, complete.	IA IIC (Str. II)	
1	M 4575	Conical	Steatite						locus 574	Lamon/Shipton 1939: pl. 93.42.		Conical, steatite spindle whorl, complete.	IA IIC (Str. II)	
1	M 833	Conical	Steatite						quad Q 11	Lamon/Shipton 1939: pl. 93.44		Conical, steatite spindle whorl, complete. Quite flattened.	IA IIC (Str. II)	
1	M 1966	Conical	Limestone						locus 567	Lamon/Shipton 1939: 116.		Conical, limestone spindle whorl.	IA IIC (Str. II)	
1	M 3364	Conical	Limestone						locus 937	Lamon/Shipton 1939: pl. 93.51		Conical limestone spindle whorl, complete.	IA IIC (Str. II)	
1	M 2618	Conical truncated	Steatite						locus 943	Lamon/Shipton 1939: pl. 93.65		Conical truncated (?), steatite spindle whorl, complete.	IA IIB (Str. III)	
1	M 4393	Conical truncated	Bone						locus 1486	Lamon/Shipton 1939: pl. 94.17.		Conical truncated, bone spindle whorl, complete.	IA IIB (Str. III)	
1	M 4515	Conical truncated	Steatite						locus 1474	Lamon/Shipton 1939: pl. 94.29.		Conical truncated, steatite spindle whorl, complete.	IA IIB (Str. III)	
1	M 922	Conical truncated	Limestone						locus 300	Lamon/Shipton 1939: pl. 94.67		Conical truncated, limestone spindle whorl, complete. Highly damaged	IA IIB (Str. III)	
1	08/H/72/AR1	Cylindrical	Limestone	2,7	3,6		1	40,32+x	H-7	Blockman/Sass 2013: 880, fig. 23.1		Cylindrical, limestone spindle whorl, fragmentary. Decorated by a series of incised lines on the side. Very worn.	Early IA IIA	09-570
1	12/Q/93/AR3	Cylindrical	Pottery	1,8	2,3		0,8	5		unpublished		Cylindrical, pottery spindle whorl, broken in half. Quite well shaped.	Earth debris IA II	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 5061	Cylindrical	Limestone						locus 1557	Lamon/Shipton 1939: pl. 94:69		Cylindrical, limestone spindle whorl, complete.	IA II (Str. IV)	
1	M 5183	Cylindrical	calcite						locus 1650	Lamon/Shipton 1939: pl. 94:72		Cylindrical, calcite spindle whorl, complete but worn.	IA II (Str. IV)	
1	M 165	Cylindrical	calcite						Quad P 12	Lamon/Shipton 1939: pl. 94:73		Cylindrical, calcite spindle whorl, complete but worn.	IA II (Str. IV)	
1	M 2863	Cylindrical	Bone						Locus 977	Lamon/Shipton 1939: pl. 95.3		Cylindrical, bone spindle whorl (?), complete. Extremely small	IA II (Str. IV)	
1	M 5482	Cylindrical	Limestone	3	3,5		1	40,41	locus 1714	Lamon/Shipton 1939: pl. 95.30.		Cylindrical, limestone spindle whorl, complete. Oblique incised lines on the side, traces of dark painting. Hole not perfectly cylindrical.	IA II (Str. V)	
1	M 5483	Cylindrical	Limestone						locus N 1708	Lamon/Shipton 1939: pl. 95.31.		Cylindrical, limestone spindle whorl, complete. Oblique incised lines on the side. Hole not perfectly cylindrical.	IA II (Str. V)	
1	M 5458	Cylindrical	Steatite						Locus N 1710	Lamon/Shipton 1939: pl. 95.32		Cylindrical, steatite spindle whorl, complete. Shaped as having a ring on the side.	IA II (Str. V)	
1	M 5128	Cylindrical	Steatite						Locus E 1619	Lamon/Shipton 1939: pl. 95.37.		Cylindrical, steatite spindle whorl, complete.	IA II (Str. V)	
1	98/H/26/AR1	Cylindrical	Pottery	1,5	2,2		0,7	9,5	Level H-4	Sass/Cinamon 2006: 385, fig. 18.22.		Cylindrical, pottery spindle whorl, complete. Badly shaped, irregular with hourglass hole.	IA IIB	09-275
1	M 4445	Cylindrical	Steatite						locus 1454	Lamon/Shipton 1939: pl. 94.35		Cylindrical, steatite spindle whorl, complete. Quite large.	IA IIB	
1	M 4785	Cylindrical	Limestone						locus 1573	Lamon/Shipton 1939: pl. 93.64.		Cylindrical, limestone spindle whorl, complete.	IA IIB (Str. III)	
1	M 3324	Cylindrical	Limestone						locus 597	Lamon/Shipton 1939: pl. 94.1		Cylindrical, limestone spindle whorl, complete.	IA IIB (Str. III)	
1	M 4695	Cylindrical	Steatite						locus 1559	Lamon/Shipton 1939: pl. 94.12		Cylindrical steatite spindle whorl, complete.	IA IIB (Str. III)	
1	M 4231	Cylindrical	Steatite						locus 1340	Lamon/Shipton 1939: 128.		Cylindrical, steatite spindle whorl.	IA IIB (Str. III)	
1	M 5034	Cylindrical	Limestone						locus N 1584	Lamon/Shipton 1939: pl. 94.28.		Cylindrical, limestone spindle whorl, complete. Crudely worked and sharp-cornered.	IA IIB (Str. III)	
1	M 4798	Cylindrical	Bone						locus 1545	Lamon/Shipton 1939: pl. 94.42.	Found with spatula M 5120	Cylindrical, bone spindle whorl, complete. Very tall cylindrical spindle whorl, well shaped.	IA IIB (Str. III)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 895	Cylindrical	Bone						locus 292	Lamon/Shipton 1939: pl. 95.11		Cylindrical, bone spindle whorl.	IA IIB (Str. III)	
1	M 1567	Cylindrical	Pottery						locus 489	Lamon/Shipton 1939: pl. 95.17		Cylindrical, pottery spindle whorl, roughly made.	IA IIB (Str. III)	
1	M 2066	Cylindrical	Limestone						locus 555	Lamon/Shipton 1939: pl. 93.31.		Cylindrical, limestone spindle whorl, complete.	IA IIC (Str. II)	
1	M 1400	Cylindrical	Limestone						locus 435	Lamon/Shipton 1939: pl. 93.37		Cylindrical, limestone spindle whorl, complete. Flattened.	IA IIC (Str. II)	
1	M 934	Cylindrical	Limestone						Quad. Q10	Lamon/Shipton 1939: pl. 93.38		Cylindrical, limestone spindle whorl, complete. Flattened.	IA IIC (Str. II)	
1	M 4827	Cylindrical	Steatite						locus 1259	Lamon/Shipton 1939: pl. 93.40		Cylindrical (or flattened dome) steatite spindle whorl, complete.	IA IIC (Str. II)	
1	M 4414	Cylindrical	Steatite						locus 1441	Lamon/Shipton 1939: pl. 93.43		Cylindrical, steatite spindle whorl, complete. Tall.	IA IIC (Str. II)	
1	M 4101	Cylindrical	Hematite						locus 1260	Lamon/Shipton 1939: pl. 93.66		Cylindrical, hematite spindle whorl, complete.	IA IIC (Str. II)	
1	02/M/33/AR4	Cylindrical	Stone					68,8 +x	M-4, F?	Blockman/Sass 2013: 880, fig. 23.1.	Original weight 140 g	Cylindrical, stone spindle whorl, broken in half.	Late IA I	
1	08/Q/22/AR2	Cylindrical	stone	1,4	2,7x 2,5		0,35	9	Q-4	unpublished		Cylindrical spindle whorl, made of white stone. Roughly made, hourglass hole.	Late IA IIA	
1	M 1012	Discoid	Limestone						locus 283	Lamon/Shipton 1939: pl. 94:50.	Found with whorl M 1010 and spatula M 5158.	Small discoid spindle whorl, made of limestone. Complete.	IA II (Str. IV)	
1	M 1181	Discoid	Limestone						locus 323	Lamon/Shipton 1939: pl. 94:68		Discoid, limestone spindle whorl, complete. Well shaped.	IA II (Str. IV)	
1	M 2114	Discoid	Limestone						locus 637	Lamon/Shipton 1939: pl. 94:70		Small, discoid limestone spindle whorl, complete.	IA II (Str. IV)	
1	M 112	Discoid	calcite						Quad Q 12	Lamon/Shipton 1939: pl. 94:74		Discoid (?), calcite spindle whorl, complete.	IA II (Str. IV)	
1	M 5011	Discoid	Limestone						locus 977 (Q 8)	Lamon/Shipton 1939: 142.		Discoid, limestone spindle whorl.	IA II (Str. IV)	
1	M 4494	Discoid	Ivory						Locus 1482	Lamon/Shipton 1939: pl. 95.12.		Discoid, ivory spindle whorl, complete.	IA II (Str. IV)	
1	M 102	Discoid	Pottery						Quad Q 12	Lamon/Shipton 1939: pl. 95.9.		Discoid, pottery spindle whorl, possibly a reworked sherd.	IA II (Str. V)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	06/L/34/AR1	Discoid	Limestone					17,62	L-2	Blockman/Sass 2013: 880, fig. 23.1.		Discoid, limestone spindle whorl, complete but worn surface.	IA IIB	
1	5227	Discoid	Limestone						locus 286	Lamon/Shipton 1939: pl. 96.52		Discoid, limestone spindle whorl, complete. Chipped on the side.	IA IIB	
1	08/Q/118/AR121	Discoid	Stone	1,2	4,7		0,8	29	Q-3	unpublished		Discoid spindle whorl, fragmentary. Made of grey stone. Well rounded and polished. Cylindrical hole slightly off-centre.	IA IIB	
1	M 3334	Discoid	Steatite						locus 1060	Lamon/Shipton 1939: 126.		Discoid, steatite spindle whorl.	IA IIB (Str. III)	
1	M 4437	Discoid	Limestone						locus 1424	Lamon/Shipton 1939: pl. 94.7		Discoid, limestone spindle whorl, complete. Rounded edges.	IA IIB (Str. III)	
1	M 4742b	Discoid	Steatite						locus 1591	Lamon/Shipton 1939: pl. 94.56.		Discoid, steatite spindle whorl, complete. Chipped on the side.	IA IIB (Str. III)	
1	M 897	Discoid	Limestone						locus 292	Lamon/Shipton 1939: 123.		Discoid, limestone spindle whorl.	IA IIB (Str. III)	
1	M 4689	Discoid	Limestone						Locus 996	Lamon/Shipton 1939: pl. 93.24		Discoid, limestone spindle whorl, complete.	IA IIC (Str. II)	
1	M 1895	Discoid	Limestone						locus 543	Lamon/Shipton 1939: 115.		Discoid, limestone spindle whorl.	IA IIC (Str. II)	
1	98/H/53/AR1	Discoid	Limestone	1,2	5,5		nn	33,4+x	Level H-5	Sass/Cinamon 2006: 382, fig. 18.20	Original weight 60 g.	Discoid, limestone spindle whorl, very irregular and with unpolished surface. Perforation made from one side.	Late IA IIA	670024
1	10/Q/37/AR7	Discoid	Stone	1	3,6		0,6	20	Q-4?	unpublished		Discoid spindle whorl (?), white stone (limestone). Well rounded and polished.	Late IA IIA	
1	14/Q/97/AR8	Discoid	stone	1,2	4,4x 4,6		0,8	38	Q-4	unpublished		Discoid, stone spindle whorl, complete. Well shaped.	Late IA IIA	
1	06/H/15/AR2	Dome	Limestone					99,1	H-7	Blockman/Sass 2013: 880, fig. 23.1		Dome, limestone spindle whorl, complete. Slightly concave base. Wear traces near the upper hole.	Early IA IIA	
1	96/K/7/AR1	Dome	Bone					4,5	Level K-3 (F)	Sass 2000: 377, fig. 12.18:1		Dome, bone spindle whorl, very small.	Early IA IIA	
1	96/K/65/AR1	Dome	Ivory	1,3	3		0,6	9	Level K-3 (F)	Sass 2000: 377, fig. 12.18:2		Dome, ivory spindle whorl, complete. Well shaped, tiny wear traces near upper hole. Lathe marks on the dome.	Early IA IIA	01-2971

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	12/Q/91/AR1	Dome	Bone	1,9	3,5		0,65	12	Q-5	unpublished		Dome, bone spindle whorl, broken. Cancellous bone exposed.	Early IA IIA	
1	x464	Dome	Slate						tomb 27	Guy/Engberg: fig 175:25, pl. 171		Flat dome spindle whorl, made of slate. Complete.	IA II	
1	M 106	Dome	Limestone						Quad Q 12	Lamon/Shipton 1939: pl. 94:64		Large, dome spindle whorl made of bone. Complete.	IA II (Str. IV)	
1	M 1113	Dome	Limestone						Quad. O 11	Lamon/Shipton 1939: pl. 94:65		Dome, limestone spindle whorl, complete. Very worn on the upper surface.	IA II (Str. IV)	
1	M 5185	Dome	Bone						locus 1613	Lamon/Shipton 1939: 144.	Found with other 3 whorls	Dome, bone spindle whorl.	IA II (Str. IV)	
1	M 5099	Dome	Limestone						locus 1620	Lamon/Shipton 1939: 144.		Dome, limestone spindle whorl.	IA II (Str. IV)	
1	M 5060	Dome	Steatite						locus 1496	Lamon/Shipton 1939: pl. 94:81		Dome, steatite spindle whorl, complete. Well shaped.	IA II (Str. IV)	
1	M 5045	Dome	Limestone						locus 1490	Lamon/Shipton 1939: 143.		Dome, limestone spindle whorl.	IA II (Str. IV)	
1	M 5089	Dome	Bone						locus 1612	Lamon/Shipton 1939: pl. 95.7		Dome, bone spindle whorl, complete. Decorated by nine incised circles on the dome and on the base.	IA II (Str. IV)	
1	M 5098	Dome	Bone						locus 1620	Lamon/Shipton 1939: pl. 95.8		Dome, bone spindle whorl, complete. Well preserved.	IA II (Str. IV)	
1	M 180	Dome	Bone						Quad P 12	Lamon/Shipton 1939: pl. 95.10.		Dome, bone spindle whorl, complete. Very high.	IA II (Str. IV)	
1	M 1269	Dome	Limestone						locus 380	Lamon/Shipton 1939: 142.	Found with basalt ring M 1179	Dome, limestone spindle whorl.	IA II (Str. IV)	
1	M 5368	Dome	Bone						locus 1674	Lamon/Shipton 1939: pl. 95.23.		Dome, bone spindle whorl, complete. Well preserved.	IA II (Str. IV)	
1	M 5299	Dome	Bone						locus 1674	Lamon/Shipton 1939: pl. 95.24.		Dome, bone spindle whorl, complete.	IA II (Str. IV)	
1	M 5091	Dome	Bone						locus 1626	Lamon/Shipton 1939: pl. 95.25.		Dome, bone spindle whorl, complete. Very small.	IA II (Str. IV)	
1	M 5195	Dome	Limestone						locus 1650	Lamon/Shipton 1939: 144.		Dome, limestone spindle whorl.	IA II (Str. IV)	
1	M 5363	Dome	Bone						locus 1674	Lamon/Shipton 1939: pl. 95.27.		Dome, bone spindle whorl, completed. Very high dome.	IA II (Str. IV)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	5410	Dome	Limestone						Quad Q 12	Lamon/Shipton 1939: pl. 94:66		Dome, limestone spindle whorl, complete.	IA II (Str. V)	
1	M 2021	Dome	Limestone						Quad R 12	Lamon/Shipton 1939: 148.		Dome, limestone spindle whorl.	IA II (Str. V)	
1	M 5145	Dome	Limestone						locus 1619	Lamon/Shipton 1939: pl. 95.28.		Dome, limestone spindle whorl, complete. Very large and high, a vertical incised sign on the side.	IA II (Str. V)	
1	M 5335	Dome	Bone						Locus N 1684	Lamon/Shipton 1939: pl. 95.33		Dome, bone spindle whorl, complete. Very small.	IA II (Str. V)	
1	M 5644	Dome	Bone						Locus 1714	Lamon/Shipton 1939: pl. 95.35.		Dome, bone spindle whorl, complete.	IA II (Str. V)	
1	M 5643	Dome	Bone						Locus 1714	Lamon/Shipton 1939: 155.		Dome, bone spindle whorl.	IA II (Str. V)	
1	M 66	Dome	bone						Locus N=37	Lamon/Shipton 1939: 149.		Dome, bone spindle whorl.	IA II (Str. V)	
1	M 2609	Dome	Steatite						Locus 50	Lamon/Shipton 1939: 149.		Dome, steatite spindle whorl.	IA II (Str. V)	
1	M 2610	Dome	Bone						Locus 50	Lamon/Shipton 1939: 149.		Dome, bone spindle whorl.	IA II (Str. V)	
1	M 172	Dome	Basalt						Quad Q 13	Lamon/Shipton 1939: pl. 95.2.		Dome, basalt spindle whorl, complete.	IA II (Str. IV)	
1	94/H/8/AR15	Dome	Limestone	2	3,7		0,6	26,5	Level H-3 (F);	Sass 2000: 376, fig. 12.17:17.		Dome, limestone spindle whorl, complete. Circular wheel's signs on dome and base. On the base traces of polishing. Hole slightly larger at the base. Wear traces near the upper hole, not near the lower hole.	IA IIB	
1	M 4193	Dome	Limestone						locus 1284	Lamon/Shipton 1939: pl. 94		Error in publication.	IA IIB	
1	08/Q/79/AR18	Dome	Stone	1,8	3		0,6	18	Q-2	unpublished		Dome, stone spindle whorl, complete. Well-polished. Traces of wear near both sides of hole.	IA IIB	
1	08/Q/79/AR20	Dome	Stone	1,9	3,1		0,6	19	Q-2	unpublished		Dome spindle whorl, complete. Made of grey stone. Well dressed, perfectly polished on both sides. Small chips near upper hole and external diameter.	IA IIB	
1	M 4366	Dome	Limestone						locus 959	Lamon/Shipton 1939: pl. 93.30		Dome, limestone spindle whorl, complete. Large and tall.	IA IIB (Str. III)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 4541	Dome	Limestone						locus 959	Lamon/Shipton 1939: 126.		Dome, limestone spindle whorl.	IA IIB (Str. III)	
1	M 4391	Dome	Limestone						locus 994	Lamon/Shipton 1939: 126.		Dome, limestone spindle whorl.	IA IIB (Str. III)	
1	M 4233	Dome	Limestone						locus 1296	Lamon/Shipton 1939: pl. 93.55.		Dome, limestone spindle whorl, very well shaped.	IA IIB (Str. III)	
1	M 800	Dome	Limestone						Locus 261	Lamon/Shipton 1939: pl. 93.63		Dome, limestone spindle whorl, complete and well-shaped.	IA IIB (Str. III)	
1	M 5038	Dome	Limestone						locus S 1587	Lamon/Shipton 1939: pl. 94.2.		Large, dome shaped, limestone spindle whorl with cracked surface.	IA IIB (Str. III)	
1	M 4797	Dome	Limestone						locus W=1577	Lamon/Shipton 1939: pl. 94.3.		Dome, limestone spindle whorl, complete and well-shaped.	IA IIB (Str. III)	
1	M 4770	Dome	Limestone						locus E 1479	Lamon/Shipton 1939: pl. 94.4.		Dome, limestone spindle whorl, complete and well shaped.	IA IIB (Str. III)	
1	M 4336	Dome	Limestone						locus 1003	Lamon/Shipton 1939: pl. 94.5		Dome, limestone spindle whorl, complete and well shaped.	IA IIB (Str. III)	
1	M 4957	Dome	Limestone						locus 1540	Lamon/Shipton 1939: pl. 94.6.		Dome, limestone spindle whorl, complete and flattened.	IA IIB (Str. III)	
1	M 4904	Dome	Limestone						locus 1424	Lamon/Shipton 1939: 129.		Dome, limestone spindle whorl.	IA IIB (Str. III)	
1	M 4538	Dome	Steatite						locus 1472	Lamon/Shipton 1939: pl. 94.11.		Dome steatite spindle whorl, complete.	IA IIB (Str. III)	
1	M 4740	Dome	Steatite						locus 1580	Lamon/Shipton 1939: pl. 94.14.		Dome steatite spindle whorl, complete.	IA IIB (Str. III)	
1	M 4805	Dome	Bone						locus S 1544	Lamon/Shipton 1939: pl. 93.16.		Dome, bone spindle whorl, complete. Very small.	IA IIB (Str. III)	
1	M 4543	Dome	Bone						locus 1426	Lamon/Shipton 1939: pl. 94.18.		Dome, bone spindle whorl, complete and well shaped.	IA IIB (Str. III)	
1	M 4546	Dome	Limestone						locus 1426	Lamon/Shipton 1939: 130		Dome, limestone spindle whorl.	IA IIB (Str. III)	
1	M 4287	Dome	Limestone						locus 1332	Lamon/Shipton 1939: 128.		Dome, limestone spindle whorl.	IA IIB (Str. III)	
1	M 4642	Dome	Limestone						locus 1469	Lamon/Shipton 1939: 131.		Dome, limestone spindle whorl.	IA IIB (Str. III)	
1	M 4707	Dome	Limestone						locus N 1552	Lamon/Shipton 1939: pl. 94.24.		Dome, limestone spindle whorl, complete and well shaped.	IA IIB (Str. III)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 4170	Dome	Limestone						locus 1280	Lamon/Shipton 1939: pl. 93.25		Dome, limestone spindle whorl, complete and well shaped.	IA IIB (Str. III)	
1	M 4902	Dome	Limestone						locus S 1529	Lamon/Shipton 1939: pl. 94.27		Dome, limestone (?) spindle whorl, complete.	IA IIB (Str. III)	
1	M 5110	Dome	Limestone						locus N 1584	Lamon/Shipton 1939: 138, pl. 94.23.		Dome, limestone spindle whorl, complete. Chipped at the edge.	IA IIB (Str. III)	
1	M 4708	Dome	Limestone						locus 1474	Lamon/Shipton 1939: 132.		Dome, limestone spindle whorl.	IA IIB (Str. III)	
1	M 4930	Dome	Steatite						locus 1560	Lamon/Shipton 1939: pl. 94.30.		Dome, steatite spindle whorl, complete.	IA IIB (Str. III)	
1	M 4690	Dome	Limestone						locus E=1561	Lamon/Shipton 1939: 137.		Dome, limestone spindle whorl.	IA IIB (Str. III)	
1	M 4706	Dome	Steatite						locus E=1561	Lamon/Shipton 1939: pl. 94.34.		Dome, steatite spindle whorl, complete and small.	IA IIB (Str. III)	
1	M 4715	Dome	Limestone						locus 1484	Lamon/Shipton 1939: 133.		Dome, limestone spindle whorl.	IA IIB (Str. III)	
1	M 4486	Dome	Bone						locus 1481	Lamon/Shipton 1939: pl. 94.40.		Dome, bone spindle whorl, complete.	IA IIB (Str. III)	
1	M 4790	Dome	Bone						locus 1571	Lamon/Shipton 1939: pl. 94.41.		Dome, bone spindle whorl, complete. Quite large and very tall.	IA IIB (Str. III)	
1	M 4660	Dome	Limestone						locus 1549	Lamon/Shipton 1939: pl. 94.47.		Dome, limestone spindle whorl, complete.	IA IIB (Str. III)	
1	M 4659	Dome	Steatite						locus 1549	Lamon/Shipton 1939: pl. 94.53		Dome, steatite spindle whorl, complete. Incised decoration on the base: a concentric incision along the edge and radial grooves near the hole.	IA IIB (Str. III)	
1	M 4742a	Dome	Limestone						locus 1591	Lamon/Shipton 1939: pl. 94.51		Dome, limestone spindle whorl, complete.	IA IIB (Str. III)	
1	M 4735	Dome	Limestone						locus 1598	Lamon/Shipton 1939: 139.		Dome, limestone spindle whorl.	IA IIB (Str. III)	
1	M 1809	Dome	Steatite						locus 511	Lamon/Shipton 1939: pl. 94.54.		Dome, steatite spindle whorl, complete. Very small.	IA IIB (Str. III)	
1	M 2622	Dome	Limestone						Quad. M8	Lamon/Shipton 1939: pl. 93.28.		Dome, limestone spindle whorl, complete.	IA IIC (Str. II)	
1	M 4087	Dome	Limestone						Quad. Q8	Lamon/Shipton 1939: pl. 93.29		Dome, limestone spindle whorl, complete.	IA IIC (Str. II)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 1976	Dome	Limestone						locus 564	Lamon/Shipton 1939: 116.		Dome, limestone spindle whorl.	IA IIC (Str. II)	
1	M 4639	Dome	Limestone						locus 1473	Lamon/Shipton 1939: pl. 93.33		Dome, limestone spindle whorl, complete. Very well shaped.	IA IIC (Str. II)	
1	M 4436	Dome	Limestone						locus 1275	Lamon/Shipton 1939: pl. 93.34		Dome, limestone spindle whorl, complete. Very well shaped.	IA IIC (Str. II)	
1	M 4328	Dome	Limestone						locus 1393	Lamon/Shipton 1939: 120.		Dome, limestone spindle whorl.	IA IIC (Str. II)	
1	M 4258	Dome	Limestone						locus 757	Lamon/Shipton 1939: pl. 93.36		Dome, limestone spindle whorl, complete. Flattish top.	IA IIC (Str. II)	
1	M 4164	Dome	Limestone						locus 723	Lamon/Shipton 1939: 116.		Dome, limestone spindle whorl.	IA IIC (Str. II)	
1	M 2910	Dome	Bone						locus 990	Lamon/Shipton 1939: pl. 93.46		Dome, bone spindle whorl, complete. Quite flattened.	IA IIC (Str. II)	
1	M 4319	Dome	Bone						locus 1406	Lamon/Shipton 1939: pl. 93.47		Dome, bone spindle whorl, complete. Very small.	IA IIC (Str. II)	
1	M 4355	Dome	Bone						locus 1004	Lamon/Shipton 1939: pl. 93.48		Dome, bone spindle whorl, complete.	IA IIC (Str. II)	
1	M 4409	Dome	Limestone						locus 1441	Lamon/Shipton 1939: 120.		Dome, limestone spindle whorl.	IA IIC (Str. II)	
1	M 3247	Dome	Limestone						locus 1019	Lamon/Shipton 1939: 118.		Dome, limestone spindle whorl.	IA IIC (Str. II)	
1	M 3289	Dome	Pottery						locus 1033	Lamon/Shipton 1939: pl. 93.50		Dome pottery spindle whorl, complete. Decorated by a series of small incisions on the edge.	IA IIC (Str. II)	
1	M 2554	Dome	Limestone						locus 934	Lamon/Shipton 1939: pl. 93.52		Dome, limestone spindle whorl, complete but chipped or broken near the upper hole.	IA IIC (Str. II)	
1	5190	Dome	Bone						quad O 13	Lamon/Shipton 1939: pl. 93.67		Dome, bone spindle whorl, complete but chipped near the upper hole.	IA IIC (Str. II)	
1	00/H/36/AR1	Dome	Bone	1,7	3,8		0,4	12,6	Level H-5	Sass/Cinamon 2006: 384, fig. 18.21,	Cattle caput femoris	Dome, bone spindle whorl, quite thick and not decorated. Hole slightly larger at the base (0,6). Dome well polished while base shows the cancellous bone.	Late IA IIA	
1	10/Q/49/AR5	Dome	Ivory	1	2,8		0,35	5,2	Q-4?	unpublished		Dome, ivory spindle whorl, broken in half. Well polished dome but signs of hole manufacture are still visible. Flat side with evident signs of	Late IA IIA	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
												parallel lines crossing in various directions.		
1	M 1157	Spherical	Pottery						locus 359	Lamon/Shipton 1939: pl. 95.13.	Found with bone spatulas M 1153, 1154, 1155, 1156	Spherical, pottery spindle whorl, complete. Quite irregular but well rounded.	IA II (Str. IV)	
1	M 4431	Spherical	Pottery						locus 1421	Lamon/Shipton 1939: pl. 93.60		Spherical, pottery spindle whorl, complete. Quite well shaped.	IA IIB (Str. III)	
1	M 4910	Spherical	Limestone						Locus 1532	Lamon/Shipton 1939: 135, pl. 94.49.		Spherical, limestone spindle whorl, roughly shaped.	IA IIB (Str. III)	
1	M 4913	Spherical	Pottery						locus E 1550	Lamon/Shipton 1939: pl. 94.44.		Spherical, pottery spindle whorl, complete. Roughly shaped.	IA IIB (Str. III)	
1	M 5056	Spherical	Limestone						locus 1591	Lamon/Shipton 1939: 139.		Spherical, limestone spindle whorl, complete.	IA IIB (Str. III)	
1	M 1896	Spherical	Bone						locus 543	Lamon/Shipton 1939: pl. 93.49		Spherical (?), bone spindle whorl, chipped or broken.	IA IIC (Str. II)	
Unknown context														
1	06/K/1/AR2	???	Bone					6,3		Blockman/Sass 2013: 880				
1	08/Q/10/AR1	Biconical	Pottery	2,2	2,8		0,7	13	Surface finds	unpublished		Biconical, pottery spindle whorl, complete. Roughly made.		
1	x 100	Biconical	Pottery			2,7			tomb 1	Guy/Engberg 1938: 170, pl. 153		Biconical, pottery spindle whorl.		
1	M 97	Biconical	Pottery						tomb 73	Guy/Engberg 1938: pl. 163		Biconical, pottery spindle whorl.		
1	94/F/25/AR2	Biconical	Pottery	2,8	4,3		0,7	28+x	unstratified	Sass 2000: 377, fig. 12.19:4.	Original weight 112 g.	Biconical, pottery spindle whorl, fragmentary. Hole off-centre.		525397
1	98/J/116/AR1	Biconical	Pottery	3	4		nn	23,1+x		Sass/Cinamon 2006: 385, fig. 18.22.	Original weight 46 g.	Biconical pottery spindle whorl, half missing. Well shaped.		670004
1	00/J/85/AR1	Biconical	Pottery	3,1	3,9		0,4	36,75		Sass/Cinamon 2006: 385, fig. 18.22.	Asymmetrical	Biconical, pottery spindle whorl, almost complete. Very worn. Wear traces near the hole.		
1	06/K/31/AR6	Biconical	Pottery					13,87		Blockman/Sass 2013: 881, fig. 23.4		Biconical pottery spindle whorl, complete. Well shaped.		

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	06/K/92/AR4	Biconical	Pottery					19,81		Blockman/Sass 2013: 881, fig. 23.4		Biconical pottery spindle whorl, complete. Well shaped.		
1	?	Biconical	stone	1,8	2,4		0,7	8,83				Biconical stone spindle whorl, complete. Perfectly polished. Cylindrical hole.		01-2932
1	04/K/58/AR2	Button	Serpentinite							Blockman/Sass 2013: 880, fig. 23.1	Original weight 20,86 g.	Serpentinite button, fragmentary.		
1	04/K/81/AR15	Button	Bone					2,44		Blockman/Sass 2013: 880, fig. 23.2		Bone button, complete.		
1	00/F/88/AR001	Button	Ivory	0,4	3,3			1,5 +x	??	Sass/Cinamon 2006, 370, fig. 18.13		Bone button (?) broken in half.		
1	96/K/I0/AR3	Conical	Black stone					4,5+ x	Unstratified	Sass 2000: 374, fig. 12.17:14.	Original weight 9 g	Small conical spindle whorl made of black stone (serpentinite?). Fragmentary, incised decoration on the base.		
1	3099a	Cylindrical	Limestone						tomb 59	Guy/Engberg 1938: pl. 157		Cylindrical, limestone spindle whorl.		
1	98/J/19/AR3	Cylindrical	Limestone	1,9	3,2	1,6	nn	15,9 +x		Sass/Cinamon 2006: 382, fig. 18.20.	Original weight 48 g.	Cylindrical, limestone spindle whorl, fragmentary. Well shaped. Possible “basalt ring”.		670019
1	06/K/92/AR1	Cylindrical	Pottery					14,33		Blockman/Sass 2013: 882, fig. 23.4		Cylindrical pottery spindle whorl, complete.		
1	02/K/57/AR3	Cylindrical	Alabaster					12,2		Blockman/Sass 2013: 917, fig. 15.24.		Cylindrical, alabaster object, possibly a spindle whorl.		
1	96/K/77/AR3	Cylindrical	Limestone	1,6	3,4		0,7	23,8		?		In Sass 2000 a spatula under this label.		01-2927
1	00/J/103/AR2	Discoid	Limestone		3,9		1,1	24,6 +x		Sass/Cinamon 2006: 382, fig. 18.20.	Original weight 28 g.	Rounded pebble with hourglass hole		09-260
1	06/K/50/AR4	Discoid	Limestone					22,95		Blockman/Sass 2013: 880, fig. 23.1		Discoid limestone spindle whorl, complete. Well shaped.		
1	3099b	Dome	Serpentinite						tomb 59	Guy/Engberg 1938: pl. 157		Dome, serpentinite spindle whorl.		
1	x 1975	Dome	Bone						tomb 59 A	Guy/Engberg 1938: pl. 157		Dome, bone spindle whorl.		
1	02/K/22/AR1	Dome	Serpentinite					25,2		Sass/Cinamon 2006: 381, fig. 18.20.		Dome, serpentinite spindle whorl, complete. Well shaped.		
1	98/H/20/AR1	Dome	Limestone					14,55		Sass/Cinamon 2006: 381, fig. 18.20.		Dome, limestone spindle whorl, complete. Slightly chipped.		
1	00/K/62/AR1	Dome	Ivory					1,4+ x		Sass/Cinamon 2006: 384, fig. 18.21.	Original weight 4,2 g.	Dome/discoid fragment of ivory spindle whorl.		

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	04/K/35/AR2	Dome	Serpentinite							Blockman/Sass 2013: 880, fig. 23.1	Original weight 9,9 g.	Dome, serpentinite spindle whorl, 1/3 missing. Well shaped.		
1	04/K/50/AR3	Dome	Serpentinite					9,11		Blockman/Sass 2013: 880, fig. 23.1		Dome, serpentinite spindle whorl, complete. Well shaped.		
1	04/M/57/AR1	Dome	Serpentinite					2,59		Blockman/Sass 2013: 880, fig. 23.1		Dome, serpentinite spindle whorl. Very small.		
1	08/J/10/AR4	Dome	Bone					3,55		Blockman/Sass 2013: 880, fig. 23.2		Dome, bone spindle whorl, complete.		
1	04/K/26/AR1	Dome	Bone					2,95		Blockman/Sass 2013: 880, fig. 23.2		Dome, bone spindle whorl, complete.		
1	08/H/9/AR1	Dome	Bone					12,7		Blockman/Sass 2013: 880, fig. 23.3		Dome, bone spindle whorl, complete. Wear traces near upper hole.		
1	04/M/61/AR1	Dome	Bone					2,75		Blockman/Sass 2013: 880, fig. 23.3		Dome, bone spindle whorl, complete. Very small.		
1	06/M/45/AR1	Dome	Bone					4,39		Blockman/Sass 2013: 880, fig. 23.3		Dome, bone spindle whorl, complete.		
1	267	Dome	Bone	2	4,4		0,5	14,8				Dome, bone spindle whorl, almost complete. Well polished dome, base with cancellous bone exposed. Wear traces near upper hole.		I-1564
1	239	Dome	Bone	1,7	4		0,4	10,48				Dome, bone spindle whorl, almost complete. Well polished dome, base with cancellous bone exposed. Wear traces near upper hole.		I-2845
1	98/K/7/AR1	Dome	Bone	0,6	2,4		0,35	3,84				Dome, bone spindle whorl, almost complete. Well polished dome, base with signs of manufacture. Cylindrical hole.		01-2970
1	12/H/92/AR1	Dome	Bone	1,7	2,2		0,25	2,7+x	unclassified debris	unpublished		Dome, bone spindle whorl, small part missing. Well polished dome, base with signs of manufacture. 4 circles with central dot incised on the dome. Neatly cut hole, no traces of wear.		
1	M 69	Spherical	Pottery						tomb 73	Guy/Engberg 1938: pl. 161		Spherical, pottery spindle whorl.		
1	04/K/122/AR2	Spherical	Pottery					12,12+x		Blockman/Sass 2013: 881, fig. 23.4		Spherical, pottery spindle whorl, quite well shaped. 1/3 missing.		
1	04/J/34/AR1	Spherical	Pottery							Blockman/Sass 2013: 882, fig. 23.4	Original weight 60 g.	Spherical pottery spindle whorl, half preserved.		

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	04/M/39/AR5	Spherical	Pottery							Blockman/Sass 2013: 882, fig. 23.4	Original weight 18 g.	Spherical, pottery spindle whorl, fragmentary.		
1	96/J/5/AR2	Biconical	Pottery	2,6	2,7		nn	9+x	unstratified/J-7 (A)	Sass 2000: 377, fig. 12.19:2.	Original weight 18 g.	Biconical spindle whorl, broken in half. Well shaped.		525394
1	96/J/5/AR5	Biconical	Pottery	3,2	nn		nn	18+x	unstratified/J-7 (A)	Sass 2000: 377, fig. 12.19:3.	Original weight 40 g.	Biconical spindle whorl, broken in half. Well shaped.		525395
1	94/J/80/AR1	Discoid	Limestone	1,2	4,2		1	20	unstratified; PT: EB main	Sass 2000: 374, fig. 12.17:7.		Discoid limestone spindle whorl, complete. Very well shaped.		01-2930

Perforated sherds

Early Bronze Age

1	98/J/121/AR1	Prf. sherd	Pottery	1	4,1	1,7		9,78+x	Level J-3	Sass/Cinamon 2006: 385, fig. 18.22.	Original weight 30 g. Occupational debris.	Half missing. Perforated sherd roughly cut, with sharp edges. Hourglass hole.	EB Ib	67005
1	04/J/42/AR1	Prf. sherd	Pottery		1,7				J-6b, F	Blockman/Sass 2013: 882.	Floor and accumulation floor	Perforated sherd.	EB III	
1	00/J/12/AR4	Prf. sherd	Pottery					32,85	J-6	Sass/Cinamon 2006: 381, fig. 18.19.	Brick material. Found with a weight 00/J/12/AR1	Complete, but broken in two pieces. Hole near one rim, probably not used as whorl.	EB III	670286+670287
1	06/J/36/AR1	Prf. sherd	Pottery		4				J-5, A	Blockman/Sass 2013: 882.	Construction fill	Fragmentary perforated sherd.	EB III	

Middle Bronze Age

1	96/F/29/AR9	Prf. sherd	Pottery						Level F-12 (A);	Sass 2000: 377, fig. 12.19:12.	Earthen rampart	Complete, quite rounded with unfinished hole.	MB II	
1	2799	Prf. sherd	Pottery	1,2	6,8x7,2		0,4	71,8				Perforated sherd, quite rounded. Hourglass hole, slightly diagonal.	MB I	I- 3304
1	613	Prf. sherd	Pottery	0,8	6x5,7		0,5x0,7	37,4			T3	Perforated sherd, complete. Quite well rounded, oval hourglass hole.	MB I	I-1586

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	06/K/22/AR8	Prf. sherd	Pottery	1	nn		nn	nn	K-10, F	unpublished	Occupational accumulation on a compacted earth floor.	Fragment of a pottery disk, irregular shape.	MB III/LB I	
1	269	Prf. sherd	Pottery	0,8	4,9x 5,4		0,55	30				Perforated sherd, complete. Not well rounded, quite irregular. Hourglass hole.	MB I	I-1566
1	12/K/65/AR9	Prf. sherd	Pottery	0,8	nn		nn	nn	K-11	Unpublished	Storage pit. Many stoppers from the same context.	Perforated sherd, fragmentary. Well rounded and smoothed edge.	MB II	
1	10/K/99/AR1	Prf. sherd	Pottery	0,8	4,4		0,5	19	K-10		Unpublished	Perforated sherd, complete. Quite well rounded, hourglass hole.	MB III/LB I	
1	14/K/75/AR1	Prf. sherd	Pottery	0,9	2,8		nn	7	K-11		Unpublished	Reworked sherd, complete. Well rounded. Perforation not finished.	MB III/LB I	
1	14/K/101/AR 1	Prf. sherd	Pottery	1,6	4,9		0,9	44	K-12		Unpublished	Perforated sherd, complete. Well rounded, small chips on the edge. Hourglass hole.	MB	
1	14/K/102/AR 1	Prf. sherd	Pottery	0,9	nn		nn		K-12		Unpublished	Perforated sherd, half missing. Hole not finished.	MB	
Late Bronze Age														
1	08/K/33/AR8	Prf. sherd	Pottery	0,7	5,7		0,3	16+x	Level K-9?		Unpublished	Perforated sherd, half preserved. Roughly cut, sharp edge. Hourglass hole, slightly diagonal.	LB IIA	
1	08/K/33/AR18	Prf. sherd	Pottery	0,9	2,9x 3,2		0,3	12	Level K-9?		Unpublished	Perforated sherd, complete. Well rounded and smoothed edge. Hourglass hole.	LB IIA	
1	08/K/49/AR14	Prf. sherd	Pottery	0,7	4,4		nn	8,5+x	Level K-9?		Unpublished	Perforated sherd, half preserved. Smooth but irregolar shape.	LB IIA	
1	08/K/78/AR3	Prf. sherd	Pottery	0,7		5,2		11,8+ x	Level K-9		Unpublished	Perforated sherd, fragmentary.	LB IIA	
1	08/K/50/AR3	Prf. sherd	Pottery	0,8	5,1x 3,9		0,3	17,8	Level K-9		Unpublished	Perforated sherd, complete. Not rounded, sharp edge. Hourglass hole.	LB IIA	
1	10/K/60/AR8	Prf. sherd	Pottery	1	4.3x 4.6		0,5	25	Level K-9		Unpublished	Perforated sherd, complete. Roughly cut, sharp edge. Thick layer of encrustation on the lower surface. Hourglass hole.	LB IIA	
1	10/K/61/AR9	Prf. sherd	Pottery	1.1	6,9		0,5	61	Level K-9		Unpublished	Perforated sherd, complete. Well rounded, smoothed edge. Hourglass hole.	LB IIA	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 2531	Prf. sherd	Pottery			1			tomb 876	Guy/Engberg 1938: 170, pl. 142		Perforated sherd, complete or partially chipped. Hourglass hole.	LB II	
1	04/K/111/AR7	Prf. sherd	Pottery		6				K-8?, A	Blockman/Sass 2013: 882.	Mudbrick material		LB IIB	
1	04/K/119/AR7	Prf. sherd	Pottery		4				K-8?, F?	Blockman/Sass 2013: 882.	Occupational debris		LB IIB	
1	06/K/24b/AR2	Prf. sherd	Pottery		5				K-8, F	Blockman/Sass 2013: 882.	Mudbrick material		LB IIB	
1	06/K/25/AR2	Prf. sherd	Pottery		5				K-8, F	Blockman/Sass 2013: 882.	Mudbrick material		LB IIB	
1	06/K/100/AR4	Prf. sherd	Pottery		3				K-8, F	Blockman/Sass 2013: 883.		Hole not completed.	LB II	
1	06/K/123/AR5	Prf. sherd	Pottery		2,5				K-8, F	Blockman/Sass 2013: 882.	Occupational debris. Several grinding tools		LB IIB	
1	08/K/101/AR2	Prf. sherd	Pottery		3,5				K-8, F	Blockman/Sass 2013: 882.	Wall removal		LB IIB	
1	06/K/111/AR3	Prf. sherd	Pottery		2,5				K-7?, F?	Blockman/Sass 2013: 882.	Mudbrick material		LB IIB	
1	08/K/29/AR4	Prf. sherd	Pottery		4,5				K-7, A	Blockman/Sass 2013: 882.	Wall removal. Several grinding tools		LB IIB	
1	02/K/62/AR1	Prf. sherd	Pottery					17,6+ x	K-6, F?	Blockman/Sass 2013: 882.	Original weight 44 g. Earth debris.	Fragmentary, hole off-centre.	LB III	
1	04/M/83/AR1	Prf. sherd	Pottery		4,5				M-6, F?	Blockman/Sass 2013: 882.	Occupational accumulation.		LB III	
1	04/M/8/AR18	Prf. sherd	Pottery		8				M-6, F?	Blockman/Sass 2013: 882.			LB III	
1	02/K/82/AR6	Prf. sherd	Pottery		5,5				K-6, F	Blockman/Sass 2013: 883.	Occupational debris		LB III	
1	10/H/64/AR1	Prf. sherd	Pottery	0,6	5,6x 4,7		0,4	20	H12, F	unpublished	Accumulation on flagstone floor.	Perforated sherd, complete. Roughly cut, not rounded. Hourglass hole, slightly off-centre.	LB III	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	10/H/25/AR1	Prf. sherd	Pottery	0,9	10,4 x9,6		0,9	110	Sq. F9, H12, F	unpublished	Accumulation on flagstone floor Same context of loom weight 10/H/25 002	Large perforated sherd, complete. Slightly chipped on the edge. Smoothed edge but irregular shape. Hourglass hole.	LB III	
Iron I														
1	00/K/22/AR3	Prf. sherd	Pottery	0,6	3,4		0,4	5,7+ x	K-4	Sass/Cinamon 2006: 385, fig. 18.23.	Original weight 11,5 g. Occupational debris.	Perforated sherd, half missing. Quite well rounded, hourglass hole, very diagonal.	Late IA I	671759
1	00/K/25/AR1	Prf. sherd	Pottery	0,8	6,7		0,4	34	K-4	Sass/Cinamon 2006: 385, fig. 18.23.	Complete. Brick collapse. Found with a serpentine flywheel.	Perforated sherd, half preserved. Roughly cut. Slightly hourglass hole, well centred.	Late IA I	09-267
1	00/K/27/AR4	Prf. sherd	Pottery	0,7	7,3		0,4	26+ x	K-5	Sass/Cinamon 2006: 385, fig. 18.22.	Original weight 43 g. Floor accumulation. Found with several grinding tools.	Perforated sherd, fragmentary. Quite well rounded. Hourglass hole.	Early IA I	669997
1	00/K/29/AR5	Prf. sherd	Pottery	0,8	5,9		0,3	31,6	K-4	Sass/Cinamon 2006: 385, fig. 18.23.	Complete. Brick collapse. Found with a bone flywheel.	Perforated sherd, complete. Roughly cut, sharp edges. Hourglass hole, small and oval.	Late IA I	09-272
1	00/K/29/AR6	Prf. sherd	Pottery	0,9	6,3x 6,5		0,3	37.2 +x	K-4	Sass/Cinamon 2006: 385.	Original weight 44 g. Brick collapse. Found with a bone flywheel.	Perforated sherd, chipped on the side. Hourglass hole.	Late IA I	09-576
1	00/K/31/AR2	Prf. sherd	Pottery	1,4	11,2 x13		0,5	129, 75+ x	K-4	Sass/Cinamon 2006: 385.	Original weight 200 g.	Very large perforated sherd, partially chipped. Very small hourglass hole. Broken in two pieces.	Late IA I	671718
1	00/K/34/AR1	Prf. sherd	Pottery	0,8	6,5		nn	16,4 +x	K-4	Sass/Cinamon 2006: 385.	Original weight 23 g. Occupational debris.	Perforated sherd, broken in different points. Hole not finished.	Late IA I	671745

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	00/K/42/AR1	Prf. sherd	Pottery	0,6	5,9		0,6	18,31	K-4	Sass/Cinamon 2006: 376, fig. 18.15	Floor accumulation	Perforated sherd, half preserved. Quite well rounded and smoothed, slightly hourglass hole.	Late IA I	09-254
1	00/K/45/AR13	Prf. sherd	Pottery	0,1	7,8x9		0,3x0,4	99	K-4	Sass/Cinamon 2006: 385.	Complete. Floor accumulation.	Perforated sherd, complete. Central hole, hourglass and oval. Roughly cut, sharp edges.	Late IA I	09-573
1	00/K/45/AR6	Prf. sherd	Pottery	0,9	5,6x6,3		0,1	37,37	K-4	Sass/Cinamon 2006: 385.	Floor accumulation	Perforated sherd, complete. Roughly cut, hole hourglass but probably not finished.	Late IA I	09-580
1	00/K/45/AR7	Prf. sherd	Pottery	1	7,5x7		0,5	65	K-4	Sass/Cinamon 2006: 385.	Complete. Floor accumulation.	Perforated sherd, complete. Roughly cut but almost round. Hourglass hole.	Late IA I	09-575
1	00/K/5/AR3	Prf. sherd	Pottery	1	6,2			31,45+x	K-4	Sass/Cinamon 2006: 385.	Original weight 63 g. Burnt debris.	Perforated sherd, half preserved. Smoothed edge. Hourglass hole, very diagonal.	Late IA I	671756
1	00/K/51/AR5	Prf. sherd	Pottery	0,9	4,6x5		0,4	23,75	K-4	Sass/Cinamon 2006: 385.	Complete. Occupational debris. Found with two basalt flywheels.	Perforated sherd, complete. Roughly cut. Hourglass hole, diagonal.	Late IA I	09-574
1	00/K/51/AR9	Prf. sherd	Pottery	0,7	4,6x5		0,25	17,92	K-4	Sass/Cinamon 2006: 385, fig. 18.23.	Complete. Occupational debris. Found with two basalt flywheels	Perforated sherd, complete. Oval in shape but smoothed edge. Hourglass hole.	Late IA I	09-266
1	00/K/58/AR6	Prf. sherd	Pottery	1	5,5		0,5	13,4+x	K-4	Sass/Cinamon 2006: 385.	Occupational debris. Original weight 30 g.	Perforated sherd, half preserved. Irregular and sharp edges. Cylindrical hole.	Late IA I	671743
1	00/K/64/AR1	Prf. sherd	Pottery	1	6,9x6		0,5	53,2	K-4	Sass/Cinamon 2006: 385.	Complete. Floor accumulation.	Perforated sherd, complete. Roughly cut but quite rounded. Hourglass hole.	Late IA I	09-579
1	00/K/99/AR3	Prf. sherd	Pottery	0,8	5,4		0,3	35,45	K-4	Sass/Cinamon 2006: 385.	Complete.	Perforated sherd, complete. Hourglass hole, small and off-centre.	Late IA I	09-578
1	00/K/99/AR6	Prf. sherd	Pottery	0,8	4,1		0,45	8,45+x	K-4	Sass/Cinamon 2006: 385.	Original weight 15 g.	Perforated sherd, half preserved. Irregular edges, hourglass hole.	Late IA I	671760
1	02/K/36/AR2	Prf. sherd	Pottery	0,6	4		0,5	10,9+x	K-5	Sass/Cinamon 2006: 385.	Original weight 13,5 g. Occupational debris.	Perforated sherd, fragmentary. Roughly cut, sharp edges. Hourglass hole.	Early IA I	671818
1	02/K/47/AR15	Prf. sherd	Pottery	0,7	5,2x4,8		0,4	21,6	K-5	Sass/Cinamon 2006: 382, fig. 18.43.	Occupational debris.	Perforated sherd, complete. Roughly cut, sharp edges. Hourglass hole.	Early IA I	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	02/K/47/AR17	Prf. sherd	Pottery	0,9	4,8x 5,7		0,5x 03	29	K-5	Sass/Cinamon 2006: 385.	Complete. Occupational debris.	Perforated sherd, complete. Hole hourglass, off-centre.	Early IA I	09-577
1	02/K/47/AR22	Prf. sherd	Pottery	0,7	3,8		0,4	11,2 5	K-5	Sass/Cinamon 2006: 385, fig. 18.22.	Complete. Occupational debris.	Perforated sherd, complete. Roughly cut, sharp edges. Hourglass hole.	Early IA I	09-276
1	06/H/49/AR1	Prf. sherd	Pottery		5				H-9, F	Blockman/Sass 2013: 882.	Destruction debris		Late IA I	
1	06/H/50/AR1	Prf. sherd	Pottery		4,5				H-9, F	Blockman/Sass 2013: 882.	Accumulation on floor		Late IA I	
1	06/H/50/AR2	Prf. sherd	Pottery		5,5				H-9, F	Blockman/Sass 2013: 882.	Accumulation on floor		Late IA I	
1	06/M/31a/AR1	Prf. sherd	Pottery		7				M-5,F	Blockman/Sass 2013: 882.	Occupational debris.		Early IA I	
1	08/H/47/AR4	Prf. sherd	Pottery	1,2	7,2x 6,9		0,6	70	Sq. E6, H-10, F?	unpublished	Floor, living surface	Perforated sherd, broken in two pieces, slightly chipped. Roughly cut, irregular shape. Hourglass and diagonal hole.	Early IA I	
1	08/H/19/AR1	Prf. sherd	Pottery		9				H-9, F	Blockman/Sass 2013: 882.	Accumulation on floor		Late IA I	
1	08/H/36/AR15	Prf. sherd	Pottery		4,5				H-9, F	Blockman/Sass 2013: 883.	Accumulation on floor	Unfinished hole.	Late IA I	
1	10/H/8/AR2	Prf. sherd	Pottery	1	4,5		nn	14+ x	Sq. F9, H-11, F?	unpublished	Floor, living surface	Perforated sherd, half preserved.	Early IA I	
1	10/H/8/AR3	Prf. sherd	Pottery	0,7	nn		nn	nn	Sq. F9, H-11, F?	unpublished	Floor, living surface	Perforated sherd, almost 1/4 preserved. Hourglass hole.	Early IA I	
1	10/H/94/AR2	Prf. sherd	Pottery	0,8	4,6x 4,1		0,3	20	Sq. F7, H-11, F	unpublished	Occupational accumulation.	Perforated sherd with very small and diagonal hourglass hole.	Early IA I	
1	96/K/101/AR10	Prf. sherd	Pottery	0,8	4,5		0,6	18,4	Level K-4 (F)	Sass 2000: 377, fig. 12.19:10	Brick material in room. Found with another limestone spindle whorl.	Perforated sherd, well smoothed edge, slightly ovoidal. Broken in two pieces.	Late IA I (mixed context)	01-2025
1	96/K/77/AR5	Prf. sherd	Pottery	0,8	6,1		nn	19,5 9+x	Level K-4 (F)	Sass 2000: 377, fig. 12.19:11	Original weight 20 g. Mixed context. Collapse of burnt bricks.	Perforated sherd, broken. Roughly cut, hourglass hole.	Late IA I	525403
1	96/K/92/AR1	Prf. sherd	Pottery	0,8	3,9		0,3	16	Level K-4 (F?)	Sass 2000: 377, fig. 12.19:6	Brick material.	Perforated sherd, complete. Roughly cut.	Late IA I	01-2022

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	98/K/100/AR2	Prf. sherd	Pottery	0,8	3,6		0,4	14,8		Sass/Cinamon 2006: 385.	Complete. Floor accumulation.	Perforated sherd, complete. Quite well shaped, central hole. Perforation made from both sides but well smoothed and almost cylindrical.		09-583
1	98/K/120/AR4	Prf. sherd	Pottery	0,6	3,1		0,5x 0,6	7,1	k-4	Sass/Cinamon 2006: 385, fig. 18.23.	Complete. Brick collapse.	Perforated sherd, small and welll rounded. Off centre hole, quite oval and hourglass.	Late IA I	09-268
1	98/K/120/AR7	Prf. sherd	Pottery	1	4,1x 3,5		0,4	19,9	K-4	Sass/Cinamon 2006: 385, fig. 18.23.	Complete. Brick collapse.	Perforated sherd, complete. Irregular shape, central hole, made perforating from both sided but almost cylindrical.	Late IA I	09-269
1	98/K/121/AR3	Prf. sherd	Pottery	1,2	6,8	1 4	0,4	42,7	K-4	Sass/Cinamon 2006: 385.	Original weight 107 g. Brick and ashy material.	Perforated sherd, fragmentary. Hourglass hole. .	Late IA I	671758
1	98/K/24/AR4	Prf. sherd	Pottery					26,6 +x	K-4	Sass/Cinamon 2006: 385.	Original weight 88 g. Accumulation on floor.	Fragmentary	Late IA I	671762
1	98/K/33/AR7	Prf. sherd	Pottery		12			126, 85+ x	K-4	Sass/Cinamon 2006: 385.	Original weight 254 g!!!!	Too large and heavy. Fragmentary.	Late IA I	
1	98/K/33/AR8	Prf. sherd	Pottery	0,7	nn		nn	9,9+ x	K-4	Sass/Cinamon 2006: 385.	Original weight 33 g. Brick material.	Perforated sherd, fragmentary. Slightly horglass hole.	Late IA I	671761
1	98/K/41/AR14	Prf. sherd	Pottery	1,1	6,5		0,5	52,9	K-4	Sass/Cinamon 2006: 385, fig. 18.22.	Complete. Occupational debris. Found with other whorls and a needle.	Perforated sherd, complete. Well rounded and central and almost cylindrical hole. Perfect spindle whorl.	Late IA I	09-273
1	98/K/41/AR4	Prf. sherd	Pottery	0,7	4,2		0,6	8,15 +x	K-4	Sass/Cinamon 2006: 385, fig. 18.22.	Original weight 27 g. Occupational debris. Found with other whorls and a needle.	Perforated sherd, fragmentary. Hole slightly hourglass.	Late IA I	669999
1	98/K/41/AR5	Prf. sherd	Pottery	1,4	6			60,5 5	K-4	Sass/Cinamon 2006: 385.	Unfinished hole. Occupational debris. Found with other	Perforated sherd, roughly cut. Hourglass hole unfinished.	Late IA I	671757

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
											whorls and a needle.			
1	98/K/41/AR7	Prf. sherd	Pottery	1,1	6,5			53,15	K-4	Sass/Cinamon 2006: 385, fig. 18.23.	Unfinished hole. Occupational debris. Found with other whorls and a needle.	Perforated sherd, complete. Hole unfinished and drilled only from one side.	Late IA I	09-270
1	98/K/42/AR8	Prf. sherd	Pottery		4,8			9,45 +x	K-4	Sass/Cinamon 2006: 385.	Brick collapse. Found with two needles. Original weight 19 g.	Perforated sherd, fragmentary. Unfinished hole	Late IA I	
1	98/K/45/AR6	Prf. sherd	Pottery	0,9	5		nn	10,5 +x	K-4	Sass/Cinamon 2006: 385, fig. 18.22.	Original weight 23 g. Occupational debris.	Perforated sherd, half preserved. Irregular shape. Hourglass hole.	Late IA I	669996
1	14/Q/13/AR4	Prf. sherd	Pottery	0,9	nn	3.3x s2.4	nn		Q-7	unpublished		Perforated sherd, fragment.	Late IA I	
1	14/Q/162/AR1	Prf. sherd	Pottery	0,6	3,7		nn	13	Q-7	unpublished		Perforated sherd, well rounded, hole unfinished but drilled from both sides.	Late IA I	
Iron II														
1	14/Q/157/AR2	Prf. sherd	Pottery	0,9	5,6x 5,3		0,4	33	Q-6	unpublished		Perforated sherd, complete. Irregular shape, not rounded. Hourglass hole, off-centre.	Early IA IIA	
1	96/K/45/AR3	Prf. sherd	Pottery	0,9	4,4		0,4	17	Level K-3 (F)	Sass 2000: 377, fig. 12.19:7.	Occupation debris. Found with an unbaked loom weight.	Perforated sherd, roughly cut. Hourglass hole.	Early IA IIA	01-2023
1	96/K/12/AR1	Prf. sherd	Pottery	0,7	3,8			10	Level K-2 (F)	Sass 2000: 377, fig. 12.19:8.	Occupation debris.	Perforated sherd, roughly cut. Hourglass, ovoidal and irregular hole.	Late IA IIA	01-2024
1	96/H/24/AR1	Prf. sherd	Pottery						Level H-3? (F)	Sass 2000: 377.	Not illustrated. Occupational debris?	Perforated sherd, small fragment.	IA IIB	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	96/H/15/AR1	Prf. sherd	Pottery	1,2	7,1		0,7	40+ x	Level H-l (A)	Sass 2000: 377, fig. 12.19:9.	Mixed context. Make up. Original weight 73 g.	Perforated sherd, irregular shape but smoothed edge. Hourglass hole but centrally cyilindrical. Fragmentary.	IA IIB	525401
1	98/K/28/AR1	Prf. sherd	Pottery	1	7		0,6	61,5 5	K-3	Sass/Cinamon 2006: 385.	Brown debris. Found with a bone spatula.	Perforated sherd, complete. Centred hole, perforation made starting from both sides but cylindrical.	Early IA IIA	09-581
1	98/H/30/AR2	Prf. sherd	Pottery	0,6	6		0,5	15,7 +x	H-5	Sass/Cinamon 2006: 385.	Original weight 39 g. Floor accumulatio n.	Perforated sherd, fragmentary. Quite irregular but smoothed edge. Perforation made starting from both sides but cylindrical.	Late IA IIA	671737
1	04/L/39/AR1	Prf. sherd	Pottery		5				L-?	Sass/Cinamon 2006: 423.			IA II	
1	06/H/67/AR3	Prf. sherd	Pottery					6	H-7	Blockman/Sass 2013: 882.	Beaten earthen floor		Early IA IIA	
1	96/K/08/AR5	Prf. sherd	Pottery	0,8	4,4		0,4	18,4 4	K-3	Sass 2000: 377.	Occupation debris	Perforated sherd, quite rounded. Hole slighly off centre and hourglass.	Early IA IIA	02-947
1	13/H/10/AR2	Prf. sherd	Pottery		7,6	0,8	0,4	25		unpublished		Perforated sherd, half preserved. Edge not smoothed. Irregular, hourglass and diagonal hole.		
1	96/K/2/AR1	Prf. sherd	Pottery						Level K-3 (F);	Sass 2000: 377, fig. 12.19:13	Occupation debris	Unfinished hole.	Early IA IIA	
1	96/K/36/AR3	Prf. sherd	Pottery						Level K-2 (F)	Sass 2000: 377, fig. 12.19:14	Occupation debris	Unfinished hole.	Late IA IIA	
1	08/H/26/AR1	Prf. sherd	Pottery						H-8, A	Blockman/Sass 2013: 882.	Tabun		Early IA IIA	
1	M 5027a	Prf. sherd	Pottery						1574	Lamon/Shipton 1939: 121.			IA IIC (Str. II)	
1	M 5027b	Prf. sherd	Pottery						1574	Lamon/Shipton 1939: 121.			IA IIC (Str. II)	
1	M 4637	Prf. sherd	Pottery						locus 782	Lamon/Shipton 1939: pl. 93.68		Perforated sherd, complete. Well rounded.	IA IIC (Str. II)	
1	M 4953	Prf. sherd	Pottery						locus 1542	Lamon/Shipton 1939: pl. 93.54	Found with spindle whorl M 4648 and another prf.	Perforated sherd, complete. Base of a vessel, as in Hazor	IA IIB (Str. III)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
											Sherd M 4954			
1	M 4825	Prf. sherd	Pottery						locus 1316	Lamon/Shipton 1939: pl. 93.61		Perforated sherd, complete. Well rounded.	IA IIB (Str. III)	
1	M 4955	Prf. sherd	Pottery						locus 1316	Lamon/Shipton 1939: pl. 93.62		Perforated sherd, complete. Base of a vessel, as in Hazor	IA IIB (Str. III)	
1	M 4909	Prf. sherd	Pottery						locus 1538	Lamon/Shipton 1939: pl. 94.21		Perforated sherd, complete. Roughly cut.	IA IIB (Str. III)	
1	M 4896	Prf. sherd	Pottery						locus 1561	Lamon/Shipton 1939: pl. 94.45	Found with basalt ring M 4897	Perforated sherd, partially broken.	IA IIB (Str. III)	
1	M 4954	Prf. sherd	Pottery						locus 1542	Lamon/Shipton 1939: pl. 94.46		Perforated sherd, complete. Well rounded.	IA IIB (Str. III)	
1	M 873	Prf. sherd	Pottery						locus 285	Lamon/Shipton 1939: pl. 94.60		Perforated sherd, complete. Well rounded.	IA IIB	
1	5339	Prf. sherd	Pottery						locus 292	Lamon/Shipton 1939: pl. 95.18		Perforated sherd, complete. Roughly cut.	IA IIB (Str. III)	
1	M 5024a	Prf. sherd	Pottery						locus 1674	Lamon/Shipton 1939: pl. 93.68	filling	Perforated sherd, complete. Well rounded.	IA II (Stra. IV)	
1	M 5187	Prf. sherd	Pottery						locus 1613	Lamon/Shipton 1939: pl. 95.15	Found with other 3 whorls	Perforated sherd.	IA II (Stra. IV)	
1	881	Prf. sherd	Pottery						locus 286	Lamon/Shipton 1939: 123			IA IIB (Str. III)	
1	M 4627	Prf. sherd	Pottery						locus 1406	Lamon/Shipton 1939: 129			IA IIB (Str. III)	
1	5424	Prf. sherd	Pottery						Locus 594	Lamon/Shipton 1939: pl. 95.19		Perforated sherd, complete. Well rounded, but oval.	IA II (Stra. V)	
1	08/Q/10/AR2	Prf. sherd	Pottery	1,3	5		0,5	41	Q-2	Unpublished		Perforated sherd, partially rounded, complete. Central and cylindrical hole.	IA IIB	
1	08/Q/22/AR14	Prf. sherd	Pottery	0,7	3,8		0,3	12	Q-4	Unpublished		Perforated sherd, complete. Well rounded, central and cylindrical hole but very small.	Late IA IIA	
1	08/Q/68/AR10	Prf. sherd	Pottery	1,1	5,3		0,4	39	Q-4	unpublished		Perforated sherd, complete. Well rounded. Cntral and cylindrical hole. Another unfinished small hole near the previous one.	Late IA IIA	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	10/Q/114/AR9	Prf. sherd	Pottery	1,3	nn		nn	nn	Q-4?	unpublished		Perforated sherd, fragmentary.	Late IA IIA	
1	10/Q/169/AR2	Prf. sherd	Pottery	1	6x6,5		0,5	51	Q-4	unpublished		Perforated sherd, complete. Irregular, off-centre and hourglass hole.	Late IA IIA	
1	12/Q/80/AR1	Prf. sherd	Pottery	0,8	4,8		0,5	19	Q-4	unpublished		Perforated sherd, quite rounded. Central and cylindrical hole.	Late IA IIA	
1	12/Q/172/AR1	Prf. sherd	Pottery	0,9	7x6,2		0,7	53	Q-5	unpublished		Perforated sherd, complete. Irregular shape. Off centre and hourglass hole.	Early IA IIA	
Unknown context														
1	10/Q/91/AR26	Prf. sherd	Pottery	0,8	5,3x4,9		0,5	29		unpublished		Perforated sherd, complete. Irregular shape. Slightly hourglass hole.		
1	96/K/48/AR5	Prf. sherd	Pottery	0,9	3,5		0,4	14,82	Unstratified		Mixed bricks and later disturbance.	Perforated sherd, complete. Quite rounded but not smoothed and totally off-centre hole.		02-949
1	96/J/5/AR12	Prf. sherd	Pottery	0,9	3,9x3,2		0,4x0,6	14,67	Topsoil/fill	Sass 2000: 377.		Perforated sherd, roughly cut. Conical hole, irregular shape.		02-1181
1	96/K/084/AR1	Prf. sherd	Pottery	1	4,4x4,9		0,4	24,69				Perforated sherd, roughly cut.		02-946
1	08/K/17/AR3	Prf. sherd	Pottery	0,8	3,5x3,8		0,7x0,2	12,2			Unpublished	Perforated sherd, complete. Hourglass hole, oval and not suitable for inserting a shaft.		
1	5529	Prf. sherd	Pottery		5				tomb 67A	Guy/Engberg 1938: 170 pl. 88				
Spinning bowls														
1	P. 6437		pottery						S=1820	Loud 1948: pl.70:3		Fragment of spinning bowl with two loops inside.	LB III (Str. VIIA)	
Loom weights														

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
Early Bronze Age														
1	00/J/35/AR1		Basalt					209,6+ x	J-1	Sass/Cinamon 2006: 381, fig. 18.19.		Fragment with irregular shape and part of a hole.	EB I	
1	98/J/32/AR2	Discoidal	limestone	1,6	6,2		0,8	53,42	J-6	Sass/Cinamon 2006: 381, fig. 18.19.		Cylindrical pebble, irregular, with rthrough hole made from one side. Complete.	EB III	09-292
1	00/J/12/AR1		limestone					123,45	J-6	Sass/Cinamon 2006: 381, fig. 18.19.		Irregular pebble with through hole.	EB III	
1	00/J/105/AR2		limestone						J-6	Sass/Cinamon 2006: 381, fig. 18.19.		Irregular shape, unfinished hole.	EB III	
1	10/J/177/AR1	Discoid	Stone	1,1	5,9x 4,8			44,5	J-6c	unpublished		Discoid object, semicircular shape. Perforation started from both sides.	EB III	
1	10/J/51/AR1	Discoid	Stone (pebble)	1,6	5x5, 1		0,2	56,7	J-4	unpublished		Pebble with perforation near the edge, as if it was a pendant.	EB I	
1	10/J/60/AR1	Dome	Stone	3,1	6,1		1,1x 1.5	157	J-6C	unpublished		Weight almost complete, made of limestone. Flat base a sort of dome. On the side some grooves are present.	EB III	
Middle Bronze Age														
1	d 277	Conical	Unfired clay						NE 5076	Loud 1948: pl. 169		Conical weight made of unfired clay.	MB I (Str. XIII)	
1	d 261	Conical	Unfired clay	11,1	7,7		0,7	532	5070	Loud 1948: pl. 169		Vertically perforated. Conical weight made of unfired clay, well shaped.	MB I (Str. XIII)	1939-548
1	c 535	Conical	Unfired clay						4089	Loud 1948: pl. 169		Vertically perforated. Conical weight made of unfired clay, well shaped.	MB I (Str. XIII)	
1	c 370	Conical	Unfired clay						4097	Loud 1948: pl. 169		Conical weight made of unfired clay.	MB I (Str. XIII)	
1	c 369	Conical	Fired clay	11,4	6,2		0,5	447	4097	Loud 1948: pl. 169		Conical weight, quite rounded, with small, horizontal hole. Made of fired clay and covered by a red slip, burnished. Base perfectly flat. Very well dressed.	MB I (Str. XIII)	1938-963
1	c 368	Conical	Unfired clay						4097	Loud 1948: pl. 169		Conical weight made of unfired clay.	MB I (Str. XIII)	
1	c 367	Conical	Unfired clay						4097	Loud 1948: pl. 169		Conical weight made of unfired clay.	MB I (Str. XIII)	
1	c 366	Conical	Unfired clay						4097	Loud 1948: pl. 169		Conical weight made of unfired clay.	MB I (Str. XIII)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	06/J/107/AR2	Conical	Fired clay					494 +x	J-10a, F	Blockman/Sass 2013: 887, fig. 23.6.	Original weight 543 g. Found in a grave.	Conical weight made of fired clay. Broken.	MB I	
1	d 260	Conical	Unfired clay						5077	Loud 1948: pl. 169		Conical weight made of unfired clay. Fragmentary Sealing on the surface.	MB II (Str. XII)	
1	b 746	Conical	Fired clay	9,6	5,9x 6,2		0,5	337	S =T.3107	Loud 1948: pl. 169		Conical weight, horizontal hole. Scarab sealing on top.	MB II (Str. XI)	1937-913
1	c 244	Conical	Unfired clay						T.4056	Loud 1948: pl. 169		Conical weight made of unfired clay. Sealing on the surface.	MB II (Str. XI)	
1	c 637	Conical	Fired clay	7,5	7,8		nn	494 +x	4063	Loud 164:3?		Conical weight, broken at the height of hole. Horizontal perforation and scarab seling on the side.	MB II (Str. XI)	1938-991
1	94/F/30/AR1	Conical	Fired clay					187 +x	Level F-12/F-l1?	Sass 2000: 370, fig. 12.15:5.	Original weight 400 g	Only base, hole not preserved.	MB II	
1	96/F/26/AR5	Biconical	Fired clay					154 +x	Level F-12 (A)	Sass 2000: 370, fig. 12.15:6.	Mixed context, EB/ MB I-II.	Only base, hole not preserved.	MB II	
1	c 357	Conical	Fired clay	10,6	7,6		0,5	600	4019	Loud 1948: pl. 169		Conical weight, quite rounded, with small, horizontal hole. Made of fired clay and covered by a red slip, burnished. Base perfectly flat. Very well dressed.	MB III/LB I (Str. X)	1938-961
1	c 107	Conical	Fired clay	10	7,7		0,4	628	4025	Loud 1948: pl. 169		Conical weight, rounded with small hole. Seal impression on top showing egyptian figure kneeling and holding forward something (lotus flower?)	MB III/LB I (Str. X)	1938-923
1	c 199	Conical	Unfired clay						N 3147	Loud 1948: pl. 169		Conical weight made of unfired clay. Sealing on the surface.	MB III/LB I (Str. X)	
1	b 377	Conical	Unfired clay			1,8			E 3037	Loud 1948: pl. 169		Conical weight made of unfired clay.	MB III/LB I (Str. X)	
1	c 84	Conical	Unfired clay						T.4007	Loud 1948: pl. 169		Conical weight made of unfired clay. Sealing on the surface.	MB III/LB I (Str. X)	
26	b 459	Conical	Unfired clay						E 3036	Loud 1948: pl. 170		26 conical weight made of unbaked clay. Horizontal perforation. At least one with vertical perforation.	MB III/LB I (Str. X)	
1	b 389	Conical	Unfired clay						T 3052	Loud 1948: pl. 170		Conical weight, complete. Horizontally pierced, sort of waist under the top.	MB III/LB I (Str. X)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	a 206	Conical	Unfired clay						T 2034	Loud 1948: pl. 170		Conical weight, complete. Horizontally pierced.	MB III/LB I (Str. X)	
2	a 146	Conical	Unfired clay						2025	Loud 1948: pl. 170		2 conical weights, complete. Horizontally pierced.	MB III/LB I (Str. X)	
1	b 247	Conical	Fired clay	10,4	6,3		0,6	363	3180	Loud 1948: pl. 170	Megiddo exc. 1937. Level X Tomb E=3026 n. b 247	Conical weight, horizontal hole. Scarab sealing on the side. Well shaped.	MB III/LB I (Str. X)	1937-868
1	10/K/92/AR4	Conical	Fired clay	14	6,2x 5,4		0,9	1018	K-11		Unpublished	Conical weight, complete. Made of fired clay, very large.	MB II	
1	14/K/23/AR2	Biconical	Fired clay	3,2	4,3		0,8	57	K-10		Unpublished	Biconical weight, very worn.	MB III/LB I (Str. X)	
1	14/K/34/AR1		Fired clay	1,4	3,2	1,7			K-10		Unpublished	Fragments of a objects, possibly pertaining to a loom weight.	MB III/LB I (Str. X)	
Late Bronze Age														
1	06/M/48/AR6	Conical	Fired clay					210, 45	M-7?, F?	Blockman/Sass 2013: 887, fig. 23.6.		Conical weight, made of fired clay.	LB I	
1	08/K/65/AR15	Conical	Fired clay	7,5+ x	5,2		nn	139 +x	Level K-10?	Unpublished		Conical weight, horizontally pierced. Broken at half.	LB IIA	
1	M 3641		Fired clay						tomba 1100 A	Guy/Engberg 1938: pl. 145		No description is provided	LB I	
1	c 108	Conical	Unfired clay						N=T 3169	Loud 1948: pl. 170		Conical weight, horizontal hole. Scarab sealing on the side. Well shaped.	LB I	
1	b 248	Conical	Unfired clay						T 3027	Loud 1948: pl. 170		Conical weight, made of unfired clay. Complete.	LB I	
1	b 246	Pyramidal	Unfired clay						T 3018 D	Loud 1948: pl. 170		Pyramidal weight, made of unfired clay. Complete.	LB I	
1	a 177	Conical	Unfired clay						N=T 2011	Loud 1948: pl. 170		Conical weight, top missing.	LB I	
1	98/F/107/AR1	Conical	Fired clay	7,3	6,3+ x			239 +x	F-10A	Sass/Cinamon 2006: 392, fig. 18.28.	Original weight 400-480 g.	Conical weight, well shape, base and top missing. Sealing on the side, not clearly visible.	LB I	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	98/F/8/AR3	Discoid elliptical	Fired clay					9,85 +x	F9	Sass/Cinamon 2006: 381, fig. 18.19.		Discoid elliptical weight, fragmentary.	LB IIA	
1	06/K/4/AR4	Discoid elliptical	limestone					54,2	K-8, F	Blockman/Sass 2013: 878, fig. 15.4		Natural pebble, hole near the edge.	LB IIB	
1	00/K/28/AR9		limestone					6,15	K-6, A	Blockman/Sass 2013: 878.			LB III	
1	00/K/112/AR 5		limestone					61,6	K-6, F	Blockman/Sass 2013: 878.		Natural pebble, hole near the edge.	LB III	
1	08/K/40/AR2		Fired clay	2,2		l5,4, s 3,1			K-9	Unpublished		Fragment of a pottery object, quite irregular but rounded.	LB IIA	
1	10/K/40/AR1	Conical truncated	Pottery	9,1	4,7		0,24	176	K-9	Unpublished		Conical truncated pottery weight, horizontally pierced. Very worn.	LB IIA	
1	10/H/43/AR4	Conical	stone	5,7	3		0,4	56	Sq. F8, H-12, F	unpublished	Accumulation on floor.	Small conical weight, complete. Horizontally pierced, flat base.	LB III	
1	12/Q/129/AR 2	Doughnut	Fired clay	5	nn	l10, 1xs4 ,6	nn	216 +x	Q-7?	unpublished		Doughnut weight, only 1/4 preserved.	LB III	
Iron Age I														
1	10/H/92/AR3	Cylindrical	stone	2,2	5,7			38,2 +x	Sq. E/F7, H-11, F	unpublished		Cylindrical weight, broken in half. Made of white stone.	Early IAI	
1	a 143	spool	Unfired clay	7,2	6,5				Locus 2022, Area AA, Quad M8	Loud 1948: pl. 170:26. Paice 2004: 60, 161, pl. 21:2.	Oriental Institute Museum A18299	Spool, slighly waisted on the centre.	Late IAI (Str. VIA)	
1	96/K/73/AR1	Discoid elliptical	Basalt					218 +x	Level K-4 (F)	Sass 2000: 370, fig. 12.15:4.	Original weight 262 g.	Discoid elliptical weight, fragmentary.		
1	M 5660+								Locus E=1751, R8. Area CC.	Paice 2004: 160	Found with another loom weight		IA I (Str. VI)	
1	P 6326+								Locus N=1760, S9, Area CC	Paice 2004: 160	Two spindle whorls from the same locus		IA I (Str. VI)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	P 6392+								Locus 1803, S9, Area CC	Paice 2004: 160	Two spindle whorls from the same locus		IA I (Str. VI)	
1	NN		Fired clay						Locus 1760	Paice 2004: 160			IA I (Str. VI)	
1	NN		Fired clay						Locus 1757	Paice 2004: 160	From the same locus a spindle whorl and a needle		IA I (Str. VI)	
1	NN		Fired clay						Locus 1754	Paice 2004: 160	From the same locus a spindle whorl and a needle		IA I (Str. VI)	
1	NN		Fired clay						Locus W=1772, S9-10, Area CC	Paice 2004: 160			IA I (Str. VI)	
20	a 364	Cylindrical	Fired clay						Locus 2069, Quad K8, Area AA	Loud 1948: 160. Paice 2004: 161.	Stratum VIA. Oriental Institute Museum A18366	Clindrical and perforated. It is said that they were pinched in the middle but they are not spools. More than 20 found grouped.	IA I (Str. VI)	
1	M 5541		Fired clay						Locus 1729, Q10, Area CC	Loud 1948: 149. Paice 2004: 161.			IA I (Str. VI)	
1	M 5657		Fired clay						Locus 1729, Q10, Area CC	Loud 1948: 149. Paice 2004: 161.			IA I (Str. VI)	
1	M 5658		Fired clay						Locus 1741, Q9, Area CC	Paice 2004: 161.			IA I (Str. VI)	
1	M 5659		Fired clay						Locus 1733, R9, Area CC	Loud 1948: 150. Paice 2004: 161.			IA I (Str. VI)	
1	M 5660		Fired clay						Locus 1750, R8, Area CC	Loud 1948: 151. Paice 2004: 161.			IA I (Str. VI)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 6163		Fired clay						Locus W=1814, S9, Area CC	Loud 1948: 155. Paice 2004: 161.			IA I (Str. VI)	
1	M 6179		Fired clay						Locus 1825, Q9, Area CC	Paice 2004: 161.			IA I (Str. VI)	
1	M 6180		Fired clay						Locus 1820, R9, Area CC	Loud 1948: 155. Paice 2004: 161.			IA I (Str. VI)	
1	P 6115+		Fired clay						Locus E=1756, S8, Area CC	Paice 2004: 161.			IA I (Str. VI)	
1	P 6313+		Fired clay						Locus 1755, R8, Area CC	Paice 2004: 161.			IA I (Str. VI)	
1	M 5150		Fired clay						Locus 1567, Q10, Area B	Paice 2004: 161			IA I (Str. VI)	
1	00/K/13/AR2	Cylindrical	Basalt	6,3	8,4+x			377,75+x	k-4	Sass/Cinamon 2006: 381.		Cylindrical weight made of basalt, fragmentary. Very heavy, probably the original weight exceeded 1000 g.	Late IAI	
1	98/K/32/AR2	Conical	Fired clay	7,4	5,5+x		0,7x1	167+x	K-4	Sass/Cinamon 2006: 392, fig. 18.28.	Original weight 340-500 g.	Conical weight, well shaped, fragmentary. Lower part missing.	Late IAI	
1	98/K/32/AR1	Doughnut	Unfired clay	3,7	5+x				k-4	Sass/Cinamon 2006: 393.		Doughnut weight, fragmentary.	Late IAI	
1	98/K/32/AR15	Doughnut	Unfired clay	6	10,6		1,9	560,8	K-4	Sass/Cinamon 2006: 393, fig. 18.28.		Doughnut shaped weight made of unfired clay, almost complete. Roughly shaped.	Late IAI	
1	00/L/126/AR2	Doughnut	Fired clay	4,7	12,4		0,9	505+x	L-5	Sass/Cinamon 2006: 393, fig. 18.28.	Original weight 727 g.	Doughnut shape, made of fired clay. Quite well shaped, small hole.	Late IAI	
1	00/L/126/AR3	Doughnut	Unfired clay	4,8	9,5		0,9	453+x	L-5	Sass/Cinamon 2006: 393, fig. 18.28.	Original weight 500 g.	Doughnut shaped weight, made on unfired clay. Almost complete. Small hole.	Late IAI	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
Iron II														
1	00/H/37/AR1		limestone					65,1	H-5	Sass/Cinamon 2006: 381, fig. 18.19.		Irregular object with a through hole near one edge.	Late IA IIA	
1	98/H/46/AR1	Doughnut	Fired clay						H-5	Sass/Cinamon 2006: 393, fig. 18.28.	Fragmentary, discerded.	Doughnut shaped weight, made of fired clay.	Late IA IIA	
1	96/K/45/AR4	Cylindrical	Unfired clay						Level K-3 (F)	Sass 2000: 372, fig. 12.16:9	Mixed context.	Small cylindrical weight, made of unfired clay. Fragmentary.	Early IA IIA	
1	96/K/29/AR1	Spherical	Unfired clay						Level K-2 (F)	Sass 2000: 372, fig. 12.16:10		Small spherical weight, made of unfired clay. Fragmentary. Diagonal hole.	Late IA IIA	
1	96/K/29/AR2	Biconical	Unfired clay						Level K-2 (F)	Sass 2000: 374, fig. 12.16:12		Small biconical weight, made of unfired clay. Fragmentary.	Late IA IIA	
1	96/K/29/AR4		Unfired clay						Level K-2 (F)	Sass 2000: 374.		Fragmentary.	Late IA IIA	
1	96/H/26/AR1	Biconical	Unfired clay						Level H-3	Sass 2000: 372, fig. 12.16:1		Small biconical weight, made of unfired clay. Fragmentary.	IA IIB	
1	96/H/36/AR1	Biconical	Unfired clay						Level H-3 (F)	Sass 2000: 372, fig. 12.16:2		Small biconical weight, made of unfired clay. Fragmentary.	IA IIB	
1	96/H/44/AR3	Biconical	Unfired clay						Level H-3 (F)	Sass 2000: 372, fig. 12.16:3	96/H/44 crollo di mattoni bruciati ma nessuna info sui pesi	Small biconical weight, made of unfired clay. Fragmentary.	IA IIB	
1	96/H/44/AR4		Unfired clay						Level H-3 (F)	Sass 2000: 372.		Fragmentary.	IA IIB	
1	96/H/44/AR5	Biconical	Unfired clay						Level H-3 (F)	Sass 2000: 372, fig. 12.16:4		Small biconical weight, made of unfired clay. Fragmentary.	IA IIB	
1	96/H/44/AR6	Spherical	Unfired clay						Level H-3 (F)	Sass 2000: 372, fig. 12.16:5		Small spherical weight, made of unfired clay. Fragmentary.	IA IIB	
1	96/H/44/AR7	Spherical	Unfired clay						Level H-3 (F)	Sass 2000: 372, fig. 12.16:6		Small spherical weight, made of unfired clay. Fragmentary.	IA IIB	
1	96/H/44/AR8	Biconical	Unfired clay						Level H-3 (F)	Sass 2000: 372, fig. 12.16:7		Small biconical weight, made of unfired clay. Fragmentary.	IA IIB	
1	96/H/44/AR9		Unfired clay						Level H-3 (F)	Sass 2000: 372.		Fragmentary.	IA IIB	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	96/H/44/AR10		Unfired clay						Level H-3 (F)	Sass 2000: 372.		Fragmentary.	IA IIB	
1	96/H/44/AR12		Unfired clay						Level H-3 (F)	Sass 2000: 372.		Fragmentary.	IA IIB	
1	96/H/44/AR13		Unfired clay						Level H-3 (F)	Sass 2000: 372.		Fragmentary.	IA IIB	
1	96/H/5/AR1	Biconical	Unfired clay						Level H-1 (A)	Sass 2000: 372, fig. 12.16:8	Mixed context.	Small biconical weight, made of unfired clay. Fragmentary.	IA IIB	
1	96/H/47/AR1	Spherical	Unfired clay						Level H-3 (F)	Sass 2000: 374, fig. 12.16:11	Mixed context.	Small spherical weight, made of unfired clay. Fragmentary.	IA IIB	
1	98/H/60/AR1	Spherical	Unfired clay	5,5	8,3		1,8	128 +x	H-4	Sass/Cinamon 2006: 393, fig. 18.28.	Original weight 155 g	Small spherical weight, made of unfired clay. Fragmentary.	IA IIB	
1	98/H/60/AR2	Doughnut	Fired clay						H-4	Sass/Cinamon 2006: 393, fig. 18.28.		Fragmentary. Completely crumbled, impossible to measure.	IA IIB	
1	98/H/16/AR1	Doughnut	Unfired clay	4,8	8,4		1,8x 2	250		Sass/Cinamon 2006: 393, fig. 18.28.		Doughnut weight, made of unfired clay. Complete.		
1	08/Q/42/AR9		Pottery	2,2	nn		nn	nn	Q-4	Unpublished		Ring base of a vessel, like Hazor.	Late IA IIA	
1	08/Q/79/AR4	Spherical	Fired clay	3,2	3,8		0,6	17,3 +x	Q-2	Unpublished		Fragment of a fired clay weight, probably spherical.	IA IIB	
1	08/Q/79/AR21	Spherical	clay	4,5	7,5		1,8	187	Q-2	Unpublished		Spherical weight, almost complete.	IA IIB	
1	08/Q/115/AR2	Spherical	Fired clay	5,6	6,5		nn	101 +x	Q-3	Unpublished		Spherical weight, half preserved.	IA IIB	
1	08/Q/121/AR1	Spherical	Fired clay	4,2	7,1		1,6	182	Q-4	unpublished		Spherical weight, almost complete. Fired or poorly fired clay.	Late IA IIA	
1	10/Q/12/AR2		Stone	5x4, 5		2,1	0,8	36,8	Q-2	unpublished		Weight with hole near the edge. Made of a grey stone.	IA IIB	
1	10/Q/18/AR1		Stone (pebble)	0,6		l3,2, s1,8	0,8	8,4+ x	Q-4	unpublished		Pierced pebble broken in half.	Late IA IIA	
1	10/Q/26/AR5	Spherical	clay	nn	nn		nn	nn	Q-4	unpublished		Fragment of a weight, probably spherical, 1/3 preserved. Extremely worn as it was washed.	Late IA IIA	
1	10/Q/66/AR1	Spherical	stone	5,5	6,7		1,7	228	Q-4?	unpublished		Spherical weight made of grey stone.	Late IA IIA	
1	10/Q/73/AR9		Stone (pebble)	2,6	5x6, 6		1	128	Q-5	unpublished		Pierced pebble.	Early IA IIA	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	10/Q/91/AR19	Spherical	Fired clay	5,4	9,2		2	345	Q-4	unpublished		Spherical weight made of fired clay. Well preserved.	Late IA IIA	
1	10/Q/110/AR1	Doughnut	clay	4,1	nn		nn	108	Q-4	unpublished		Two fragments of a doughnut shape weight, burnt.	Late IA IIA	
1	12/Q/15/AR1	Spherical	clay	nn	6,6		1,4	136 +x		unpublished		Spherical weight made of unfired or poorly fired clay, very worn. Half preserved.	Earth debris IAIIA	
1	12/Q/18/AR2	Spherical	clay (burnt)	3,8	4,6		0,8x 1	52+ x	Q-2?	unpublished		Spherical weight, burnt. Fragmentary.	IA IIB	
1	12/Q/87/AR1	Doughnut	clay	5,1	9,3		1,8x 2,1	429 +x	Q-4	unpublished		Doughnut shaped weight, broken.	Late IA IIA	
1	12/Q/104/AR1	Spherical	clay	3,7	6,2		1,3	126	Q-5	unpublished		Spherical weight made of unfired clay, quite well preserved.	Early IA IIA	
1	12/Q/104/AR2	Spherical	clay	5	7,4		0,5	260	Q-5	unpublished		Spherical weight made of unfired clay, quite well preserved.	Early IA IIA	
1	12/Q/140/AR1	Spool	Fired clay	nn	6,3	l.9,8 , s4.6 x2,5		225 +x	Q-2	unpublished		Cylindrical weight, partially preserved. Possible spool.	IA IIB	
1	12/Q/152/AR1	Spherical	Fired clay	3,9	nn	44+ x	nn		Q-2	unpublished		Spherical weight, half preserved.	IA IIB	
1	14/Q/11/AR1	Spherical	Fired clay	4,7	nn	l4,8 xs3, 2	nn	67+ x	Q-2	unpublished		Spherical weight, 1/4 preserved.	IA IIB	
1	14/T/14/AR4	Doughnut	Stone	2,3x 1,8	4,8x 4,3		0,8	66	T2?	unpublished		Weight made of a white stone, roughly doughnut shaped. Very worn but complete.	IA IIB	
1	14/T/26/AR5		Fired clay	2,8	3,7	1,5	nn		T3	unpublished		Fragment of weight, possibly spherical. Burnt.	IA IIB	
Unknown context														
1	4028	Spherical	Unfired clay			6,7			Tomba 73	Guy/Engberg 1938: pl. 162		Spherical weight made of unfired clay		
1	4122	Conical	Basalt			3,4			Tomba 80	Guy/Engberg 1938: pl. 174		Loom weight or mace head made of basalt, half preserved.		
1	94/F/66/AR7	Conical	Pottery					338	topsoil	Sass 2000: p. 372, Fig. 12.15:7.		Conical loom weight, horizontal hole. Broken.		
1	98/K/25/AR1	Conical	Pottery	10,5	6,5		0,7	372, 5+x		Sass/Cinamon 2006: 392, fig. 18.28,	Original weight 465 g.	Conical loom weight, horizontal hole. Broken.		

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	98/H/A6/AR1	Doughnut	Fired clay					250,6		Sass/Cinamon 2006: 393, fig. 18.28.		Doughnut shaped weight made of fired clay.		
1	98/H/55/AR1	Doughnut	Unfired clay	3,6	6,3		1,2	275 +x		Sass/Cinamon 2006: 393, fig. 18.28.	Original weight 500 g.	Fragment of doughnut shaped weight, made of unfired or poorly fired clay. Very worn.		
1	00/L/31/AR1	Doughnut	Unfired clay	5	0,1			88,7 +x		Sass/Cinamon 2006: 393.		Fragment of weight, doughnut shaped made of unfired clay.		
1	00/L/49/AR1		Unfired clay	4,1	8,4x 7,2			131 +x		Sass/Cinamon 2006: 393.		Fragment of object made of unbaked clay, possibly a loom weight.		
1	06/K/55/AR7	Conical	Fired clay					309,4		Blockman/Sass 2013: 887, fig. 23.6.				
1	98/M/13/AR3	Conical	Fired clay					269		Blockman/Sass 2013: 887, fig. 23.6.				
1	04/M/39/AR6	Doughnut	Fired clay					28,76		Blockman/Sass 2013: 888, fig. 23.6.				
1	06/M/42/AR1	Biconical	Fired clay					30,45		Blockman/Sass 2013: 888, fig. 23.6.				
1	06/L/61/AR1	Biconical	Unfired clay							Blockman/Sass 2013: 888, fig. 23.7.				
1	02/M/10/AR1	Cylindrical	Unfired clay					131,9+x		Blockman/Sass 2013: 888, fig. 23.7.	Original weight 175 g.	Fragmentary.		
1	10/K/66/AR5	Conical	Fired clay	8,4	6,4		0,7	358	Mixed debris	unpublished		Conical weight with horizontal hole, complete. Traces of rubbing near the hole.		
1	12/K/4/AR2	Spool (?)	Fired clay		4	2,5	0,5?	49+x	US	unpublished		Spool transversally pierced. Broken in half.		
1	12/K/6/AR4	Conical	Fired clay	9,7	5,2		0,5x 0,6	207	US	unpublished		Conical weight made of fired clay. Horizontally pierced. Complete.		
1	12/K/66/AR7	Conical	Fired clay	9,3	6,1		0,7	415	Mixed debris	Unpublished		Conical weight made of fired clay. Horizontally pierced. Complete.		

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
Basalt rings														
Early Bronze Age														
1	00/J/136/AR1	Spherical	Basalt	1,8	2,6		NN	7,2+x	J-3	Sass/Cinamon 2006: 381, fig. 18.20.	Original weight 22 g.	Basalt ring, quite small and almost spherical. Well rounded and smooth. Fragmentary.	EB Ib	670016
1	98/J/23/AR1	Cylindrical	Basalt	2,8	3,7		1,1	23,15+x	J-6	Sass/Cinamon 2006: 381.	Original weight 57 g.	Fragmentary.	EB III	
1	98/J/60/AR3	Discoid	Basalt	1,4	3,4		1	12,95+x	J-6	Sass/Cinamon 2006: 381, fig. 18.20.	Original weight 68 g.	Basalt ring, quite large and flattish. Rough surface, hourglass hole. Fragmentary.	EB III	670010
1	04/J/20/AR1	Cylindrical	stone						J-6a, F	Blockman/Sass 2013: 880, fig. 23.1.	Original weight 52,39 g.	Fragmentary.	EB III	
1	M 3905	Cylindrical	Basalt	2,2	3,8		1,2	49,9	Stage IV Exc. 1928-33			Basalt ring, cylindrical shape, complete. Well shaped central hole, still partially hourglass.		
1	93/J/64/151/1	Cylindrical	Basalt	2,3	3,7		1	18,5+x	South of Shrine 4050; unstratified. Meg XIX	Sass 2000: 374, fig. 12.17:3.	Original weight 37g.	Basalt ring, broken in half. Well shaped, hole almost cylindrical.		531000
1	96/J/62/AR1	Cylindrical	Basalt	1,4	3	1,1	nn	7,88+x	J-4 (F)	Sass 2000: 374, fig. 12.17:1.	Original weight 20 g.	Basalt ring, quite flattish. 1/3 preserved. Hourglass hole.		530998
1	A16885/M3662	Cylindrical	Basalt						U16, Tomb 1226	Braun 2013: 101-102, pl. 75a		complete	EB I	
1	A16884/M3661	Cylindrical	Basalt						U16, Tomb 1226	Braun 2013: 101-102, pl. 75b			EB I	
1	M2555	Cylindrical	Basalt						Tomb 903 upper	Braun 2013: 101-102, pl. 75d. Guy/Engberg 1938: 170, pl. 76:5		complete	EB I	
1	M2635	Cylindrical	Basalt						Tomb 903	Braun 2013: 101-102, pl. 75d.		complete	EB I	
		Cylindrical	Basalt						B/V/1	Braun 2013: 101-102, pl. 33-34		Cache of basalt rings.	EB I	
1	10/J/92/AR1	Cylindrical	Basalt	2,5x2,7	4,7		1,1	91	J-6bc	unpublished		Basalt ring, complete. Well rounded and polished. Hourglass hole.	EB III	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	10/J/152/AR1	Spherical	Basalt	3,2	5,3		1,3	67	J-4	unpublished		Basalt ring, half preserved. Well polished.	EB I	
1	10/J/70/AR1	Cylindrical	Basalt	2,4	4,2		1,4	27,8		unpublished		Basalt ring, half preserved. Well rounded but not well polished.	EB III	
Middle Bronze Age														
1	M3792	Cylindrical	Basalt	2,3	4,5		1,2	60,5	tomb 1102 lower, Exc. 1931/2	Guy/Engberg 1938: 26, pl. 85:12.		Basalt ring, cylindrical, complete. Well shaped, hole slightly hourglass.	MB II	1934-2691
1	10/K/78/AR6	Cylindrical	Basalt	1,4	3,6		1,2	12,4	K-10	Unpublished		Basalt ring, half preserved.	MB III-LB I	
Late Bronze Age														
1	M 2708	Cylindrical?	Basalt			2,1			tomb 877	Guy/Engberg 1938: 170 pl. 96		Basalt ring, hole slightly off-centre.	LB II	
1	00/F/22/AR1	Cylindrical	Basalt	2,6	3		nn	15,7 +x	F-9	Sass/Cinamon 2006: 381, fig. 18.20.	Original weight 63 g.	Basalt ring, fragmentary. 1/4 preserved. Well shaped.	LB IIA	670011
1	08/K/33/AR16	Cylindrical	Basalt	1,3	3,5		1	23,4	K-9	Unpublished		Basalt ring, complete. Well shaped, cylindrical hole made starting from both sides.	LB IIA	
1	10/K/61/AR23	Cylindrical	Basalt	1,8	4,2		0,8	41	K-9	Unpublished		Basalt ring, complete, not perfectly rounded.	LB IIA	
1	08/K/33/AR44	Cylindrical	Basalt	1,3	3,5		1	23,4	K-9	Unpublished		Basalt ring, complete. Well shaped, cylindrical hole made drilling from both sides.	LB IIA	
1	12/Q/132/AR2	Cylindrical	Basalt	1,8	3,2		0,9	27	Q-9	Unpublished		Basalt ring, large hole compared to diameter. Well shaped.	LB IIA	
Iron Age I														
1	02/K/47/AR6		Basalt					1486+ x		Sass/Cinamon 2006: 388, fig. 18.24.	Original weight 3000 g	Pivot for drilling? Half preserved.		
1	00/K/21/AR4		Basalt					407+x	K-4	Sass/Cinamon 2006: 388, fig. 18.24.	Original weight 2000 g	Pivot for drilling?	Late IA I	
1	00/K/61/AR6		Basalt					2058	K-4	Sass/Cinamon 2006: 388, fig. 18.24.		Pivot for drilling?	Late IA I	
1	00/K/61/AR7		Basalt					2525	K-4	Sass/Cinamon 2006: 388, fig. 18.24.		Pivot for drilling?	Late IA I	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	00/K/90/AR3	Basalt ring	Basalt	2,1	4,6		1,4	31,15 +x	K-5	Sass/Cinamon 2006: 381, fig. 18.20.	Original weight 58 g.	Basalt ring, fragmentary. Well shaped, hourglass hole with evident signs of manufacture. Two rounded hollows on one side.	Early IA I	670009
1	00/K/51/AR8	Basalt ring	Basalt	1,5x 1,7	4,2x 3,8		1,1	34,75	K-4	Sass/Cinamon 2006: 381, fig. 18.20.		Basalt ring, irregular shape and thickness. Slightly squared. Hourglass hole.	Late IA I	09-261
1	00/K/51/AR1	Cylindrical	Basalt	2,1	4		1,2	41,43	K-4	Sass/Cinamon 2006: 381, fig. 18.20.		Basalt ring, well shaped and almost cylindrical hole.	Late IA I	09-259
1	10/H/30/AR8	Cylindrical	Basalt	2,1	nn			15,7+ x	H-11, A	unpublished		Basalt ring, fragmentary	Early IA I	
1	12/Q/109/AR1	Cylindrical	Basalt	1,8	3,8x 3,6		1,1	30	Q-7	unpublished		Basalt ring, well shaped but not perfectly rounded.	Late IA I	
Iron Age II														
1	96/K/2/AR5	Cylindrical	Basalt					126 5	Level K-3 (F)	Sass 2000: 376, fig. 12.18:3	Diameter > 10 cm	Pivor for drilling?	Early IA IIA	
1	96/K/41/AR3		limeston e						Level K-3 (F)	Sass 2000: 376, fig. 12.18:5		Fragmentary. Pivot for drilling?	Early IA IIA	
1	M 1179	Cylindrical	Basalt		2,8				locus 380	Lamon/Shipton 1939: pl. 94:82	Found with whorl M 1269	Basalt ring, quite flat. Unpolished surface.	IA II (Stra. IV)	
1	M 374	Cylindrical	Basalt		2,7				locus 203	Lamon/Shipton 1939: pl. 95		very irregular. Broken? Unfinished? Maybe not an actual basalt ring.	IA II (Stra. V)	
1	M 4386	Cylindrical	Basalt		2,5				Locus 1431	Lamon/Shipton 1939: pl. 93.19		Actual basalt ring, quite flattish.	IA IIB (Str. III)	
1	M 1423	Cylindrical	Basalt		2,7				Quadrato Q8	Lamon/Shipton 1939: pl. 93.25		Very regular, seem more a cylinder than a basalt ring.	IA IIC (Str. II)	
1	M 4381	Cylindrical	Basalt		2,6				locus 1001	Lamon/Shipton 1939: pl. 94.15		Actual basalt ring, rounded surface but seem not polished	IA IIB (Str. III)	
1	M 4881	Cylindrical	Basalt						Locus 1445	Lamon/Shipton 1939: 130.		Quite flattish	IA IIB (Str. III)	
1	M 4897	Cylindrical	Basalt		2,7				locus 1561	Lamon/Shipton 1939: pl. 94.37	Found with prf. sherd M 4896.	Very rounded in shape with convex sides and quite high.	IA IIB (Str. III)	
1	M 4921	Cylindrical	Basalt						locus 1542	Lamon/Shipton 1939: 135.			IA IIB (Str. III)	
1	M 5033	Cylindrical	Basalt						locus 15686	Lamon/Shipton 1939: 138.	Found with spindle		IA IIB (Str. III)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
											whorl M 4772.			
1	M 4590	Cylindrical	Basalt		2,3				locus 1461	Lamon/Shipton 1939: pl. 94.38		Actual basalt ring.	IA IIB (Str. III)	
1	96/K/47/AR2	Cylindrical	Basalt	2x1, 8	3,7		1	19+ x	Level K-3 (F)	Sass 2000: 374, fig. 12.17:6.	Original weight 38 g.	Basalt ring, broken in half. Well shaped, hourglass hole but well polished.	Early IAIIA	531003
1	M 5130	Cylindrical	Basalt		2,8				locus N 1598	Lamon/Shipton 1939: pl. 94.39	Found with spatula M 5127	Flattish basalt ring	IA IIB (Str. III)	
1	M 874	Cylindrical	Basalt		2,5				locus 285	Lamon/Shipton 1939: pl. 94.58		Oblique and irregular upper surface, probably not a basalt ring.	IA IIB	
1	94/H/5/AR2	Cylindrical	Basalt					570 +x	Level H-1 (A)	Sass 2000: 376, fig. 12.18:4	Original weight 2475 g	Pivot for drilling?	IA IIB	
1	M 4121		Basalt						Locus 1270	Lamon/Shipton 1939: pl. 114	Stratum II	Pivot for drilling?	IA IIC	
1	M 4891		Basalt						Locus 1309	Lamon/Shipton 1939: pl. 114	Stratum II	Pivot for drilling?	IA IIC	
Unknown context														
1	3756		Basalt			3,4			tomb 63 B	Guy/Engberg 1938: pl. 158		Partially broken, hourglass hole apparently small.		
1	98/J/88/AR1		limeston e						790,2+x	Sass/Cinamon 2006: 388, fig. 18.24.	Original weight 1589 g.	Fragmentary. Pivot for drilling?		
1	00/J/184/AR1		Basalt						123,7+x	Sass/Cinamon 2006: 388, fig. 18.24.	Original weight 250 g.	Unfinished perforation. Fragmentary.		
1	M 5600		Basalt						Locus E=1748, Q9, Area CC	Paice 2004: 167. Loud 1948: 151.				
1	M 5804		Basalt						Locus N=1794, S9, Area CC	Paice 2004: 167. Loud 1948: 153.				
1	98/J/3/AR1	Cylindrica l	Basalt	2,3	4,2		1,1 ca	23,2 +x		Sass/Cinamon 2006, 381.	Original weight 48 g.	Basalt ring, fragmentary. Well rounded and polished. Hourglass hole.		

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	00/F/66/AR2	Cylindrical	Basalt	2,1	nn			21,7 +x		Sass/Cinamon 2006: 381, fig. 18.20.	Original weight 90 g.	Basalt ring, fragmentary. Well rounded and polished. Hourglass hole.		
1	00/F/68/AR2	Cylindrical	Basalt	2,8	2,8	1,4	nn	13,7 +x		Sass/Cinamon 2006: 381, fig. 18.20.	Original weight 68,5 g.	Small fragment of basalt ring.		670008
1	00/K/3/AR1	Cylindrical	Basalt	1,8	3,2		1	26,05		Sass/Cinamon 2006: 381, fig. 18.20.		Basalt ring, complete, quite thick and well shaped. Hourglass hole but polished.		09-258
1	12/K/14/AR5	Spherical	Basalt	3,3	4,1		1,2	33,8		unpublished		Basalt weight, spherical, very well shaped and rounded. Cylindrical hole. Half preserved.		

Bone Spatulae

Neolithic/Chalcolithic

1	M4870	spatula	Bone						U16 stage V	Braun 2013: 99, pl.74	Uncertain chronology: Neolithic/BA	Bone spatula, complete. Long and thin, quite pointed.		
1	M4873	spatula	Bone						U16 stage VI	Braun 2013: 99, pl.74. Engberg/Shipton 1934: fig. 13M	Uncertain chronology: Neolithic/BA	Bone spatula, one end missing. Triangular point.		
1	M4874	spatula	Bone						U16 stage VII	Braun 2013: 99, pl.74. Engberg/Shipton 1934: fig. 13N	Uncertain chronology: Neolithic/BA	Bone spatula, one end missing. Pen-nib point.		

Early Bronze Age

	c 480	pin beater	Bone		10,8	1	0,5		4067 Exc. 1938			pin beater? Broken at both ends. Extremely polished.	EB I (Str. XIX)	1939-681
	96/J/21/AR3	spatula	Bone						Level J-4 (F)	Sass 2000: 379.		Fragment polished on one side.	EB Ib	
	96/J/35/AR2	spatula	Bone						Level J-4 (A)	Sass 2000: 379, fig. 12.20:1.		Rib of sheep/goat, point broken.	EB Ib	
	96/J/48/AR1	spatula	Bone						Level J-6 (A)	Sass 2000: 379.		Fragment of cattle rib, polished on one side	EB III	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
	00/J/50/AR3		Bone						Level J-1	Sass/Cinamon 2006: 395.			EB I	
	98/J/21/AR3		Bone						Level J-4	Sass/Cinamon 2006: 395.		Fragment	EB Ib	
	00/J/123/AR1		Bone						Level J-4	Sass/Cinamon 2006: 395.			EB Ib	
	00/J/166/AR3		Bone						Level J-4	Sass/Cinamon 2006: 395.			EB Ib	
	98/J/32/AR6	spatula	Bone						Level J-6	Sass/Cinamon 2006: 395, fig. 18.29		Bone spatula, broken at both ends.	EB III	
	98/J/32/AR8	spatula	Bone						Level J-6	Sass/Cinamon 2006: 395, fig. 18.29		Fragmentary bone spatula, one end with long point.	EB III	
	00/J/125/AR4		Bone						Level J-6	Sass/Cinamon 2006: 395.			EB III	
	98/J/20/AR2	spatula	Bone						Level J-7	Sass/Cinamon 2006: 395, fig. 18.29		Small fragment of bone spatula, triangular point, asymmetrical.	EB III	
	c 206	spatula	Bone						4049	Loud 1948: pl. 198:3		Bone spatula, incomplete. Long and narrow with a triangular point.	EB Ib (Str. XVIII)	
	c 53	spatula	Bone						E=3177	Loud 1948: pl. 198:5		Bone spatula, incomplete. Long and very thin point like a pen-nib.	EB III (Str. XVII)	
	c 304	spatula	Bone	7,5	1,4	0,5			E 4049	Loud 1948: pl. 198:4		Bone spatula, smoothed and shiny. One end rounded and the other pointed.	EB Ib (Str. XVIII)	1939-678
	d 610	spatula	Bone						N 5193	Loud 1948: pl. 198:6		Bone spatula, incomplete. Convex shape. Triangular point preserved.	EB III (Str. XVI)	
	d 776	spatula	Bone						N 5184	Loud 1948: pl. 198:8		Bone spatula broken at both end. Quite peculiar shape. Right-hand edge sharpened	EB III (Str. XVI)	
	d 660	spatula	Bone						N 4040	Loud 1948: pl. 198:9		Bone spatula, long and thin, made from a rib. One end missing, the other ending with a well shaped triangular point.	EB III (Str. XV)	
Middle Bronze Age														
1	2833	spatula	Bone	1 7	2	0,2			T 24		Megiddo exc. 1925-27 Tomb 24, n. 1833	Fragment of bone spatula, one preserved end rounded. Broken on two sides. Smoothed where preserved.	MB II	I-3063
1	2833a	spatula	Bone	1 3,8	1,8	0,2			T 24		Megiddo exc. 1925-27 Tomb 24, n. 1833	Fragment of bone spatula, one preserve end with elongated point, well dressed and polished. Long and this scratches on the surface. Not part of 2833.	MB II	I-3063

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	04/J/22/AR11	spatula	Bone						J-9b	Blockman/Sass 2013: 888, fig. 23.8		Small fragment of bone spatula, with the traingular point preserved, but chipped.	MB I	
1	d 524	pin beater	Bone						T.5180	Loud 1948: pl. 198.13		Pin beater. Complete, chipped on the point.	MB I (Str. XIV)	
1	d 525	pin beater	Bone						T.5180	Loud 1948: pl. 198.12		Pin beater, almost complete. Cut to form a thin point	MB I (Str. XIV)	
1	d 460	pin beater	Bone						T.5121	Loud 1948: pl. 198.15		Pin beater, almost complete. Cut to form a thin point	MB I (Str. XIV)	
1	d 400	pin beater	Bone						T.5121	Loud 1948: pl. 198.14		Pin beater, almost complete. Cut to form a thin point	MB I (Str. XIV)	
1	d 455	pin beater	Bone						T.5125	Loud 1948: pl. 198.16		Pin beater, almost complete. Cut to form a thin point	MB I (Str. XIV)	
1	d 373	pin beater	Bone						T.5125	Loud 1948: pl. 198.17		Pin beater, almost complete. Cut to form a thin point	MB I (Str. XIV)	
1	d 300	pin beater	Bone						E 5095	Loud 1948: pl. 199.21		Pin beater, almost complete. Cut to form a thin point	MB I (Str. XIIIa)	
1	d 719	pin beater	Bone						T.5255	Loud 1948: pl. 199.22		Pin beater, complete. Cut to form a thin point	MB II (Str. XII)	
1	b 342	pin beater	Bone						3049	Loud 1948: pl. 199.23		Pin beater, complete. Cut to form a thin point	MB II (Str. X)	
Late Bronze Age														
1	a 295	spatula	Bone						S 2048	Loud 1948: pl. 199.25		Bone spatula, with a rounded end and the other pointed (?).	LB II-III	
1	00/F/55/AR1	spatula	Bone						F-10a	Sass/Cinamon 2006: 395, fig. 18.29.		Beautiful bone spatula, almost oval, both ends rounded. Groove (or fracture?) on side.	LB I	
1	00/F/31/AR1		Bone						F-9	Sass/Cinamon 2006: 395, fig. 18.29.		Gazelle horn.	LB IIA	
1	06/M/8/AR15	pin beater	Bone						M-6	Blockman/Sass 2013: 887, fig. 23.5.		Beater with triangular section.	LB III	
Iron Age I														
1	M 5512	spatula	Bone						E 1727	Loud 1948: pl. 199		Bone spatula with one rounded and slightly oblique end and the other pointed.	IA I (Str. VI)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 5637	spatula	Bone						E1760	Loud 1948: pl. 199		Bone spatula with a flat end and the other pointed but broken.	IA I (Str. VI)	
1	12/Q/117/AR1	Point	Bone	7	0,9				Q-8	Unpublished		Bone point, broken at one end. Pin beater? Surface marks compatible with manufacture-	Late IA I	
Iron Age II														
1	12/Q/99/AR1	Spatula	Bone	9,4	1,7	0,3			Q-5	Unpublished		Bone spatula, broken at one end, the other has a triangular point. All the surface appear smoothed and polished.	Early IA IIA	
1	96/K/I05/AR8	spatula	Bone						Level K-2 (F)	Sass 2000: 379, fig. 12.20:2		Fragment of cattle rib, longitudinally cut and polished on both sides. One end triangular, the other missing.	Late IAIIA	
1	96/K/46/AR5	spatula	Bone						Level K-2 (F)	Sass 2000: 379.		Bone spatula, polished on top and on sides.	Late IAIIA	
1	M 5531		Bone						under Room 1734 Area CC	Paice 2004: 81.				
1	98/K/28/AR2		Bone						K-3	Sass/Cinamon 2006: 395.			Early IA IIA	
1	98/H/79/AR2		Bone						H-5	Sass/Cinamon 2006: 395.			Late IAIIA	
1	00/H/22/AR12		Bone						H-5	Sass/Cinamon 2006: 395.			Late IAIIA	
1	00/H/22/AR13		Bone						H-5	Sass/Cinamon 2006: 395.			Late IAIIA	
1	00/H/39/AR2	spatula	Bone						H-5	Sass/Cinamon 2006: 395, Fig. 18.29.		Bone spatula, fragmentary. Triangular point.	Late IAIIA	
1	00/L/22/AR2	spatula	Bone						L-3	Sass/Cinamon 2006: 395, Fig. 18.29.		Bone spatula, complete. One end pointed, the other flat.	Late IAIIA	
1	M 276	spatula	Bone						Quad Q 13	Lamon/Shipton 1939: pl. 95		Bone spatula, complete. One end with a pen-nib point, the other flat.	Late IA IIA (Str. V)	
1	M 5405	spatula	Bone						Locus 1493 (R 10)	Lamon/Shipton 1939: pl. 96		Bone spatula, complete. One end with an elongated point, the other rounded.	Late IA IIA (Str. V)	
1	M 5442	spatula	Bone						Locus 1712	Lamon/Shipton 1939: pl. 96		Bone spatula, broken. One end with an elongated point, the other missing.	Late IA IIA (Str. V)	
1	M 5293	spatula	Bone						Locus 1666	Lamon/Shipton 1939: pl. 96		Bone spatula, broken. One end with a triangular point, the other missing.	Late IA IIA (Str. V)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 5378	spatula	Bone						Locus 1700	Lamon/Shipton 1939: pl. 96		Bone spatula, complete. One end with a triangular point, the other rounded.	Late IA IIA (Str. V)	
1	M 5281	spatula	Bone						Locus 1660	Lamon/Shipton 1939: pl. 96		Bone spatula, broken. Large, one end with a triangular point the other rounded.	Late IA IIA (Str. V)	
1	M 5353	spatula	Bone						Locus 1660	Lamon/Shipton 1939: pl. 96		Bone spatula, broken. One end with a pen-nib point.	Late IA IIA (Str. V)	
1	96/K/11/AR3	spatula	Bone						Level K-2 (F)	Sass 2000: 379, fig. 12.20:3.		Bone spatula, complete. One end with a triangular point, the other rounded. One side completely smoothed, the other partially.	Late IA IIA	
1	a 720	spatula	Bone						N 2103	Loud 1948: pl. 199		Bone spatula, complete. One end rounded, the other with a sharp point.	Late IA IIA (Str. Va)	
1	a 4	spatula	Bone						Sq. N 14, 401 (IV)	Loud 1948: pl. 199		Bone spatula, complete. One end flat, the other with a sharp point.	IA IIA (Str. V)	
1	a 823	spatula	Bone						2081	Loud 1948: pl. 199		Bone spatula with a rounded end, the other with a sharp point.	Late IA IIA (Str. Va)	
1	96/K/28/AR2/1	spatula	Bone						Level K-2 (F)	Sass 2000: 379, fig. 12.20:5.		Fragment of a cattle rib, polished on both sides. Broken at both ends.	Late IA IIA	
1	96/K/28/AR2/2	spatula	Bone						Level K-2 (F)	Sass 2000: 379, fig. 12.20:4.		Bone spatula, broken. One end with a triangular point, the other rounded. Polished on both sides.	Late IA IIA	
1	96/K/28/AR2/3	spatula	Bone						Level K-2 (F);	Sass 2000: 379, fig. 12.20:6.		Fragment of bone spatula, polished on both sides, broken at both ends.	Late IA IIA	
1	00/H/72/AR5	spatula	Bone						H-7, F	Blockman/Sass 2013: 888, fig. 23.8.		Almost complete bone spatula, partially broken at one end. Well shaped triangular end, the other was probably rounded. Flat.	Early IA IIA	
1	M 1306	pin beater	Bone (gazelle)						Locus 419	Lamon/Shipton 1939: pl. 98:13			Late IA IIA (Str. V)	
1	M 1820	pin beater	Bone (gazelle)						Sq. M 7 sup.	Lamon/Shipton 1939: pl. 98:16			Late IA IIA (Str. V)	
1	M 4518	spatula	Bone						Locus 1478	Lamon/Shipton 1939: pl. 95		Bone spatula, one end missing, the other with a triangular point.	IA IIB (Str. IV)	
1	M 350	spatula	Bone						Sq. Q 12	Lamon/Shipton 1939: pl. 95		Bone spatula, quite large and roughly made. One end with an elongated point, but broken and the other diagonally cut.	IA IIB (Str. IV)	
1	M 1343	spatula	Bone						Locus 338	Lamon/Shipton 1939: pl. 95		Long and thin spatula with a sharp point and the other rounded.	IA IIB (Str. IV)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 5286	spatula	Bone						Locus 1674 filling	Lamon/Shipton 1939: pl. 96.1		Long and thin bone spatula with an elongated point and the other end flat.	IA IIB (Str. IV)	
1	M 5232	spatula	Bone						Locus 1674 filling	Lamon/Shipton 1939: pl. 96.2		Bone spatula, roughly cut. One end pointed and the other rounded.	IA IIB (Str. IV)	
1	M 5230	spatula	Bone						Locus 1674 filling	Lamon/Shipton 1939: pl. 96.3		Bone spatula, one point diagonally cut and the other end broken.	IA IIB (Str. IV)	
1	M 5248	spatula	bone						Locus 1674 filling	Lamon/Shipton 1939: 147.		Long and thin bone spatula with an elongated point and the other end flat. Similar to 96.1	IA IIB (Str. IV)	
1	M 5269	spatula	bone						Locus 1674 filling	Lamon/Shipton 1939: 147.		Long and thin bone spatula with an elongated point and the other end flat. Similar to 96.1	IA IIB (Str. IV)	
1	M 5354	spatula	bone						Locus 1674 filling	Lamon/Shipton 1939: 147.		Long and thin bone spatula with an elongated point and the other end flat. Similar to 96.1	IA IIB (Str. IV)	
1	M 5397	spatula	bone						Locus 1674 filling	Lamon/Shipton 1939: 147.		Long and thin bone spatula with an elongated point and the other end flat. Similar to 96.1	IA IIB (Str. IV)	
1	98/H/38/AR3		Bone						H-4	Sass/Cinamon 2006: 395.	Not illustrated		IA IIB	
1	94/H/13/AR2		Bone						Level H-3 (F)	Sass 2000: 379	Not illustrated	Fragment of a cattle rib.	IA IIB	
1	96/H/44/AR20		Bone						Level H-3 (F)	Sass 2000: 379	Not illustrated	Small fragment polished on both sides.	IA IIB	
1	M 4426	spatula	Bone						Locus 1437	Lamon/Shipton 1939: pl. 95		Bone spatula, almost complete with triangular point.	IA IIC (Str. II)	
1	M 4619	spatula	Bone						Locus 1526	Lamon/Shipton 1939: pl. 95		Bone spatula, complete. One end with a triangular point and the other rounded.	IA IIB (Str. III)	
1	M 4808	spatula	Bone						Locus 1585	Lamon/Shipton 1939: pl. 95		Bone spatula, almost complete. One end with a triangular point and the other rounded.	IA IIB (Str. III)	
1	M 4511	spatula	Bone						Locus W 1432	Lamon/Shipton 1939: pl. 95		Bone spatula, one end rounded and the other missing.	IA IIB (Str. III)	
1	M 4583	spatula	Bone						Locus 1490	Lamon/Shipton 1939: pl. 95		Bone spatula, complete. One end with a triangular point and the other rounded.	IA IIB (Str. III)	
1	M 4609	spatula	Bone						Locus 1534	Lamon/Shipton 1939: pl. 95		Long bone spatula, complete. One end with a pen-nib point and the other flat.	IA IIB (Str. III)	
1	M 5120	spatula	Bone						Locus 1545	Lamon/Shipton 1939: pl. 95		Bone spatula, complete. One end with a tringular point and the other rounded.	IA IIB (Str. III)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 4655	spatula	Bone						Locus 4655	Lamon/Shipton 1939: pl. 95		Bone spatula, complete. One end with a tringular point and the other rounded.	IA IIB (Str. III)	
1	M 4514	spatula	Bone						Locus 1474	Lamon/Shipton 1939: pl. 95		Bone spatula, complete. One end with a tringular point and the other rounded.	IA IIB (Str. III)	
1	M 4529	spatula	Bone						Locus 1488	Lamon/Shipton 1939: pl. 95		Bone spatula, almost complete with both ends pointed. One end well shaped, the other irregular or broken.	IA IIB (Str. III)	
1	M 871	spatula	Bone						Quad R1	Lamon/Shipton 1939: pl. 95		Bone spatula, complete. One end with an elongated point and the other flat.	IA IIB (Str. III)	
1	M 4453	spatula	Bone						Locus 1414	Lamon/Shipton 1939: pl. 95		Bone spatula, complete. One end with an elongated point and the other flat.	IA IIB (Str. III)	
1	M 4480	spatula	Bone						Locus 1414	Lamon/Shipton 1939: pl. 95		Bone spatula, complete. One end with a tringular point and the other rounded.	IA IIB (Str. III)	
1	M 824	spatula	Bone						Locus 272	Lamon/Shipton 1939: pl. 95		Bone spatula, complete. One end with a tringular point and the other rounded.	IA IIB (Str. III)	
1	M 336	spatula	Bone						Locus 201	Lamon/Shipton 1939: pl. 95		Bone spatula, long and thin, broken. Preserved end with an elongated point.	IA IIB (Str. III)	
1	M 1101	spatula	Bone						Locus 317	Lamon/Shipton 1939: pl. 95		Bone spatula, complete. One end with a triangular point, the other rounded.	IA IIB (Str. III)	
1	M 906	spatula	Bone						Locus 297	Lamon/Shipton 1939: 123.	Not illustrated	Bone spatula with triangular point and the other end rounded.	IA IIB (Str. III)	
1	M 915	spatula	Bone						Locus 297	Lamon/Shipton 1939: 123.	Not illustrated	Bone spatula with triangular point and the other end rounded.	IA IIB (Str. III)	
1	M 4187	spatula	Bone						Locus 1252	Lamon/Shipton 1939: pl. 95		Bone spatula with triangular point and the other end rounded.	IA IIC (Str. II)	
1	M 4487	spatula	Bone						Locus 1449	Lamon/Shipton 1939: pl. 95		Bone spatula with triangular point and the other end slightly pointed.	IA IIC (Str. II)	
Unknown context														
1	x 623		Bone						Tomb 26 E	Guy/Engberg 1938: pl. 155		Bird bone		
1	1861		Bone						Tomb 59	Guy/Engberg 1938: pl. 157		Bird bone		
1	98/J/19/AR6		Bone							Sass/Cinamon 2006: 395, fig. 18.29.		Small fragment		
1	00/J/14/AR2		Bone							Sass/Cinamon 2006: 395.	Not illustrated			

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	00/J/45/AR5		Bone							Sass/Cinamon 2006: 395.	Not illustrated			
1	00/K/44/AR7	Spatula	Bone							Sass/Cinamon 2006: 395, fig. 18.29.		Bone spatula with an elongated point. Broken.		
1	08/Q/78/AR18	Spatula	Bone	6,1	1,7	0,4				Unpublished		Bone spatula broken at both ends, very well polished. One end probably elongated.		
1	10/Q/79/AR6	Spatula	Bone	6,4	2,1	0,2				Unpublished		Bone spatula with a rounded end and the other missing. Very thin and fragile. Well polished on both sides.		
1	10/Q/91/AR5	Spatula	Bone		ca 2,9					Unpublished		Bone spatula, fragmentary with a triangular point.		
1	10/K/47/AR1	Point	Bone	8,2	1,6	0,5						Not a beater nor a spatula.		
1	10/K/44/AR5	Point	Bone	7,8	1,1	0,5			US	Unpublished		Not a beater nor a spatula.		
1	10/Q/14/AR1	spatula	Bone	6,7	3	0,15				Unpublished		Bone spatula broken at one end, while the other is rounded. Very thin and fragile. Well polished on both sides.		

Needles and bodkins

Early Bronze Age

5	c 374	bodkin	Bone						Cave 4067	Loud 1948: 140, pl. 165	Above roof debris	5 needle shuttles. 5 bone bodkins, fragmentary, large and flat. Very large and rounded point which could be used as spatula. One preserved part of the eye.	EB I (Str. XX)	39679
1	c 167		Bone						Rm N 4042	Loud 1948: pl. 186.1		Bone needle, complete. Large, triangular head and tapering toward the other end which is pointed.	EB III (Str. XVII)	
1	d 522		Bronze						Quad M 12, angolo SW	Loud 1948: pl. 186.2		Bronze needle, with eye missing. Thickening in the middle and one end slightly bent.	EB III (Str. XVI)	
1	a 52		Bronze						N 2048	Loud 1948: pl. 187.12		Long and thick bronze needle, complete. Large eye obtained	EB II (Str. VIII)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
												probably by bending on itself the upper part of the shaft		
Middle Bronze Age														
1	M3228		Bone						Tomb 1014 B	Guy/Engberg 1938: 47, pl. 102		Bone needle, broven in several fragments. One of the end is flat and has a round hole passing through it.	MB I	
1	d 720		Bronze						Quad N 13, angolo NW	Loud 1948: pl. 186.3		Bronze needle, complete. Large eye obtained by bending on itself the upper part of the shaft	MB I (Str. XIV)	
1	d 792		Bronze						5265	Loud 1948: pl. 186.4		Bronze needle, not complete, point missing. Large eye obtained by bending on itself the upper part of the shaft	MB II (Str. X)	
1	d 683		Bronze						T.5240	Loud 1948: pl. 186.5		Bronze needle, complete. Large eye obtained by bending on itself the upper part of the shaft	MB II (Str. X)	
1	d 127		Bronze						E 5033	Loud 1948: pl. 186.6		Long and thick bronze needle, complete. Large eye obtained by bending on itself the upper part of the shaft	MB II (Str. X)	
1	b 297		Bronze						E 3036	Loud 1948: pl. 186.7		Long and thin bronze shat, no eye is visible. Bent on the upper part	MB II (Str. X)	
1	b 343		Bronze						3049	Loud 1948: pl. 186		Toggle pin? Long and thin needle, bent, but eye not properly at the top.	MB II (Str. X)	
1	98/J/124/ar7		Bone	5,9	0,8x 0,5	0,3	0,3		MB pit	Sass/Cinamon 2006: 389, fig. 18.26.		Bone needle broken at one end. Hole made by drilling from both sides.	MB	
Late Bronze Age														
1	M 3516		Bronze						Tomba 1100 A	Guy/Engberg 1938: pl. 145.6		Short and thick bronze needle. Large eye obtained by bending on itself the upper part of the shaft	LB I	
1	M 3484		Bronze						Tomba 1100 C	Guy/Engberg 1938: pl. 148.4		Bronze needle, complete. Eye (not visible from publication) obtained by bending on itself the ending part of the shaft. Shaft bent in the middle.	LB I	
1	b 224		Bronze						T.3018 D	Loud 1948: pl. 186.9		Small bronze needle with large eye obtained by bending on itself the ending part of the shaft. Complete.	LB I (Str. IX)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	a 103		Bronze						N=T.2017	Loud 1948: pl. 186.10		Toggle pin? Long and very thin needle, but eye not properly at the top.	LB I (Str. IX)	
1	d 641		Bronze						N 5110	Loud 1948: pl. 186.11		Long and thick bronze needle, complete. Large eye obtained by bending on itself the upper part of the shaft	LB I (Str. IX)	
1	b 348		Bronze						3187	Loud 1948: pl. 187.13		Extremely long bronze shaft (eye not visible from image), bent in the middle.	LB IIB (Str. VIIB)	
1	M 6121		Bronze						N 1833	Loud 1948: pl. 187.14		Thick bronze shaft with flat end where eye should be.	LB IIB (Str. VIIB)	
1	a 1120		Bronze						2039	Loud 1948: pl. 187.15		Long and thick bronze needle, almost complete, point missing. Large eye obtained probably by bending on itself the upper part of the shaft	LB IIB (Str. VIIB)	
1	M 5828		Bronze						N 1805	Loud 1948: pl. 187.16		Bronze needle with large eye obtained by bending on itself the ending part of the shaft. Broken.	LB III (Str. VIIA)	
1	98/F/72/AR4		Bronze						F-10	Sass/Cinamon 2006: 389, fig. 18.26.		Very small and thin bronze needle	LB I	
1	98/M/12/AR2		Bronze						M-6	Blockman/Sass 2013: 885, fig. 23.5.2.		Small fragment of a bronze needle probably with large eye obtained by bending on itself the ending part of the shaft. Broken.	LB III	
1	06/K/4/AR11		Bronze						K-8, F	Blockman/Sass 2013: 885, fig. 23.5.4.		Bronze needle, complete. with large eye obtained by bending on itself the ending part of the shaft.	LB IIB	
1	06/K/60/AR5		Bronze						K-8, F	unpublished, not studied			LB IIB	
Iron Age I														
1	b 304		Bronze	12,7	0,4				Locus 3041, Area AA	Loud 1948: pl. 187.17. Paice 2004: 90, pl. 29:4		Long and thick bronze needle, complete. Large eye obtained probably by bending on itself the upper part of the shaft	Early IA I (Str. VIB)	
1	M 5632		Bronze	20	0,5				Locus 1761, Area CC	Loud 1948: pl. 187. Paice 2004: 91, pl. 29:2.		Long and thick bronze needle, complete. Large eye obtained probably by bending on itself the upper part of the shaft	IA I (Str. VI)	
1	M 5465		Bronze	22	0,4				Locus 1741, Area CC	Loud 1948: pl. 187. Paice 2004: 90, pl. 29:1.		Long and thick bronze needle, complete. Large eye obtained probably by bending on itself the upper part of the shaft	IA I (Str. VI)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 5530		Bronze	15,5	0,4				Quad R 9, 1734 (V), Area CC	Loud 1948: pl. 187. Paice 2004: 90, pl. 29:3.		Long and thick bronze needle, complete. Large eye obtained probably by bending on itself the upper part of the shaft	IA I (Str. VI)	
3	a 366		Bronze						2070	Loud 1948: pl. 187. Paice 2004: 81, 90, pl. 29:17.		Group of needles (3) inside of a bone needle case (7.9x1.5 cm). Needles are long 9, 10, 11 cm and 0,1 cm thick.	Late IA I (Str. VIA)	
3	a 400		Bronze						Locus 2071, Area AA	Loud 1948: pl. 187. Paice 2004: 81, 90, pl. 29:18.		Three needles vey thin without a case. Lenghts of 7,5, 8, 8,5 cm and diam of 0,1 cm.	Late IA I (Str. VIA)	
1	M 5738		Bone						Locus N=1732 area CC	Loud 1948: 150. Paice 2004: 81	Not drawn		IA I (Str. VI)	
1	M 5749		Bone						Locus 1740 Area CC	Paice 2004: 81	Not drawn		IA I (Str. VI)	
1	M 5667		Ivory						Locus 1769, Area CC	Loud 1948: 152.Paice 2004: 81, 162.	Not drawn		IA I (Str. VI)	
1	a 459		Bronze						Locus 2078, Area BB	Loud 1948: 161. Paice 2004: 91.	Not drawn		IA I (Str. VI)	
1	a 935		Bronze						Locus 2101, Area AA	Loud 1948: 163. Paice 2004: 91.	Not drawn		IA I (Str. VI)	
1	M 5529		Bronze						Locus 1735, Area CC	Loud 1948: 150. Paice 2004: 91.	Not drawn		IA I (Str. VI)	
1	M 5536		Bronze						Locus 1738, Area CC	Loud 1948: 150. Paice 2004: 91.	Not drawn		IA I (Str. VI)	
1	M 5543		Bronze						Locus 1743, Area CC	Loud 1948: 151. Paice 2004: 91.	Not drawn		IA I (Str. VI)	
1	M 5591		Bronze						Locus 1738, Area CC	Loud 1948: 150. Paice 2004: 91.	Not drawn		IA I (Str. VI)	
1	M 5617		Bronze						Locus 1757, Area CC	Loud 1948: 152.Paice 2004: 91.	Not drawn		IA I (Str. VI)	
1	M 5669		Bronze						Locus 1769, Area CC	Loud 1948: 152. Paice 2004: 91.	Not drawn		IA I (Str. VI)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 5697		Bronze						Locus 1741, Area CC	Paice 2004: 91.	Not drawn		IA I (Str. VI)	
1	M 5699		Bronze						Locus 1754, Area CC	Loud 1948: 152.Paice 2004: 91.	Not drawn		IA I (Str. VI)	
1	M 5736		Bronze						Locus 1732, Area CC	Loud 1948: 149. Paice 2004: 91.	Not drawn		IA I (Str. VI)	
1	M 5737		Iron						Locus 1732, Area CC	Loud 1948: 149. Paice 2004: 91, 162	Not drawn		IA I (Str. VI)	
1	M 5735		Ivory						Locus N=1732 area CC	Loud 1948: 150. Paice 2004: 81, 162.	Not drawn		IA I (Str. VI)	
1	98/K/41/AR18		Bronze						K-4	Sass/Cinamon 2006: 389, fig. 18.26	Occupational debris. Found with 4 other whorls.	Small fragment of bronze needle. Large eye obtained probably by bending on itself the upper part of the shaft	Late IA I	
1	98/K/42/AR3		Bronze						K-4	Sass/Cinamon 2006: 389, fig. 18.26		Bronze needle, complete. Large eye obtained probably by bending on itself the upper part of the shaft	Late IA I	
1	98/K/42/AR4		Bronze						K-4	Sass/Cinamon 2006: 389, fig. 18.26		Bronze needle, upper part bent. Eye not visible.	Late IA I	
1	98/K/89/AR1		Bronze						K-4	Sass/Cinamon 2006: 389, fig. 18.26		Small bronze shaft, probably needle.	Late IA I	
1	08/H/6/AR2	needle	Bronze						H-9	Blockman/Sass 2013: 885, fig. 23.5.		Bronze needle, complete. Large eye obtained probably by bending on itself the upper part of the shaft	Late IA I	
1	08/H/24/AR4	needle	Bronze						H-9	Blockman/Sass 2013: 885, fig. 23.5.		Small fragment of a bronze needle. Large eye obtained probably by bending on itself the upper part of the shaft	Late IA I	
1	00/M/38/AR1	bodkin	bone						M-4	Blockman/Sass 2013: 888, fig. 23.8.		Bone bodkin, with point missing. Rounded section, quite thick head with a eye. Worked antler of Mesopotamian fallow deer. Considered as a beater.	Late IA I	
Iron Age II														
1	a 329		Bone						Quad M 13, 404	Loud 1948: pl. 187		Round section, flattened toward head, which il very large.	IA II (Str. V?)	

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	M 5229		Bronze						Locus 1674	Lamon/Shipton 1939: pl. 84.		Quite long and thick bronze needle. Eye probably perforated through the shaft.	IA II (Str. IV)	
1	M 5234		Bronze						Locus 1674	Lamon/Shipton 1939: pl. 84.		Quite small and thin bronze needle. Eye not visible. Bent	IA II (Str. IV)	
1	M 5315		Bronze						Locus 1674	Lamon/Shipton 1939: pl. 84.		Short and thick bronze needle. Point seem to split in two. Not visible how eye was obtained	IA II (Str. IV)	
1	M 5236		Bronze						Locus 1674	Lamon/Shipton 1939: pl. 84.		Very thick bronze needle (?) or loop-headed pin. Complete.	IA II (Str. IV)	
1	M 5214		Bronze						Locus 1674	Lamon/Shipton 1939: pl. 84.		Very long bronze needle. Complete. Large eye obtained probably by bending on itself the upper part of the shaft	IA II (Str. IV)	
1	M 222		Bronze						Locus 67	Lamon/Shipton 1939: pl. 84.		Very thin bronze needle, complete. Eye obtained probably by bending on itself the upper part of the shaft	IA II (Str. V)	
1	M 114		Bronze						Locus 592	Lamon/Shipton 1939: pl. 84.		Very thin bronze needle, complete. Eye obtained probably by bending on itself the upper part of the shaft	IA II (Str. V)	
1	M 4464		Bronze						Locus 728	Lamon/Shipton 1939: pl. 84.		Long bronze needle, complete. Eye obtained probably by bending on itself the upper part of the shaft	IA IIC	
1	M 3323		Bronze						Locus 1004	Lamon/Shipton 1939: pl. 84.		Very thick bronze needle , point missing. Eye obtained probably by bending on itself the upper part of the shaft	IA IIC	
1	M 4348		Bronze						Locus 1421	Lamon/Shipton 1939: pl. 84.		Long and thin bronze needle, eye obtained perforating the shaft.	IA IIB	
Unknown context														
1	x624		Bronze						Tomb 26 E	Guy/Engberg 1938: pl. 155				
1	M 707		Bronze						Tomb 19	Guy/Engberg 1938: pl. 175		Complete.		
1	96/K/54/AR8		Iron							Sass 2000: 379, fig. 12.21: 1.		Fragmentary		
1	00/F/74/AR1		Bronze	12,4	0,3	head 0,5				Sass/Cinamon 2006: 389, fig. 18.26.		Eye not visible		

Q.	N.	Typology	Material	H	D	Th	Hole	W	Level	Bibliography	Notes	Description	Dating	IAA
1	98/K/47/AR7		Bronze							Sass/Cinamon 2006: 389.		Eye missing		
1	00/K/37/AR1		Bronze							Sass/Cinamon 2006: 389, fig. 18.26.		Not a needle		
1	98/M/12/AR2		Bronze							Blockman/Sass 2013: 885, fig. 23.5.				
1	04/K/51/AR4		Bronze							Blockman/Sass 2013: 885.	Frammento con la cruna	Fragment with eye.		

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA

8.2 BETH SHEAN

Spindles													
1	27-10-524		bone						1251	James/McGovern 993: 183, fig. 109.5.		Bone rod, not complete. One end is flat and the other missing. Incised decoration on the surface. Section irregular, not rounded. Not tapering towards one end. It seems difficult that it could be used as a spindle.	LB IIB (Str. VII)	
1	25-9-32		ivory						1002	ames 1966: fig. 114. PPS II, I, pl. 31:46	P. 29-105-210	Bone or ivory rod, not complete. One end is rounded and the other seems broken. Incised decoration on the surface.	IA II	

Spindle whorls													
Neolithic – Chalcolithic													
1	33-10-1092	Dome	Limestone						below room 1881	Braun, Eliot. 2004. Early Beth Shan (strata XIX-XIII): G.M. Fitzgerald's Deep Cut on the Tell. : Page/Fig./Plate: 4.9/9	P. 34-21-140		Chalcolithic/EB IA (Str. XVII)	
1	33-11-275 a	Discoid	Stone						1892		P. 34-21-141		Chalcolithic/EB IA (Str. XVII)	
1	33-11-92	Discoid	Limestone						1896		P. 34-21-143		Chalcolithic/EB IA (Str. XVII)	
1	33-11-289a	Discoid	Limestone						pit N. of 1898		P. 34-21-380		Neolithic/Chalcolithic (Str. XVIII)	
1	33-11-124a	Discoid	Limestone						below rooms	Braun 2004, 4.9/13	P. 34-21-263		Neolithic/Chalc	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
								1895-1896				olithic (Str. XVIII)	
1	33-11-124b	Discoid	Stone					below rooms 1895-1896		P. 34-21-264		Neolithic/Chalcolithic (Str. XVIII)	
1	33-11-226a	Discoid	Stone					1898		P. 34-21-266		Neolithic/Chalcolithic (Str. XVIII)	
1	33-11-289a	Discoid	Limestone					1898		P.34-21-380		Neolithic/Chalcolithic (Str. XVIII)	
1	33-11-70a	Discoid	Stone					Pit W. of 1899		P.34-21-381		Neolithic/Chalcolithic (Str. XVIII)	
1	33-10-1092	Dome	Limestone					below room 1881	Braun 2004, 4.9/9	P.34-21-140		Chalcolithic/EBIA (Str. XVII)	
1	33-11-275a	Discoid	Stone					1892		P.34-21-141		Chalcolithic/EBIA (Str. XVII)	
1	33-11-275b	Discoid	Stone					1892		P.34-21-142	Incompleted pierced from two sides.	Chalcolithic/EBIA (Str. XVII)	
1	33-11-92	Discoid	Limestone					1896	Braun 2004 4.9/14	P.34-21-143			
1	33-11-124c	ovoid	Stone					below rooms 1895-1896	Braun 2004, 4.8/10	P.34-21-265	Perforated pebble	Neolithic/Chalcolithic (Str. XVIII)	
Early Bronze Age													

N.		Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1		Discoid	Limestone	0,5	nn	3,8	1,2	3,5	L 10961		M			
1	380236		Baked clay	0,9		3,5x 3,7		16,2 0 +x	L 38005	Mazar/Rotem 2012: 357.	M 2b	Pottery fragment of an object. Oblong and half preserved		
1	1435/457 or 14-1764	Discoid	Stone	0,7	4,2		0,7	17,5 6+x				Flat pebble with cylindrical hole. Broken		
1	181207	Discoid	Grey stone	1	3,8		2,7	19,7 8+x	10056	Mazar/Rotem 2012, 371 pl. 9.9:20		Gray stone disk. Well rounded. Cylindrical hole		
1	380094	Biconical	Baked clay	1,5	3,7		0,7	21,3 2	38002	Mazar/Rotem 2012, 371 pl. 9.9:16		Biconical spindle whorl. Almost complete. Ruined surface		
1	33-10-680b	Biconical	Red stone	1,2	3,2		0,6	15,7	1865	Beth Shan Exc. 1933, Level XIV, Room 1865.		Biconical spindle whorl. Red stone, well crafted and smooth. Nice eliptical hole. No wear traces.		341148
1	281137	Cylindrical?	Baked clay	1,3	4,1x 4,7		1,6	19,0 5	10056	Mazar/Rotem 2012, 354,fig. 9.2:1		Ring shaped object, roughly handmade, possibly a spindle whorl, complete.		
1	33-10-847	Discoid	Limestone						1847		P.34-20-939		EB I-II (Str. XV)	
1	33-10-855	Cylindrical	Limestone						1877		P.34-20-940		EB I-II (Str. XV)	
1	33-11-792	Discoid	Limestone						below room 1931		P.34-20-704		EB Ib (Str. XIII)	
Middle Bronze Age														
1		Discoid	Stone	1,1	3,3		0,4	13,4 5				Well crafted spindle whorl. White rough stone. External damaged surface. Hourglass hole	MB II	2008-1052
1		Discoid	Stone			l4,4 xl2, 1xs 0,7	0,6	12,5 +x				Fragment of spindle whorl, ruined. External surface looks polished. Well crafted hole	MB II	658261
1	103017/1	Discoid	Stone	1,1	2,7		0,2	9,5	10302	Yahalom-Mack 2007c: 663, fig. 12.3:8		Complete spindle whorl. Dark stone and well crafted. Small hole. Bead?	Late MB IIB (Str. R-3)	2008-1041
1		Discoid	Stone	1	3,5x 3,8		1	20,4				Grey stone spindle whorl (basalt). Ovoid with hourglass hole	MB II	2008-1043
1		Cylindrical	Basalt	1,8	3,1		1	22,2 6				Cylindrical basalt spindle whorl. Complete and pretty well crafted. Hourglss hole	MB II	2008-1042
1	658266	Discoid	Stone	1,2	3		0,5	7,7				Pebble spindle whorl. Perforated and smoothed. Broken	MB II	658266
1	785074	Dome	Bone	0,7	2,9		0,3	4,95	78514	Yahalom-Mack 2007c: 665, fig. 12.4:4.		Dome-shaped bone spindle whorl. Complete and partially ruined on the edges. Very damaged base. The hole is wear on the top	Late MB IIB (Str. R-3)	652631

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
											not in the bottom. Made from the head of a cow femur.		
1	485266	Dome	Bone	0,6	3,8		0,4	8,87 +x			Dome-shaped bone spindle whorl, almost flat on the top. Very ruined surface. The hole tends to flare towards the base	MB II	652628
1	103042	Cylindrical	Limestone	1,5	3		0,7		10301	Yahalom-Mack 2007c: 663, fig. 12.3:2.		Incomplete, convex, ring-shaped.	Late MB IIB (Str. R-4a-b)	
1	103044	Lenticular	Limestone	1,2	2,9		0,7		10301	Yahalom-Mack 2007c: 663, fig. 12.3:3.		Incomplete, polished surface. Drilled from both sides.	Late MB IIB (Str. R-4a-b)	
1	983217	Discoid	Stone	0,8	4,7		0,7		88312	Yahalom-Mack 2007c: 663, fig. 12.3:5.		Incomplete, chipped on the upper surface	Late MB IIB (Str. R-4b-5)	
1	781047	Discoid	Stone	0,6	3,4		0,6		78114	Yahalom-Mack 2007c: 663, fig. 12.3:6.		Incomplete.	Late MB IIB (Str. R-3)	
1	883036	Discoid	Calcite	1	3,3		0,5		88312	Yahalom-Mack 2007c: 663, fig. 12.3:7.		Complete	Late MB IIB (Str. R-4b-5)	
1	885164	Dome	Bone	1,4	4,1		0,4	11,23	79137	Yahalom-Mack 2007c: 663, fig. 12.4:1.		Complete, polished on convex side. Made from the head of a cow femur	Late MB IIB (Str. R-3)	
1	285207	Dome	Bone	1,4	3,8		0,5	9,44	28533	Yahalom-Mack 2007c: 665, fig. 12.4:2.		Complete, polished on convex side. Made from the head of a cow femur	Late MB IIB (Str. R-3)	
1	985266	Dome	Bone	0,6	3,65		0,5	8,77	98540	Yahalom-Mack 2007c: 665, fig. 12.4:3.		Complete, polished on convex side. Made from the head of a cow femur. Worn surface	Late MB IIB (Str. R-4a-b)	
1	31-10-139a	Conical	ivory	1,1	2,7				1601		P.32-15-294		Late MB IIB (Str. Xa)	
1	31-10-139c	Dome	ivory	0,5	2				1601		P.32-15-296		Late MB IIB (Str. Xa)	
1	32-15-300	Button?	ivory	0,7	2,5				1648		P.32-15-300		Late MB IIB (Str. Xa)	
1	31-11-332	Dome	ivory	0,9	2,3				1655		P.32-15-305		Late MB IIB (Str. Xa)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	31-11-306	Dome	ivory	0,7	2,8				1614		P.32-15-306		Late MB IIB (Str. Xa-b)	
1	31-11-371	Conical	Steatite	1,4	2,2				1612		P.32-15-236		Late MB IIB (Str. Xa-b)	
1	31-11-331	Dome	ivory	0,8	2,2				1625-27		P.32-15-297		Late MB IIB (Str. Xa)	
1	33-11-320	Dome	Gypsum						in walls		P.34-20-110	Edge chipped.	Late MB IIB (Str. Xb)	
1	31-11-370	Dome	ivory	0,8	2,5				W of room 1612		P.32-15-298		Late MB IIB (Str. Xa-b)	
1	31-10-139b	Dome	ivory	0,5	2,6				1601		P.32-15-295	Top chipped.	Late MB IIB (Str. Xa)	
Late Bronze Age														
1	285203	Dome	Bone	0,8	2,5		0,3	4,44	28533	Yahalom-Mack 2007c: 665, fig. 12.4:5.		Dome-shaped bone spindle whorl. Complete. On the base are clearly visible signs of polishing. On the side of the dome are visible signs of the lathe. The hole is wear on the top not in the bottom. The hole on the bottom is a bit larger than on the top (0,4)	LB I (Str. R-1b)	652639
1	885064	Dome	Bone	0,5	2,2		0,4	2,34	88518	Yahalom-Mack 2007c: 665, fig. 12.4:8.		Dome-shaped bone spindle whorl. Complete. Very ruined surface. Decorated with radial incisions which branches near the edge. Made from the head of sheep/goat femur.	LB I (Str. R-1b)	652638
1	285046	Dome	Bone	0,9	2,6			5,27	68123	Yahalom-Mack 2007c: 665, fig. 12.4:7.		Complete, polished on both sides. Made from the head of a sheep femur.	LB I (Str. R-1b)	
1	580599	Dome	Bone	0,5	2,5			3,4	58154	Yahalom-Mack 2007c: 665, fig. 12.4:6.		Complete, chipped, polished on both sides. Made from the head of a sheep femur. Worn around the central hole.	LB I (Str. R-1b)	
1	189091	Lenticular	Limestone	0,9	2,2		0,8		18913	Yahalom-Mack 2007c: 663, fig. 12.3:11.		Incomplete, broken in half and chipped. Surface highly abraded.	LB I (Str. R-1b)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	580414	Discoid	Limestone	1	3,5		0,7		13,49	Yahalom-Mack 2007c: 663, fig. 12.3:10.		Incomplete	LB I-II (Str. R-1a-2)	
1	I 3843	Cylindrical	Stone	1,7	3,2		0,4	30,49	L 1343			Cylindrical dark stone spindle whorl. On one of the bases a decoration made of concentric carved circles is present	LB II	
1	28-10-62	Conical	Limestone	1,7	4,2		0,4	16,96	1371	James/McGovern 1993: fig. 108.7.		Pottery fragment of an object, light. Conical spindle whorl. Complete. Wear/Fall damages near the top side of the hole. Rough incisions on the base, except for a kind of candelabrum	LB IIB (Str. VII)	I 3836
1		Discoid	Stone	1	3,5		0,6	12,4+x				Disk spindle whorl. Red stone extremely ruined and broken. Cylindrical hole	LB II	2008-1049
1		Discoid	Stone	0,9	4,4		0,6	16,58+x				Disk spindle whorl. White stone, scratched and half preserved. Well crafted and smoothed. Cylindrical hole	LB II	658268
1	285212	Discoid	Baked clay	1,1	4,5		0,8	27,8	28535	Yahalom-Mack 2007c: 662, fig. 12.1:4)		Pottery fragment of an object. Disk spindle whorl. Complete except for a small notch. Well crafted. Cylindrical hole (it seems to be realised after firing)	LB I-II (Str. R-1)	2008-1047
1		Dome	Bone	0,6	2,5		0,3	3,52+x				Dome-shaped bone spindle whorl. Partially broken. Ruined surface.	LB II	652640
1	27-10-811	Dome	ivory		2,1				1262	James/McGovern 1993: fig. 108.1, pl. 50d.	P.29-105-229	Small bone spindle whorl, complete. Flat Dome shaped.	LB IIB (Str. VII)	
1	27-10-868	Dome	Slate	0,5	2				1267	James/McGovern 1993: fig. 108.2.	P.29-107-771	Small steatite spindle whorl, complete. Flat Dome shaped.	LB IIB (Str. VII)	
1	28-10-185	Dome	Gypsum	1	4,3				1381	James/McGovern 1993: fig. 108.3.	P.29-107-806	Large alabaster spindle whorl, complete. Flat Dome shaped. Apparently not perfectly rounded	LB IIB (Str. VII)	
1	27-10-632	Dome	Steatite	1,2	2,6				1243	James/McGovern 1993: fig. 108.6.	P.29-107-769	Small steatite spindle whorl, complete. Dome shaped.	LB IIB (Str. VII)	
1	28-10-207	Dome	Gypsum	1,1	5				1381	James/McGovern 1993: fig. 108.8.	P.29-107-805	Large alabaster spindle whorl, complete but chipped. Flat Dome shaped. Apparently not perfectly rounded. Chipped.	LB IIB (Str. VII)	
1	27-10-859	Dome	Gypsum						1262	James/McGovern 1993: fig. 108.9.	P.29-107-798	Large alabaster spindle whorl, complete. Dome shaped.	LB IIB (Str. VII)	
1	27-11-225	Dome	Gypsum	1,5	4,3				1295	James/McGovern 1993: fig. 108.9.	P.29-107-800	Large alabaster spindle whorl, complete. Dome shaped.	LB IIB (Str. VII)	
1	27-10-845	Conical	Steatite	1	2				1267	James/McGovern 1993: fig. 108.10.	P.29-107-770	Small steatite spindle whorl, complete. Conical shape.	LB IIB (Str. VII)	
1	27-10-120	Conical	Steatite	1	2,2				1261	James/McGovern 1993: fig. 108.10.	P.29-107-772	Small steatite spindle whorl, complete. Conical shape.	LB IIB (Str. VII)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	28-10-203	Dome	Gypsum	1,5	2,6				1383	James/McGovern 1993: fig. 108.11.	P.29-107-807	Small alabaster spindle whorl, almost complete. Dome shaped.	LB IIB (Str. VII)	
1	27-11-80	Conical	Gypsum	1,2	2,9				1255	James/McGovern 1993: fig. 109.1.	P.29-107-802	Alabaster spindle whorl, complete. Conical shape with surface shaped as a sort of ring series.	LB IIB (Str. VII)	
1	25-11-217	Conical	Steatite	1,4	2,4				1072	James/McGovern 1993: fig. 109.2.	P.29-107-756	Steatite spindle whorl, complete. Conical shape, base decorated with an incised circle.	LB IIB (Str. VII)	
1	27-10-889	Button	Bone	0,9	2,7				1271	James/McGovern 1993: fig. 109.3.	P.29-105-231	Bone button, complete.	LB IIB (Str. VII)	
1	25-11-342	Biconical	Steatite						1086	James/McGovern 1993: fig. 109.4.	P.29-107-757	Steatite spindle whorl, complete. Biconical shape, not perfectly simmetrical.	LB IIB (Str. VII)	
1	27-11-150	Dome	Stone	1,1	4,7				1284		P.29-107-804	Hourglass perforation	LB IIB (Str. VII)	
1	27-10-811	Dome	ivory		2,1				1262		P.29-105-229		LB IIB (Str. VII)	
1	28-10-51		Baked clay		5,2				1374		P.29-103-1066		LB IIB (Str. VII)	
1	27-11-151b	Dome	Bone	0,6	2,8				1284		P.29-105-347		LB IIB (Str. VII)	
1	27-11-151a	Discoid	Bone	0,5	2,5				1284		P.29-105-346	Disc shaped with boss	LB IIB (Str. VII)	
1	28-10-439b	Dome	Bone						1386	James/McGovern 1993: fig. 109.6.	Discarded	Bone spindle whorl, complete. Flat Dome shape, fire blackened.	LB IIB (Str. VIII)	
1	28-10-439a	Dome	Bone		3,2				1386	James/McGovern 1993: fig. 109.7.	P.29-105-194	Bone spindle whorl, complete. Flat Dome shape.	LB IIB (Str. VIII)	
1	27-11-219a	Dome	Bone						1295	James/McGovern 1993: fig. 109.8.		Bone spindle whorl, complete. Flat Dome shape.	LB IIB (Str. VIII)	
1	26-8-8d	Dome	Bone						1072	James/McGovern 1993: fig. 109.8.	P.29-105-349	Bone spindle whorl, complete. Flat Dome shape.	LB IIB (Str. VIII)	
1	26-11-2	Dome	Bone	0,75	2,5				1108	James/McGovern 1993: fig. 109.9.	P.29-105-324	Bone spindle whorl, complete. Flat Dome shape.	LB IIB (Str. VIII)	
1	26-8-25	Conical	Bone	0,7	1,8				1068	James/McGovern 1993: fig. 109.10.	P.29-105-232	Bone spindle whorl, complete. Conical shape	LB IIB (Str. VIII)	
1	27-11-150	Dome	Stone	1,1	4,7				1284		P.29-107-804	Hourglass perforation	LB IIB (Str. VIII)	
1	28-11-398	Conical	ivory		2,22				1392		P.29-105-189		LB I-IIA (Str. IX)	
1	29-105-183	Dome	ivory		2				1398		P.29-105-183		LB I-IIA (Str. IX)	
1	28-11-141	Dome	Bone	0,8	2,6				1401		P.29-105-184		LB I-IIA (Str. IX)	
1	28-11-251	Dome	ivory		3				1407		P.29-105-199	Incised circle on the base	LB I-IIA (Str. IX)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	28-8-11	Dome	ivory		2,2				1332		P.29-105-388		LB I-IIA (Str. IX)	
1	28-10-280	Dome	ivory		2,2				1385		P.29-105-196		LB I-IIA (Str. IX)	
1	27-11-30	Conical	Gypsum	1,2	2,9				1255		P.29-107-802		LB IIB (Str. VII)	
1	28-9-46	Dome	Gypsum	0,8	3,9				1340		P.29-107-811		LB I-IIA (Str. IX)	
1	28-11-243	Dome	Sandstone	1,2	2,8				1401		P.29-107-778		LB I-IIA (Str. IX)	
1	28-11-16	Dome	ivory		2,57				1389		P.29-105-226	Top bearing incised decoration in four lines radiating from centre; at the ends of these radii incised chevrons.	LB I-IIA (Str. IX)	
1	28-11-375	Dome	ivory		4,4				1395		P.29-105-187	Incised circle on bottom; chipped edges.	LB I-IIA (Str. IX)	
1	28-11-419	Discoid	ivory		2,6				1392		P.29-105-237	Large hole.	LB I-IIA (Str. IX)	
1	28-10-380	Dome	Bone		2,2				1396		P.29-105-446	Blackened by fire, highly polished	LB I-IIA (Str. IX)	
1	28-10-268	Conical	Serpentine						1385		P.29-107-776		LB I-IIA (Str. IX)	
1	28-11-9a	Dome	Serpentine	0,8	1,8				1400		P.29-107-777		LB I-IIA (Str. IX)	
1	31-9-162	Dome	Steatite	1,2	2,8				1559		P.32-15-237		LB I-IIA (Str. IX)	
1	28-11-104	Dome	ivory		2				1398		P.29-105-183		LB I-IIA (Str. IX)	
1	27-8-41	Dome	Gypsum	1,5	3,5				1170A		P.29-107-803		LB I-IIA (Str. IX)	
1	25-11-431	Dome	ivory	1,5					1088		P.29-105-256	Decorated by incised dots and circles.	LB I-IIA (Str. IX)	
1	28-9-19	Conical	ivory		2,28				1332		P.29-105-387		LB I-IIA (Str. IX)	
1	27-11-245	Button?	Bone	0,6	1,45				1297		P.29-105-235	Bone button.	LB IIB (Str. VIII)	
1	28-11-85	Dome	ivory		2,8				1407		P.29-105-239		LB I-IIA (Str. IX)	
1	28-10-333a	Dome	ivory		3				1387		P.29-105-192		LB I-IIA (Str. IX)	
1	28-11-244	Dome	ivory		2,21				1401		P.29-105-186		LB I-IIA (Str. IX)	
1	28-10-271	Dome	ivory		2				1385		P.29-105-197		LB I-IIA (Str. IX)	

	N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	28-11-368	Discoid	ivory		2,9				1331		P.29-105-188		LB I-IIA (Str. IX)	
1	28-9-43	Dome	ivory		2,3				1340		P.29-105-386		LB I-IIA (Str. IX)	
1	28-11-139a	Dome	ivory		2,7				1407		P.29-105-198		LB I-IIA (Str. IX)	
1	28-11-139b	Conical	Bone		2,1				1407		P.29-105-233		LB I-IIA (Str. IX)	
1	28-11-441	Dome	ivory		2,4				1339		P. 29-105-238		LB I-IIA (Str. IX)	
1	28-9-237	Dome	Gypsum	0,5	2,3				1340		P.29-107-810	Blackened.	LB I-IIA (Str. IX)	
1	28-10-337	Dome	Bone		3,9				1391		P.29-105-195		LB I-IIA (Str. IX)	
1	28-11-214	Dome	ivory		4,5				1410		P.29-105-185		LB I-IIA (Str. IX)	
1	28-11-417	Dome	Stone	1,3	5				1392		P.29-107-808		LB I-IIA (Str. IX)	
1	28-10-333b	Dome	ivory		2,2				1393		P.29-105-193	Half preserved.	LB I-IIA (Str. IX)	
1	28-9-236	Dome	Limestone	1,8	2,4				1340		P.29-107-823	Flat base with several scratchings.	LB I-IIA (Str. IX)	
1	28-11-179	Dome	ivory		3				1407		P.29-105-190	Roughly cut. Circle incised on the base.	LB I-IIA (Str. IX)	
1	28-11-120	Dome	Bone		2,1				1398		P.29-105-447	Blackened by fire.	LB I-IIA (Str. IX)	
1	31-11-344	Conical	ivory	1,3	2,3						P.32-15-303	Top missing	LB I-IIA (Str. IX)	
1	31-11-315	Dome	ivory	0,5	2,4						P.32-15-301		LB I-IIA (Str. IX)	
1	989130	Biconical	Baked clay	2,4	3		0,5	18,3	98920	Yahalom-Mack/Mazar 2006: 159, ph. 6.3.		Complete.	LB IIB (Str. Q-2)	
1	989091	Dome	Bone	0,7	2,1		0,3	3,19	98913	Yahalom-Mack/Mazar 2006: 160, fig. 6,2		Dome-shaped bone spindle whorl. Ruined surface with lathe traces on the side and sanding marks on the bottom. No wear traces visible.	LB IIB (Str. Q-2)	681878
1	989082	Conical	Bone	0,5	2,3		0,3	2,44	98906	Yahalom-Mack/Mazar 2006: 160, fig. 6,2		Conical bone spindle. Complete but broken in half. Sanded surfaces.	LB IIB (Str. Q-2)	681882
Iron Age I														

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	28-10-427	Dome	ivory		2,5				1370		P.29-105-191		LB IIB-IA IA (Str. VII)	
1	26-9-408	Dome	Gypsum						Tomb 211		P.29-107-813	Incised circle on top.	Early IA	
1	27-9-315	Dome	Bone	0,8	2,95				1214	James/McGovern 1993: fig. 108.4.	P.29-105-228	Large bone spindle whorl, complete. Dome shaped.	IA I (Late Str. VII)	
1	27-12-143	Dome	Bone	0,65	2,5				1293	James/McGovern 1993: fig. 108.5.	P.29-105-230	Small bone spindle whorl, complete. Flat Dome shaped.	IA I (Late Str. VII)	
1	107174	Dome	Bone	0,6	3,5		0,4	7	88866	Panitz-Cohen/Yahalom-Mack 2009: 738, fig. 15.1:1.		Complete, polished. Head of a cow femur. Extremely ruined base, wear signs on the top side of the hole	IA IA (Str. S-4)	2014-2085
1	102124	Dome	Bone	0,95	2,7		0,4	6,4	10223	Panitz-Cohen/Yahalom-Mack 2009: 738, fig. 15.1:2.	.	Complete, polished. Chipped near the top hole. Concentric incised line along perimeter of base	IA IA (Str. N-3a)	2014-2086
1	984174	Dome	Bone	0,6	2,2		nn	1,77 +x	98435	Panitz-Cohen/Yahalom-Mack 2009: 738, fig. 15.1:3.		Incomplete. Almost half preserved. Head of a sheep/goat. Smoothed surfaces	IA IA (Str. N-3a)	2014-2087
1	288312	Conical	Gypsum	2,2	3,2		0,8	30,8	18735	Panitz-Cohen/Yahalom-Mack 2009: 738, fig. 15.1:4.		Complete. Slightly chipped near top hole.	IA IA (Str. S-4)	
1	188153	Conical	Serpentine	0,9	1,4			3	98852	Panitz-Cohen/Yahalom-Mack 2009: 739, fig. 15.1:6.		Chipped on the basis, polished.	IA IA (Str. S-4)	
1	987256	Dome	Basalt	1	2,3			8,9	98716	Panitz-Cohen/Yahalom-Mack 2009: 739, fig. 15.1:7.		Chipped on the basis, polished.	IA IA (Str. S-3)	
1	104164	Dome	Basalt	1,4	3,1			16,61	10425	Panitz-Cohen/Yahalom-Mack 2009: 739.		Chipped on top and basis, polished.	IA IA (Str. N-3)	
1	887156	Cylindrical	Chalk	0,6	2			1,96	88711	Panitz-Cohen/Yahalom-Mack 2009: 739, fig. 15.1:8.		Chipped along edges. Too light.	IA IA (Str. S-3a)	
1	987314	Lenticular	Chalk	1,2	5,4				98728	Panitz-Cohen/Yahalom-		Unfinished perforation. Chipped near edges. Very irregular.	IA IA (Str. S-4-3)	

N.		Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
										Mack 2009: 739, fig. 15.1:9.				
1	788107	Cylindrical	Basalt	1,2	4,3		0,7		78828	Panitz-Cohen/Yahalom-Mack 2009: 739, fig. 15.1:10.		Incomplete and chipped on both sides.	IA IA (Str. S-3)	
1	102048/2	Cylindrical	Baked clay	1	4,4				10222	Panitz-Cohen/Yahalom-Mack 2009: 739, fig. 15.1:13.		Incomplete, perforation made from both sides before firing.	IA IA (Str. N-3)	
1	107169/2	Biconical	Baked clay	3,5	3			20,6	10728a	Panitz-Cohen/Yahalom-Mack 2009: 739, fig. 15.1:14.		Complete, small part missing along crack. Found together with 107169/2	IA IA (Str. S-3b)	
1	107169/1	Spherical	Baked clay	1,6	2,2				10728a	Panitz-Cohen/Yahalom-Mack 2009: 739, fig. 15.1:15.		Incomplete, with diagonal perforation. Low fired.	IA IA (Str. S-3b)	
1	288317?	Conical	Gypsum	2,4	3,4		0,6	30,78				Complete spindle whorl made of gypsum. Irregular, not smoothed and tilted. Centred hole, eliptical on the bottom (0,7)		2014-2088
1	104164	Dome	Steatite	1,3	3,2		0,3	16,62				Dome-shaped steatite spindle whorl. Polished but slightly ruined. Wear traces at the top and at the bottom of the hole. Sanding marks on the base.		2014-2092
1	987256	Dome	Steatite	1,2	2,4		0,3x 0,4	8,9				Dome-shaped steatite spindle whorl. Polished with some scratches. Sanding marks on the base. Damaged on one side. Oval hole made from the base to the top		2014-2091
1	182153	Conical	Stone	0,9	1,7		0,15	3				Conical dark stone spindle whorl. Polished. Flared hole at the base. Sanding marks on the base. Too small to be a spindle whorl		2014-2090
1	107169/2	Biconical	Baked clay	3,5	3		0,3	20,78				Biconical spindle whorl. Oblong with a slightly flared hole. Partially broken. The hole is damaged.		2014-2099
1	286321	Dome	Limestone	1,9	3,7		nn	11,91+x	L 28636 Stratum P-7 Building 28636	Yahalom-Mack/Mazar 2006: 476, fig. 13.3:8.		Fragment of bone (or limestone) spindle whorl. Broken in half, dome is missing. Cylindrical hole. Sanding marks on the bottom.		688695
1		Discoid	Stone	1,1	4,6		0,6	21,75+x				Pebble spindle whorl. Perforated and ruined. Hourglass hole		2014-2096

N.		Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	788107	Discoid	Stone	1,4	4,1		0,7	32,78+x				Pebble spindle whorl. Perforated and ruined. Hourglass hole		2014-2095
1	987314	Discoid	Stone	1,4	5,3x4,7		nn	23,3				Pebble spindle whorl. Perforated and ruined. unfinished hole. White and light stone		2014-2094
1	887387	Cylindrical	Gypsum ?	1,1	2,4		0,6	5,95				Cylindrical gypsum spindle whorl. Almost complete. Deeply engraved decoration on the side. Ring motif.		2014-2097
1		Conical	Gypsum	0,7	1,7		0,4	1,64				Conical gypsum spindle whorl (?). Broken on the top. Too small to be a spindle whorl. Cylindrical hole off-centre		2014-2089
1	788202	Lenticular	Bone	0,6	2,3		0,4	3,16	78841	Panitz-Cohen et al. 2009:		Lenticular bone spindle whorl. Complete. Wear traces near the hole, on the un-decorated side. Engraved decoration consisting in a couple of parallel lines othogonal to another couple of parallel lines. Probably made from the head of a cow femur.	IA IA (Str. S-3)	2014-2154
1		Button	Bone	0,8	2,7		0,25	3,76				Bone button. Complete and polished on the lathe on both sides. Slightly eliptical hole		681881
1	150686	Button	Bone	0,4	1			0,2				Small bone button. Too small to be a spindle whorl.		681883
1	1989-1881	Conical	Bone	0,8	3,1		0,25	5,8				Conical bone spindle whorl. Extremely ruined surface. Flared hole near the base. No wear traces		1989-1881
1	78731	Button	Bone	0,7	2				78740	Panitz-Cohen et al. 2009:		Bone button, complete but chipped. Polished surface. Made from a metacarpal/metatarsal of a sheep/goat.	IA IA (Str. S-3b)	
1	31-11-321	Dome	ivory						1585	James 1966: fig. 101	Discarded	Small ivory spindle whorl, complete. Flat Dome shaped.	IA I (Late Str. VI)	
1	31-10-469	Cylindrical	Gypsum	1,5	3,1				1557	James 1966: fig. 114.	P.32-15-231	Large hole, complete. Incised concentrical line near the edge.	IA I (Str. VI)	
1	28-9-191	Lenticular	ivory		3				1349		P.29-105-240	Chipped.	IA I (Str. VI)	
1	28-9-192	Conical	Bone		2,2				1349		P.29-105-241		IA I (Str. VI)	
1	26-9-56	Conical truncated	Bronze	1,3	1,9				1101		P.29-108-461		IA I (Str. VI)	
1	27-11-95		Baked clay						1280		P.29-103-1077		IA I (Str. VI)	
1	25-10-327	Conical	Gypsum	1,8	2,7				1044		P.29-107-790	Piercing incomplete.	IA I (Str. VI)	
Iron Age II														

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	887387	Cylindrical	Chalk	1,1	2,5			88721	Panitz-Cohen/Yahalom-Mack 2009: 739, fig. 15.1:12.		Complete, restored. Decorative incisions.	IA IIA (Str. S-1)	
1	988208	Lenticular	Gypsum	0,6	1,8		0,8	1,65	18735	Panitz-Cohen/Yahalom-Mack 2009: 739, fig. 15.1:5.		Complete. Perforation off centre. Too light	IA IIA (Str. S-1b-2)	
1	286354	Cylindrical	Limestone	2,7	3,7		0,8	43,86	L 28641	Yahalom-Mack/Mazar 2006: 474, fig. 13.3:6.		Cylindrical limestone spindle whorl. Compete and well crafted. Signs of burning.	IA IIB (Str. P7)	2009-1025
1	384250	Cylindrical	Gypsum	2,5	3,2		1,5	35,35	L 38401	Yahalom-Mack/Mazar 2006: 476,		Complete gypsum spindle whorl. Very ruined. Carved decoration consisting in some wavy lines enclosed between two parallel incisions.	IA IIA (Str. S-1)	2009-1027
1	384191/2	Conical	Gypsum	1,9	3,2x 3,5		1	23,78	L 38401	Yahalom-Mack/Mazar 2006: 476, fig. 13.3:9.		Complete spindle whorl made of gypsum. Irregular, not smoothed and tilted. Hole slightly off-centre, eliptical on the bottom	IA IIA (Str. S-1)	2009-1024
1	28-9-218a	Dome	Serpentine	0,8	2				1350	James 1966: fig. 110.	P. 29-107-775	Small serpentine spindle whorl, complete. Dome shaped.	IA II (Str. V)	
1	28-9-218b	Dome	Sandstone	1,6	2,7				1350	James 1966: fig. 110.	P. 29-107-774	Quite large sandstone spindle whorl, complete. Dome shaped.	IA II (Str. V)	
1	25-9-2	Cylindrical	Gypsum	1,6	2,5				1002	James 1966: fig. 114.	P. 29-107-787	Shape not clear. Large hole, complete.	IA II (Str. V)	
1	27-9-211	Discoid	Black stone	1,3	2,8				4	James 1966: fig. 114.	P.29-107-767	Shape not clear. Complete.	IA II (Str. V)	
1	3165	Dome	Serpentine	2,1	4,4				48	James 1966: fig. 114.	P.29-107-715	Dome shaped with flattened top.	IA II (Str. V)	
1	26-11-485	Dome	Gypsum	2	3,4				1075		P.29-107-793		IA II (Str. V)	
1	25-11-580	Dome	Gypsum	1,5					1080		P.29-107-791		IA II (Str. V)	
1	25-9-361	Dome	Gypsum	2,5	4				1020		P.29-107-785		IA II (Str. V)	
1	25-9-362	Dome	Steatite	2,2	3,8				1020		P.29-107-755		IA II (Str. V)	
1	25-9-139	Dome	Limestone	1,3	3,2				1011		P.29-107-750		IA II (Str. V)	
1	28-9-217	Dome	Gypsum	1	2,7				1350		P.29-107-809		IA II (Str. V)	
1	25-9-70	Dome	Limestone	2	3,9				1005	James 1966: fig. 114.	P.29-107-753	Limestone spindle whorl, complete. Dome shaped.	IA II (Str. V)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	27-9-71	Discoid	Gypsum	1,9	6				1183		P.29-107-801	Concave base	IA II (Str. V)	
1	25-9-231	Dome	Stone	1,8	3,7				1012		P.29-107-754		IA II (Str. V)	
1	25-10-7	Conical truncated	Gypsum	1,5	2,7				1027		P.29-107-789	Hollow base	IA II (Str. V)	
1	25-9-147	Dome	Stone	1,6	4,8				1011		P. 29-107-780	Blackened	IA II (Str. V)	
1	27-9-175	Dome	Stone	1	2,8				1183		P.29-107-779		IA II (Str. V)	
1	25-9-268	Dome	Stone	0,8	1,6				1013		P.29-107-752	Polished	IA II (Str. V)	
1	25-9-240	Dome	Limestone	1,9	3,7				1012		P.29-107-751	Base chipped	IA II (Str. V)	
1	25-9-534	Conical	Gypsum	1,3	2,5				1021		P.29-107-788	Convex base	IA II (Str. V)	
1	25-9-140	Dome	Limestone	2,2	2,9				1011		P.29-107-764		IA II (Str. V)	
1	25-9-212	Dome	Gypsum	1,4	3,4				1010		P.29-107-812	Wide rectangular piercieng	IA II (Str. V)	
1	27-9-48		Baked clay	2,6	6				1183		P.29-103-1067		IA II (Str. V)	
1	3232	Dome	Gypsum	0,9	2,3				65		P.29-107-782		IA II (Str. V)	
1	27-9-38	Dome?	Gypsum	2,4	3,5				1183		P.29-107-822	Blackened	IA II (Str. V)	
1	25-9-493	Dome	Gypsum	2	3,3				1021a		P.29-107-818	Hollow base	IA II (Str. V)	
1	30-11-136	Dome	ivory	1,8	3				1536		P.31-50-197		IA II (Str. V)	
1	30-12-16		Sandstone	2,1	4,5				1542		P.31-50-329	Convex base, sides contracting to a flattened top.	IA II (Str. V)	
1	25-9-239	Biconical	Baked clay	2,5	3,2				1012		P.29-103-1075		IA II (Str. V)	
1	286250	Dome	Limestone	1,6	2,5		0,5	14,31	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 474, fig. 13.3:7)		Dome-shaped limestone spindle whorl. Complete and polished. Cylindrical hole slightly flared at the bottom. Small wear traces at the top of the hole	IA IIB (Str. P7)	2009-1026
1	386247	Discoid	Limestone	0,9	3,5		0,9	10,19	L 38607	Yahalom-Mack/Mazar 2006: 474, fig. 13.3:5		Incomplete, broken in half and chipped.	IA IIB (Str. P8)	

N.		Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	26-11-290	Cylindrical	Gypsum						1135	James 1966: fig. 118. PPS II, I, 39:16.		Cylindrical spindle whorl, made of gypsum. Outer edge incised with hatched line decoration between horizontal line borders.	IA IIB (Str. IV)	
1	26-11-420	Cylindrical	Gypsum	1,5	3,5				1155	James 1966: fig. 118.	P. 29-107-829	Cylindrical spindle whorl, made of gypsum. Outer edge incised with hatched line decoration between horizontal line borders.	IA IIB (Str. IV)	
1	25-9-45	Cylindrical	Gypsum						1147	James 1966: fig. 118.		Cylindrical spindle whorl, made of gypsum. Outer edge incised with hatched line decoration between horizontal line borders.	IA IIB (Str. IV)	
1	26-11-479	Dome	Gypsum	1,1	2,6				1152	James 1966: fig. 118.	P. 29-107-796	Small gypsum spindle whorl, complete. Dome shaped.	IA IIB (Str. IV)	
1	30-11-32	Dome	Sandstone	1,2	3				1510		P.31-50-338		IA IIB (Str. IV)	
1	26-11-171	Dome	Steatite	0,9	2,2				1125		P.29-107-760		IA IIB (Str. IV)	
1	26-11-264	Dome	Steatite	2,5	3,7				1136		P.29-107-766		IA IIB (Str. IV)	
1	26-11-476	Dome	Limestone	1,3	3				East of 1152		P.29-107-794		IA IIB (Str. IV)	
1	26-11-19	Dome	Limestone	2,6	4,2				1109		P.29-107-765		IA IIB (Str. IV)	
1	26-11-289	Dome	Gypsum	1,8	3,7				1135		P.29-107-792	Chipped	IA IIB (Str. IV)	
1	30-11-28a	Dome	Gypsum	1,7	3,2				1507		P.31-50-331		IA IIB (Str. IV)	
1	30-11-24b	Dome	Steatite	1	2,9				N.W. of room 1507		P.31-50-334		IA IIB (Str. IV)	
1	30-11-24a	Dome	Limestone	2,3	3,9				N.W. of room 1507		P.31-50-328	Chipped	IA IIB (Str. IV)	
1	30-11-25b	Conical	Steatite	1,3	2,5				N.W. of room 1507		P.31-50-341		IA IIB (Str. IV)	
1	30-11-24c	Dome	Steatite	1	2,7				N.W. of room 1507		P.31-50-335	The upper surface bears two incised concentric circles	IA IIB (Str. IV)	
1	788010	Cylindrical	Marl	1,2	4,8		0,7	21,8	78802	Panitz-Cohen/Yahalom-Mack 2009: 740, fig. 15.1:11.		Complete but chipped and faceted	Topsoil	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
Perforated sherds													
Neolithic - Chalcolithic													
1	33-11-289a	Prf. sherd	Pottery						Pit N. of Room 1898	Braun, 2004, fig. 4.9/16	P. 34-21-376		Neolithic/ Chalcolithic (Str. XVIII)	
1	33-11-289b	Prf. sherd	Pottery						Pit N. of Room 1898		P.34-21-376		Neolithic/ Chalcolithic (Str. XVIII)	
Early Bronze Age														
1	281338	Prf. sherd	Pottery	1	nn	1 3,4x 2	nn	6,43 +x	L 28121	Mazar/Rotem 2012: 356, fig. 9,2:6		Perforated sherd.	EB IB (Str. M-3)	
1	109218	Prf. sherd	Pottery	0,6	nn	1,8x 2,8	0,3	3,12 +x	L 10977	Mazar/Rotem 2012: 356, fig. 9,2:7		Perforated sherd, decorated with reddish band motif.	EB IB (Str. M-2b)	
1	281202	Prf. sherd	Pottery	0,9	nn	6,1x 3,8	0,9	21,9 5 +x	L 28110	Mazar/Rotem 2012: 354, fig. 9.2:3		Perforated sherd. Well rounded	EB IB (Str. M-2b)	
1	380553	Prf. sherd	Pottery	0,7	4,6		0,6	17,2 5	L 38038	Mazar/Rotem 2012: 356, fig. 9,2:4.		Perforated sherd, complete. Well rounded. Cylindrical hole	EB IB (Str. M-2b)	847170
1	380212	Prf. sherd	Pottery							Mazar/Rotem 2012: 356		Perforated sherd, roughly cut. Perforation started from both sides but not finished.	EB IB (Str. M-2b)	
1	181037/9	Prf. sherd	Pottery							Mazar/Rotem 2012: 356		Perforated sherd, roughly cut. Perforation started from both sides but not finished.	EB IB (Str. M-3)	
1	380466	Prf. sherd	Pottery							Mazar/Rotem 2012: 356		Perforated sherd, well rounded. Unfinished hole.	EB IB (Str. M-2b)	
1	281286	Prf. sherd	Pottery							Mazar/Rotem 2012: 356		Perforated sherd, hole made starting from both sides but almost cylindrical.	EB IB (Str. M-3)	
Middle Bronze Age														
1	983010	Prf. sherd	Pottery	1,2	4,3		1	15,2 +x	88315	Yahalom-Mack 2007c: 661, fig. 12.1:2		Perforated sherd, half preserved. Well rounded and cylindrical hole. Scratches on the top. No wear signs.	Late MB IIB (Str. R-4b)	658262
1	31/11/72A	Prf. sherd	Pottery	0,6	4x3, 7		0,5	9,38	Below Thut Level			Perforated sherd with two hourglass holes. Distance 0,3		1932-43
1	883050/5	Prf. sherd	Pottery	1	5,1x 5,5		nn	32	88316	Yahalom-Mack 2007c: 661, fig. 12.1:1)		Perforated sherd, well rounded and smoothed. Hole unfinished and made starting from only one side.	Late MB IIB (Str. R-4b)	2008-1045

N.		Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1		Prf. sherd	Pottery	0,8	3,6		0,3	13,49				Perforated sherd, roughly cut with sharp edges. Slightly oval and hourglass hole	mb ii	2008-1044
1	883021	Prf. sherd	Pottery	0,7	3x3,2		0,7	8,25	78302	Yahalom-Mack 2007c: 661, fig. 12.1:3)		Perforated sherd, complete. Well rounded and smoothed. Hole started from one side but left unfinished.	Late MB IIB (Str. R-3)	2008-1048
1	33-9-654	Prf. sherd	Pottery						1080		P. 34-20-142	Perforated sherd.	MB IIB (Str. XI)	
Late Bronze Age														
1	189195	Prf. sherd	Pottery	0,9	3,8		0,4	12,48	18954	Yahalom-Mack 2007c: 661, fig. 12.1:5)		Perforated sherd, complete. Roughly rounded with unfinished edges. Hole drilled from both sides.	LB I A-B (Str. R-2)	2088-1044?
1	27-10-622	Prf. sherd	Pottery						1244	James/McGovern 1993: fig. 120.1.		Perforated sherd, complete, well rounded with cylindrical hole.	LB IIB (Str. VII)	
1	28-10-51	Prf. sherd	Pottery						1374	James/McGovern 1993: fig. 120.2.		Perforated sherd, complete, roughly rounded with hourglass perforation.	LB IIB (Str. VII)	
1	28-10-249	Prf. sherd	Pottery		5,2				1384	James/McGovern 1993: fig. 120.3.	P.29-103-1065	Perforated sherd, complete, roughly rounded with cylindrical perforation.	LB IIB (Str. VII)	
Iron Age I														
1	25-10-202	Prf. sherd	Pottery						1021 Seti I temple		P.29-103-1072	Perforated sherd, roughly rounded	IA IA	
1	102048/7	Prf. sherd	Pottery	1,1	4,5		nn	10,42+x			FE I	Perforated sherd, half preserved. Well rounded. Hourglass hole.		2014-2098
Iron Age II														
1	186212	Prf. sherd	Pottery	1,5	6,2		0,7	59,48	L 18601 Building 28636	Yahalom-Mack/Mazar 2006: 474, fig. 13.3:1.		Perforated sherd, complete. Well rounded. Cylindrical but diagonal hole.	IA IIB (Str. P-7)	2009-1020
1	888283	Prf. sherd	Pottery	0,8	3,7x3,3		0,4	10,73	L 88862	Yahalom-Mack/Mazar 2006: 475, fig. 13.3:3.		Perforated sherd, roughly cut. Cylindrical hole.	IA IIA (Str. S-1b)	2009-1022
1	386322	Prf. sherd	Pottery	0,8	3,7x3,3		0,4	13,63	L 38626	Yahalom-Mack/Mazar 2006: 474, fig. 13.3:4, 13.11c.		Perforated sherd, quite well rounded. Hole cylindrical but slightly diagonal, made starting perforation from both sides.	IA IIB (Str. P-8b)	2009-1021
1	286177/50	Prf. sherd	Pottery	0,8	7,4		0,5	52,5	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 474, fig. 13.11b.		Perforated sherd, chipped. Quite well rounded. Cylindrical hole.	IA IIB (Str. P-7)	2009-1023
1	25-10-87	Prf. sherd	Pottery		4,5				1026		P.29-103-1071		IA II (Str. V)	
1	25-11-71	Prf. sherd	Pottery						1066		P.29-103-1069	Perforated sherd, well rounded.	IA II (Str. V)	

N.		Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	25-9-373	Prf. sherd	Pottery						1020		P.29-103-1073		IA II (Str. V)	
1	25-9-391	Prf. sherd	Pottery		3x3, 5				1018		P.29-103-1074		IA II (Str. V)	
1	25-9-421	Prf. sherd	Pottery		5,5				1021		P.29-103-1076	Perforated sherd, cut from a base of a vessel.	IA II (Str. V)	

Spinning bowls

Late Bronze Age

1	25-11-569		Pottery						1088	Fitzgerald 1930: pl. 41.29. James/McGovern 1993: fig. 27.11.		Base of a spinning bowls with two loops inside.	LB IIB (Str. VII)	
1	25-10-333		Pottery						1051	Fitzgerald 1930: pl. 44.11..	Early Seti Level	Base of a spinning bowls with two loops inside.		
1	27-10-901		Pottery						1271	James/McGovern 1993: fig. 27.10.	P.29-102-488.	Spinning bowl, fragmentary. Part of the rim, base and two internal loops preserved.	LB IIB (Str. VII)	
1	28-11-117		Pottery	6,5	base 7,5	14,8 x11, 4	Anello 18,2xs2,1xh3, 3		Exc. 1928 Level IX, Room 1403			Fragment of the base of a spinning bowl. One loop is fully preserved, partially the other. Simple bowl with thick walls. The loop is hand-made and well crafted. Wear signs on the external side of the loop.	LB IB-IIA (Str. IX)	I. 3877
1	28-10-163°		Pottery						1381	James/McGovern 1993: 60.		Not drawn. From the same locus also two alabaster spindle whorls and three clay spools.	LB IIB (Str. VII)	
1	27-11-108		Pottery	5,2	8,4				1273	James/McGovern 1993: 63.			LB IIB (Str. VII)	

Iron Age I

1	888237/4		Pottery						88855	Panitz-Cohen 2012: 437, fig. 13.4:2.		Spinning bowl, fragmentary. Part of the base and two internal loops preserved.	IA I (Str. S-3a)	
1	888237/6		Pottery						88855	Panitz-Cohen 2009: pl. 46.8		Spinning bowl, fragmentary. Part of the base and two internal loops preserved.	IA I (Str. S-3a)	
1	108060/10		Pottery						10816	Panitz-Cohen 2009: pl. 46.9		Spinning bowl, fragmentary. Part of the base and two internal loops preserved.	IA I (Str. S-3a)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	108060 e 108068		Pottery			l10x dia m23 ,4			L 10816		??	Spinning bowl, made of different fragments. Incomplete. Rim and part of a loop are preserved.		
1	108060/13 e 17		Pottery	5,3		l9,5			10816		??	Spinning bowl, made of 2 parts : base and part of the side wall. On the base parts of one loop preserved.		821683
1	184257/5		Pottery						18431	Panitz-Cohen 2012: 487, fig. 13.4:3.		Spinning bowl, fragmentary. Part of the base and two internal loops preserved.	Mixed	
1	31-10-452		Pottery						1589	James 1966: pl.50	Jerusalem		IA IA (Lev. VI)	
1	27-10-9		Pottery						1224	James 1966: fig.49	Discarded	Three grooves near rim on the external side.	IA IA (Lev. VI)	
1	31-10-453a		Pottery						1589	James 1966: fig.49	Discarded		IA IA (Lev. VI)	
1	31-10-453b		Pottery						1589	James 1966: fig.49	Discarded		IA IA (Lev. VI)	
1	31-11-57c		Pottery						1586	James 1966: fig.49	Discarded		IA IA (Lev. VI)	
1	31-11-298a		Pottery						1585	James 1966: fig.49	Discarded		IA IA (Lev. VI)	
1	31-11-380a		Pottery						1709	James 1966: fig.51	Discarded		IA IA (Lev. VI)	
1	33-9-259		Pottery	9	19				1728	James 1966: fig.53	Jerusalem		IA IA (Lev. VI)	
1	27-10-474		Pottery						1185	James 1966: fig.55	Discarded		IA IA (Lev. VI)	
1	27-9-158		Pottery						1195	James 1966: fig.55	Discarded		IA IA (Lev. VI)	
1	25-10-373		Pottery						1053	James 1966: fig.56	P.29-102-489.	Two loop handles inside.	IA IA (Lev. VI)	
1	31-11-298a		Pottery	7,6		base 7,4x 9,2. l wall 13,1	Loo p 10,7 xh4, 2x th2, 4		Exc. 1931 Area 1585 Level VI			Part of the base of a spinning bowl. One of the two loops is well preserved. Well crafted. Clay ware rich of inclusions. Internal slip. Roughly bournished on the external side. Smoothed internal surface. Wear traces on the top of the loop, its surface appear quite shiny.	IA IA	32297
1	28-9-159		Pottery	3,8	base 7	l. 13,3 x11, 8	loop l 10,9 x1,8		Exc. 1928, Level VI,			Fragment of the base of a spinning bowl with 2 preserved loops. Flat base, fine ware, internal slip also on the loops. Traces of hand-working are visible inside. Wide bowl.	IA IA	I 3830

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
						hole, th 2,3, h3,5		Room 1343			Wear traces inside the loops and shiny surface and one deep groove due to rubbing.		
1		Pottery	4,8	base 9,5	16,7 x14	h max 4,7		Under VI 63			Fragment of a spinning bowl. Flat base with the joints of the 2 loops visible. Irregular surface. The area beneath one of the loop is polished.	IA IA	I 6005
1	33-9-259	Pottery	11	l 14.2				Exc. 1933 Level VI-VII, Room 1728			Fragment of a spinning bowl with two loops, one of which is complete. Side wall and edges are preserved. Pretty wide bowl. Signs of burning on the surface.	IA IA	34976
1	188196/6	Pottery	3,1	14,7		2,8		L 10822	Panitz-Cohen 2009: pl. 25.13	Ash and debris layers related to oven 10821. No other textile tools from this locus	Base and side wall of a spinning bowl. Two loops still preserved. One loop has grooves due to rubbing of fibers. The other is broken and fixed. Encrusted surface	IA IA (Str. S-4)	816560
1	188196/3	Pottery	5	15,5		3,3		L 10822	Panitz-Cohen 2009: pl. 25.14		Base and side wall of a spinning bowl. Two loops still preserved. On both loops grooves due to rubbing of fibers are visible.	IA IA (Str. S-4)	816561
1	104211	Pottery	5,5	11,5		3		L 10414 N-3b			Base and side wall of a spinning bowl. Two loops of which one still preserved. On the complete loop grooves due to rubbing of fibers are visible. Bowl made of different fragments.		813030
1	104041/1	Pottery	3,1 bordo	6,5	3,7 foro 1,8			L 10415 N-3a			Fragment of a spinning bowl base. One loop is preserved. Wear traces are visible on the loop		813791
1	787346/1	Pottery	4,3	9		3,5 interno 1,8		78722	Panitz-Cohen 2009: 396, pl. 56.		Fragment of a spinning bowl base. One loop is preserved. Wear traces are visible on the loop	IA IA (Str. S-3a)	823967
1	288053	Pottery	9,6			2,6x 1,4		28811	Panitz-Cohen 2009: 383, pl. 49.		Part of the base, side wall and edge af a spinning bowl. One loop and part of the second are preserved. No wear traces are visible on the loop. On the external side are visible impressions.	IA IA (Str. S-3a)	821733
1	288120	Pottery	10,2	22,6		2,9h x11,		28831	Panitz-Cohen 2009: 383, pl. 49.		Spinning bowl made of different fragments. Loops have been rebuilt (not original parts).	IA IA (Str. S-3a)	821732

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
						1lx1 ,3ho le							
1	188297/6		Pottery	4,2		15	h 3,5, dia m 2 l 11,3		L 18832, East-West Street	Panitz-Cohen 2009: 346, pl. 31.		Fragment of a spinning bowl. The base, part of the side wall and 2 loops are preserved. Deep wear traces on the loops, on both directions.	IA IA (Str. S-4)	817006
1	388087/1		Pottery	4,2	9		h3,2 x1,8 hole xl6		38819	Panitz-Cohen 2009: 410, pl. 63.		Fragment of a spinning bowl. The base, part of the side wall and one loop are preserved. No wear traces.	IA IA (Str. S-3a)	834262
1	988121/4		Pottery	5,5	7,8		h3,2 x1,8 hole xl5, 7		88866	Panitz-Cohen 2009: 348, pl. 32		Part of a spinning bowl, made of different fragments. The base, part of the side wall and 2 broken loops are preserved. The area beneath one loop presents a deep slot. There is a spike under the base which destabilise the bowl.	IA IA (Str. S-4)	817031
1	187221/1		Pottery						18734	Panitz-Cohen 2009: pl. 20.21		Wear marks on the inner part of the loops.	IA IA (Str. S-5)	
1	687022/10		Pottery	4,3	base 7,3		l6,8 xh3 xhol e1,4		68709	Panitz-Cohen 2009: pl. 69.3.		Fragment of a spinning bowl. The base, a loop broken in half and the joints of the other loop are preserved.	IA IB (Str. S-2)	834481

Loom weights

Middle Bronze Age

1	33-11-346a	Conical	Baked clay	11	7,2		0,5	596				Baked clay loom weight. Conical shape	MB IIB (Lev. XB)	341285
1	33-11-346b	Conical	Clay								P.34-20-99	Baked clay loom weight. Conical shape	MB IIB (Lev. XB)	
1	985343	Conical	Baked clay	10,6	8	5,4	0,8	543		Yahalom-Mack 2007c: 668, fig. 12.5:5	BM	Baked clay loom weight. Conical shape but pretty flatted. Regular base. Well crafted hole		08-1066
1		Conical	Clay	9,8	5	4,5	0,6	172 +x				Incomplete conical clay loom weight. Well preserved all along its lenght, but a slice is		08-1064

N.		Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
												missing and consumed. Small and cylindrical hole		
1	105378	Conical	Clay	8,4	6,2		0,7	305, 32	10572	Yahalom-Mack 2007c: 666, fig. 12.5:1.		Complete, unbaked clay. Poorly preserved.	MB II (Str R-5-7)	
1	883082	Conical	Clay	8,1	6		0,5	269, 86	88312	Yahalom-Mack 2007c: 668, fig. 12.5:2.		Complete, unbaked clay. Poorly preserved.	MB IIB (Str. R-4b-5)	
1	580190	Conical	Clay	9,8	5,3	4,9	0,5		58054	Yahalom-Mack 2007c: 668.		Incomplete, made of unfired clay.	MB IIB (Str. R-4b-5)	
1	783032	Conical	Clay	9,1	7,4	6,8	0,4	436, 73	78304	Yahalom-Mack 2007c: 668, fig. 12.5:3.		Complete, made of fired clay, very friable.	Late MB IIB (Str. R-3)	
1	783130	Conical	Clay	7,9	7,4	6,8	0,4	436, 73	78335	Yahalom-Mack 2007c: 668, fig. 12.5:4.		Complete, made of well fired clay. Top slightly chipped, hole not joining from the two sides.	Late MB IIB (Str. R-3)	
1	985343	Conical	Clay	10,6	8,2	5,4	0,8	545, 92	98542	Yahalom-Mack 2007c: 668, fig. 12.5:5.		Complete, made of well fired clay. Slightly convex at the height of hole.	Late MB IIB (Str. R-4b)	
1	105133	Conical	Clay	10,5	5,1		0,4	267, 09	98542	Yahalom-Mack 2007c: 669, fig. 12.5:6		Complete, made of well fired clay. Slightly convex at the height of hole.	MB IIB (Str. R-5b)	08-1063
1	31-11-208		Clay						1627		P.32-15-211	Flat base, sides contracting slightly to a flat knob top which is pierced horizontally.	MB IIB (Lev. XB)	
Late Bronze Age														
15	27-11-200	Spool	Clay	max. 8min 7	max .5 min 4				1287	James/McGovern 1993: 188, fig. 118.2a-b.	P.29-103-1056	At least fifteen spool shaped loom weights made of unbaked clay. Published as dumpbell objects. Two examples drawn. One is complete, the other partially broken. One specimen smaller than the other (3.5x3 cm).	LB IIB (Str. VIII)	
3	28-9-291	Spool	Clay	10,5	6				1353	James/McGovern 1993: fig. 115.4a-c.		Spool shaped loom weights made of unbaked clay. Published as bread models.	LB IIB (Str. VII)	
1	28-10-29	Spool	Clay	10,5	6				1372	James/McGovern 1993: fig. 115.5.		Spool shaped loom weight made of unbaked clay. Published as a bread model.	LB IIB (Str. VII)	
1	25-11-215	Spool	Clay	10,5	6				1068	James/McGovern 1993: fig. 115.6.	P.29-103-1057	Spool shaped loom weight made of unbaked clay. Published as a bread model.	LB IIB (Str. VII)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	28-10-198a	Spool	Clay	10,5	6				1381	James/McGovern 1993: fig. 115.7.	P.29-103-1060	Spool shaped loom weight made of unbaked clay. Published as a bread model. They were not found in tombs.	LB IIB (Str. VII)	
1	28-11-402a	Pear shaped	Gypsum	9,3	7				1392		P.29-107-620		LB IB-IIA (Lev. IX)	
1	28-11-402b	Pear shaped	Gypsum	9,5	7,5				1392		P.29-107-619		LB IB-IIA (Lev. IX)	
1	28-11-402c	Pear shaped	Gypsum	9,2	5,7				1392		P.29-107-618		LB IB-IIA (Lev. IX)	
1	28-11-402d	Pear shaped	Gypsum	9	7				1392		P.29-107-621		LB IB-IIA (Lev. IX)	
1	27-11-236	Spherical	Baked clay						1291		P.29-103-745		LB IIB (Lev. VIII)	
1	27-8-40	Doughnut	Clay						1170A		29-103-712C		LB IIB (Lev. IX)	
1	27-8-40	Conical	Clay						1170A		29-103-712A		LB IIB (Lev. IX)	
1	27-8-40	Conical	Clay						1170A		29-103-712B		LB IIB (Lev. IX)	
Iron Age I														
1	187205	Spool	Clay	6,7	5				78739	Panitz-Cohen/Yahalom-Mack 2009: fig. 16.2.	Found in a secondary context	Incomplete, cylindrical shape with slightly covex sides. Poorly fired.	Str. S-3-2	
1	28-9-164	Spool	Clay						1345	James 1966: fig. 105.	P.29-103-1058	Incomplete. Cylindrical shape with slightly convex sides.	IA IA (Lev. VI)	
1	27-10-451	Spool	Clay						1196	James 1966: fig. 105.	P.29-104-79	15 scarab impressions with hieroglyphs signs for imenyt "daily offering".	IA IA (Lev. VI)	
1	27-10-452	Spool	Clay						1201	James 1966: fig. 105.	P.29-104-80	6 scarab impressions with illegible signs. Flattened sphere?	IA IA (Lev. VI)	
1	28-10-216	Spool	Clay						1343	James 1966: fig. 105.	P.29-103-1059	Spool, complete. Cylindrical shape with convex side and a flat base, while the other seems more rounded.	IA IA (Lev. VI)	

N.		Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	28-9-124	Spherical	Clay						1343		P.29-103-727		IA IA (Lev. VI)	
1	27-9-243	Oval	Gypsum	8,2	7,4				1212		P.29-107-575		IA IA (Lev. VI)	
1	27-9-200	Spherical	Clay						1201		P.29-103-721	Baked clay, partly bored	IA IA (Lev. VI)	
1	27-9-512	Spherical	Baked clay						1224		P.29-103-723		IA IA (Lev. VI)	
Iron Age II														
13	26-8-189	Pear shaped	Basalt						1084	James 1966: fig. 110.		Horizontally perforated	IA IB-IIA (Lev. V)	
2	26-11-496	Pear shaped	Basalt						1080	James 1966: fig. 110.		Horizontally perforated	IA IB-IIA (Lev. V)	
3	26-11-216	Pear shaped	Limestone						1126	James 1966: fig. 110.		Horizontally perforated	IA IB-IIA (Lev. V)	
2	25-11-73	Pear shaped	Gypsum						1066	James 1966: fig. 110.		Horizontally perforated	IA IB-IIA (Lev. V)	
1	27-9-9	Pear shaped	Gypsum						1076	James 1966: fig. 110.		Horizontally perforated	IA IB-IIA (Lev. V)	
4	25-10-394	Pear shaped	Gypsum						1048	James 1966: fig. 110.		Horizontally perforated	IA IB-IIA (Lev. V)	
17	25-10-418	Pear shaped	Gypsum						1045	James 1966: fig. 110.		Horizontally perforated	IA IB-IIA (Lev. V)	
1	25-10-417	Pear shaped	Stone						1045	James 1966: fig. 110.		Horizontally perforated	IA IB-IIA (Lev. V)	
8	25-10-364	Pear shaped	Gypsum						1046	James 1966: fig. 110.		Horizontally perforated	IA IB-IIA (Lev. V)	
20	25-10-396	Spherical	Clay						1045	James 1966: fig. 110.			IA IB-IIA (Lev. V)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
12	25-10-365	Spherical	Clay						1046	James 1966: fig. 110.			IA IB-IIA (Lev. V)	
15	25-10-395	Spherical	Clay						1046	James 1966: fig. 110.			IA IB-IIA (Lev. V)	
1	25-9-61	Pear shaped	Gypsum						1001	James 1966: fig. 114.		Horizontally perforated	IA IB-IIA (Lev. V)	
1	25-9-69	Spherical	Clay						1005	James 1966: fig. 114.			IA IB-IIA (Lev. V)	
1	25-9-37	Pear shaped	Gypsum						1004	James 1966: fig. 114.		Horizontally perforated	IA IB-IIA (Lev. V)	
1	27-9-255	Spherical	Clay						1211		P.29-103-742		IA IB-IIA (Lev. V)	
1	27-10-906	Spherical	Clay						1265		P.29-103-725		IA IB-IIA (Lev. V)	
1	27-10-906	Discoid	Clay						1265		P.29-103-719		IA IB-IIA (Lev. V)	
1	27-10-861a	Spherical	Clay						1265		P. 29-103-753		IA IB-IIA (Lev. V)	
1	27-10-861b	Conical	Baked clay						1265		P.29-103-711A		IA IB-IIA (Lev. V)	
1	27-10-861b	Conical	Baked clay						1265		P.29-103-711B		IA IB-IIA (Lev. V)	
1	27-10-880	Spherical	Baked clay						1265		P. 29-103-704		IA IB-IIA (Lev. V)	
1	3162	Pear shaped	Gypsum	8,2	3,7				51		P.29-107-588		IA IB-IIA (Lev. V)	
1	3598	Pear shaped	Gypsum	8,3	6				48		P.29-107-612		IA IB-IIA (Lev. V)	

N.		Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	3655	Pear shaped	Limestone	7,5	7				300		P.29-107-613		IA IB-IIA (Lev. V)	
1	3631	Pear shaped	Gypsum	8,6	8				21		P.29-107-614		IA IB-IIA	
1	3134	Pear shaped	Gypsum	5,5	4				39		P. 29-107-601		IA IB-IIA (Lev. V)	
1	3632	Pear shaped	Gypsum	6,5	5,8				21		P.29-107-608		IA IB-IIA (Lev. V)	
1	3597	Pear shaped	Gypsum	7,5	5,5				48		P.29-107-610		IA IB-IIA (Lev. V)	
1	3135	Pear shaped	Gypsum	6,2	5,3				29		P.29-107-602		IA IB-IIA (Lev. V)	
1	3623	Pear shaped	Gypsum	8,2	6,5				21		P.29-107-606		IA IB-IIA (Lev. V)	
1	3161	Pear shaped	Gypsum	12	7				51		P.29-107-593		IA IB-IIA (Lev. V)	
1	3231	Pear shaped	Gypsum	10	8				65		P. 29-107-598		IA IB-IIA (Lev. V)	
1	3630	Pear shaped	Gypsum	9	5,5				21		P.29-107-607		IA IB-IIA (Lev. V)	
1	3619	Spherical	Clay						22		P.29-103-739		IA IB-IIA (Lev. V)	
1	3620	Spherical	Clay						22		P.29-103-741		IA IB-IIA (Lev. V)	
1	3163	Spherical	Clay						51		P.29-103-715		IA IB-IIA (Lev. V)	
1	3621	Spherical	Clay						22		P.29-103-737		IA IB-IIA (Lev. V)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	3654		Baked clay						299		P.29-103-731		IA IB-IIA (Lev. V)	
1	3617	Spherical	Clay						4		P.29-103-750	Poorly baked clay	IA IB-IIA (Lev. V)	
1	3628		Clay						21		P.29-103-736		IA IB-IIA (Lev. V)	
1	3626	Spherical	Clay						21		P.29-103-716		IA IB-IIA (Lev. V)	
1	27-11-109	Spherical	Clay						1269		P.29-103-744		IA IB-IIA (Lev. V)	
1	27-10-905	Pear shaped	Gypsum	7,3	5,2				1265		P.29-107-617		IA IB-IIA (Lev. V)	
1	27-10-879	Pear shaped	Gypsum	7,5	6				1265		P.29-107-616		IA IB-IIA (Lev. V)	
1	26-11-404	Doughnut	Basalt						1076		P.29-107-662		IA IB-IIA (Lev. V)	
1	25-10-90		Baked clay						1026		P.29-103-703		IA IB-IIA (Lev. V)	
1	27-9-25		Baked clay						1183		P.29-103-748		IA IB-IIA (Lev. V)	
1	28-10-336	Conical	Baked clay						1389		P.29-103-717		IA IB-IIA (Lev. V)	
1	27-10-904	Conical	Baked clay						1265		P.29-103-718		IA IB-IIA (Lev. V)	
1	27-11-43	Spherical	Baked clay						1265		P.29-103-722		IA IB-IIA (Lev. V)	
1	27-9-480	Spherical	Baked clay						22		P.29-103-724		IA IB-IIA (Lev. V)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	27-9-238	Spherical	Baked clay					1211		P.29-103-743		IA IB-IIA (Lev. V)	
1	27-10-881	Spherical	Baked clay					1265		P.29-103-752		IA IB-IIA (Lev. V)	
1	27-10-862	Discoid	Clay					1265		P.29-103-749.1		IA IB-IIA (Lev. V)	
1	27-10-862	Discoid	Clay					1265		P.29-103-749.2		IA IB-IIA (Lev. V)	
1	26-11-157	Spherical	Clay					1116		P.29-103-747A		IA IB-IIA (Lev. V)	
1	26-11-157	Spherical	Clay					1116		P.29-103-747B		IA IB-IIA (Lev. V)	
1	25-9-11	Pear shaped	Baked clay					1003		P. 29-103-710	Poorly baked clay	IA IB-IIA (Lev. V)	
1	30-12-101	Conical	Baked clay	9,6	7		0,8	534			Conical baked clay loom weight. Complete and pretty well crafted, except for its base. On the hole is visible the slot used to fix the thread.		I 9688
1	30-11-51	Spherical	Baked clay	4,8	4,8		0,5	89,9	Room 1509		Stratum V - Fe I	Spherical baked clay loom weight. Roughly crafted		I 9664
1	887239	Spherical	Clay	4,3	5,3		0,8	111,7	L 88721	Yahalom-Mack/Mazar 2006: 476, fig. 13.4:5.		Doughnut shaped, complete. Very much corroded.	IA IIA (Str. S-1)	2009-1075
1	887355	Conical	Clay	6,3	6,4x 5,3		0,7		L 88721	Yahalom-Mack/Mazar 2006: 477.		Conical loomweight, made of unbaked clay. Not seen	IA IIA (Str. S-1)	
1	987036	Conical	Gypsum	9,2	7,3x 5,2		1	390,63	L 88703	Yahalom-Mack/Mazar 2006: 483, fig. 13.4:11		Conical gypsum (or limestone) loom weight. The hole is circular on one side and eliptic on the other. Complete	IA IIA (Str. S-1a)	2009-1064
1	687006/2	Conical	Gypsum	8,9	7,9x 5,4		1	408,15	L 68704	Yahalom-Mack/Mazar 2006: 483, fig. 13.4:9.		Conical gypsum (or limestone) loom weight. Well rounded hole on both sides. One side of the hole has edgy borders.	IA IIA (Str. S-1)	2009-1063

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	687006/3	Conical	Gypsum	10,2	7,6x4,5		0,9x1	385	L 68704	Yahalom-Mack/Mazar 2006: 483.		Conical gypsum (or limestone) loom weight. The hole is well rounded on both sides, but edges are ruined. No wear traces are visible.	IA IIA (Str. S-1)	2009-1062
1	384192	Conical	Gypsum	7,1	5,7		0,9	196,24	L 38401	Yahalom-Mack/Mazar 2006: 483, fig. 13.4:14.	Non tornava il locus	Conical gypsum (gray stone) loom weight. The hole is circular on one side and eliptical on the other. Edges seems chamfered. No wear traces. The stone shows crystal planes. Broken and burnt	IA IIA (Str. S-1)	2009-1066
1	687006/4	Conical	Gypsum	9,2	6,2x5,3		0,7	367,94	L 68704	Yahalom-Mack/Mazar 2006: 483, fig. 13.4:8.		Conical gypsum (gray stone) loom weight. The hole is circular on one side and eliptical on the other. Edges seems chamfered, more on one side than on the other.	IA IIA (Str. S-1)	2009-1053
1	384254	Conical	Gypsum	8,5	7,3x5,6		0,9	376	38413	Yahalom-Mack/Mazar 2006: 483, 13.4:12.		Conical gypsum (dark gray stone) loom weight. Well crafted but unpolished. Hole presents a slot on one side.	IA IIA (Str. S-1)	2009-1065
1	687006/1	Conical	Gypsum	8,8	6,9x5,9		0,7x0,9	383	L 68704	Yahalom-Mack/Mazar 2006: 483, 13.4:7.		conical gypsum (or limestone) loom weight. Well crafted. The small hole has one side circular, the other eliptical.	IA IIA (Str. S-1)	2009-1061
1	988011	Conical	Gypsum	7,5	5,5 X5,7		0,8	249	88859	Yahalom-Mack/Mazar 2006: 483, 13.4:13.		Conical gypsum loom weight. Well crafted and polished. Slightly eliptical hole. Edges slightly chamfered. Complete	IA IIA (Str. S-1B)	2009-1068
1	386414	Spherical	Clay	4,4	5,9			115,5	L 38661	Yahalom-Mack/Mazar 2006: 477, fig. 13.4:6.		Doughnut shaped, incomplete. Unfired, with a diagonal perforation. Not seen	IA IIB (Str. P8)	2009-1076
1	386128	Doughnut	Clay	5,2	9,1		1,6	259 +x	L 38608	Yahalom-Mack/Mazar 2006: 477.		Doughnut shaped, incomplete. Unfired.	IA IIB (Str. P8)	2009-1079
1	386050	Doughnut	Baked clay	6,8	7,8		1,6	447,23	L 38605	Yahalom-Mack/Mazar 2006: 478.		Current measures: 4,2x5,7, hole 1,3, weight 114+x. Spherical baked clay loom weight, partially broken. Cylindrical hole, fired clay.	IA IIB (Str. P7)	2009-1077
1	106016	Doughnut	Baked clay	4,1	7,2			196,86	L 10608	Yahalom-Mack/Mazar 2006: 478.		Complete, doughnut shape, burnt. Not seen.	IA IIB (Str. P6)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	286334/1	Conical	Clay	15	17,2		1,7	2360	L 28641 Building 28636	Yahalom-Mack/Mazar 2006: 474, fig. 13.2:7.	Found with a batch of loomweights	Large and heavy conical object with a flat base made of unfired clay. Horizontal hole. Too heavy to be a loom weight.	IA IIB (Str. P7)	
1	888017	Conical	Gypsum	9	7,4x4,3		0,7x0,8	304+x	88805 topsoil	Yahalom-Mack/Mazar 2006: 483, fig. 13.4:10.		Conical gypsum loom weight. Well crafted but a bit tilted. The stone is god looking if compared with other pieces. The hole is chamfered on both sides. One side of the hole is circular, the other slightly oval. Incomplete.	Topsoil	2009-1067
1	384140	Conical	Gypsum	9	7,5		1	43,28	38401	Yahalom-Mack/Mazar 2006: 483, 13.20.	Tutti i pesi in gypsum vengono dall'area S e datano al FEII	Conical gypsum loom weight. Complete but very damaged.	IA IIA (Str. S-1a)	
2	26-11-531	Spherical	Clay					107	1152	James 1966: fig. 118.			IA IIB (Str. IV)	
6	26-11-238	Spherical	Clay						1135	James 1966: fig. 118.			IA IIB (Str. IV)	
1	26-11-299	Spherical	Clay						1137	James 1966: fig. 118.		Unfired	IA IIB (Str. IV)	
3	26-11-366	Spherical	Clay						1138	James 1966: fig. 118.			IA IIB (Str. IV)	
1	26-11-203	Spherical	Clay						1131	James 1966: fig. 118.		Hole on the top	IA IIB (Str. IV)	
1	26-11-210	Pear shaped	Limestone						1131	James 1966: fig. 118.			IA IIB (Str. IV)	
1	26-11-211	Pear shaped	Basalt						1131	James 1966: fig. 118.			IA IIB (Str. IV)	
3	26-11-381	Pear shaped	Limestone						1136	James 1966: fig. 118.			IA IIB (Str. IV)	
1	26-11-453	Pear shaped	Stone						1146	James 1966: fig. 118.			IA IIB (Str. IV)	
1	26-12-11	Pear shaped	Limestone						1146	James 1966: fig. 118.	P.29-107-572		IA IIB (Str. IV)	
1	29-103-707	Pyramidal	Baked clay						1071		P.25-11-258		IA IIB (Str. IV)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	286278/50	Doughnut	Clay	6,4	10,5			630,11	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479, fig. 13.4:1.		Doughnut shaped loom weight. Burning traces. Wel crafted and regular.	IA IIB (Str. P7)	2009-1080
1	286278/51	Doughnut	Clay	5,9	7,9		0,6	304,07	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Spherical baked clay loom weight. A part is missing. Burning traces on the surface.	IA IIB (Str. P7)	2009-1082
1	286278/52	Doughnut	Clay	4,6	6,6			148,9	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Doughnut shaped clay loom weight. Broken and ruined. Burning traces on the surface.	IA IIB (Str. P7)	2009-1083
1	286278/53	Doughnut	Clay	3,3	5			56,66	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Doughnut shaped clay loom weight. Complete. Many burning traces	IA IIB (Str. P7)	2009-1084
1	286319/1	Conical	Clay	16,8	16,9			2390	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 474, fig. 13.2:8.	Found with a batch of loomweights	Large and heavy conical object with a flat base made of clay. Slightly burnt. Horizontal hole. Too heavy to be a loom weight.	IA IIB (Str. P7)	
1	286293/1	Conical	Clay	12,4	15		1	1183	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 474, fig. 13.2:9.	Probably a jar stopper	Large and heavy conical object with a flat base made of clay. Asymmetrical hole. Surface burnt. Too heavy to be a loom weight.	IA IIB (Str. P7)	
1	286292/1	Doughnut	Clay					134,91	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/1a	Doughnut	Clay					320,5	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/1b	Doughnut	Clay	5,3	7			381,8	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/2	Doughnut	Clay					375	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/3	Doughnut	Clay	5	7,2			195,85	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/4	Doughnut	Clay	5,1	7,5			295,85	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/5	Doughnut	Clay	6,5	8,8			423,14	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	286292/6	Doughnut	Clay	5,4	7,5			264,85	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/7	Doughnut	Clay	4,9	6,8			215,9	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/8	Doughnut	Clay	7	9,1			411,29	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/9	Doughnut	Clay					229,5	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/10	Doughnut	Clay					142,46	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/11	Doughnut	Clay	6	7,7			311,67	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/12	Doughnut	Clay	6	7			268,3	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/13	Doughnut	Clay					349,77	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/14	Doughnut	Clay	6	7,6			303,8	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/15	Doughnut	Clay	7	8,8			451,35	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/16	Doughnut	Clay	5,5	7,7			285,42	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/17	Doughnut	Clay	5,5	7,5			280	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/18	Doughnut	Clay					237,75	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/19	Doughnut	Clay					255	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	286292/20	Doughnut	Clay	4,1	6,8			141,96	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/21	Doughnut	Clay					510,7	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/22	Doughnut	Clay	6,6	7,9			280,86	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/23	Doughnut	Clay					366,86	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/24	Doughnut	Clay	6,9	7,3			355,55	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/25	Doughnut	Clay	6,6	7,6			355,55	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/26	Doughnut	Clay	5,7	7,7			302,63	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/27	Doughnut	Clay	5,2	6,8			260,41	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/28	Doughnut	Clay	6,6	8			397,54	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/29	Doughnut	Clay	5,5	7,7			271,24	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/30	Doughnut	Clay	4,9	8			263,97	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/31	Doughnut	Clay	5,3	7,4			330,4	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/32	Doughnut	Clay	6	7,4			287,54	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/33	Doughnut	Clay					153,74	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	286292/34	Doughnut	Clay					156,23	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/35	Doughnut	Clay	4,4	6,8			178,1	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/36	Doughnut	Clay					200,47	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/37	Doughnut	Clay					378,92	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/38	Doughnut	Clay					380,3	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/39	Doughnut	Clay	6,9	7,5			359,41	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/40	Doughnut	Clay	6,5	8			359,41	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/41	Doughnut	Clay					215,05	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/42	Doughnut	Clay	5,8	7,7			265,96	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/43	Doughnut	Clay	5,1	7,4			260,39	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/44	Doughnut	Clay					170,25	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/45	Doughnut	Clay	6,2	8,8			552	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/46	Doughnut	Clay	5,9	7,1			260,67	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/47	Doughnut	Clay	5,9	8,4			412,48	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	286292/48	Doughnut	Clay	5,9	7			296,71	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/49	Doughnut	Clay	6,1	7,9			342,66	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/50	Doughnut	Clay	6,3	8,1			411,58	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/51	Doughnut	Clay					154,59	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/52	Doughnut	Clay	6	6,7			244,19	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/53	Doughnut	Clay	5	7,5			281,65	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/54	Doughnut	Clay	6	7,2			256,56	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/55	Doughnut	Clay	6,7	8,9			355,95	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/56	Doughnut	Clay	6,2	7,7			341,07	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/57	Doughnut	Clay	6,3	8,7			444,85	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/58	Doughnut	Clay	6,6	8,1			336,81	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/59	Doughnut	Clay	5,5	6,9			223,07	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/60	Doughnut	Clay					173,63	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/61	Doughnut	Clay	4,7	6,8			206,18	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	286292/62	Doughnut	Clay					185,19	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/63	Doughnut	Clay					285,08	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/64	Doughnut	Clay	4,6	6,6			187,27	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/65	Doughnut	Clay	3,6	6,4			147,73	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/66	Doughnut	Clay					240,27	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/67	Doughnut	Clay	4,6	6,6			165,84	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/68	Doughnut	Clay					80,44	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/69	Doughnut	Clay	4,1	6			175,88	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/70	Doughnut	Clay	4,8	8			286,86	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/71	Doughnut	Clay	6	7,6			336,62	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/72	Doughnut	Clay	5,9	7,1			300,15	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/73	Doughnut	Clay					60,6	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/74	Doughnut	Clay					201,13	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/75	Doughnut	Clay	5,8	7,3			288,65	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	286292/76	Doughnut	Clay					156,61	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/77	Doughnut	Clay	5,6	6,3			219,73	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/78	Doughnut	Clay	4,6	6,8			205,02	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/79	Doughnut	Clay					143,73	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/80	Doughnut	Clay	5,9	7,3			273,55	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/81	Doughnut	Clay	4,9	7,5			245,65	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/82	Doughnut	Clay	6,4	7,2			271,81	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/83	Doughnut	Clay					131,42	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.		Not complete	IA IIB (Str. P7)	
1	286292/84	Doughnut	Clay	5,1	6,7			199,38	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/85	Doughnut	Clay	3,4	5			57,93	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/86	Doughnut	Clay	5,3	8,5			334,13	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/87	Doughnut	Clay	6,1	8			308,47	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/88	Doughnut	Clay	5,7	7,1			231,24	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/89	Doughnut	Clay	5	7			219,79	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	286292/90	Doughnut	Clay	6	6,6			223,46	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/91	Doughnut	Clay	6,3	9,6			482,15	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/92	Doughnut	Clay	5,1	6,1			159,17	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/93	Doughnut	Clay	2,6	4,6			43,28	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/94	Doughnut	Clay	5,4	7,7			321,32	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/95	Doughnut	Clay	5,1	6,9			298,89	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/96	Doughnut	Clay	6,7	9			450,75	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/97	Doughnut	Clay					358,69	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/98	Doughnut	Clay	6,1	8,1			354,33	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	
1	286292/99	Doughnut	Clay	6,4	7,5			311,92	L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 479.			IA IIB (Str. P7)	

Basalt rings

Early Bronze Age

1	181333	Cylindrical	Basalt	1,7	5,3		0,5	59,39	10018	Mazar/Rotem 2012:371, fig. 9.9:15.		Basalt disk with hourglass hole. Complete. Polished	EB Ib (Str. M-3)	
1	181121	Cylindrical	Limestone	0,7	3,3		0,5		10056	Mazar/Rotem 2012:371, fig. 9.9:19.		Incomplete. Polished surface.	EB Ib (Str. M-3)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	181207	Cylindrical	Limestone	1	3,8		0,7	19,78	10056	Mazar/Rotem 2012:371, fig. 9.9:20.		Slightly broken. Polished surface. Pebble?	EB Ib (Str. M-3)	
1	380094	Cylindrical	Limestone	1,5	3,7		0,7	21,32	38002	Mazar/Rotem 2012:371, fig. 9.9:16.		Sharpened edges. Not properly rounded in shape. Conical perforation.	EB Ib (Str. M-2)	
1	281257	Cylindrical	Limestone	1,4	4		0,9		10016	Mazar/Rotem 2012:371, fig. 9.9:18.		Fragment.	EB Ib (Str. M-2)	
1	100195	Cylindrical	Limestone	1,1			0,8		10019	Mazar/Rotem 2012:371, fig. 9.9:18.		Fragment.	EB Ib (Str. M-2a)	
1	170088?	Cylindrical	Basalt	2,4	4,3		1,2	59,52				Basalt ring. Well rounded. Cylindrical hole		
1	181313	Cylindrical	Basalt	1,9	3,8		1,2	34,51	W10006	Mazar/Rotem 2012:370, fig. 9.9:10.		Basalt ring. Well rounded. Cylindrical hole	EB Ib (Str. M-2)	
1	281117	Cylindrical	Basalt	1,8	3,1		0,9-1,5	21,63	18125	Mazar/Rotem 2012: 370, fig. 9.9:14.		Basalt ring. Well rounded. Cylindrical hole	EB Ib (Str. M-2b)	
1	380543	Cylindrical	Basalt	1,4	3,6		1	28.66	38039	Mazar/Rotem 2012: 370, fig. 9.9:13.		Basalt ring. Well rounded. Cylindrical hole	EB Ib (Str. M-3)	
1	281253	Cylindrical	Basalt	1,7	3,5		1,2	30,4	28114	Mazar/Rotem 2012: 370, fig. 9.9:12.		Basalt ring. Well rounded. Cylindrical hole. Porous stone	EB Ib (Str. M-3)	
1	380500	Cylindrical	Basalt	1,7	3,7		1,1	31,98	W18227	Mazar/Rotem 2012: 370, fig. 9.9:11.		Basalt ring. Well rounded. Cylindrical hole	EB Ib (Str. M-2)	
1	380102	Cylindrical	Basalt	2	3,9		1,3	42,3	38015	Mazar/Rotem 2012: 370, fig. 9.9:8.		Basalt ring. Well rounded. Cylindrical hole	EB Ib (Str. M-2b)	
1	380581/1	Cylindrical	Basalt	2,1	4,2		1,2	57,92	38038	Mazar/Rotem 2012: 371, fig. 9.9:5.		Basalt ring. Well rounded. Cylindrical hole	EB Ib (Str. M-3)	
1	380581/2	Cylindrical	Limestone	1,8	4,4		0,9	45,14	38038	Mazar/Rotem 2012: 371, fig. 9.9:7.		Complete.	EB Ib (Str. M-3)	
1	380581/3	Cylindrical	Basalt	2	4,2		1,3	45,55	38038	Mazar/Rotem 2012: 371, fig. 9.9:6.		Complete, asymmetrical	EB Ib (Str. M-3)	
1	380572	Cylindrical	Tuff	2,9					38039	Mazar/Rotem 2012: 371.		Small fragment, oval.	EB Ib (Str. M-3)	
1	100088/1	Cylindrical	Basalt	2,7	4,4		1,4	61,47	10018	Mazar/Rotem 2012: 370, fig. 9.9:3.		Basalt ring. Well rounded. Cylindrical hole with some chippings nearby	EB Ib (Str. M-3)	
1	100088/2	Cylindrical	Basalt	2,4	4,2		1,1	59,65	10018	Mazar/Rotem 2012: 370, fig. 9.9:4.		Basalt ring. Complete and well rounded. Hourglass hole with a wider side	EB Ib (Str. M-3)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	281526	Cylindrical	Limestone	2,1	3,8		1	35,5	28121	Mazar/Rotem 2012: 370, fig. 9.9:9.		Basalt ring, complete. Rounded and cylindrical hole. Wear surfaces.	EB Ib (Str. M-3)	
1	380356	Spherical	Limestone	3,8	3,8		1,1		38033	Mazar/Rotem 2012: 370.		Incomplete.	EB Ib (Str. M-3)	
1	181047	Cylindrical	Tuff	2,5	4,1		1,2		10018	Mazar/Rotem 2012: 370.		Incomplete, asymmetric.	EB Ib (Str. M-3)	
1	380123	Spherical	Tuff	2,6	2,7		nn	13,49+x	38007	Mazar/Rotem 2012: 370.		Fragment of a spherical tuff object. Inside the hole are visible the signs of the crafting process.	EB Ib (Str. M-2b)	IAA 850623
1	320581/3	Cylindrical	Basalt	2,1	4,2		1,3	45,48				Basalt ring. complete and well rounded. Cylindrical hole		
1	33-10-691 g.	Cylindrical	Basalt	1,9	4,1		1,1	49,17	1858			Basalt ring. Complete and well rounded.Not perfectly smoothed	Eb Ib (Lev. XIV)	341157
1	33-10-691 c	Cylindrical	Basalt	1,7	3,9		1	44,06	1858			Basalt ring. Well rounded. Cylindrical hole	Eb Ib (Lev. XIV)	341156
1	33-10-691 a	Cylindrical	Basalt	2,2	3,5		1	38	1858			Basalt ring. complete and well rounded.Not perfectly smoothed	Eb Ib (Lev. XIV)	341159
1	33-10-673 c	Cylindrical	Basalt	1,5	3,3		1,1	23,5	1873			Basalt ring. Complete and well rounded. Hourglass hole well polished.	Eb Ib (Lev. XIV)	341147
1	341444	Cylindrical	Basalt	1,6	4,7		1,1	62,06				Basalt ring. Complete and well rounded. Hourglass hole well polished.	Eb Ib (Lev. XIV)	
1	33-10-568	Cylindrical	Basalt	2,5	4x4,3		1,2	67,78	1848			Basalt ring. Complete and slightly eliptical. Hourglass hole	Eb Ib (Lev. XIII)	341134
1	33-10-571	Cylindrical	Basalt	1,8	3		1	21,62	1848			Well crafted. Hourglass hole	Eb Ib (Lev. XIII)	341135
1	100236	Cylindrical	Basalt	2,7	8,1				10038	Mazar/Rotem 2012: 370, fig. 9.9:1.		Unpolished, incomplete. Unfinished perforation. Not a basalt ring. Too large.	EB III (Str. M-1)	
1	380131	Cylindrical	Basalt	1,2	3,4		1		38002	Mazar/Rotem 2012: 370.		Incomplete.	EB Ib (Str. M-2)	
1	182045	Cylindrical	Basalt	2,2			1,4		10964	Mazar/Rotem 2012: 370.		Fragment.	EB Ib (Str. M-2)	
1	182422	Cylindrical	Limestone	2,8	5		1,5		18251	Mazar/Rotem 2012: 370.		Incomplete, asymmetrical.	EB Ib (Str. M-2b)	
1	100029	Cylindrical	Basalt	3,1	4,7		1,5		94,19	Mazar/Rotem 2012: 370, fig. 9.9:2.		Complete, quite Spherical. Cylindrical hole, not hour glass perforation. Perhaps a macehead.	EB Ib (Str. M-3)	
Middle Bronze Age														
1	189197	Cylindrical	Basalt	3,1	1,8		1	22,29	18960	Yahalom-Mack 2007c: 663, fig. 12.3:1.		Complete, ring shaped, perforated from both sides.	Late MB II (Str. R-3)	

N.		Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	189215	Cylindrical	Basalt	1	3,8		1	20,47	18961	Yahalom-Mack 2007c: 663, fig. 12.3:4.		Complete, ring shaped, perforated from both sides.	Late MB II (Str. R-3)	
1	580516	Biconical	Basalt	2,9	4,4		1,5		58117	Yahalom-Mack 2007c: 663, fig. 12.3:9.		Incomplete, perforated from both sides	Late MB II (Str. R-4a)	
Bone spatulae and beaters														
Early Bronze Age														
1	380580	Spatula	Bone	5,7	1,5	0,3			38038	Mazar/Rotem 2012: 386, fig. 9.16:7.		Fragment of a bone spatula with triangular point, the other end missing.	EB Ib (Str. M-3)	
1	281709	Spatula	Bone	8,7	1,4	0,3			10056	Mazar/Rotem 2012: 386, fig. 9.16:3.		Bone spatula with triangular point, the other end missing.	EB Ib (Str. M-3)	
1	281043	Spatula	Bone	9,5	2,5	0,3			10037	Mazar/Rotem 2012: 386, fig. 9.16:2.		Part of a bone spatula with triangular point, the other end missing. Parallel striations near the point.	EB Ib (Str. M-2a-b)	
1	281076	Spatula	Bone	9,5	1,55	0,25			18104	Mazar/Rotem 2012: 386, fig. 9.16:4.		Part of a bone spatula with triangular point, the other end missing. Cutting marks near the point.	EB Ib (Str. M-2b)	
1	380113	Spatula	Bone	7,1	1,7	0,4			38005	Mazar/Rotem 2012: 386, fig. 9.16:5.		Fragment of a bone spatula with triangular point, the other end missing.	EB Ib (Str. M-2b)	
1	281578	Spatula	Bone	3					10025	Mazar/Rotem 2012: 386, fig. 9.16:8.		Small fragment of point of a spatula	EB Ib (Str. M-2b)	
1	380411	Spatula	Bone	2,3	0,8	0,2			38037	Mazar/Rotem 2012: 386.		Small fragment of point of a spatula	EB Ib (Str. M-2b)	
1	283183	Spatula	Bone	11	1,9	0,2			28320	Mazar/Rotem 2012: 386, fig. 9.16:6.		Two fragments of a bone spatula, both ends missing.	EB III (Str. R-12)	
1	383025	Spatula	Bone	8,8	2	0,3			28328	Mazar/Rotem 2012: 386, fig. 9.16:1.		Bone spatula, almost complete. Triangular point, the other end missing.	EB III (Str. R-12b)	
1	281317	Beater	Bone	5	1,2	0,3			28121	Mazar/Rotem 2012: 386, fig. 9.16:14.		Bone point, one end missing, the other apparently quite sharpened (?). Point burnt.	EB IB (Str. M-3)	
1	380580	Spatula	Bone	5,7	1,5	0,3			38038	Mazar/Rotem 2012: 386, fig. 9.16:7.		Bone point, probably belonging to a spatula, triangular shape.	EB IB (Str. M-3)	
Late Bronze Age														
1	27-12-299	Spatula	Bone	4,6	1,6				1327		P. 29-105-393	Bone spatula, rounded point, the other missing. Penn pics.	LB IB-IIA (Str. IX)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	387521	Spatula	Bone	3,4		0,1			38739	Panitz-Cohen/Yahalom-Mack 2009: 740, fig. 15.2.		Bone spatula, broken, with large and rounded tip. Horizontal line incised above an X.	LB IIB (Str. N-4)	
Iron Age I														
1	989007	Spatula	Bone	7,4	1,8				88935 Building 1500	Yahalom-Mack/Mazar 2006: 161.		Bone spatula with triangular point, the other end missing. Cancellous bone visible on the lower surface.	IA IA (Str. Q-1)	
Iron Age II														
1	286320	Spatula	Bone	5	2,4	0,1			L 28636 Building 28636	Yahalom-Mack/Mazar 2006: 497, fig. 13.10:3)		Small bone spatula. Brokeb. Triangular point. One side is smooth, the other shows cancellous bone structure. Edgy point, but smoothed on the side. No wear traces are visible, except on the lower edge (they could be sanding traces)	IA IIB (Str. P-7)	681879
1	386423	Spatula	Bone	6,1	2,3	0,2			L 38661	Yahalom-Mack/Mazar 2006: 497, fig. 13.10:4)		Bone broken spatula. Only the rounded edge is preserved. Slightly convex and well polished. Barely visible wear traces.	IA IIB (Str. P-8a)	681880
1	26-9-1	Spatula	Bone						1076	James 1966: fig. 110.	P.29-105-286	Bone spatula, triangular point, the other partially rounded.	IA II (Str. V)	
1	3191	Spatula	Bone	7,2					63	James 1966: fig. 114.	P. 29-105-429	Bone spatula, triangular point, the other missing.	IA II (Str. V)	
1	3665	Spatula	Bone	10					58	James 1966: fig. 118.	P. 29-105-440	Bone spatula, pen-nib point, complete. The other end is rounded.	IA IIB (Str. IV)	
1	NFN	Spatula	Bone	5,5					273	James 1966: fig. 118.	P. 29-105-440	Bone spatula, pen-nib point, complete. The other end is rounded.	IA IIB (Str. IV)	
1	3612	Spatula	Bone	9,5					99	James 1966: fig. 118.		Bone spatula, pen-nib point, complete. The other end is rounded.	IA IIB (Str. IV)	
1	3559	Spatula	Bone	7,7					254	James 1966: fig. 118.	P. 29-105-431	Bone spatula, pen-nib point, complete. The other end is rounded.	IA IIB (Str. IV)	
1	NFN	Spatula	Bone						183	James 1966: fig. 118.		Bone spatula, pen-nib point, complete. The other end is rounded.	IA IIB (Str. IV)	
1	26-11-367	Spatula	Bone	9,3	2				1138	James 1966: fig. 118.	P. 29-105-417	Bone spatula, pen-nib point, complete. The other end is rounded.	IA IIB (Str. IV)	

Needles and bodkins

Early Bronze Age

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	181340	bodkin	Bone	17,9	1,1	0,35			18101	Mazar/Rotem 2012: 38, fig. 9.16:9.		Long and narrow object with a rounded perforation near one of the ends. Worked and polished on both sides.	EB Ib (Str. M-2b)	
Middle Bronze Age													
1		Needle	bronze	7,5	0,5		0,3					Broken bronze needle. On the top the eye is a oval hole slightly flatted.		142258
1		Needle	bronze	6,2	0,4							Broken bronze needle point.		142259
1	985049	Needle	bronze	7,7	0,4				88568	Yahalom-Mack 2007a: 612, fig. 9.3:7.		Broken needle, two pieces preserved, point missing. Eye perforated on the shaft.	Late MB IIB (Str. R-3)	
Late Bronze Age													
1	791018		bronze	10,9	0,3			2,97	79115	Yahalom-Mack 2007a: 611, fig. 9.3:6.		Bent needle, incomplete. Loop shaped eye (?)=Large eye obtained probably by benting on itself the upper part of the shaft	LB I (Str. R-1b)	
1	27-10-538		bronze	12,5	0,5				1252	James/McGovern 1993: fig. 150.1.	P.29-108-311	Long and thick needle, point missing. Large eye obtained probably by benting on itself the upper part of the shaft.	LB IIB (Str. VII)	
1	27-11-248		copper -base						1289	James/McGovern 1993: fig. 150.3.		Long and thick needle, broken in three. Large eye obtained probably by benting on itself the upper part of the shaft.	LB IIB (Str. VIII)	
1	26-10-500		copper -base						1108	James/McGovern 1993: fig. 150.4. Rowe 1940; pl. 32.18		Long and thick needle, point missing, broken in two. Large eye obtained probably by folding on itself the upper part of the shaft.	LB IIB (Str. VIII)	
1	184250		bronze	13,4	0,5			11,1	18411	Yahalom-Mack 2009: 565, fig. 10.9.		Long and thick needle,complete. Large eye obtained by folding on itself the upper part of the shaft.	LB IIB (Str. N-4)	
Iron Age I													
1	108196		bronze	7,5	0,7	0,5		7,1	10841	Yahalom-Mack 2009: 565, fig. 10.9.		Long and thick needle, point missing. Large eye obtained by folding on itself the upper part of the shaft.	IA IA (Str. S-4)	
1	987333		bronze	8,8	0,4				98741	Yahalom-Mack 2009: 565, fig. 10.9.		Long shaft tapering to a point, broken in two pieces. Probably part of a needle. Upper part missing.	IA IA (Str. S-3)	
1	27-10-450	Needle	bronze	11,3	0,5				1197	James 1966: 104.	P.29-108-310	Long and thick bronze needle, point missing. Eye pierced	IA IA (Lev. VI)	
1	33-9-84	Needle	bronze						1724	James 1966: 104.	P.34-20-45	Bronze needle slightly curved.	IA IA (Lev. VI)	

N.	Typology	Material	H	D	Th	Hole	Weight	Locus	Bibliography	Notes	Description	Dating	IAA
1	31-11-273	bodkin	bronze					1599	James 1966: 104.		Thick shaft of bronze with no eye preserved.	IA IA (Lev. VI)	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA

8.3 HAZOR

Spindles													
Late Bronze Age													
1	A 52071		Bone	5,8	0,7x 0,5			2,24	A4	L. 8286 MU			Fragment of bone shaft, broken at one end, slightly thickening toward the other but ending with a point.	LB II (Str. XIII)	
1	H 53		Bronze	18					H	2115	Yadin 1989, CCLXXXII I:33.		Decorated bronze shaft, probably a kohl stick, similar to those of Persian period found at Hazor, area A.	LB II (Str. 1A)	
Iron Age II													
1	A 60880		Bone	7,3	0,5			3	A 5	L. 9142 M			Bone shaft, well polished. Both ends missing.	IA IIA-B (Str. VIII-VII)	
1	A 54586		Bone	11,2	0,5-0,4			4	A4	L. 8575			Bone shaft, well polished with spiral marks on point.	IA IIA-B (Str. VIIa)	
1	A 27973		Bone	nn	0,7x 0,6 min 0,4			5	A2	L. 4023 M			Bone shaft, well polished, tends to tapers toward one end. Both ends broken.	IA IIA-B (Str. VIIIa)	
1	A 54504		Bone	9,9	0,9			9	A4	L. 8558			Bone shaft, well polished. One end flat, the other missing. probably part of a pendent.	IA IIC (Str. IVb)	
1	A 21609		Bone	7,8	0,7-0,8			4	A2	L. 3217 M			Bone shaft, well polished, point preserved, roughly shaped. Traces of polishing manufacture on the whole surface.	IA IIC (Str. V)	
1	A 60466		Bone	4,6	0,6			1,35	A 5	L. 9077			Bone shaft, well polished with long and thin point. Broken in the nearby of the hole.	IA IIC (Str. V)	
1	A 23013		Bone	2,5	0,6x 0,7			1,44	A2	L. 3432 M			Small fragment of bone shaft.	IA IIC (Str. VI-V)	
1	M 72788		Bone	8,1	0,7			5	M	L. 07-334			Fragment of bone shaft, cylindrical shape and flat hole, other end missing.	IA IIC	
1	M 72378		Bone	8,2	0,8			5,52	M	L. 07-329 M			Fragment of bone shaft, cylindrical with rounded point, the other end missing. Possible spindle.	IA IIC	

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	M 93332		Bone	4,6	0,7			3,23	M3	L. 14-520 M		Fragment of bone shaft with a flat end and traces of manufacture on the surface. Not perfectly rounded.	IA II C	
1	B 572/1		bone	13					B	3116	Yadin 1960, pl. CV:27, CLXVI:9.		Bone rod, thickening toward the middle. Both ends are rounded.	IA II C (Str. IV)	
1	B 4190/1		bone						B	3180	Yadin 1989, CCXIX:35.		Bone rod, cylindrical with a rounded end and the other missing.	IA II C (Str. VI)	
Unknown context															
1	A 1237		Bone	9,5	0,7			4,79 +x	A				Thin bone shaft, broken at both ends. Well polished on the whole rod.		
1	A 12895		Bone	8,9	1,1			10	A1	L. 1344	Hazor VI Bechar: 499, fig. 8.1	Fill of uncertain date	Hollow bone, accurately polished. One end flat and the other missing. Incised ring near the end. Made of metatarsus of gazelle		
1	A 61843		Bone	19	0,8-0,9			14	A5	L. 9278 M			Bone shaft, polished surface, one end missing and the other with a rounded point.		
1	M 34722		Bone	2	1			2,62	M	L. 5579 tomb			Small fragment of bone shaft broken at both ends.		
1	M 34751		Bone	7,3 ca	0,9				M	L. 5585			Two fragments of bone shafts, not matching but probably part of the same object. One has a well carved point.		
1	M 34988		Bone	3,7	0,7			1,46	M	L. 5603 T			Fragment of bone shaft with a rounded point.		
1	M 73115		Bone	6,5	min 0,5 max 0,8			3,35	M	L. 08-316 M			Fragment of bone shaft, tapering toward one end, slightly chipped. Oval section. Diagonal marks on the surface, probably due to manufacture process.		
1	A 3272/1		Bone	9	0,7			6,01 +x	H				Fragment of bone shaft with a flat end and the other broken. Not perfectly cylindrical, even if polished.		
1	A 2312/2		Bone	4,1	0,9			4,06 +x	A	57n			Fragment of bone shaft, broken at both ends.		
1	A 3022/1		Bone	7,2	0,7			4,78 +x	A	57n			Part of bone shaft, one end flat and the other broken. Not perfectly cylindrical even if polished. Slightly faded area near the end.		

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
Spindle whorls													
Middle Bronze Age													
1	D 7007	dome	bone					D	9023	Yadin 1958: CII:27, CLX.12.		Dome bone spindle whorl, chipped on the side.	MB II (Str. 2)	
1	210/A1-71/1	dome	bone					210/A1	2005	Yadin 1989: CCXCIX:5		Dome bone spindle whorl, complete.	MB II (Str. 3)	
1	210/A1-25/1	dome	bone		2,1			210/A1	2012	Yadin 1989: CCXCIX:6, CCCXXXVI:13.		Dome bone spindle whorl, complete.	MB II (Str. 4)	
1	C 656b/1	discoid	bone					C	6203	Yadin 1960: CXXVI:19.	Button?	Extremely flat and hole seems very small from the drawing	MB II (Str. 3)	
1	C 656b/2	conical truncated	bone					C	6203	Yadin 1960: CXXVI:20, CLXXIX:21	Button?	Extremely flat and hole seems very small from the drawing	MB II (Str. 3)	
1	C 468/1	dome	bone					C	6203	Yadin 1960: pl. CXXVI:21, CLXXIX:19		Dome bone spindle whorl.	MB II (Str. 3)	
1	C 710/5	dome	bone					C	6203	Yadin 1960: CXXVI:22, CLXXIX:20		Dome bone spindle whorl.	MB II (Str. 3)	
Late Bronze Age													
1	F 1302/1	button	clay					F	L 4-5	Yadin 1989, pl. CCXLIV:9.		Button made of clay, complete.	MB II-LB I	
1	49290	dome	bone						07-026	Ben Tor 2017: 559.	no fig.	Dome, bone spindle whorl.	LB (Str. XVIII)	
1	E 1143	conical	bone					E	7021	Yadin 1958: pl. CXLII:19, fig. CLXVI:15.	55n /E H43?	Conical bone spindle whorl.	LB I	
1	16873	dome	bone						1719, buiding 7050, fill	Ben Tor 2017: 554, fig. 12,15		Dome-shaped bone spindle whorl	LB IB-IIA (Str. XIV)	

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	17876	dome	bone (?)						1719, buiding 7050, fill	Ben Tor 2017: 554, fig. 12,15		Dome-shaped bone spindle whorl	LB IB-IIA (Str. XIV)	
1	17140		bone						1774	Ben Tor 2017: 558.	no fig.		LB IIA-B (Stra. XIII)	
1	47629								7780	Ben Tor 2017: 558.	no fig.		LB II (Str. XIV-XIII(	
1	49022								07-003	Ben Tor 2017: 558.	no fig.		LB II (Str. XIV-XIII)	
1	M 70416 a	dome	Ivory	0,8	2,5		0,4	5,03	M2	L. 6537 fill	Cimadevilla 2012: 560, fig. 12.2.		Bone spindle whorl, dome shaped with worn surface. Lathe rounded marks on the dome, parallel marks of polishing on the base.	LBA	
1	M 70416 b	dome	bone	0,6	2,5		0,3	3,45	M2	L. 6537 fill			Bone spindle whorl, dome shaped with highly polished surface. Lathe rounded marks on the dome, parallel marks of polishing on the base. Small chipps near the upper hole. Hole slightly conical, larger on the base (0,4).	LBA	
1	A 40979	dome	stone	1,2	2,6		0,5	10,64	A3	L. 7050F		floor	Dome stone (serpentinite?) spindle whorl, heavily encrusted. Due concentrical rings on the dome, base slightly hollow.	LB II (Str. XIII)	
1	A 12946	dome	stone	1,2	2,5		2,5	9,63	A1	L. 1372 F		floor	Small spindle whorl, dome shaped, made of stone (serpentinite?). Hole slightly conical, larger near the base. Small chippings near the upper hole.	LB II (Str. XIII)	
1	A 13723	button	bone	0,5	2,1		0,25	1,24	A1	L. 1462 F		mudbrick collapse	Small bone button, base quite worn.	LB II (Str. XIII)	
1	M 34618	dome	bone	0,7	2,2		0,3	3,07	M	L. 5571			Dome bone spindle whorl, surface abraded and worn, possibly an attempt of polishing. Polishing manufacture visible on the base. Hole slightly conical, larger near the base.	LBA destruction	
1	A 90894	conical truncated	stone	2,1	3,5		0,6	37,42	A3	L. 9583 F			Conical truncated spindle whorl, made of stone (steatite?). Upper part very worn. Cylindrical hole.	LB II?	
1	A 45809	dome	stone	0,8	2,2		nn	1,73 +x	A3	L. 7540 M		mudbrick collapse	Dome spindle whorl made of stone (serpentinite?), broken in half. Circular lathe marks on the dome, polishing marks on the base.	LB II (Str. XIII)	

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A 47086	dome	bone	1	2,8		nn	3,15 +x	A3	L. 7730 M		fill	Bone spindle whorl, more than half broken. Dome shaped.	LB II (Str. XIV-XIII)	
1	A 18641	dome	bone	2,3	4,4		0,6	18,03	A1	W. 4013 W			Dome bone spindle whorl, quite tall. Hole very ruined on both sides.	LB II (Str. XIII)?	
1	A 48016	button	stone	0,9	3,7		0,3	9,58 +x	A3	L 7852 U		floor	Stone button (serpentinite) very large with small hole, slightly conical, larger at the base. Traces of polishing on the base.	LB II (Str. XIII)	
1	A 26961	spherical	pottery	2,7	2,4		nn	7,33 +x	A2	L. 3877 M		fill	Spherical pottery spindle whorl, roughly shaped and not polished.	LB II (Str. XIV-XIII)	
1	A 55787	biconical	pottery	2,2	3,2		0,9	16,14	A4	L. 8788 F		floor	Biconical spindle whorl made of pottery, small and roughly shaped. Ruined near both sides of hole.	LB II (Str. XIV)	
1	A 49415	dome	bone	1	2,9		0,35	9,82	A6	L. 12-903		floor	Dome bone spindle whorl, almost complete. Very worn on the surface. Hole slightly larger at the base (0,45).	LB II (Str. XIV)	
1	A 92392	cylindrical	stone	2,1	3,7		nn	18,07+x	A4	L. 80036 M		Fill	Fragment of perforated object made of stone. Very irregular but well shaped cylindrical hole.	LB II (Str. XIV)	
1	A 42306	conical truncated	stone	1,3	2,6		0,5	13,65	A	L. 7223 B		floor	Conical spindle whorl, made of stone (steatite?), well polished. Hole slightly larger at base (0,6). Upper part worn and chipped, inferior side of hole neately cut. Small chippings on the side.	LB II (Str. XIII)	
	B 4994	dome	bone						B	3284	Yadin 1989: CC:29	Found with shaft/needle B 5011	Dome, bone spindle whorl with concentric incisions on the dome and on the flat base.	LB II	
	C 5118	Lenticular	bone						C	6063	Yadin 1958: LXXXVI: 21		Lenticular bone spindle whorl	LB II (Str. 1b)	
	D 11684	dome	bone						D	9044	Yadin 1958: XCV:19		Dome bone spindle whorl, quite high.	LB II (Str. 2)	
	D 2852	dome	bone						D	9017	Yadin 1958: CX: 13, CLX:9.		Dome, bone spindle whorl, decorated on the base by a circular incision.	LB II	
	C 1880	dome	bone						C	6117	Yadin 1958: LXXXIX:17, CLX:22.		Dome bone spindle whorl.	LB II	
	K 222/1	dome	limestone		3,2				K	5005	Yadin 1989: CCXCIV:5,		Dome limestone spindle whorl.	LB II (Str. 1a)	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
									CCCXXXV:14				
	C 443/1	dome	bone					C	6197	Yadin 1960: pl. CXXVI:28, CLXXIX		Dome bone spindle whorl.	LB I (Str. 2)	
	C 1101/3	dome	black stone					C	6215	Yadin 1960: CXXVII:27, CLXXIX:8		Dome spindle whorl, made of black stone.	LB II (Str. 1b)	
	C 760	dome	stone					C	6214	Yadin 1960: pl. CXXVII:34		Dome stone spindle whorl.	LB II (Str. 1 a-b)	
	F 1076/115	dome	bone					F	8144	Yadin 1960: CXXXVII:26		Dome bone spindle whorl.Very small	LB II (Str. 1b)	
	F 1076/154	dome	bone					F	8144	Yadin 1960: CXXXVII:27		Dome bone spindle whorl.	LB II (Str. 1b)	
	F 1076/165	dome	bone					F	8144	Yadin 1960: CXXXVII:28		Dome bone spindle whorl, quite high.	LB II (Str. 1b)	
1	L 632	dome	bone	1,5	3,8		0,6	8,91 +x	L	1099		YADIN, floor	Dome bone spindle whorl, worn and partially broken. On the base, cancellous bone exposed.	LB II (Str. XIV-XIII)	
Iron Age I															
1	A 45746	dome	stone	0,6	2,1		0,25	1,64 +x	A3	L. 7530 W		fill	Dome spindle whorl, made of grey stone, light and polished. Prossibly a bead.	IA I (Str. XII-XI)	
Iron Age II															
1	A 50957	conical truncated	stone	2	3,5		0,7	26,82	A4	L. 8070 MU		floor	Conical truncated spindle whorl, made of stone. Very worn, especially near the upper side of the hole.	IA IIA (Str. Xb)	
1	A 59149	conical	stone	1,1	2,9		0,5	12,24	A4	W. 5353 W	Cimadevilla 2012: 560, fig. 12.2.	Wall	Conical spindle whorl, made of stone (serpentinite?). On the base traces of polishing.	IA IIA (Str. IXb)	
1	A 50521	conical	chalk	2,6	5,7		0,8	81,04	A4	L. 8052 MU?	Cimadevilla 2012: 560, fig. 12.2.	Building 200-202, Make Up	Conical spindle whorl made of stone.	IA IIA (Str. Xa)	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A 54729	conical	pottery	2,7	5,4		0,7	76,05	A4	L. 8595 F	Cimadevilla 2012: 560, fig. 12.2.	Building 8158	Conical pottery spindle whorl, complete. Hole slightly conical.	IA IIA (Str. Xb)	
1	A 50700	conical	Steatite	1,3	1,9		0,5	5,27	A4	L. 8029 fill	Cimadevilla 2012: 560, fig. 12.2.		Conical spindle whorl made of steatite. Small and slightly tilted but working as a whorl. Wheel traces on the surface.	IA IIA (Str. Xa)	
1	A 57970	cylindrical	pottery	2,2	4,4		0,75	55	A4	L. 9080 F		fill	Cylindrical spindle whorl, made of pottery and well shaped, hole slightly warped.	IA IIA (Str. IX)	
1	M 76167	dome	bone	0,9	2,4		0,3	4,48	M	L. 10-378 M		Standing stones complex	Dome bone spindle whorl, small chipping on the side. Wheerl marks visible on the dome, traces of polishing on the base. Quite worn surface.	IA II A (Xth century)	
1	B 2751/1	conical	stone						B	3220	Yadin 1989, pl. CCXIII:23.		Conical stone spindle whorl. Concentric incisions on the dome and on the flat base.	IA IIA (Str. X)	
1	A 3364/2	conical truncated	bone							203d	Yadin 1989: CLXXIII:10 , CCCLIX:17		Conical truncated bone spindle whorl. Small holes on the surface as decoration	IA IIA (Str. Xb)	
1	B 4180	conical	hematite						B	3251	Yadin 1989, pl. CCXVI:22.		Conical spindle whorl made of hematite.	IA IIA-B (Str. VII-VIII)	
1	A 3049/6	dome	hematite							193a	Yadin 1989: CLXXX:26.		Dome spindle whorl, made of hematite.	IA IIA-B (Str. VII)	
1	L 463	dome	limestone						L	L. 1072	Hazor V: 252, 253, fig. III.33: 25.		Dome spindle whorl, made of limestone.	IA IIA-B (Str.VII)	
1	A 12507	discoid	pottery	1,6	5,3x 5,6		0,5	54,09	A1	L. 1250 M		fill	Discoid spindle whorl made of pottery, specially made. Broken in two pieces. Roughly shaped but cylindrical hole.	IA II A-B (Str. VIII-VII)	
1	M 75485	biconical	pottery	3,1	3,5		0,3	33,45	M	L. 10-320 M			Biconical spindle whorl, made of pottery, complete. Very small hole.	IA IIA-B	
1	A 47668	dome	pottery	2,1	5,6		1	53.77	A3	L.7789			Pottery spindle whorl, slightly domed, very worn. Cylindrical hole.	IA II A-B (Str.VIII)	
1	L 3309	biconical	pottery	3,7	4,5		0,6	67,35	L	L. 1073	intera	Four room house (Hazor V)	Biconical spindle whorl, made of pottery, complete. Small hole.	IA IIA-B	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A 63402	conical	stone	1,4	3,4		0,4	16,45	A5	L. 50086 M	Cimadevilla 2012: 560, fig. 12.2.	Fill of moat	Conical stone spindle whorl with traces of small chippings on the upper edge.	IA IIA-B (Str. VIII-VII)	
1	A 13057	dome	stone	1,3	4,2		0,3	20,32	A 1	L. 1395 F	Cimadevilla 2012: 560, fig. 12.2.	Building 1395	Large spindle whorl, dome shaped made of stone (hematite?). Well polished. Chipped and ruined in several points of the surface.	IA IIA-B (Str. VIII)	
1	A 19069	conical truncated	stone	2	3,7		0,6	33,26	A1	L. 1911 M		fill	Conical truncated spindle whorl, made of stone (steatite?), complete. Wheel traces on the whoel surface. Upper side of hole very ruined. Lower side slightly irregular and flaring (0,7).	IA II A-B (Str. VIII-VII)	
1	A 18643	conical	stone	1	2,6		0,4	5,97	A1	L. 1851 F		floor	Conical stone spindle whorl (steatite?), complete. Wheel traces on the whole surface. Upper side of hole very worn. Base covered by incisions, probably intended as decorative.	IA II A-B (Str. VIIIb)	
1	A 13214	conical truncated	pottery	2,2	4		0,7	34,85	A1	L. 1421 M	Cimadevilla 2012: 560, fig. 12.2.	Building 1373	Conical truncated spindle whorl made of pottery, quite well shaped. Upper side of hole covered by chippings, lower sides neatly cut but slightly larger (0,9).	IA IIA-B (Str. VIIb)	
1	A 11225	conical	Alabaster	2,5	3,7		0,5	35,45	A1	L. 1111	Cimadevilla 2012: 560, fig. 12.2.	Fill	Conical spindle whorl made of white stone, extremely polished. No traces of manufacture are detectable, several chippings on the upper side.	IA IIA-B (Str. VII)	
1	A 11937	conical	stone	2,3	2,7		0,5	16,41	A1	L. 1231		floor	Conical spindle whorl, made of grey stone. Cylindrical hole with chippings on the upper side. Slightly larger on the lower side (0,6).	IA IIA-B (Str. VIIa)	
1	A 12723	conical	stone	2,2	3,8		0,4	29,57	A1	L. 1311 F		floor	Conical spindle whorl made of white-brownish stone. Chippings on the upper and lower side of the hole, and on the edge. Deep traces of polishing on the base.	IA II A-B (Str. VIIa)	
1	A 57598	conical	stone	2,1	3,7		0,7	33,1	A4	L. 9031 M		floor	Conical spindle whorl, made of white stone. Deep chippings on upper edge and sides, some near the lower side of the hole.	IA II A-B (Str. VIIIa)	
1	A 1268/1		bone						A	149	Yadin 1960: LXXVIII: 28.		Completely warp	IA IIA-B (Str. VIII)	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A 62844	discoid	pottery	1,8	6,4			35,09	A5	L. 9435 M			Discoid pottery spindle whorl, broken in half. Hole quite irregular.	IA IIC (Str. V)	
1	M 30800	button	stone	1	3,2		0,5	8,4	M	L. 5089			Button spindle whorl made of stone (serpentinite?), chipped on the edge and near the upper hole. Quite large for being a button.	IA IIC	
1	A 5184	dome	stone	3,8	2,3		0,7	30,36	A1	L. 2046 M	Cimadevilla 2012: 560, fig. 12.2.	fill	Dome stone spindle whorl, very well shaped, wheel traces on the dome. Worn and chipped on the upper side of the hole.	IA IIC (Str. VI)	
1	A 63264	dome	bone	2,3	3,7		0,6	12,41 +x	A5	L. 50059 M	Cimadevilla 2012: 560, fig. 12.2.	Building 9367	Dome bone spindle whorl, quite high. Very worn.	IA IIC (Str. Vc)	
1	A 54441	conical	stone	1	2,7		0,3	8,75	A4	L. 85549 F	Cimadevilla 2012: 560, fig. 12.2.	Building 8551	Conical spindle whorl made of stone (serpentinite?). On the bases traces of polishing.	IA IIC (Str. VIa)	
1	A 63263	discoid	stone	1,3	5,8		1	65,7	A1	L. 50059 M	Cimadevilla 2012: 560, fig. 12.2.	Building 9367	Discoid spindle whorl made of white stone. Roughly shaped but with notches on the edge. Hole quite well rounded.	IA IIC (Str. V)	
1	A 11226	dome	stone	0,5	2,2		0,3	3,56 +x	A1	L. 1150		fill	Small spindle whorl made of stone (serpentinite), chipped in several points.	IA II (Str. VII-VI)	
1	A 54442	dome	pottery	2,4	3,9		0,6	35,02	A4	L. 8549 F		floor	Dome pottery spindle whorl, slightly chipped near the edges, at the base and on the upper hole.	IA IIC (Str. Via)	
1	A 54502	dome	bone	1,7	3,8		0,6	15	A4	L. 8559 F		floor	Dome bone spindle whorl.	IA IIC (Str. VIb)	
1	A 13271	cylindrical	bone	1,6	3,2		0,6	14,04	A1	L. 1425 M		floor	Cylindrical bone spindle whorl, encrusted.	IA IIC (Str. VIa)	
1	A 57231	dome	stone	1,6	2,5		0,6	12,63	A4	L. 8963 M		floor	Dome spindle whorl, made of grey stone. Quite flattened and worn near the upper hole, but no wear traces are detectable.	IA IIC (Str. VIb)	
1	A 62490 M	dome	stone	1,8	3,8		0,8	32,14	A4	L. 9385 M			Dome spindle whorl made of green stone, wheel traces on the whole surface, both sides of hole damaged.	IA IIC (Str. V)?	
1	A 61604	conical	stone	2,1	4,2		nn	23,3+ x	A5	L. 9224 M			Conical spindle whorl made of a grey, chalky stone. Half missing.	IA?	
1	A 46290	conical	stone	1,3	3,6			8,52+ x	A3	L. 7580 pit		pit	Fragment of conical spindle whorl made of white stone.	IA IIC (Str. IV)	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A 62449	dome	stone	2,2	3,4		0,6	15,22 +x	A5	L. 9374 M		fill	Dome spindle whorl made of a grey-yellowish stone. Well polished. Damaged at the base. Half preserved.	IA IIC (Str. Vb)	
1	A 62625	dome	stone	2	3,3		1,1	23,38	A5	L. 9399 F		floor	Dome spindle whorl made of stone (steatite?), with well dressed cylindrical hole. Wear traces on the upper side of the hole, almost nothing near the lower side of the hole.	IA IIC (Str. V)	
1	A 61977	dome	stone	3	4,6		0,7	60,66	A5	L. 9266 M		floor	Dome spindle whorl made of stone (steatite?), quite high. Wheel marks on the dome and on the base. Cylindrical hole. Encrusted.	IA IIC (Str. V)	
1	M 92956	dome	stone	1,6	2,5		0,6	13,78	M-west	L. 13-522 M			Dome spindle whorl made of a light stone. Well shaoed with a cylindrical hole. Upper side of the hole slightly worn, lower side neatly cut.	IA II C	
1	M 78759	conical truncated	pottery	1,4	2,7		0,6	8,8	M4	L. 14-346 M			Discoid pottery spindle whorl, burnt, very ruined and irregular.	IA IIC	
1	M 78947	discoid	stone	1,3	4,3		0,9	15,87 +x	M3	L. 15-301 M			Spindle whorl made of stone, fragmentary. Well shaped with cylindrical hole.	IA IIC	
1	A 3599	dome	limestone	0,8	3,6		0,5	14,61	A	48	Yadin 1958, pl. LXV:19.		Dome limestone spindle whorl, quite flattish. Not perfectly rounded, but cylindrical hole, neatly cut, smoothed surfaces.	IA II C (Str. VI)	
1	A 4025/1	dome	limestone							233	Yadin 1989: CLXXXVIII:13		Dome limestone spindle whorl.	IA IIC (Str. VI)	
1	A 2302/1	dome	bone							85a	Yadin 1989: CLXXXVIII:14; CCCLXI:8.		Dome bone spindle whorl.	IA IIC (Str. VI)	
1	A 2478/1	dome	limestone	2	4,1		0,8	35,86	A	188	Yadin 1989: CLXXXVIII:15		Large spindle whorl, dome shaped and made of limestone. Not perfectly symmetrical. Slightly off-centre hole but cylindrical. Base slightly convex with clear signs of polishing. Wear traces near the upper side of hole.	IA IIC (Str. VI)	
1	B 4051	conical	hematite						B	3177	Yadin 1989, pl. CCXXIV:25.		Conical hematite spindle whorl	IA IIC (Str. Vb)	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	G 740	conical	stone						G	10037c	Yadin 1989: CCL:26		Conical stone spindle whorl	IA IIC (Str. VI)	
1	G 567/1	dome	stone						G	10037c	Yadin 1989: CCL:27		Dome limestone spindle whorl. Concentric incisions on the dome and on the flat base.	IA IIC (Str. VI)	
1	G 551/1	dome	limestone						G	10035b	Yadin 1989: CCLIII:12, CCCLXI:9, 11.		Dome limestone spindle whorl. Concentric incisions on the dome and on the flat base.	IA IIC (Str. V)	
1	G 550/1	conical truncated	limestone						G	10039b	Yadin 1989: CCLIII:13, CCCLXI:10.		Conical truncated limestone spindle whorl.	IA IIC (Str. V)	
1	B 908/1	dome	stone						B	3067a	Yadin 1960: pl. CV:26.	From locus 3067a a batch of loomweights has been recovered, but not described.	Dome stone spindle whorl. Concentric incision on the base	IA IIC (Str. Va)	
1	B 1107/1	dome	bone						B	3132a	Yadin 1960: CV:32, CLXVI:12.		Dome bone spindle whorl.	IA IIC (Str. Va)	
1	B19355	dome	bone						B	3512	Yadin 1958: 45, pl. LXXIV:34		Dome bone spindle whorl. Quite flattish.	IA IIC (Str. V)	
1	B 7582	dome	stone						B	South Wall	Yadin 1958: pl. LXXV:12, CLIV:5		Dome stone spindle whorl. Concentric incision on the base	IA IIC (Str. V)	
1	A 10232	conical truncated	stone	1,8	3,4		0,4	25,68	A	L. 1045		floor	Conical truncated stone spindle whorl, made of a light grey stone. Well shaped, wheel marks on the surface. Hole slightly larger near the base. Wear traces and chippings near the upper hole.	IA IIC (Str. Vb)	
Unknown context															
1	599	dome	bone	0,6	2,3		0,2	2,28	A	800		Yadin	Dome bone spindle whorl with very small hole. Wheel marks on the dome, polishing on the base.		
	F 1013/1	dome	bone						F		Yadin 1960, CXCVI:13.				

	N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
	F 78/1	dome	bone						F		Yadin 1960, CXCVI:14.			
1	A 5061	discoid	stone	1	5		0,5	41,81	A1	L. 2022 M		Pebble with off-centre hole, slightly hourglass.		
1	876/98-3038	dome	pottery	1,9	3		0,6	20,16				Dome spindle whorl, made of pottery, complete. Hole perfectly cylindrical, very well shaped whorl.		
1	A 62661	discoid	limestone	0,6		4,2x 2,2		8,48+ x	A5	L. 9415 M		Fragment of limestone spindle whorl, well shaped.	V?	
1	A 46770	biconical	pottery	1,4	2,3		0,3	7	A3	L. 7690 M	Cimadevilla 2012: 560, fig. 12.2.	Intrusive into LB II fill	Biconical pottery spindle whorl, small and roughly shaped. Quite damaged near both sides of hole, which is very small.		
1	M 30891	conical	stone	1,4	2,7		0,4	11,69	M	L. 5122			Conical spindle whorl made of black stone (serpentinite?) with concentric rings incised on the upper part. Wear traces near the upper hole.		
1	A 51074	discoid	stone	1,7	4,2		0,7	37,98 +x	A4	B/F 11-12			Discoid spindle whorl made of stone, heavely chipped. Cylindrical hole.		
1	A 53648	dome	stone	1,8	2,7		0,4	15,3	A4	W. 1019 W		fill	Dome spindle whorl, made of white stone, well shaped. Conical hole.	surface	
1	M 34413	conical	stone	0,9	2,1		0,25	5,55	M	5555			Conical spindle whorl made of dark stone (serpentinite?) with polishing traces on the base and dome perfectly smoothed.		
1	M 37938	dome	stone	1	2,9		0,3	7,6	M1	L. 5797 M			Dome spindle whorl, made of light grey stone, broken in two pieces.		
1	M 37828	conical	stone	1,7	4,2		0,3	25,85	M1	L. 14/15 M			Conical spindle whorl made of white stone, very worn. Small and slightly conical hole.	baulk	
1	A 62390	discoid	pottery	1,8	5,9		0,7	58,16	A5	Surface			Discoid pottery spindle whorl, 1/4 missing. Roughly shaped. Cylindrical hole.	surface	
1	M 34049	cylindrical	stone	1,4	3		0,5	18,43	M 68	L. 5510			Cylindrical spindle whorl made of grey stone, quite well shaped. Hole not perfectly cylindrical.		
1	M 37719	biconical	pottery	4,2	4,2x 4,5		0,3	60,77	M2	L. 5772			Biconical pottery spindle whorl, not very well shaped. Encrusted.		
1	M 74688	dome	stone	1,8	3,2		0,7	21,09	M	L. 09-345 M			Dome spindle whorl, made of white-pinkish chalky stone.		
1	M 74717	dome	stone	1,9	3,6		0,6	32,26	M	L. 09-329 F			Dome spindle whorl, worn surface.	?	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A 48200	conical truncated	stone	1,6	3,2		0,6	21,69	A3	L. 7880		fill	Conical truncated spindle whorl, made of stone (steatite), well shaped. No traces of manufacturing, possibly wheel traces on the base. Upper side of hole very worn, lower side neatly cut. Slightly larger at the base (0,5).	surface	
1	?	dome	bone	1,6	4,2		0,3	14,69 +x	A			YADIN	Dome bone spindle whorl, large and damaged. On the base cancellous bone exposed. Smaller hole at the base 0,5 cm.		
1	A 3445	dome	bone	2,7	4,5		0,6	28,35 +x	A	55n		YADIN	Dome bone spindle whorl, large and damaged. On the base cancellous bone exposed. Larger hole at the base (0,8 cm).		
1	A 3072	dome	stone	1,4	3		0,4	19,31	A	55n		YADIN	Stone spindle whorl, probably made of limestone, unfinished hole.		
1	L 1007	dome	stone	1,6	3,3		0,6	21,47	L	46		YADIN	Spindle whorl made of limestone. Well shaped. Cylindrical hole. Smoothed surfaces and small chippings near the upper side of the hole. Lower base very damaged.		
1	A 2211/3	dome	stone	2	3,5		nn	14,13 +x	A			YADIN	Dome spindle whorl, made of white-pinkish stone. Quite high and broken in half. Wheel marks quite evident on the dome.		
1	4226/1	dome	bone	0,6	2,6x 2,3		0,3	4,1		57n		YADIN	Dome bone spindle whorl, very warp. Small hall.		
1	A 6936	conical truncated	stone	1,3	1,8		0,3	3,02	A	L. 1047 (92a)		YADIN	Conical truncated spindle whorl. Small and off-centre hole. Surface very worn.		
1	645	dome	stone	1,8	3,1		0,6	24,6		213n		YADIN	Steatite dome spindle whorl, well shaped nad polished. Cylindrical hole. Upper side of the hole flattened and rough, as it is the edge.		

Perforated sherds

Early Bronze Age

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	92562/6		pottery						L. 80058	Hazor VII:157, fig. 5.5 n.31		Perforated sherd, half preserved.	EB IIIB Str. XX	
Middle Bronze Age														
1	A 92083	Prf. sherd	pottery	1,2	5,5		0,8	46,66	A4	L. 80006 M			Perforated sherd, complete. Well rounded and smoothed. Hole slightly hourglass.	IBA (Str. XVIII)	
1	A 49301	Prf. sherd	pottery	0,7	4,1			8,10 +x	A2	L. 07-026 F		floor	Perforated sherd, half preserved. Roughly shaped, hourglass hole.	IBA (Str. XVIII)	
1	A 58429	Prf. sherd	pottery	0,7	4,3		0,5	14,84	A4	L. 9084 M			Perforated sherd, complete. Well rounded, hourglass and slightly diagonal hole.	MB II?	
Late Bronze Age														
1	H 962/21		pottery							L. 2146	Yadin 1989: CCLXIX:28		Perforated sherd, rounded and smooth	LB I (Str. 2)	
1	F 346/5		pottery							L. 8037	Yadin 1960: pl. CXLVI:30			LB II (Str. 1)	
1	D 12080	Prf. sherd	pottery						D	L. 9024	Yadin 1958, pl. CXXIV:15			LB I (Str. 3)	
1	B 1258/2	Prf. sherd	pottery						B	L. 3112	Yadin 1989, pl. CCXXXII:21			LB I (Str. 3)	
1	A 44890	Prf. sherd	pottery	0,8	3,8x4,4		0,1	18,04	A3	L. 7418 M			Perforated sherd, roughly cut, very small hole. Certainly not used as a whorl.	LB II (Str. XIII)	
1	A 90852	Prf. sherd	pottery	1,1	4,7		0,7	31,38	A3	L. 9572 fill		fill	Perforerated sherd, well rounded and smoothed. Hole almost cylindrical, but still visible which was perforated starting from both sides.	LB II (Str.XIV)	
1	A 25065	Prf. sherd	pottery	1,4	5		0,3	36,12	A2	L. 3749 M			Perforated sherd (or vessel base?), very worn. Small and hourglass hole.	LB II (Str.XIV-XIII)	
1	A 48694	Prf. sherd	pottery	0,6	2,6+x		0,3	1,9+x	A2	L. 7931			Fragment of perforated sherd. Small but cylindrical hole.	LB II (Str. XIV)	
1	A 48872	Prf. sherd	pottery	0,6	3		0,3	6,44 +x	A2	L. 7946 M		fill	Small fragment of perforated sherd, roughly cut. Hourglass hole.	LB II (Str. XIV)	

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A 27060	Prf. sherd	pottery	1,8	3,8x4,1		0,7	35,42	A2	L. 3883 F		floor	Perforated sherd, roughly cut. Slightly conical hole.	LB II (Str. XIII)	
1	A 56432	Prf. sherd	pottery	0,8	5,3		0,5	28,51	A4	L. 8848		ash layer	Perforated sherd, well rounded and smoothed. Cylindrical hole. Slightly off-centre.	LB II (Str.XIV)	
1	A 53830	Prf. sherd	pottery	0,6	4,1		0,3	12,57	A4	L. 8432 M		floor	Perforated sherd, complete. Roughly cut, hourglass hole.	LB II (Str.XIII)	
1	M 71158	Prf. sherd	pottery	0,6	3,7		0,3	4,23 +x	M	L. 6612 M			Perforated sherd, broken at 1/3. Roughly cut, hourglass hole.	LBA courtyard	
1	A 14678	Prf. sherd	pottery	1,6	5,6		0,5	53,3	A1	L. 1574		floor	Perforated sherd, complete. Well rounded with cylindrical hole.	LB II (Str. XIV)	
1	A 48873	Prf. sherd	pottery	0,7	4,5		0,5	6,64 +x	A2	L. 7946 M		fill	Perforated sherd, half missing. Roughly rounded, cylindrical hole.	LB II (Str. XIV)	
1	A 25909	Prf. sherd	pottery	1	5x4,4		0,5	27,5	A2	L. 3752		fill	Perforated sherd, complete. Quite well rounded and smoothed. Cylindrical hole.	LB II (Str. XIII)	
Iron Age I															
1	L 490/8	Prf. sherd	pottery	0,9	4		0,4	12,69	L	L. 1012	Hazor V: 223, fig. III.20:17.	floor	Perforated sherd, well rounded and smoothed. Perforation made starting from both sides but central part of the hole almost cylindrical.	IA I (Str. XII-XI)	98-1962
Iron Age II															
1	A 26778	Prf. sherd	pottery	0,8	3,8		0,3	15,25	A2	L. 3863 M		floor	Perforated sherd, well rounded. Small hourglass hole.	IA IIA (Str. Xb)	
1	A 58790	Prf. sherd	pottery	0,7	4,2x4,8		0,5	18,29	A4	L. 9155		fill	Perforated sherd, not rounded. Cylindrical hole.	IA IIA (Str.X-IX)	
1	A 13410	Prf. sherd	pottery	1,1	5,8x6,3		0,7	45,66	A1	L. 1432 pit		floor	Perforated sherd, roughly cut. Cylindrical hole.	IA IIA-B (Str.VIIIb)	
1	A 12615	Prf. sherd	pottery	0,7	3,5		0,3	4,82+x	A1	L. 1248		fill	Perforated sherd, half preserved. Well rounded with cylindrical hole.	IA IIA-B (Str. VII)	
1	A 11799	Prf. sherd	pottery	0,8	6,9		0,6	43,64	A1	L. 1218		floor	Perforated sherd, quite well rounded with hole made from beneath.	IA II A-B (Str. VIIb)	
1	M 72377	Prf. sherd	pottery	2,8	4,9		0,6	14,16 +x	M	L. 07-329			Perforated sherd, half missing. Well rounded and smoothed.	IA IIC	
1	A 53465	Prf. sherd	pottery	1	6		0,4	44,7	A4	L. 8402 floor			Perforated sherd, complete. Well rounded and smoothed.	IA IIC (Str. VI)	

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	M 72359	Prf. sherd	pottery	0,9	5,3		0,5	32,65	M	L. 07-332			Perforated sherd, well rounded and smoothed.	IA IIC	
1	A 91253	Prf. sherd	pottery	1	7,7		0,6	65,08	A3	07-213		floor	Perforated sherd, complete. Roughly cut and diagonal hole.	IA IIC (Str.VI)	
1	A 48519	Prf. sherd	pottery	1,2	5x5, 5		0,4	34,36	A2	L.7914		floor	Perforated sherd, roughly cut. Hourglass hole.	IA IIC (Str.VI)	
1	A 46615	Prf. sherd	pottery	0,8	4		0,3	13,38	A3	L. 7655		Fill	Perforated sherd, well rounded and smoothed. Small hourglass hole.	IA I-II (Str. XII-VIII)	
1	A 41698	Prf. sherd	pottery	0,9	3,1x 3,8		0,3	11,94	A3	L. 7105 M		fill	Perforated sherd, not rounded. Small and diagonal hole.	IA IIC (Str. VI)	
1	A 22849	Prf. sherd	pottery	1,8	5,5			28,26 +x	A2	L. 3386 M		fill	Perforated sherd, half preserved. Roughly cut, hourglass hole.	IA IIC (Str. V)	
1	A 21327	Prf. sherd	pottery	0,9	3,8		0,5	14,73	A2	L. 3184 floor		floor	Perforated sherd, roughly cut but rounded. Hourglass hole damaged in the upper part.	IA IIC (Str. V)	
1	A 27725	Prf. sherd	pottery	1	4x3, 7		0,7	17,6	A2	L. 3580 F		fill	Perforated sherd, well rounded and smoothed. Hole quite large and well worked, still partially hourglass.	IA II (Str.VII-V)	
1	A 22255	Prf. sherd	pottery	0,9	5,2			16,26 +x	A2	L. 3309 M		fill	Perforated sherd, half preserved. Well rounded and smoothed. Hole quite large and well worked, still partially hourglass.	IA IIC (Str.V)	
1	M 38097	Prf. sherd	pottery	0,9	3,4		0,25	13,8	M1	L. 5784			Perforated sherd, quite well rounded. Hole off centre, small and hourglass, perforation made almost completely from one side.	IA IIC	
1	A 82095	Prf. sherd	pottery	1,1	6,1x 5,8		0,2	46,36	A2	L. 3289 Floor O.		floor	Perforated sherd, well rounded and polished. Very small hole.	IA IIC (Str. Va)	
1	A 22802	Prf. sherd	pottery	1,1	4,5		0,8	14,50 +x	A2	L. 3371 M (F)		floor	Perforated sherd, half preserved. Quite well rounded with hourglass hole.	IA IIC (Str. VI)	
1	A 41652	Prf. sherd	pottery	1,1	3,6		0,3	14,9	A3	L. 7105 M		fill	Perforated sherd, not rounded. Small and hourglass hole.	IA IIC (Str. VI)	
1	A 23871	Prf. sherd	pottery	2,3	4,4		nn	56,36	A2	L. 3562 F		floor	Very thick perforated sherd, well rounded. Hole made from both sides but left unfinished.	IA IIC (Str. VI)	
1	A 62502	Prf. sherd	pottery	0,7	4,5		0,4	19,1	A5	L. 9379 M		floor	Perforated sherd, roughly rounded. Cylindrical hole.	IA IIC (Str. V)	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
Unknown context													
1	M 39106	Prf. sherd	pottery	1,1	3,6		0,3	15,83	M1	L. 5907 T			Perforated sherd, almost complete. Quite well rounded and smoothed. Small hole.		
1	A 522	Prf. sherd	pottery	0,9	4		0,75	10,81 +x	A	55n		YADIN	Perforated sherd, very well rounded. Hourglass hole.		
1	A 3804	Prf. sherd	pottery	0,7	4		0,5	8,56+ x	A			YADIN 55n	Perforated sherd, well rounded but not smoothed. Hole almost cylindrical.		
1	A 48599	Prf. sherd	pottery	0,7	4,6x 4,3		0,3	18,92	A2	L. 7925 M			Perforated sherd, well rounded and smoothed.		
1	A 64014	Prf. sherd	pottery	2,1	6,3		0,6	83,76	A5	06-A5-001 M			Perforated sherd (or vessel base), rounded and very worn. Hourglass hole.		
1	A 62475	Prf. sherd	pottery	1,2	7,5		0,4	41	A5	L. 9375 M			Perforated sherd, 1/4 preserved. Quite well rounded and cylindrical hole.		
1	A 5062	Prf. sherd	pottery	1,1	5,6x 5,1		0,6	42,14	A1	L. 2021 M		fill	Perforated sherd, roughly cut. Hourglass hole.	surface	
1	A 63296	Prf. sherd	pottery	0,8	5,1		0,3	21,38	A5	L. 50066 M			Perforated sherd, roughly cut but rounded. Hourglass hole.		
1	M 38800	Prf. sherd	pottery	0,7	3,4x 3,9		0,4	9,91	M2	L. 5885			Perforated sherd, roughly cut. Hourglass hole.		
1	A 53719	Prf. sherd	pottery	0,6	2,7		0,5	3,81+ x	A4	L. 8434 M		disturbed fill	Perforated sherd, well rounded. Irregular and hourglass hole.		
1	A 48934	Prf. sherd	pottery	1	5,1		0,3	28,47	A2	L. 06-A2-012 M			Perforated sherd, well rounded and smoothed. Small hourglass hole.		
1	A 60872	Prf. sherd	pottery	1,2	5,3		1	34,28	A5	L. 136 M			Perforated sherd. Well rounded and smoothe. Large and cylindrical hole.		
1	M 31811	Prf. sherd	pottery	0,9	3		0,5	10,9	M	L. 5221			Perforated sherd (?), well rounded with hourglass hole.		
1	A 58195	Prf. sherd	pottery	0,7	3,6		0,4	8,74	A4	W. 5332 W			Perforated sherd, roughly cut. Hourglass hole.		
1	M 24766/1	Prf. sherd	pottery	0,9	5,5x 6,5		0,6	38,9	M?	B115-16?			Perforated sherd. Roughly cut. Hole off centre but cylindrical.	baulk	
1	A 42555	Prf. sherd	pottery	1	4,3x 6,5+ x			36,9+ x	A3	L. 7260 F			Perforated sherd, half preserved. Well rounded and almost cylindrical hole.		
1	A 55295	discoid	pottery	1	5,2x 5,5		0,3	33,26	A4	L. 8688			Perforated sherd, well rounded and smoothed. Small and hourglass hole.	Fill -no date	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
Spinning bowl													
1	16953/1		Pottery	13	7,3	loop 1,3	4,3			L. 1706 16/51n	Bechar 2017: 335, fig. 7.72		Fragment of bowl with loop inside. Attached to the wall and not to the bottom. Shape of a handle.	LB II Str. XIV	
Loom weights													
Middle Bronze Age													
1	A 56221	discoid	baked clay	1,5	5,1x 5,6		0,4	42,3 5	A4	L. 8836		fill	Weight/pendant made of baked clay. Hole near one edge.	MB IIB (Str. XVII-XVI)	
Late Bronze Age													
1	BA 41	conical	clay						BA	4020	Yadin 1989: CCXXXVI: 24		Small conical loomweight horizontally perforated on the upper part.	LB I (ph. 11, Str. XV)	
	BA 71	conical	clay						BA	4020	Yadin 1989: CCXXXVI: 25		Conical loomweight horizontally perforated on the upper part.	LB I (ph. 11, Str. XV)	
1	A 55245	doughnut	baked clay	4,5	7		1,3	210	A4	L. 8635 M			Doughnut shaped weight, poorly baked clay. Complete but broken in two pieces.	LB II (Str. XIV-XIII)	
1	M 70408	flat trapezoida l	baked clay	8,9	6,5	2,7	nn	162 +x	M2	L. 6533 M			Weight flat trapezoidal. Made of baked clay, top missing, part of a hole preserved. Hole off-centre, possibly a second was present.	LBA	
1	A 48115	prf. base	baked clay	2,6	5,9		0,7	92,0 4	A3	L. 7866 M		Floor	Thick base of a vessel , complete. Well made amd partially smoothed. Hole off-centre and irregular.	LB I (Str. XV)	
1	A 49124	prf. base	baked clay	2,3	6,5		0,9	54,2 6+x	A2	L. 07-017 M		Floor	Perforated base of a vessel, half preserved.	LB I-II (Str. XV-XIV)	

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A 49153	prf. base	baked clay	2,1	5,5		0,7	23,26+x	A2	L. 07-017 F		Floor	Perforated base of a vessel, half preserved. Roughly cut, hole irregular.	LB I-II (Str. XV-XIV)	
1	A 53517	prf. base	baked clay	2,4	8,2		0,5	138	A4	L. 8412 fill		Fill	Perforated base of a vessel, complete. Cylindrical hole.	LB II (Str. XIII)	
1	A 26218	prf. base	baked clay	2,3	6,3		1,1	66,64	A2	L. 3786 M			Perforated base of a vessel, no attempt to make it regular.	LB II (XIV)	
1	A 49118	prf. base	baked clay	1,8	6,2		1,2	49,78+x	A2	L. 07-008		Floor	Perforated base of a vessel, almost complete. Hole well centred, large and damaged. Well rounded edge but not smoothed.	LB II (Str. XIV)	
1	A 55793	prf. base	baked clay	1,9	6,9		0,5	78,67	A4	L. 8790 M		Floor	Perforated base of a vessel, complete. Well rounded edge but not smoothed.	LB II (Str. XIV)	
1	16744/1	prf. base	baked clay	2,1	7,4		nn	49,49+x	?	L.1710		Floor	Perforated base of a vessel, half preserved. Quite well rounded.	LB II (Str. XIV)	
1	A 47927	prf. base	baked clay	2,1	6,2		2	29,13+x	A3	L. 7826 F		Fill	Perforated base of a vessel, half preserved. Roughly cut, large and cylindrical hole.	LB II (Str. XIII)	
1	A 48170	prf. base	baked clay	1,3	5,8		nn	18,27+x	A3	L. 7851 U?		Floor	Perforated base of a vessel, half preserved. Roughly cut, irregular hole.	LB II (Str. XIII)	
1	A 17681	prf. base	baked clay	2,4	6,8		nn	61+x	A1	L. 1746		Floor	Perforated base of a vessel, half preserved. Hourglass hole. Very damaged.	LB II (Str. XIV)	
1	A 17680	Prf. sherd	pottery	1,6	6,6			29,34+x	A1	L. 1741 M		floor	Perforated base of a vessel, half preserved. Smoothed edge. Hole damaged.	LB II (Str. XIV-XIII)	
1	A 13349	spherical?	clay					215+x	A1	L. 1443		fill	Fragments of large spherical or doughnut shaped loom weight.	LB II (Str. XIII)	
Iron Age I															
1	L205/3	spherical	baked clay							L. 1025	Hazor V: 221, fig. III,19:12.		Spherical/doughnut shaped loom weight, only partially preserved.	IA I	
1	A 50980	prf. base	baked clay	1,9	6,1		1,1	43+x	A4	L. 8099 M		fill	Perforated base of a vessel, half preserved. Not symmetrical. Small oval hourglass hole.	IA I (Str. XII-XI)	
1	A 51646	prf. base	baked clay	1,6	5,7		0,3	49,88+x	A4	L. 8224		Fill	Perforated base of a vessel, fragmentary, quite rounded edge. Very small hole.	IA I (Str. XII-XI)	

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A 49016	prf. base	baked clay	2,2	6,2			33,10+x	A2	L. 07-015 P		pit	Perforated base of a vessel, almost half preserved. Roughly cut, irregular hole.	IA I (Str. XII-XI)	
Iron Age II															
1	L225/7	spherical	baked clay							L. 1035	Hazor V: 228, fig. III.22:5			IA IIA (X sec.)	
1	B 4792/16	biconical	clay						B	L. 3295	Yadin 1989: CCXIII:18		Biconical clay object, but apparently very small.	IA IIA (Str. X)	
1	A 55660	doughnut	baked clay	2	4,7		0,9	30+x	A4	L. 8767 F		floor	Doughnut shaped loom weight, half preserved. Roughly shaped, made of baked clay. Cylindrical hole.	IA II A (Str. IXb)	
1	A 11025	doughnut	baked clay	3,1	4,4		nn	29+x	A1	L. 1107		Floor	Fragment of a doughnut shaped loom weight.	IA IIA (Str. Xb)	
1	A 55619		clay	3,8	9,4		1	211+x	A4	L. 8748 F		Floor	Fragment of a loom weight. Burnt.	IA IIA (Str. IXa)	
1	A 58924	cylindrical	baked clay	3	5,8		0,5	116	A4	L. 9127		floor	Cylindrical loom weight, well shaped, almost cylindrical. Small hole, slightly off centre.	IA II A (Str. IX)	
1	A 18614	prf. base	baked clay	1,1	6,9		0,8x1,1	44,68	A1	L. 1852 M		Floor	Perforated base of a vessel, quite well rounded. Large and irregular hole.	IA IIA-B (Str. VIIIb)	
1	A 13074	doughnut	clay	4,1	4,5			192+x	A1	L. 1409 F		pit	Fragments of one or more loom weight, soughnut shaped. Made of unbaked clay.	IA II A-B (Str. VIII-VII)	
1	A 46655	prf. base	baked clay	1,5	4,6		nn	19,66+x	A3	L. 7671 M		fill	Perforated base of a vessel, fragmentary. Quite well rounded, cylindrical hole.	IA IIA-B (Str. VIII)	
1	A 12644	spherical	clay					179+x	A1	L. 1296		Floor	Fragments of loom weight, probably spherical. Made of unbaked clay.	IA II A-B (Str. VIIa)	
1	A 13430	doughnut	clay	4,2+x	6,5+x			182+x	A1	1395 F		Floor	Several fragments of a doughnut shaped loom weights (measures of the largest fragment).	IA IIA-B (Str.VIIIb)	
1	A 12828	doughnut	clay	nn	nn		nn	143+x	A1	1332F		Floor	Small fragments of a loom weight, made of clay. Probably doughnut shaped.	IA IIA-B (Str.VIII)	
1	A 43205	spherical	clay	5,3	7,8			268	A5	L. 4041		fill	Fragments of a spherical loom weight, made of unbaked clay. Almost complete, but broken in many pieces.	IA II A-B (Str. X-VIII)	

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A 46321	spherical	clay					148 +x	A3	L. 7612 P		pit	Fragments of clay loom weights, partially preserved.	IA II A-B (Str. VIII-VII)	
1	A 42650	spherical	clay	4,7	5,7			74+ x	A3	L. 7282		floor	Spherical loom weight, half preserved.	IA II A-B (Str.VIIa)	
1	A 20898		stone	14,7	4,5	1,5	0,6	207	A2	L. 3108		Floor	Long and thin weight.	IA II A-B (Str. VIIa)	
1	A 55453	spherical	baked clay	5,4	8,3x 8,7		1,2	358	A4	L. 8740	Cimadevilla 2012: 560, fig. 12.1	Building 158	Spherical loom weight, complete. Well preserved.	IA II A-B (Str. VIIa)	
1	A 12811	spherical	clay	5,4	7,8		1,9	225	A1	L. 1309 F		Floor	Spherical loom weight, broken in many pieces but complete. Made of baked clay.	IA IIA (Str.Xb)	
1	A 34809	spherical	baked clay	5,5	7,1 X7, 4		1,3 X1, 6	272	A1	L. 1225	Cimadevilla 2012: 560, fig. 12.1	Baulk N14/15	Spherical weight well preserved, not symmetrical. Made of baked clay.	IA IIA-B (Str.VIIa)	
1	A 56675	doughnut	clay	5,1	7,5		1,6	249 +x	A4	L. 8890 M	Cimadevilla 2012: 560, fig. 12.1	Building 158	Doughnut shaped loom weight, almost complete.	IA IIA-B (Str. VIIa)	
1	A 14768	doughnut	baked clay	3,7	5,2			56+ x	A1	L. 1570 M		fill	Doughnut shaped loom weight, half preserved.	IA IIA-B (Str. VIII-VII)	
2	M 32258	doughnut	clay	6,2	8,2		nn	292 +x	M	L. 5271			Fragments of at least two different loom weights. Measures belong to the largest and better preserved weight. Complete hole. Second weight: h 4,3, d 7,8 w 98+x	IA IIA-B	
1?	A 12678	nn	clay	nn	nn		nn		A1	L. 1262		Floor	Small fragments of clay object.	IA IIA (Str. IX)	
1	A 12830		clay	3,8+ x	8		nn	147 +x	A1	L. 1332 F		Floor	Fragments of a loom weight	IA IIA-B (Str. VIII)	
1	A 13046	doughnut	clay	3,7			nn	124 +x	A1	L. 1395 F		Floor	Fragments of a clay loom weight	IA IIA-B (Str. VIII)	
1	A 13090	doughnut	clay	4,4	6,8		1,5	136 +x	A1	L. 1405 M		Floor	Doughnut shaped loom weight, almost complete.	IA IIA-B (Str. VIIa)	
1	A 28203	prf. base	baked clay	1,7	4,8		0,4	32	A2	L. 4037 pit		pit	Perforated base of a vessel, oval and hourglass hole. Certainly not a spindle whorl.	IA II A-B (Str. VIII)	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A 12300	doughnut	clay				342 +x	A	L. 1225 F		Floor	Fragments of a loom weight, probably doughnut shaped.	IA II A-B (Str. VIIa)	
1	A 11616	doughnut	baked clay	4,9	6,2		93+ x	A1	L. 1172		fill	Fragment of a weight, roughly baked.	IA II A-B (Str. VII)	
1	A 13110	prf. base	baked clay	1,4	5,5		0,4	53	A1	L. 1409 F		pit	Perforated base of a vessel, oval and hourglass hole. Certainly not a spindle whorl.	IA II A-B (Str. VIII-VII)	
1	L205/1	spherical	baked clay						L	L. 1045	Hazor V: 264,265, fig. III.41:8.			IA IIC (VIII sec.)	
1	L275/1	spherical	baked clay							L. 1045	Hazor V: 264,265, fig. III.41:9.			IA IIC (VIII sec.)	
1	L275/2	spherical	baked clay							L. 1045	Hazor V: 264,265, fig. III.41:10.			IA IIC (VIII sec.)	
1	L275/1	spherical	baked clay							L. 1045	Hazor V: 264,265, fig. III.41:11. Due volte lo stesso numero?			IA IIC (VIII sec.)	
1	L408	discoid	limeston e							L.1045	Hazor V: 264,265, fig. III.41:12.			IA IIC (VIII sec.)	
1	M 31439	doughnut	clay	5,5	13,2		3,1	977 +x	M	L. 5187			Doughnut shaped loom weight almost complete. Very crumbly. Not symmetrical.	IA IIC	
1	M 30964	nn	clay	nn				290 +x	M	L. 5080			Fragments of a clay loom weight	IA IIC	
1	A 18265	doughnut	clay	3,3	5,9			47+ x	A1	L. 1821 oven		pit	Doughnut shaped loom weight, half preserved. Quite well preserved.	IA IIC (Str. IV)	
1	M 30958	spherical	clay					309 +x	M	L. 5096			Fragments of a spherical clay loom weight.	IA IIC	
1	A 13059	doughnut	clay	4	8,1		1,7	216	A1	L. 1388 Floor		Floor	Doughnut shaped loom weight, well preserved. Probably lower side partially missing.	IA IIC (Str. V)	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	M 72927	spherical	baked clay	5,9	8,3		1,2x 1,3	233 +x	M	L. 07-374			Spherical loom weight made of baked clay, fragmentary.	IA II C	
1	A 12822	doughnut	clay	nn	nn		nn	217 +x	A1	L. 1308		Floor	Small fragments of clay loom weight.	IA IIC (Str. VIb)	
1	A 40669	Prf. sherd	pottery	0,9	5,1		0,4-0,3	30,62	A3	L. 7032 F		Make up	Perforated base of a vessel, complete. Smoothed edge, hole irregular.	IA IIC (Str.Vc)	
1	A 62639	spherical	clay	4,6	5,7		1,2	138	A5	L 9510 M	Cimadevilla 2012: 560, fig. 12.1	In pubblicazione dice L9340	Spherical loom weight, complete. Made of unbaked clay but well preserved.	IA IIC (Str. V)	
1	A 62657	doughnut	clay	4,1	6,6		1,6	186	A5	L 9390 M	Cimadevilla 2012: 560, fig. 12.1	The Eastern wing, floor	Doughnut shaped loom weight, almost complete.	IA IIC (Str. Va)	
1	A 60179	biconical	baked clay	3,6	4,2x 3,6		0,3	50	A5	L. 9029 M	Cimadevilla 2012: 560, fig. 12.1		Biconical loom weight, quite oval. Roughly shaped. Small and irregular hole.	IA II C (Str. VI)	
1	A 60182	biconical	baked clay	3,7	4,2		0,5	52	A5	L. 9032 M	Cimadevilla 2012: 560, fig. 12.1	fill	Biconical loom weight, quite well shaped. Hole cylindrical but slightly off centre. Possibly a spindle whorl.	IA II C (Str. V)	
1	A 20032	biconical	baked clay	4,5	6,2		1,5	104	A 2	L. 3018 floor	Cimadevilla 2012: 560, fig. 12.1	Building 3051	Biconical loom weight, quite well shaped. Very large hole.	IA II C (Str. Va)	
1	A 60165	biconical	baked clay	2,8	3,5		0,4	27	A5	L. 9029 M floor	Cimadevilla 2012: 560, fig. 12.1		Biconical loom weight, quite well shaped. Hole cylindrical but slightly off centre. Possibly a spindle whorl.	IA II C (Str. VI)	
1	A 20139	spherical	baked clay	4,3	5,1		1	85+ x	A2	L. 3017			Spherical weight, well shaped. Made of baked clay. Oval hole.	IA IIC (Str. V)	
1	A 62801		stone	13,7	2,5	2	0,4	160	A5	L. 9430 M		Floor	Object with parallelepiped shaped, with hole at the top. Not a loom weight.	IA IIC (Str. V)	
1	A 12303	doughnut	clay	6,7	8,9		nn	381	A1	L. 1256 F		fill	Two fragments of spherical loom weight, possibly belonging to two different weights.	IA IIC (Str. VI-V)	
1	A 21507	doughnut	clay	4,7	4,2			61+ x	A2	L. 3209		Fill	Fragment of clay loom weight, probably doughnut shaped.	IA IIC (Str. V)	
1	A 42259	spherical	clay	4,7	5,5		nn	61+ x	A3	L. 7200 F		fill	Fragment of clay loom weight, probably shperical.	IA IIC (Str. V)	
1	A 10471	doughnut	clay	3,3	7,7		1,6	146 +x	A1	L. 1080		floor	Doughnut shaped loom weight, half preserved. Quite flattened on the base.	IA IIC (Str. V)	
1	M 30940	doughnut	baked clay	4,7	6,5		1,6	152 +x	M	L. 5131			Doughnut shaped loom weight, broken in several pieces. Poorly baked clay.	IA IIC	

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	M 31013	spherical	clay	4,2	5,7			73+ x	M	L. 5131 make up			Fragment of clay loom weight, probably spherical.	IA IIC	
1	A 18676	spherical	baked clay	4	5,9		0,7	112	A1	L. 1861 MU?		Floor	Spherical loom weight made of baked clay, complete. Quite well shaped and with cylindrical hole.	IA IIC (Str. V)	
1	M 30092	spherical	baked clay	3,6	4,5		0,4	53+ x	M	L. 5016			Spherical loom weight made of baked clay, 1/4 missing. Ellyptical shape. Cylindrical hole slightly off-centre.	IA IIC	
1	A 60138	prf. base	baked clay	1,7	7,6		1,2	45,2 2+x	A5	L. 9027 M		fill	Perforated base of a vessel, half preserved.	IA II (Str. VII-VI)	
1	A 336	prf. base	baked clay	1,7	6,4		nn	36,5 4+x	A1	L. 1750 M		fill	Perforated base of a vessel, half preserved. Roughly cut, irregular hole.	IA IIC (Str. IV-III)	
1	A 46648	prf. base	baked clay	1,9	6,4		nn	38,6 +x	A3	L. 7648 M		Fill	Perforated base of a vessel, half preserved. Roughly cut, irregular hole.	XII-VIII	
1	M 56151	prf. base	baked clay	1,6	6,3		0,6	31,6 3+x	A1	L 1310 ?		Floor	Perforated base of a vessel, half preserved. Well rounded and regular hole, almost cylindrical.	IA IIC (Str. V)	
1	A 20466	spherical	baked clay	4,8	6,9		1,4	215	A2	L. 3067		fill	Spherical clay loom weight, complete. Well shaped.	IA IIC (Str. V)	
1	M 72872	spherical	baked clay	6	6,7x 7,3		1,4	219 +x	M	L. 07-356			Spherical loom weight, almost complete. Made of baked clay.	IA IIC	
1	A 62838	doughnut	baked clay	3,9	7,2x 6,7		1,5	171	A2	L. 9390 M		Floor	Doughnut shaped loom weight, complete. Made of baked clay.	IA IIC (Str. V)	
1	A 62640	doughnut	baked clay	3,9	6,5		1,2	137	A5	L. 9390 M		Floor	Doughnut shaped loom weight, complete. Made of baked clay.	IA IIC (Str. V)	
1	A 62656	doughnut	baked clay	4,5	7,3		1,5	199	A5	L. 9390 M		Floor	Doughnut shaped loom weight, complete. Made of baked clay. One side of the hole very oval, similar to Tell el-Farah.	IA IIC (Str. V)	
1	M 72457	spherical	baked clay	5,1	5,9		0,6	148 +x	M	L. 07-329 M			Spherical loom weight, complete. Made of poorly baked clay. Apparently very worn.	IA IIC	
1	A 62658	doughnut	clay	5				76+ x	A5	L. 9390 M		Floor	Two fragments of a clay loom weight, probably doughnut shaped.	IA IIC (Str. V)	
1	A 1990	doughnut	clay	5,3	8,8		1,4	346 +x	A7	L. 295 floor		Floor	Doughnut shaped clay loom weight, almost complete.	IA II (Str. VIIIb-V)	
1	A 20034	spherical	clay	5,5	8,7		1,7	187 +x	A2	L. 3018		Floor	Spherical clay loom weight, almost 1/3 preserved.	IA IIC (Str. Va)	

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	M 76261	doughnut	clay	3,5	7,5		1,8	141 +x	M	L. 10-326 F eastern enclosure			Doughnut shaped clay loom weight, partially preserved.	IA IIC	
1	M 76260		clay					214 +x	M	L. 10-326 F eastern enclosure			Fragments of clay loom weight.	IA IIC	
1	M 76262		clay					182 +x	M	L. 10-326 F eastern enclosure			Fragments of clay loom weight.	IA IIC	
1	M 76264	doughnut	clay	5,4	7,7		1,7	186 +x	M	L. 10-326 F eastern enclosure			Fragments of clay loom weight.	IA IIC	
1	M 76263	doughnut	clay	2,9	7,7		1,4	100 +x	M	L. 10-326 F eastern enclosure			Fragments of clay loom weight.	IA IIC	
1	M 75265	doughnut	clay	3,8	7,9		1,7	169 +x	M	L. 10-326 F eastern enclosure			Doughnut shaped clay loom weight, partially preserved.	IA IIC	
1	M 76158		clay					48+ x	M	L. 10-326 F			Small fragments of clay loom weight.	IA IIC	
1	M 75423a	spherical	clay	6	4,3		1,4	277	M	L. 10-326 M above F			Spherical loom weight, almost complete. Poorly baked clay.	IA IIC	
1	M 75423b	spherical	clay	5,2	7,6		1,6	182 +x	M	L. 10-326 M above F			Spherical clay loom weight, half preserved. Poorly baked clay.	IA IIC	
1	M 75455a	spherical	clay	5,3	6,2		nn	141 +x	M	L. 10-306 F			Fragments of loom weight, probably spherical. Poorly baked clay.	IA IIC	
1	M 75455b	spherical	clay	6,9	8,9		nn	422 +x	M	L. 10-306 F			Fragments of loom weight, probably spherical. Poorly baked clay.	IA IIC	
1	M 76345		clay	5,3	9		nn	177 +x	M	L. 10-326 F		10	Lump of clay, probably belonging to a loom weight.	IA IIC	
1	M 76339		clay	4,8	8,2		nn	253 +x	M	L. 10-326 F		1	Lump of clay, probably belonging to a loom weight.	IA IIC	
1	M 76259		clay					367 +x	M	L. 10-326 F eastern enclosure			Small fragments of clay, belonging to one or more loom weights.	IA IIC	
1	M 76343		clay					127 +x	M	L. 10-326 F		8	Small fragments of clay, belonging to one or more loom weights.	IA IIC	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	M 76340		clay	5,1	7,8		nn	226 +x	M	L. 10-326 F		2	Fragment of clay loom weight.	IA IIC	
1	M 76341		clay					184 +x	M	L. 10-326 F		3	Small fragments of clay, belonging to one or more loom weights.	IA IIC	
1	M 76344		clay					287 +x	M	L. 10-326 F		9	Small fragments of clay, belonging to one or more loom weights.	IA IIC	
3	M 76342	doughnut	clay		8,5				M	L. 10-326 F		4-7	Four loom weights in a single lump of soil.	IA II	
1	M 92815	spherical	baked clay	5	5,9		0,8	139 +x	M-west	L. 579			Spherical loom weight, almost complete. Made of baked clay.	IA IIC	
1	M 75352	conical	stone	6,9	4,3		0,4	115	M	L. 09-384 M			Very peculiar object made of white stone. Conical shaped with a hole in the upper part, not passing through, but connecting to a hole on the top. Slightly concave base.	IA II C	
1	M 93230		stone	7,6	4,6		0,9	181	M3	L. 14-517 U			Perforated pebble.	IA II C	
1	M 93155	prf. base	baked clay	2,7	6		0,5	97	M3	L. 14-508			Base of a vessel, complete. Quite well rounded, small and irregular hole.	IA II C	
1	M 73914	doughnut	baked clay	4,5	7,3x 7		2x1, 5	199	M	L. 08-358 M above F			Doughnut shaped loom weight, complete. Roughly shaped and full of stone inclusions. Made of baked clay. Hole off-centre and quite irregular.	IA II C	
1	M 73913		clay		6,3+ x			82+ x	M	L. 08-358 M above F			Fragments of clay object, not recognizable.	IA IIC	
1	M 73047	spherical	baked clay	5,3	7,9		1,5	232 +x	M	L. 08-306 M			Peso in baked clay quasi intero con foro largo e abbastanza regolare. Peso non particolarmente ben modellato.	IA IIC	
1	M 73949	cylindrical	stone	8,4x7 ,1	8,1x 8,5		1,7x 2	571	M	L. 08-345 M			Cylindrical object made of white stone, roughly cut, hole well shaped.	IA IIC	
1	A 60450	cylindrical	stone	8,7	7x6, 4		1,3x 1,5	426	A5	L. 9067 M		Floor	Cylindrical object made of white stone, roughly cut, perforation started from both sides but left unfinished.	IA IIC (Str. V)	
	B 15154	doughnut	clay						B	3066	Yadin 1958: 31, 44, pl. LXXII.	In Locus 3066 a group of nine such balls was found together.	Unbaked clay	IA IIC (Str. V)	

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
	B 15154/2	doughnut	clay					B	3066	Yadin 1958: 31, pl. LXXII.		Unbaked clay	IA IIC (Str. V)	
	B 15154/3	doughnut	clay					B	3066	Yadin 1958: 31, pl. LXXII.		Unbaked clay	IA IIC (Str. V)	
	B 15154/4	doughnut	clay					B	3066	Yadin 1958: 31, pl. LXXII.		Unbaked clay	IA IIC (Str. V)	
	B 15156	doughnut	clay					B	3066	Yadin 1958: 31, pl. LXXII.		Baked clay	IA IIC (Str. V)	
1	A 27812	prf. base	pottery	1,6	5,9		0,6	55	A2	L. 4004 MU		floor	Perforated base of a vessel, smoothed edge. Hole damaged.	IA IIC (Str. VI)	
1	M 72692	prf. base	pottery	1,5	6,1		0,5	25,95+x	M	L. 07-366 F			Perforated base of a vessel, smoothed edge. Hourglass hole.	IA II C	
1	A 42444	prf. base	pottery	2	6			43,88+x	A3	L. 7243 F		floor	Perforated base of a vessel, half preserved. Smoothed edge, damaged hole.	IA IIC (Str. V)	
1	A 27812	prf. base	pottery	1,7	5,9		0,6	55,1	A2	L. 4004 MU		floor	Perforated base of a vessel, smoothed edge. Hourglass hole.	IA IIC (Str.VI)	
Unknown context															
1	95-1572/2	spherical	baked clay	5,7	7,8		1,8x2	338-x					Spherical clay loom weight, complete. Made of baked clay. Hole full of soil.		
1	95-1572/1	spherical	baked clay	6,2	8,4		1,7	436-x					Spherical clay loom weight, complete. Made of baked clay. Hole full of soil.		
1	M 31096		baked clay	8,2	11x11,2		1,4	957	M (?)	L. 5132		4819	Peculiar object, concave, not a loom weight.		
1	M 13112	nn	clay						M	L. 1388			Fragments of clay loom weight.		
1	M 14525	doughnut	clay	4,7	8,1		2,2	200	M	L. 1029			Doughnut shaped loom weight, complete. Poorly baked.		
1	A 21356	doughnut	clay	4,3	6,9			80+x	A2	L. 3194			Doughnut shaped loom weight, almost half preserved.		
1	M 37525	doughnut	clay	4,4	7,5		1,6	146+x	M1	L. 5777			Fragmentary doughnut shaped loom weight. Poorly baked clay.		
1	A 1974	doughnut	clay	5	nn		nn	316+x		L. 300 F			Fragments of one or more loom weight, doughnut shaped. Made of unbaked clay.		
1	M 37612	spherical	clay	5,9	8,2		1,5	156+x	M	L. 5777 M			Spherical loom weight, half preserved.		

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A 40021	pyramidal truncated	baked clay	4,8	3,2		0,3	54	A3	Taking away baulk			Pyramidal truncated loom weight, probably late.	baulk	
1	A 64040	discoid	baked clay	1,7	9,8		nn	104 +x	A5	06-A5-061			Discoid loom weight (?), well shaped. Made of baked clay.		
1	M 32620		baked clay	3	88,6		0,8	191	M	L. 5292 M			Fragment of loom weight or model wheel?		
1	M 30896		baked clay	5,3	8,7	5,4		249 +x	M	L. 5122			Possible weight but no hole visible.		
1	A 62567	spherical	baked clay	4,6	7,9		1,4	147 +x	A1	L. 9375 M			Fragment of loom weight, spherical shape.		
	M 39065	conical	baked clay						M1	L. 5900			Weight with shape of a plumb bob		
	M 31099	conical	baked clay						M8	L. 5159			Weight with shape of a plumb bob		
1	M 31032	spherical	clay	3,5	4,4		0,5	55+ x	M	L. 5149			Spherical loom weight, complete. Made of clay and quite worn.		
1	A 60215	spherical	baked clay	3,1	4,4		0,6	45+ x	A5	L. 9039 M		fill	Spherical loom weight, 1/4 missing. Ellyptical shape, hole cylindrical but off-centre.	surface	
1	A 55348	prf. base	baked clay	1,5	6,2		0,3	41,9 1+x	A4	L. B-E/9 M			Perforated base of a vessel.		
1	A 62501	prf. base	baked clay	19	6,5		nn	42,6 9+x	A5	L. 9366 M			Perforated base of a vessel, half preserved.		
1	A 64053	prf. base	baked clay	0,8	5		0,3	18,1 0+x	A5	L. 06A5-009 M			Perforated base of a vessel, almost complete. Hole near the edge. Late.		
1	A 12642	prf. base	baked clay	1,2	7		nn	32,8 2+x	A1	L. 4910 B			Perforated base of a vessel, half preserved. Quite well rounded, irregular hole.		
1	A 91222	spherical	baked clay	5,6	6,5		1,3	196	A3	L. 07-172 M			Spherical loom weight made of baked clay. Complete and well shaped.		
1	M 72437	doughnut	baked clay	4,7	8x8, 5		1,5	240	M	baulk B			Doughnut shaped loom weight, complete. Made of baked clay.	baulk	
1	A 53616	doughnut	baked clay	5,5	7,9		1,4x 1,6	189 +x	A4	L. 8420 floor			Doughnut shaped loom weight, 1/3 missing.		
1	A 53614	doughnut	baked clay	5	8,5		1,3	305	A4	L. 8420 floor			Doughnut shaped loom weight, almost complete. Made of baked clay.		
1	A 63454	doughnut	clay	5	6,6		1,4	185 +x	A5	L. 50097 M			Doughnut shaped loom weight, 1/3 preserved. Made of unfired clay.		
1	34476	spherical	baked clay	5,3	6		0,8	150	M	L. 5562			Spherical clay loom weight, complete.		

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	M 30347	spherical	baked clay	4,2	5,9		1,4	107 +x	M	L. 5053			Spherical loom weight, partially preserved, made of baked clay.		
1	M 34834	doughnut	baked clay	4,1	6,4		1,7	140	M?	8M N 15-16 ?			Doughnut shaped loom weight, complete. Well crafted and made of baked clay.	baulk	
1	A 91634	prf. base	baked clay	1,6	6,4		0,4	56,7	A3	W. 03-207 W	forse 08-207?		Perforated base of a vessel, well rounded. Small and hourglass hole.		
1	A 21505	doughnut	clay	4,5	7,8		1,4	126 +x	A2	L. 3009		fill	Doughnut shaped loom weight, half preserved.	surface	
1	M 38452	Prf. sherd	pottery	1,3	7			30,2 2+x	M1	L. 5858 fill			Perforated base of a vessel, half preserved. Smoothed edge, damaged hole.		

Basalt rings

Middle Bronze Age

47	19215		basalt							1929	Ebeling Hazor VI: 554, fig. 11.8	47 are mentioned, but only one is published.	Irregular, not an actual basalt ring.	MB IIC fill	
1	C 1175/1		basalt						C	6203 T16-17	Yadin 1960: pl. CXXVI:10			MB II (Str. 3)	

Late Bronze Age

1	F 1394/27		basalt						F	8189	Yadin 1989: CCXLIV:11		Probably too big, not clear from drawings	MB II-LBI	
1	H 548		basalt						H	2130	Yadin 1989: CCLXX:10			LB I (Str. 2)	
1	H 1054		stone						H	2133	Yadin 1989: CCLXX:17		Very thin disc. Hole not centrally drilled.	LB I (Str. 2)	
1	H 1261/1		basalt						H	2156	Yadin 1989: CCLXXVII I:3		Irregular	LB II (Str. 1a)	

Iron Age II

	N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A 4140/1		basalt						243	Yadin 1989: CLXXXVII I:11.	Too big.	More than 10 cm	IA IIC (Str. VI)	
1	A 4139/1		basalt						243	Yadin 1989: CLXXXVII I:12.	Too big.	More than 10 cm	IA IIC (Str. VI)	
1	A 4362/1		basalt						255	Yadin 1989: CLXXXVII I:18, CCCLIX:25 .		Probably too big, not clear from drawings	IA IIC (Str. VI)	
1	A 306/1		basalt					A	130	Yadin 1960: LXXVIII:5		Irregular	IA IIC (Str. VI)	
1	B 845/1		basalt					B	3100a/1	Yadin 1960: pl. CV:18, CLXIV:9	Building 3100a and court 3100b. Floor of the court lay beneath a thick layer of shattered vessels and loomweight s embedded in ashes and charcoal.	Cylindrical, hourglass hole.	IA IIC (Str. Va)	
1	C 1533										Too big.			
1	C 1530										Too big.			
1	A 26507	cylindrical	basalt	1,8	3,5		1+x	14,6 +x	A2	L. 3813 M		fill	Basalt ring, half preserved. Quite thick, well shaped, almost cylindrical hole.	IA IIA (Str. X-IX)	
1	A 24003	cylindrical	basalt	1,5	4,6		1	13,4 3+x	A2	L. 3583 M		floor	Basalt ring, half preserved. Quite well shaped, almost cylindrical hole.	IA II A-B (Str. VIIa)	
1	A 58408	cylindrical	basalt	2	3,6		1	17,9 6+x	A4	L. 9120		floor	Basalt ring, half preserved. Well shaped but slightly asymmetrical. Hourglass hole.	IA IIC (Str. V)	
1	M 74670	cylindrical	basalt	1,7	3,9		0,9	20,4 +x	M	L. 09-341 F			Basalt ring, half preserved. Quite well shaped, hourglass hole. Encrusted surface.	IA IIC	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A 5207	cylindrical	basalt	1,4	3,2		0,9	20,38	A 1	L. 2047 M		fill	Basalt ring, complete. Quite small, well shaped, hourglass hole.	IA IIC (Str. VI-V)	
1	M 75144	cylindrical	basalt	2,2	3,7		1,1	19,9 +x	M	L. 09-343 M			Basalt ring, half preserved. Almost cylindrical hole.	?	
1	A 51206	cylindrical	basalt	1,2	3,2		nn	8,76 +x	A4	W. 5006 W			Basalt ring, half preserved. Almost cylindrical hole.		

Bone spatulae and pin beaters

Middle Bronze Age

1	A 49288	Point	Bone	12	testa 2,3x 1,9	1,4x 1,2			A2	L. 07-026 F		floor	Bone point with several scratches on tip and surface.	IBA (Str. XVIII)	
1	D 13546	Awl	bone						D	9024	Yadin 1958: CXVIII:15, CLXX:14.		Awl, apparently complete	MB II	

Late Bronze Age

1	E 4293	Awl	bone						E	7021	Yadin 1958: CXLII:20, CXLVI:16.		Awl, apparently complete	LB I	
1	17302		bone							W. 1220	Ben Tor 2017: 559.		Rib of goat or sheep		
1	A 16784	Spatula	Bone						A1	L. 1714		floor	Fragments of bone objetcs, at least one was part of a spatula	LB II (Str. XIV)	
1	A 62764	Spatula	Bone	8,4	2,3	0,2			A5	L. 9421 M		fill	Bone spatula, broken in several points and one end missing. Triangular point. Smoothed on both sides.	LB II (Str. XIV-XIII)	
1	A 47808	Spatula	Bone	14,7	4,1	0,65			A3	L. 7812 M		fill	Large bone spatula, broken at both ends.	LB II (Str. XIII)	

Iron Age I

1	A 52128	beater	Bone	8	0,7		0,3		A4	8294 pit		pit	Bone beater, quite thin. Broken in two pieces.	IA I (Str. XII-XI)	

Iron Age II

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A1749/1	Spatula	bone						A	174b	Yadin 1960: pl. LXXVIII:24, CLXVI:8.		Complete bone spatula, with a triangular point.	IA IIA (Str. X)	
1	A 3413/1	Spatula	Bone	7,9	1,8	0,2			A	208b	Yadin 1989: CLXXVI:22.		Bone spatule, fragmentary. Point was probably elongated but not preserved, other end partially broken. Polished on both sides and edge smoothed.	IA IIA (Str. IXb)	
1	A 58711	Spatula	Bone	5	2,1	0,3			A4	L. 9145		fill	Bone spatula, broken. One rounded end preserved. Upper surface and edge highly smoothed, lower surface with cancellous bone exposed, although quite worn.	IA IIA (Str. IX)	
1	A 55192	Spatula	Bone	7,9	2,6	0,15			A4	L. 8680 M		floor	Bone spatula, broken in two pieces, point missing. Other end is flat. Upper side polished, lower side with cancellous bone exposed but quite worn. Edge quite sharp.	IA IIA (Str. Xb)	
1	A 61223	Spatula	Bone	6,25	1,4	0,15			A5	L. 9184 M		fill	Bone spatula, one end missing, the other rounded. Polished on both sides and on the edge.	IA IIA (Str. X-IX)	
1	M 75453	Spatula	Bone	9,9	2,4	0,4			M	L. 10-309 M			Bone spatula, both ends missing. One side smoothed, the other with cancellous bone exposed but quite worn. Edge quite sharp. Wear traces visible on the upper side.	IA IIA-B	
1	A 18548	Spatula	Bone	a4,8 b4,1	a1,5 b1,6	a0,45 b0,25			A1	L. 1240		floor	Two different objects. A) Bone spatula, both ends missing, polished edge. B) Bone spatula, one end missing, the other well rounded. Polished on both sides and smoothed edge. Deep and large wear traces on both sides.	IA II A-B (Str. VIIb)	
1	A 55129	Spatula	Bone	8,7	2,7	0,2			A4	L. 8675 F		fill	Bone spatula, fragmentary and encrusted. On one side cancellous bone exposed, even if worn.	IA II A-B (Str. VIII-VII)	
1	A 53178	Spatula	Bone	5,8	2,2	0,2			A4	L. 8341		floor	Bone spatula, one end missing, the other triangular. Well smoothed on one side, less on the other. Smoothed edge, less on the point.	IA II A-B (Str. VIII-VII)	
1	A 18738	Spatula	Bone	5,6	2,5	0,2			A1	L. 1871 M		floor	Bone spatula, one end missing, the other preserves a well shaped triangular point. One side polished, as the edge, the other with exposed cancellous bone. Some wear traces are detectable.	IA II A-B (Str. VII)	

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A 55254	Spatula	osso	18,5	2,6				L. 8684	Bechar 2012: 499, fig. 8.1.12	Pit	Bone spatula, almost complete. One triangular end, the other rounded. Broken in several pieces. Polished on both sides.	IA II A-B (Str. VII)	
1	A 62834	Spatula	Bone	4,3	2	0,3			L. 9427 M		fill	Bone spatula, one end missing the other well rounded. Well polished on both sides and on the edge.	IA II A-B (Str. VIII-VII)	
1	A 55063	Spatula	Bone	5,7	2,4	0,3			L 8662 M		floor	Bone spatula, one end missing the other quite flat. Well polished on both sides and on the edge.	IA II A-B (Str. VIIb)	
1	A 63415	Spatula	Bone	10,6	1,7	0,3			L. 50086 M	Bechar 2012: 499, fig. 8.1.11	fill	Bone spatula, complete but broken in several pieces. Long and narrow. One end has a triangular shape, the other quite flat. Well polished on the upper side and edge, cancellous bone visible on the lower side, but very smoothed. No wear traces detectable.	IA II A-B (Str. VIII-VII)	
1	A 24107	Spatula	Bone	4,25	1,8	0,2		A2	L. 3604 M		floor	Bone spatula, one end rounded, the other missing. Well polished on both sides and on the edge.	IA II A-B (Str. VIIb)	
1	A 60602	Spatula	Bone	7	2,1	0,2		A5	L. 9091 M	Bechar 2012: 499, fig. 8.1.15		Bone spatula, one elongated point preserved and very well shaped, the other end missing. Polished on both surfaced.	IA IIA-B (Str. VIII-VII)	
1	A 57619	Spatula	Bone	5,3	2,8	0,3		A4	L. 9042 M		fill	Bone spatula, only triangular point preserved. Quite thick, left unpolished, edge very sharp. Lower side with cancellous bone exposed, very rough. Never used.	IA II A-B (Str. VII)	
1	A 46280	Spatula	Bone					A 3	L. 7612 M		Pit	Bone spatula broken in several small pieces but not complete. Smoothed edge where preserved.	IA II A-B (Str. VIII-VII)	
1	A 11534a	Spatula	Bone	10,8	2	0,2		A	L. 1172	Bechar 2012: 499, fig. 8.1.13	fill	Bone spatula, complete. One pen-nib point, the other rounded. Both surfaces are polishes as well as the edge. Wear traces long the whole edge.	IA IIA-B (Str. VII)	
1	A 11865	Spatula	Bone	3,8	2,3	0,1		A1	L. 1206		floor	Bone spatula, broken. Triangular point preserved, slightly chipped. Polished on both sides and on the edge.	IA II A-B (Str. VIIb)	
1	A 45831	Spatula	Bone	6,5	0,9x 0,7			A3	L 7543		fill	Bone spatula, one pointed and, the other missing.	IA II A-B (Str. VIII)	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A 11656	Spatula	Bone	7,6	2,2	0,2			A1	L. 1206		floor	Bone spatula, broken. One triangular end preserved, other end missing. Polished on both sides. Edge quite smoothed. Wear traces more visible near one side of the edge.	IA II A-B (Str. VIIb)	
1	A 11657	Spatula	Bone	5,7	2,2	0,2			A1	L. 1206		floor	Bone spatula, broken. Rounded point preserved, very well shaped. Extremely polished on both sides and on the edge.	IA II A-B (Str. VIIb)	
1	A 11534b	Spatula	Bone	8,6	2,3	0,1			A	L. 1172		fill	Bone spatula, broken. One rounded end preserved, the other missing. Very thin, well polished on one surface, less on the other. Slightly concave. Thin edge but smooth. Wear traces on the surface.	IA IIA-B (Str. VII)	
1	A 55121	Spatula	Bone						A4	L. 8662 F		floor	Bone spatula, fragmentary. One triangular point preserved, with smoothed edge. One surface polished, the other with cancellous bone exposed, even if smoothed and polished.	IA II A-B (Str. VIIb)	
1	A 63345	Spatula	Bone	5,5	2	0,2			A5	L. 50077 F		floor	Bone spatula, broken, both ends missing. Polished on both sides and on the edge. Wear traces, thin and parallel on the surface.	IA II A-B (Str. VII)	
1	A 64008	Spatula	Bone	5,5	1,8	0,3			A5	06A5-002 M	Bechar 2012: 499, fig. 8.1.14.	fill	Bone spatula, one end rounded and the other missing. Extremely polished on both sides and on the edge.	IA II (Str. VII-VI)	
1	A 41790	Spatula	Bone						A3	L. 7148 M		floor	Small fragments of a bone spatula.	IA II (Str. VII-VI)	
1	A 46057	Spatula	Bone	4,6	1,65	0,2			A3	L. 7567		fill	Bone spatula, only one edge and part of the point preserved. Very damaged.	IA II (Str. VII-VI)	
1	A 2388/1	Spatula	Bone							L. 3A	Hazor III-IV: pl. CLXXXVIII:26. Hazor V: p. 144, fig. II.52:23		Bone spatula, one end rounded and the other missing.	IA IIC (Str. VI)	
1	A 53467	Spatula	Bone	10,3	1,9	0,2				L. 8402 floor		floor	Bone spatula, broken. One end rounded and the other missing. Polished on both sides and on the edge.	IA IIC (Str. VI)	
1	A 61364	Spatula	Bone	6	1,9	0,2			A5	L. 9199 M		floor	Bone spatula, broken and both ends missing. Point possibly triangular. Evident traces of polishing on one side, not due to wear.	IA IIC (Str. Vb)	

N.		Typology	Material	H	D	Thickness	Hole		Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A 40719	Spatula	Bone	3,8	1,7	0,15			A3	L. 7054		floor	Bone spatula, one end with a triangular point, the other missing. Quite well polished on both sides.	IA IIC (Str. VIb)	
1	A 18590	Spatula	Bone	2,1	1,8	0,15			A1	L. 1849		fill	Small fragment of spatula?	IA IIC (Str. IV-III)	
1	A 60448	Spatula	Bone						A8	L. 9079 M		fill	Bone spatula, broken in several small fragments. Where preserved, the edge appear not smoothed.	IA IIC (Str. V)	
1	A 62294	Spatula	Bone	3,5	2,8	0,15			A5	L. 9325 M		fill	Bone spatula, broken. One end rounded, the other missing. One side polished, the other less. Cancellous bone exposed, even if quite smoothed.	IA IIC (Str. V)	
1	A 63305	Spatula	Bone	5,4	1,7	0,25			A5	L. 50068 F		floor	Bone spatula, broken in two pieces and only part of the edge preserved. Well polished on all surfaces. Parte di spatola in osso divisa in due frammenti di cui si conserva	IA IIC (Str. VI)	
1	A 22927	Spatula	Bone						A2	L. 3402 floor		fill	Bone spatula broken in several small fragments. Very thin and smoothed on both side.	IA IIC (Str. V)	
1	A 60464	Spatula	Bone	5,4	2,15	0,15			A5	L. 9065		Floor	Bone spatula, one end with a triangular point, the other missing. Surface polished on both sides, but cancellous bone exposed on the lower surface. Wear traces on the upper surface.	IA IIC (Str. V)	
1	A 13227	Spatula	Bone	8,1	1,9	0,2			A1	L.1424 G		floor	Bone spatula, broken. Part of the rounded end preserved. Smoothed on both sides.	IA IIC (Str.VIa)	
1	A 11157	Spatula	Bone	6,1	1,4	0,2			A1	L. 1153		floor	Bone spatula, broken. One end rounded, the other missing. Well polished on one side, less on the other where cancellous bone is exposed, even if worn. Smoothed edge.	IA IIC (Str. V)	
1	M 74193	Spatula	Bone	5,7	1,9	0,2			M	L. 09-312 M			Bone spatula, broken. One end flat, the other missing. Well polished on both sides.	IA IIC	
1	M 75358	Spatula	Bone	2,4	2,2	0,2			M	L. 09-317 M from mudbrick wall			Fragment of bone spatula, broken. One end rounded, the other missing. Polished on both sides. Wear traces on lower surface near the edge, which appear smoothed.	IA IIC	

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	M 74336	Spatula	Bone	4,1	1,9	0,1			M	L. 09-319 M			Fragment of spatula, with a triangular point. Very thin and smoothed on both sides.	IA IIC	
1	M 73982	Spatula	Bone	4,2	1,7	0,2			M	L. 08-356 F			Fragment of bone spatula with pen-nib point. Polished on both sides and on the edge.	IA IIC	
1	M 75009	Spatula	Bone	8	2,1	0,3			M	L. 09-350 M			Bone spatula, broken but preserved for almost all length. One end with a triangular point, the other flat. Smoothed by wear on both sides, only towards the flat end cancellous bone is preserved. It becomes thinner approaching to the point.	IA IIC	
1	M 75526	Spatula	Bone	4,1	2	0,2			M	L. 10-306 F			Two fragments of a bone spatula, not joining. No ends preserved. Polished on both sides, part of cancellous bone exposed but smoothed.	IA IIC	
1	M 75456	Spatula	Bone		2,6	0,15			M	L. 10-306 F			Two fragments of bone spatula. Polished on both sides and on the edge.	IA IIC	
1	M 78637	Spatula	Bone	5,2	2,7	0,2			M	L. 14-338 I			Bone spatula, broken. One end flat, the other missing but possibly with a triangular point in origin. Polished on both sides and smoothed on the edge, even the flat end.	IA IIC	
1	M 78802	Spatula	Bone	4,7	1,8	0,2			M3	W. 15-303		Top of W	Small bone spatula, point missing. Polished on one side, while on the other cancellous bone is exposed, which disappear towards the point.	IA IIC	
1	A 2258/4	Spatula	Bone	8,5	2,7	0,2			A	L. 81A	Hazor III-IV: pl. CLXXXVIII:27. Hazor V: p. 145, fig. II.53:10		Bone spatula, complete. One end with a triangular point, the other is well rounded. Polished on both sides and on the edge.	IA IIC (Str. VI)	
1	A 2368/1	Spatula	Bone	7,9	2,4	0,2			A	188	Yadin 1989: CLXXXVIII:25.		Bone spatula, complete. One end with a triangular point, the other is well rounded. Polished on both sides and on the edge.	IA IIC (Str. VI)	
1	A 2368/1a		Bone	3,2	2,6	0,2			A	188			Small fragment of a bone spatula, with heavy parallel signs on the surface, not due to wear.	IA IIC (Str. VI)	
1	B 217/5	Spatula	bone						B	3094	Yadin 1960: pl. CV:36.			IA IIC (Str. Va)	

N.		Typology	Material	H	D	Thickness	Hole		Weight	Level	Bibliography	Notes	Description	Dating	IAA
Unknown context															
1	A 91160	Spatula	Bone	4,1	1,3	0,2				L-07-208			Bone fragment of a spatula		
1	A 26682	Spatula	Bone	9,9	1,7	0,25				L. 3835		fill (no levels)	Bone spatula, broken. One end probably flat but chipped, the other missing. One side is polished, the other with cancellous bone exposed. Smoothed edge.		
1	A 1533	Spatula	Bone	10,2	2,3	0,3				L. B-8/R-S			Bone spatula, broken. One end flat, the other missing. One side is polished, the other has cancellous bone exposed, more smoothed towards the point.		
1	A 58452	Spatula	Bone	5,6	2,4	0,25				L. 9110 M			Bone spatula with small triangular point, the other end missing. Possibly a reworking. Polished on both sides, not on the edge.		
1	A 63284	Spatula	Bone	4,4	2	0,1				L. 50065 M			Bone spatula, broken. Triangular point preserved, very well crafted and still sharp. Very thin spatula and extremely polished on all sides.		
1	A 63399	Spatula	Bone	6,7	2,2	0,3			A 5	L. 50084 M			Bone spatula, broken. One end rounded, the other missing. Broken in three pieces. Well polished on all surfaces, including edge.		
1	A 60936	Spatula	osso	3,3	2,4	0,2			A5	L. 9139 M		fill	Fragment of bone spatula, broke. Well crafted triangular point preserved, the other end missing. Polished on both sides. Deep parallel signs on the surface, not due to wear.		
1	A 63041	Spatula	Bone	7,6	2,2	0,2				L. 50015 M		M sta per fill	Bone spatula, complete. One end with a triangular point, the other rounded. Polished on both sides.		
1	A 62627	Spatula	Bone	a3,5 b4,2	a 1,5 b2,2	a 0,2 b0,1 5			A5	L. 9409 M			Two fragments of different spatulae. A) Triangular point of bone spatula, roughly shaped but polished on both sides. Deep parallel signs on the surface not due to wear. B) Bone spatula broken at both ends, edge smoothed where preserved. Polished on both side, near the point cancellous bone is visible but very worn.		
1	A 1661	Spatula	Bone	2,1	2,3	0,2			A 7	L. 274 F11			Bone spatula, broken. One end rounded, the other missing. Polished on both sides		

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
												but edge still sharp. Polishing marks visible on the surface.		
1	M 38198	Spatula	Bone	5,8	1,1	0,2		M2	L. 5801 M			Small and narrow bone spatula, broken. One end has a pen-nib point, the other is missing but probably a second point was present. Polished on both sides and on the edge.		
1	M 39456	Spatula	Bone	4,4	2,1	0,2		M1	L. 5929 pebble level			Bone spatula, broken. One end with a triangular point but rounded, the other missing. Both sides are polished but very worn.		
1	M 31802	Spatula	Bone	11,9	2,6	0,2		M	5229			Bone spatula, broken. One rounded end preserved, the other missing. Both surfaces are polished, lower side shows traces of cancellous bone. Upper surface with polishing manufacture marks.		
1	M 37557	Spatula	Bone	6,8	1,4	0,4		M	L. 5776			Bone spatula, complete. One end has a pen-nib point, the other rounded. One surface extremely polished, the other with cancellous bone exposed, partially obliterated by use. Smoothed edge.		
1	M 32407	Spatula	Bone	5,5	2,5	0,2		M	BM/L-10			Bone spatula, with a very thin triangular point. Polished on both sides and on the edge.	baulk	
1	M 73794	Spatula	Bone	3,7	2,2	0,3		M	L. 08-311 M			Bone spatula, broken. One end flat, the other missing. Well polished on both surfaces and on the edge.	?	
1	M 75646	Spatula	Bone	8,1	3	0,2		M	L. B.M. 7/8 B ?			Bone spatula, quite broad, broken. One end rounded, the other missing. Polished on all sides.	baulk	
1	M 72457	Spatula	Bone	5,7	1,3	0,15		M	L. 10-302 M above F			Bone spatula, long and narrow with a triangular point. Polished on all sides.	?	
1	M 75528	Spatula	Bone	8,1	2,8	0,3		M	L. 10-321 M			Bone spatula, broken. One end flat, the other missing. Thickening towards the flat end. Polished on both surfaces and on the edge, excuding the flat end.	?	
1	A 22062	Point	Bone	5,5	0,9		0,4	A2	3245		fill	Bone point broken on both ends.	-	
1	A 2338/1	Spatula	Bone	6,2	2,4	0,1		A	n57		YADIN	Bone spatula, broken. One rounded end, the other missing. Polished on both sides and on the edge. Very thin.		

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	A 2056/1	Spatula	Bone	8,3	2,6	0,1			A	57n		YADIN	Bone spatula, broken. One rounded end, very well crafted, the other missing. Polished on both sides and on the edge.		
1	A 11973	Spatula	Bone	5,6	1,8	0,25			A	55n		YADIN	Bone spatula, complete. One end roughly rounded, the other missing. Edge smoothed.		
1	A 2272/1	Spatula	Bone	10	2,5	0,2			a	57n		YADIN	Bone spatula, complete. One end with a triangular point, the other rounded. Polished on both sides and on the edge.		
1	A 2412/2	Spatula	Bone	6,4	2,8	0,15			A	57n		YADIN	Bone spatula, with a pen-nib point. Polished on both sides and on the edge.		
1	A 2212/2	Spatula	Bone	6,5	1,8	0,2			A	57n		YADIN	Bone spatula, broken. One end with an elongated point, the other missing. Polished on both sides and on the edge.		
1	A 3467/5	Spatula	Bone	4,1	1,8	0,2			A	57n		YADIN	Bone spatula, broken. One end with a pen-nib point. Polished on upper side, cancellous bone visible on the other, even if smoothed. Thick edge but quite smoothed. .		
1	A 2318/1	Spatula	Bone	7,2	2	0,3			A	57n		YADIN	Bone spatula, fragmentary. Point and part of the edges missing. One rounded end preserved. Polished on both sides and on the edge.		
1	A 2352/1	Spatula	Bone	6,5	1,5	0,2			A	57n		YADIN	Bone spatula, broken. Triangular point and part of the central part preserved, but not the edge.		
1	A 3102/8	Spatula	Bone	2,3	2,4	0,25			A	57n		YADIN	Fragment of a bone spatula.		

Needles

Middle Bronze Age

1	B 5074		Bronze						B	3314, tomb	Yadin 1989: CXCVIII:14.			MB II	

Late Bronze Age

1	F 850/1		Bronze						F	O6	Yadin 1989: CCXLIV:18		Thin needle shaft, probably incomplete.	MB II-LB I	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F 932/2	Bronze					F	O4	Yadin 1989: CCXLIV:19		long and thin needle, almost complete. Eye obtained perforating the upper part of the shaft, which is enlarged.	MB II-LB I	
1	H 1282	Bronze					H	2170	Yadin 1989: CCLXX:23, CCCXLIII:5		Complete. Eye obtained probably by benting on itself the upper part of the shaft.	LB I (Str. 2)	
1	H 1012	Bronze					H	2167	Yadin 1989: CCLXX:24, CCCXLIII:3		Broken eye. Eye obtained probably by benting on itself the upper part of the shaft.	LB I (Str. 2)	
1	H 770	Bronze					H	2119	Yadin 1989: CCLXXVIII: 16, CCCXLIII:7		Complete, very thin. Eye obtained by perforation of the shaft, which is enlarged where the hole is done (probably when metal was still warm)	LB II (Str. 1a)	
1	H 514	Bronze					H	2123	Yadin 1989: CCLXXVIII: 17, CCCXLIII:2		Broken, eye not preserved	LB II (Str. 1a)	
1	K 445/1	Bronze					K	5518	Yadin 1989: CCXCIV:19.		Long and thin needle, complete. Eye obtained probably by benting on itself the upper part of the shaft.	LB II (Str. 1B)	
1	K 264/1	Bronze					K	5013a	Yadin 1989: CCXCIV:20, CCCXLIII:8.		Long and thin shaft, both ends pointed.	LB II (Str. 1B)	
1	K 264/2	Bronze					K	5013a	Yadin 1989: CCXCIV:21, CCCXLIII:6.		Long and thin needle, complete. Eye obtained probably by benting on itself the upper part of the shaft.	LB II (Str. 1B)	
1	K 264/3	Bronze					K	5013a	Yadin 1989: CCXCIV:22, CCCXLIII:4.		Long and thick needle, complete. Eye obtained probably by benting on itself the upper part of the shaft.	LB II (Str. 1B)	
1	K 264/4	Bronze					K	5013a	Yadin 1989: CCXCIV:23.		Both ends pointed and hole in the middle, probably a toggle pin.	LB II (Str. 1B)	
1	H 482	Bronze					H	2116	Yadin 1989: CCCXLIII:9.		Eye missing.	LB II (Str. 1b)	
5	K 265/2	bone, bronze					K	5010	Yadin 1989: CCCXLIII:10.		Needle case with 5 needles	LB II (Str. 1a)	
1	K 265/2-1	Bronze					K	5010	Yadin 1989: CCCXLIII:10.		Needle from needle case. Long and thin needle, complete. Eye obtained probably by benting on itself the upper part of the shaft.	LB II (Str. 1a)	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	K 265/2-2	Bronze					K	5010	Yadin 1989: CCCXLIII:11.		Needle from needle case. Long and thin needle, complete. Eye obtained probably by benting on itself the upper part of the shaft.	LB II (Str. 1a)	
1	K 265/2-3	Bronze					K	5010	Yadin 1989: CCCXLIII:12.		Needle from needle case. Long and thin needle, complete. Eye obtained probably by benting on itself the upper part of the shaft.	LB II (Str. 1a)	
1	K 265/2-4	Bronze					K	5010	Yadin 1989: CCCXLIII:13.		Needle from needle case. Long and thin needle, complete. Eye obtained probably by benting on itself the upper part of the shaft.	LB II (Str. 1a)	
1	K 265/2-5	Bronze					K	5010	Yadin 1989: CCCXLIII:14.		Needle from needle case. Long and thin needle, complete. Eye obtained probably by benting on itself the upper part of the shaft.	LB II (Str. 1a)	
1	B 5011	Bronze					B	3284	Yadin 1989: CC:28.		Only part of shaft preserved, both ends missing.	LB II	
1	41238/2	ivory						7050, building 7050, floor	Ben Tor 2017: 559.	No fig.		LB IIA-B (str. XIII)	
1	F 1037-1	Bronze					F	P4	Yadin 1960: CL:10, CXCVI:11		Needle, completed. Long and thin eye obtained perforating the shaft	LB II (Str. 1)	
1	C 7457	Bronze					C	6061	Yadin 1958: pl. LXXXVIII: 23, CLX:23		Needle, completed. Very long and quite thick. Eye obtained probably by benting on itself the upper part of the shaft.	LB II (Str. 1a)	
Iron Age I													
1	47217	Bronze						7717	Ben Tor 2012: 534, 536, fig. 10.5		Eye drilled	IA I (Str. XII-XI)	
1	B 4785	Bronze					B	3279	Yadin 1989: CCIV:13		Needle? Fibula? No eye visible, both ends pointed, bent in several points.	IA I (Str. XI)	
1	B 4642/1	Bronze					B	3279	Yadin 1989: CCIV:14		Needle? Fibula? No eye visible, both ends pointed, bent in several points.	IA I (Str. XI)	
1	B 4642/2	Bronze					B	3279	Yadin 1989: CCIV:15		Short needle, broken eye, rounded tip.	IA I (Str. XI)	
1	B 5148	Bronze					B	3283	Yadin 1989: CCV:8, CCCLV:18.		Short needle or ugly toggle pin. Eye in the middle of the shaft.	IA I (Str. XI)	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
Iron Age II													
1	B 4577/1		Bronze					B	3274	Yadin 1989: CCVII:32		Bronze shaft pointed at both end, no trace of a eye	IA IIA (Str. X)	
1	B 4760		Bronze					B	3265	Yadin 1989: CCVII:33		Bronze shaft, rounded at one end, the other missing.	IA IIA (Str. X)	
1	B 5290		Bronze					B	3038d	Yadin 1989: CCXVI:21		Needle? Fibula? No eye visible, both ends pointed, bent in several points.	IA IIA (Str. IX)	
1	B 2447/1		iron					B	3194	Yadin 1989: CCXXI:12		Thick needle, broken at one end. Eye obtained probably by benting on itself the upper part of the shaft.	IA IIC (Str. Vb)	
1	B 1751/1		Bronze					B	3156	Yadin 1989: CCXXI:13		Long and thin needle, complete. Eye obtained probably by benting on itself the upper part of the shaft.	IA IIC (Str. Vb)	
1	B 949/1		Bronze					B	3116A	Yadin 1960: CVI: 26.		Needle (?), completely bent	IA IIC (Str. Va)	
1	B 1239/1		Bronze					B	3117A	Yadin 1960: CVI: 27.		Needle (?), completely bent and fragmentary	IA IIC (Str. Va)	
1	B 4465		Bronze					B	3235	Yadin 1989, pl. CCXX:37.		Shaft with rounded end and the other missing.	IA IIC (Str. VI)	
1	A 22046		Bone/ivory	3,8	0,5x 0,4			A2	L. 3208		fill	Bone/ivory point, very well crafted.	IA IIC (Str. V)	
1	M 74753		Bronze	6,1	0,15	0,5		M	L. 08-319 From cleaning winter wash			Thin bronze shaft with the upper part bent on itself to form a large eye.	IA IIC	
1	M 74193b		Bone	2,8	0,3			M	L. 09-312 M			Small bone point probably part of a needle.	IA IIC	
1	L 32		Stone	8,6	1	0,4		L	L. 1001		YADIN	Needle (?) made of stone with a large and flat head, where a hole has been made.	IA II	
Unknown context													
1	A 277		Bronze						D18 unclear provenance	Hazor V: 168, 169, fig. II.62,12.		Bronze needle, not clear how the eye has been fabricated		
1	M 77929		bone/ivory	5,6	0,35			M	L. 12-353			Thin bone shaft, probably part of a needle.		
1	M 77782		bone/ivory	6,4	0,25			M	L. 12-353			Thin bone shaft, probably part of a needle.		

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	M 34518		Bronze	7,5	0,15			M	L. 5565 M			Bronze needle, complete. Very well crafted. Eye obtaing punching the upper part of the shaft.		
1	?		Bronze	11,8	0,3	testa 0,5x 0,25					YADIN	Bronze needle, complete. Eye made by bending the upper part of the shaft on itself.		
1	?		Bronze	10,2	0,5						YADIN	Bronze shaft, probably part of a needle.		
1	?		Bronze	7,8	0,25						YADIN	Bronze shaft, probably part of a needle.		
1	A 5794		Bone	6,1	0,9	0,25		A			YADIN	Needle broken towards the point. Large and flat.		
1	A 10112/9		Bone	5,2	0,5	0,4		A			YADIN	Needle broken towards the point with small rounded hole.		

8.4 TELL EL-FAR'AH (N)

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
Spindles													
1	F 4434		bone	3,1	1,2x1		0,5	3		Sous 656			Bone shaft, hollow, probably broken at the ends, with centred decoration. Edges are smooth but irregular. Lattice motif. Possibly not a spindle.		
1	F. 2430		ivory	6	1					L. 343 déblais	Chambon 1984, pl. 73:11. De Vaux 1952, pl. XV:16.		Cylindrical ivory rod, partially preserved. One end is flat and the shaft seems not to taper towards the other (missing) end. Handle?	HS	
1	F. 355		bone	5,3	1					L.65	Chambon 1984, pl. 73:12.		Cylindrical ivory rod, hollow, complete. One end is flat and the shaft seems not to taper towards the other flat end. One circular incision is the only decoration. Handle?	Période VII II-355, VIIb - IA IIA	
Spindle whorls															
Chalcolithic															
1	F. 4556	Biconical	Pottery	2,4	3,5		0,6	26,21		L. 705			Biconical spindle whorl, well shaped. Complete, made of pottery. Hole is slightly oval on one side, perfectly round on the other.	Niveaux chalcolithique	
Early Bronze Age															
1	F. 1208	Spherical	Stone	3,4	4,8		nn	39,16+x		L. 110 C3 SE, 37.50		De Vaux Eneol.	Spherical spindle whorl, broken in half. Made of grey stone. Cylindrical hole with evident traces of manufacture.	EB I	
1	F. 3987	Cylindrical	White stone	3,2	4,4		0,9	104		L. 619			Nice and polished white stone, hour glass hole. Mace head?	Bronze Ancien Période 3	
1	F. 4393	Conical	Grey stone	1,3	5,5		0,6	28,39		L. 683			Conical spindle whorl, almost complete but chipped. Made of a grey, friable stone. Upper hole with traces of wear, lower hole perfectly cut.	Niveau de l'ancien	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
												Bronze période 1	
1	F. 4686	Spherical	Grey stone	2,9	4			20,12+x		Tr. 692 (1)			Spherical spindle whorl, more than a half missing. Made of a grey stone.	EB	
1	F. 4964	Discoid	Stone	0,7	4		0,6	9,6+x		L. 784			Discoid spindle whorl, half preserved. Made of a grey stone, well rounded and polished. Well cut cylindrical hole. Worked from a pebble.	EB	
1	F. 4101		Black stone	1,7	4,2		1	40,08+x		Sous 628			Very fine stone, more than half missing. Extremely polished and smooth. Mace head?	Ancien Bronze période 3	
1	F. 3195	Cylindrical	Stone	3	4,6		1,3	78		L. 274			Cylindrical spindle whorl, complete. Made of light grey stone. Large, conical hole.	Ancien Bronze	
Middle Bronze Age															
1	F. 4838	Cylindrical	Stone	2,8	4,6x4,8		1	87,21		L. 734 demolishing			Asymmetrical cylindrical spindle whorl, complete. Made of a whitish stone. Hour glass hole but well polished.	MB	
1	F. 3675	Cylindrical	White stone	1,8	4,3		0,7	39,18		Sous 585	Mallet 1973: 12:5. Mallet 1988: fig. 22.5.		Spindle whorl/loom weight. White stone,roghly tooled. Oblique cylindrical hole	(MB) Période V IIN.BM 505 (B,4)	
1	F. 4738	Cylindrical	Grey stone	2,1	2,6		0,7	14,55		Sous 733			Spindle whorl/bead. Gray stone with cylindrical hole. Decorated on the top with a concentric rings motif	Période V III-733	
1	F. 2913	Dome	Bone	0,6	2		0,25	0,93+x		L. 245	Mallet 1973: 22,12, Mallet 1988, fig. 32,12		Tiny bone spindle whorl, broken in half and damaged. Polished on the dome	Période V IIN.BM 245 (B,2)	
1	F. 2123	Dome	Bone	1,8	4,3		nn	14,47+x		Sous 208(=226)			Dome-shaped bone spindle whorl. Damaged. On the bottom cancellus bone is exposed	MB, niveau MB (de Vaux), Période VI Dc	
1	F. 4514	Cylindrical	Pottery	1,5	3,6		1,1	13,08+x		Ext. De 694			Spinde whorl (?) Cylindrical, pottery? Asymmetrical, broken	MB	
Late Bronze Age															
1	F. 104	Dome	Bone	0,8	2,3		0,2	3,13		C4, 1m			Dome-shaped bone spindle whorl. Damaged. Hole diameter and weight are too small to belong to a spindle whorl.	Période VI Dc	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F. 1950	Lenticular	White stone	0,9	2		0,4	4,91		Loc. 198			Spindle whorl/bead. White stone	Période de Vaux RB, période VI Dc.	
1	F. 739	Dome	Bone	0,5	2,5		0,4	2,39		T4 (14)		BR	Dome-shaped bone spindle whorl. Complete, damaged. Cylindrical hole	Période VI Dce, PL. objets; BR II?	
1	F. 3589	Conical truncated	Stone	1,8	3,7		0,7	33,33		Loc. 526 1955		Période VI Dce	Stone spindle whorl, irregular, troncoconical. Hourglass hole		
1	F. 3650	Cylindrical	White stone	1,4	3,8		0,9	27,55		Sous 539 1955		Période VI Dce	White stone spindle whorl. Irregular with cylindrical hole	T 68	
1	F. 3477	Dome	Stone	1,1	3		0,3	9,91		L. 480 1955		Période VI Dce	Dome-shaped bone spindle whorl. Brown stone (bone?) damaged at the base. The hole slightely	Bronze Recent le temple?	
1	F. 3507	Spherical	Stone	2,1	2,8		0,8	15,09		L 504 1955		Période VI Dce	Biconical spindle whorl, gray stone. Damaged at one side. Cylindrical hole. Wheel signs create a decorative mofit		
1	F. 236	Conical	Bone	1,2	2,6		0,3	6,81		C1 W, -2,25m			conical bone spindle whorl. Concave base, with spyral toolling	Période VI Dc	
Iron Age															
1	F. 3491	Cylindrical	Stone	1,1	3,1		0,8	10,25+x		sous 487 1955			Stone cylindrical spindle whorl, the base is missing. Cylindrical hole	Période VI/Période VIIa - IA I/IIA	
1	F. 1519	Lenticular	White stone	1,1	1,9		0,4	4,32		L. 150	Chambon 1984, 75:21		White stone spindle whorl/bead. Biconical and polished. Cylindrical hole. Pollibly made of bone	VIId - IA IIB	
1	F. 1666	Dome	Black stone	0,8	1,7		0,4	2,32		L. 164 (con un peso)	Chambon 1984, 74:12		Black stone spindle whorl/bead. Dome-shaped with anular carving.	VIIb - IA IIA - IA IIA	
1	F. 2455	Lenticular	Limestone	0,9	2,1		0,4	5,2		sotto 321=369	Chambon 1984, 75:20.		Limestone spindle whorl/bead. Lenticular shape, polished, with cylindrical hole.	VIIb - IA IIA	
1	F. 1474	Cylindrical	Schist	2,2	3,4		0,8	32,26		L. 113 destruction	Chambon 1984, 75:37		Schist cylindrical spindle whorl with decoration on its side. Ring motif	VIIe - IA IIC	
1	F. 2941	Dome	Bone	0,6	2,2		0,3	3,12		sous 414	Chambon 1984, 75:1		Dome-shaped bone spindle whorl. Damaged. Hole diameter and weight are too small to belong to a spindle whorl.	VIIc - IA IIB	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F. 1495	Conical	Pottery	1,1	2,1		0,3	4,21		L. 125 ext, verso est	Chambon 1984, 75:11		Conical spindle whorl. Damaged, made from pottery. Well crafted at the origin	VIId - IA IIB	
1	F. 3356	Dome	Bone	0,65	2,6					L. 447	Chambon 1984, 75:2.		Small bone spindle whorl, complete.	VIId - IA IIB	
1	F. 2908	Dome	Limestone	0,5	2					L. 407	Chambon 1984, 75:3.		Small stone spindle whorl, chipped.	VIId - IA IIB	
1	F. 393	Conical	Grey stone	1	2,55					L. 19	Chambon 1984, 75:4.		Small stone spindle whorl, complete. Circular line incised near the edge.	VIIb - IA IIA	
1	F. 1432	Dome	Grey stone	1	2,5					L. 126	Chambon 1984, 75:5.		Small stone spindle whorl, complete.	VIId - IA IIB	
1	F. 1787	Conical	Limestone	0,9	2					L. 162 sous	Chambon 1984, 75:6.	Louvre	Small stone spindle whorl, complete.	VII	
1	F. 3219	Conical	Grey stone	0,7	1,2					L. 441	Chambon 1984, 75:7.		Small stone spindle whorl, complete.	VIIb - IA IIA	
1	F. 1528	Conical	Limestone	2,7	4,2					L. 151	Chambon 1984, 75:8.		Stone spindle whorl, complete. Quite large and high.	VIId - IA IIB	
1	F. 3384	Conical truncated	Pottery	1	2,2					L. 458	Chambon 1984, 75:9.		Pottery spindle whorl, chipped.	VIId - IA IIB	
1	F. 2446	Conical truncated	Stone	1	2,8					L. 335	Chambon 1984, 75:10.		Small stone spindle whorl, complete.	VIId - IA IIB	
1	F. 1700	Button	Pottery	1	2,5					L. 158	Chambon 1984, 75:13.		Small pottery spindle whorl, complete.	VIIb - IA IIA	
1	F. 391	Conical truncated	Grey stone	1,1	1,55					L. 19	Chambon 1984, 75:14.		Small stone spindle whorl, complete. Circular line incised on the surface.	VIIb - IA IIA	
1	F. 3465	Biconical	Grey stone	2,1	3,3					L. 432	Chambon 1984, 75:15.		Stone spindle whorl, complete. Well shaped.	VIIb - IA IIA	
1	F. 3220	Biconical	Grey stone	2,1	3,5					L. 442	Chambon 1984, 75:16.		Stone spindle whorl, complete. Four radial incision on the surface.	VIIb - IA IIA	
1	F. 2470	Biconical	Pottery	1,8	4,1					L. 350	Chambon 1984, 75:17.		Pottery spindle whorl, complete. Quite irregular.	VIId - IA IIB	
1	F. 2949	Cylindrical	Schist	1,2	2,9					L. 418	Chambon 1984, 75:18.		Stone spindle whorl, complete. Well shaped.	VIIb - IA IIA	
1	F. 1711	Lenticular	Pottery	0,9	2,1					L. 175	Chambon 1984, 75:19.		Pottery spindle whorl, complete. Quite irregular.	VIIb - IA IIA	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F. 2776	Discoid	Limestone	1	3,6					L. 346	Chambon 1984, 75:23.		Stone spindle whorl, complete. Well shaped.	VIIb - IA IIA	
1	F. 1667	Cylindrical	Pottery	1	2,4					L. 173	Chambon 1984, 77:24.		Cylindrical spindle whorl with very small hole.	VIIb - IA IIA	
1	F. 1592	Cylindrical	Pottery	0,8	3,3					L. 140	Chambon 1984, 77:32.		Cylindrical spindle whorl, complete. Bent hole.	VIIb - IA IIA	
1	F. 2777	Cylindrical	Schist	0,9	3,3					L. 346 sous	Chambon 1984, 77:33.		Cylindrical spindle whorl, complete. One side shorter than the other.	VIIb - IA IIA	
1	F. 1671	Cylindrical	Stone	1,2	2,4					L. 173	Chambon 1984, 77:34.		Cylindrical spindle whorl, complete. Irregular sides.	VIIb - IA IIA	
1	F. 2361	Cylindrical	Limestone	1,4	4,2					L. 444	Chambon 1984, 77:35.		Cylindrical spindle whorl, complete. Chipped.	VIIe - IA IIC	
1	F. 1647	Cylindrical	Limestone	1,9	3,9					L. 149b sous	Chambon 1984, 77:36.		Cylindrical spindle whorl, complete. Two circular lines incised on the side.	VIIa - IA I/IIA	
1	F. 3390	Cylindrical	Schist	0,9	3,2					L. 456 sous	Chambon 1984, 77:38.		Cylindrical spindle whorl, complete. One circular line incised on the side.	VIIb - IA IIA	
1	F. 2449	Cylindrical	Schist	2	2,8					L. 367	Chambon 1984, 77:39.		Cylindrical spindle whorl, complete. Two circular lines incised on the side.	VIId - IA IIB	
1	F. 1705	Cylindrical	Pottery	0,8	2,3					L. 173	Chambon 1984, 75:22.		Cylindrical spindle whorl with hour glass perforation.	VIIb - IA IIA	
1	F. 1704	Cylindrical	Pottery	0,6	2					L. 158	Chambon 1984, 75:25.		Cylindrical spindle whorl with hour glass perforation.	VIIb - IA IIA	
1	F. 1697	Cylindrical	Pottery	0,7	2,4					L. 158	Chambon 1984, 75:26.		Cylindrical spindle whorl with hour glass perforation.	VIIb - IA IIA	
1	F. 1676	Cylindrical	Pottery	0,9	2,2					L. 173	Chambon 1984, 75:27.		Cylindrical spindle whorl with cylindrical perforation.	VIIb - IA IIA	
1	F. 1675	Cylindrical	Pottery	0,6	1,2					L. 173	Chambon 1984, 75:28.		Cylindrical objectd with very small cylindrical perforation. Certainly not a spindle whorl.	VIIb - IA IIA	

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F. 1413	Cylindrical	Pottery	0,9	1,7				L. 124	Chambon 1984, 75:29.		Cylindrical spindle whorl with cylindrical perforation.	VIIe - IA IIC	
1	F. 2370	Cylindrical	Pottery	0,7	1,8				L. 444	Chambon 1984, 75:30.		Cylindrical object with hour glass bent perforation. Certainly not a spindle whorl.	VIIe - IA IIC	
1	F. 1698	Cylindrical	Pottery	0,6	2,1				L. 158	Chambon 1984, 75:31.		Cylindrical spindle whorl with cylindrical perforation.	VIIb - IA IIA	
Unknwon context														
1	F. 4433	Biconical	Pottery	2,9	4,5		0,6	42,68		Sous 656			Biconical spindle whorl, made from pottery. Well preserved. Wear traces near the hole edges		
1	F. 142	Lenticular	Pottery	0,7	1,9		0,5	2,53		Tr. V limite C1			Decorated bead		
1	F. 4210	Spherical	Stone	3,4	3,9		1,2	102		Sous 651			Red stone mace head. Polished with cylindrical hole. Small.		
1	F. 39694	Dome	Bone	0,7	2,9		0,2	3,91					Dome-shaped bone spindle whorl. Damaged. Hole diameter is too small to belong to a spindle whorl.		
1	F. 264	Cylindrical	Limestone	1,9	4,6		1,4	23,44+x		C1, 37m			Limestone cylindrical spindle whorl, with cylindrical hole. Broken		
1	F. 2887	Lenticular	White stone	1,1	1,9		0,4	4,69					White stone spindle whorl/bead. Lenticular, polished with cylindrical hole.		
Perforated sherds														
Early Bronze Age														
1	F 4001	Prf. sherd	Pottery	0,9	3,1		nn	10,39		L. 614			Small prf. sherd, rounded, with incomplete hole on both sides.	Bronze Ancien Période 3	
1	F 4092	Prf. sherd	Pottery	0,7	3,2x2,6		0,4	7,12		L. 646			Small prf sherd roughly tooled. Hourglass hole	Bronze Ancien Période 3	
1	F 2874	Prf. sherd	Pottery	0,8	3,4x3,7		0,3	10,46		L. 240			roughly tooled. Houglass small hole	BA	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
Middle Bronze Age													
1	F 2920	Prf. sherd	Pottery	1,6	4,3		0,3	26		L. 246	Mallet 1973: 12:4, Mallet 1988, fig. 25,6		Prf. sherd with small, tilted hourglass hole.	Période V, IIN.BM 246 (B2)	
1	F 5021	Prf. sherd	Pottery	0,7	3,6x 4		0,5	14,4 3		Sous 791	Mallet 1988: fig. 4:8.		Prf. sherd roughly tooled. Hourglass hole.	Période V IV.BM 791 (A,2) phase villageois e 2	
1	F. 4871	Prf. sherd	Pottery	0,6	1,9x 2,1		0,4	3,8		L. sous 751			Tiny prf. sherd. Hourglass hole.	(BM) période V III.758	
Late Bronze Age															
1	F. 3974	Prf. sherd	Pottery	1,3	5,5x 6		0,6	46,6 5		Sous 543 trou		L. 543 EBA according to Mallet p. 74.	Prf. sherd, broken. Thick disk, hourglass hole	Niveau de Vaux BR/F?	
1	F 4354	Prf. sherd	Pottery	0,7	3,5		0,5	9,48		Sous 673 inf.			Prf. sherd roughly tooled. Conical hole, off-centered	Période VI Dc	
1	F 4387	Prf. sherd	Pottery	0,6	1,9		0,4	2,9		Sous 681			Tiny perforated sherd. Cylindrical hole	Période VI Dc	
1	F. 3294	Prf. sherd	Pottery	1	3,6		0,2	14,6 8		Trou 279-280			Prf. sherd roughly tooled. Tiny hourglass hole. Possibly not a spindle whorl.	Période VI Dce, PL. objets; BR II?	
Iron Age															
1	F 4303	Prf. sherd	Pottery	1,5	4,2x 4,9		0,4	29,7 5		Sous 654			prf. Sherd roughly tooled. Hourglass hole	Période VII II-307, VIIb - IA IIA	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F. 3393	Prf. sherd	Pottery	0,9	3,4x 3,6		0,3	10,9 1		L. 460	Chambon 1984, 77:1		prf. Sherd roughly tooled. Oblique hourglass hole	Période VII, II-460, VIIb - IA IIA	
1	F 3201	Prf. sherd	Pottery	1	3,8x 3,5		0,4	15,3		L. 440	Chambon 1984, 77:5NRc		prf. Sherd roughly tooled. Hourglass hole	VIIb - IA IIA	
1	F. 2980	Prf. sherd	Pottery	1	4,4					L. 418	Chambon 1984, 77:3.		Discoid prf. sherd with hour glass perforation. Incomplete. Base of a vessel.	VIIb - IA IIA	
1	F. 2480	Prf. sherd	Pottery	1,2	3,8					L. 365	Chambon 1984, 77:4.		Discoid prf. sherd with Discoid perforation.	VIIe - IA IIC	
1	F. 1663	Prf. sherd	Pottery	1,6	5					L. 167	Chambon 1984, 77:4NR.		Discoid prf. sherd with Discoid perforation.	VIIb - IA IIA	
1	F. 1471	Prf. sherd	Pottery	1,2	6,6					L. 120	Chambon 1984, 77:4NRa.		Discoid prf. sherd with Discoid perforation.	VIIe - IA IIC1	
1	F. 1355	Prf. sherd	Pottery	0,7	5,3					L. 113	Chambon 1984, 77:5.		Discoid prf. sherd with very small hour glass perforation.	VIIe - IA IIC	
1	F. 1464	Prf. sherd	Pottery		5,8					L. 135	Chambon 1984, 77:5NR.		Discoid prf. sherd with very small hour glass perforation.	VIId - IA IIB	
1	F. 3033	Prf. sherd	Pottery		3,6					L. 427	Chambon 1984, 77:5NRa.		Discoid prf. sherd with very small hour glass perforation.	VIIb - IA IIA	
1	F. 3371	Prf. sherd	Pottery	0,8	4,3					L. 456	Chambon 1984, 77:5NRb.		Discoid prf. sherd with very small hour glass perforation.	VIId - IA IIB	
Unknown context															
1	F 4918	Prf. sherd	Pottery	1,2	4,2		0,7	20,6 8		L. 773			Prf. Sherd well rounded. Cylindrical hole. Perforation from both sides.		
1	F 4061	Prf. sherd	Pottery	1	3,8		0,6	13,6 6		Sous 619			Prf. Sherd well rounded. Cylindrical hole. Perforation from both sides.		
1	F 3102	Prf. sherd	Pottery	2	5,5x 4,9		0,5	48,9					prf. Sherd roughly tooled. Oblique hole, off-centered. Possibly a loom weight		
1	F 2896	Prf. sherd	Pottery	0,7	3,4x 3,7		0,3	10		nn			Prf. Sherd roughly tooled. Small conical hole		

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F 4305	Prf. sherd	Pottery	0,7	2,5		0,4	6,63		Sous mur 651			Prf. Sherd roughly tooled. Small hourglass hole		
1	F 4093	Prf. sherd	Pottery	0,7	3,2x 2,6		0,4	7,12					Prf. Sherd roughly tooled. Small hourglass hole		
1	F 3761	Prf. sherd	Pottery	1	4,9x 4,5		nn	26		Sous 429			Prf. Sherd well rounded. Incomplete perforation from both sides.		
1	F. 3224	Prf. sherd	Pottery	0,7	2,2		0,2	5,71		Sous 272			Prf. Sherd roughly tooled. Tiny hourglass hole. Possibly not a spindle whorl		
1	F. 2988	Prf. sherd	Pottery	1,2	3,6			15,8 5		L. 284			Prf. Sherd well rounded. Incomplete perforation from both sides.		
Loom weights															
Early Bronze Age															
1	F. 4402		Grey stone	1,3	3,3x 3,5		0,4	20		L. 683			Loom weight, possibly a pendant	Niveau de l'ancien Bronze période 1	
1	F. 4074	Spherical	White stone	5,2	5,1x 5,6			179		L. 638			White stone loom weight, incomplete. Hourglass hole	Bronze Ancien Période 3	
1	f. 4509	Spherical	White stone	3,7	4,3		0,6	38,8 1+x		Tr. 686, niveau interm			White stone loom weight, irregular shape. Hourglass hole, well crafted.		
Middle Bronze Age															
1	F 3695	Conical	Unbak ed clay	10,6	7,3		1	360		L. 511	Mallet 1973: 13,4. Mallet 1988: fig. 24.4		Conical loom weight, horizontaly perforated. Unbaked clay, almost complete. Lower part missing	(MB) Période V IIN.BM 511 (B,3)	
1	F 4826	Conical	Unbak ed clay	7,7	6,2		0,7	233		L. 721 démolit.			Conical loom weight, horizontaly perforated. Unbaked clay, smaller than usual. Broken at the hole, split into two parts.	(MB) période V III.721, Période V	
1	F 4679	Conical	Unbak ed clay	7,8	6,8		0,9	166 +x		L. 721			Conical loom weight, horizontaly perforated. Unbaked clay. Broken below	Période de Vaux	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
											the hole. Slot on the top, possibly to hold the shaft where the warp threads are fixed. Unique exemplar.	MB, Période V III,721	
1	F 3894	Spherical	Baked clay	3,9	5,3		25+ x		L. 600	Mallet 1973: 3:5. Mallet 1988: fig. 14:5, pl. LXXXII,4		Fragment of a loom weight, baked clay, possibly spherical. Together with a second fragment of a different loom weight.	Période V IIN.BM 600 (B.1)	
1	F 2936	Conical	Baked clay	10,2	6,1		0,3	375	Sous 229 N	Mallet 1973: 14:5. Mallet 1988: fig. 24:5	T 110	Conical loom weight, horizontaly perforated. Baked clay, small hole, almost complete. On the top there is a hyksos scarab print. Untraslated	Période V, IIN.BM 229 (B 4 ou av.).	
1	F 3876	Conical	Baked clay	9,5	5,7		0,3	275	Sous 596	Mallet 1973: 14:1. Mallet 1988: fig. 24:1,pl. LXXXII,1.		Conical loom weight, well crafted, horizontally perforated. Polished, small hole. Wear traces due to warp threads hanging.	Période V, IIN.BM 601(B,1)	
1	F 3755	Conical	Unbaked clay	11,1	6,7		0,9	413 +x	L. 571	Mallet 1973: 14:3. Mallet 1988: fig. 24:3,pl. LXXXII,3.		Conical loom weight, horizontaly perforated. Unbaked clay, almost complete.	MB Période V IIN.BM 571 (B.2)	
1	F 3829	Conical	Unbaked clay	11,1	7,5		0,9	446	Sous 571	Mallet 1973: 14:2. Mallet 1988: fig. 24:2,pl. LXXXII,2.		Conical loom weight, horizontaly perforated. Unbaked clay, well crafted. Pointed top	Période V, IInN.BM 592(B,1)	
Late Bronze Age													
1	F.	Discoid	Stone	2,9	8		1,8	167 +x	Sous 681		11/9/59 sous 681 p. 143 lista	Stone loom weight, broken in half. Roughly tooled	Période VI Dc	
1	F. 4389		White stone	1,6	2,8x 3,2		0,4	15,9 5	Sous 681			White stone loom weight, irregular. A drilled stone	Période VI Dc	
1	F 1915	Spherical	Baked clay	5,5	7,6		1,7	232	Sous 189		T 83	Backed clay spherical loom weight. Almost complete. Made of two pieces.	Période De vaux RB,	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
												Période VI Dc	
1	F 4665	White stone	9	7,2		1,4	630		L. 720		Preparato da Balensi	White stone loom weight, irregular with off-centered hole. Horizontaly perforated, well crafted.	(MB) RB I de Vaux, Période VI Dce	
Iron Age													
1	F. 4774	Discoid	Grey stone	1,7	5,6x 6,6		1	68,8 7	Sous 736			Grey stone loom weight, disk-shaped, broken, with hourglass hole.	VIId - IA IIB	
1	F 1510-01	Spherical	Baked clay	6,6	8,2		1,6	391	L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)	From the same locus a spindle whorl	About one hundred of unbacked clay loom weights. Mostly broken.	VIId - IA IIB	
1	F 1510-02	Spherical	Unbak ed clay	4,2	5,3		nn	94	L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)			VIId - IA IIB	
1	F 1510-03	Spherical	Unbak ed clay	4,2	8		1,9	194 +x	L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Big loom weight of which a small part is preserved	VIId - IA IIB	
1	F 1510-04	Spherical	Unbak ed clay	5,2	6,6		nn	123 +x	L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		loom weight broken in half	VIId - IA IIB	
1	F 1510-05	Spherical	Unbak ed clay	5	6,6		1	115 +x	L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		broken loom weight, 1/3 is missing	VIId - IA IIB	
1	F 1510-06	Cylindrica l	Unbak ed clay	4,3	6			121	L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		unbaked clay loom weight, almost complete but worn. The hole is missing	VIId - IA IIB	
1	F 1510-07	Spherical	Unbak ed clay	5	5,6		1,5	142	L. 150	Chambon 1984: 76:2		Complete baked clay loom weight	VIId - IA IIB	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
									(1510), 6 (1510a), 7 (1510b)				
1	F 1510-08	Spherical	Unbaked clay	4,5	6,2			119		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		unbaked clay loom weight, almost complete but worn. The hole is missing	VIId - IA IIB	
1	F 1510-09	Doughnut	Unbaked clay	3,8	5,5			114		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		unbaked clay loom weight, almost complete but worn. The hole is missing	VIId - IA IIB	
1	F 1510-10	Spherical	Unbaked clay	4,7	5,7			117 +x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Unbaked clay loom weight, broken in half.	VIId - IA IIB	
1	F 1510-11	Doughnut	Unbaked clay	4,5	7,2			122 +x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		1/3 of an unbaked clay loom weight	VIId - IA IIB	
1	F 1510-12	Doughnut	Unbaked clay	3,8	5,7		1,1	109		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Complete unbaked clay loom weight	VIId - IA IIB	
1	F 1510-13	Doughnut	Unbaked clay	3,8	4,8x 5,3		1,4	81		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Complete unbaked clay loom weight	VIId - IA IIB	
1	F 1510-14	Doughnut	Unbaked clay	3,8	5,5		nn	102 +x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Complete unbaked clay loom weight. The hole is full of soil.	VIId - IA IIB	
1	F 1510-15	Spherical	Unbaked clay	4,5	nn l. 5,5		nn	68+ x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		1/3 of an unbaked clay loom weight	VIId - IA IIB	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F 1510-16	Spherical	Unbaked clay	4	5,5		1,6	63+x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		2/3 of an unbaked clay loom weight	VIId - IAIIB	
1	F 1510-17	Spherical	Unbaked clay	4,1	6		nn	81+x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		1/3 of an unbaked clay loom weight. The diameter is deducible.	VIId - IAIIB	
1	F 1510-18	Doughnut	Unbaked clay	3,5	6,2		1,1x1,5	100+x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Well preserved loom weight, worn	VIId - IAIIB	
1	F 1510-19	Doughnut	Unbaked clay	4,5	7,2		1,5	131+x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		half of a loom weight	VIId - IAIIB	
1	F 1510-20	Doughnut	Unbaked clay	5,2	7,4			124+x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		half of a loom weight	VIId - IAIIB	
1	F 1510-21	Doughnut	Unbaked clay	3,8	6,1			48+x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		1/3 of an unbaked clay loom weight	VIId - IAIIB	
1	F 1510-22	Doughnut	Unbaked clay	3,8	5,8x5,6		1,1x1,3	124		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Complete unbaked clay loom weight	VIId - IAIIB	
1	F 1510-23	Spherical	Unbaked clay	4,3	6,1			151		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Almost complete unbaked clay loom weight	VIId - IAIIB	
1	F 1510-24	Doughnut	Unbaked clay	4,2	5,6		1,5	97		L. 150	Chambon 1984: 76:2 (1510), 6		Almost complete unbaked clay loom weight	VIId - IAIIB	

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
										(1510a), 7 (1510b)				
1	F 1510-25	Spherical	Baked clay	4,7	5,9		1,5	85+ x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Baked clay loomweight,broken in half	VIId - IA IIB	
1	F 1510-26	Spherical	Unbak ed clay	4,8	6,9			113		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Unbaked clay loom weight, broken in half.	VIId - IA IIB	
1	F 1510-27	Spherical	Unbak ed clay	4,6	6,2			105 +x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		2/3 of an unbaked clay loom weight	VIId - IA IIB	
1	F 1015-28	Spherical	Unbak ed clay	4,3	6,2		1,4	125		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		2/3 of an unbaked clay loom weight	VIId - IA IIB	
1	F 1015-29	Doughnut	Unbak ed clay	3,3	5,7			84+ x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Almost complete unbaked clay loom weight. The hole is full of soil	VIId - IA IIB	
1	F 1015-30	Spherical	Unbak ed clay	3,8	5,7x 5,1		1,6	105		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Almost complete unbaked clay loom weight. The hole is full of soil	VIId - IA IIB	
1	F 1015-31	Spherical	Unbak ed clay	4,2	5,5		1,6	94+ x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		2/3 of an unbaked clay loom weight	VIId - IA IIB	
1	F 1015-32	Spherical	Unbak ed clay	4,7	5,8			70+ x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		1/3 of an unbaked clay loom weight	VIId - IA IIB	
1	F 1015-33	Doughnut	Unbak ed clay	3,8	5,4			78+ x		L. 150	Chambon 1984: 76:2		1/3 of an unbaked clay loom weight	VIId - IA IIB	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
									(1510), 6 (1510a), 7 (1510b)				
1	F 1015-34	Spherical	Baked clay	4,5	6,3			166		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Almost complete baked clay loom weight. The hole is full of soil	VIId - IA IIB	
1	F 1015-35	Doughnut	Unbaked clay	4,2	6,4		1,5	155		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Almost complete unbaked clay loom weight. The hole is full of soil	VIId - IA IIB	
1	F 1015-36	Spherical	Unbaked clay	5,3	5,8			152		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Almost complete unbaked clay loom weight. The hole is full of soil	VIId - IA IIB	
1	F 1015-37	Spherical	Unbaked clay	4,9	5,5x 5,9			147		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Almost complete unbaked clay loom weight. The hole is full of soil	VIId - IA IIB	
1	F 1015-38	Spherical	Unbaked clay	4,3	5,7			63+ x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		1/3 of an unbaked clay loom weight	VIId - IA IIB	
1	F 1015-39	Spherical	Unbaked clay	5,1	6		1,4	170		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Complete unbaked clay loom weight	VIId - IA IIB	
1	F 1015-40	Spherical	Unbaked clay	4,5	4,9			90+ x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		2/3 of an unbaked clay loom weight	VIId - IA IIB	
1	F 1015-41	Spherical	Unbaked clay	5,4	6,1			157		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Almost complete unbaked clay loom weight. The hole is full of soil	VIId - IA IIB	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F 1015-42	Spherical	Unbaked clay	4,1	5,5		1,5	109 +x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		2/3 of an unbaked clay loom weight	VIId - IA IIB	
1	F 1015-43	Spherical	Unbaked clay	4,7	6,7		1,5	155 +x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		2/3 of an unbaked clay loom weight	VIId - IA IIB	
1	F 1015-44	Spherical	Unbaked clay	5,3	5,4			63+ x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		1/3 of an unbaked clay loom weight	VIId - IA IIB	
1	F 1015-45	Spherical	Unbaked clay	5,4	6,5			191 +x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Almost complete, but deformed, unbaked clay loom weight. The hole is almost close at one end.	VIId - IA IIB	
1	F 1015-46	Spherical	Unbaked clay	4,6	6,8x 5,7		1,6	155 +x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		2/3 of an unbaked clay loom weight	VIId - IA IIB	
1	F 1015-47	Spherical	Unbaked clay	5,4	5,1			63+ x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Fragment of a loom weight, unbaked clay	VIId - IA IIB	
1	F 1015-48	Doughnut	Baked clay	3,7	6,3			89+ x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		About half of a baked clay loom weight.	VIId - IA IIB	
1	F 1015-49	Doughnut	Unbaked clay	4,6	6,2			140		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Almost complete unbaked clay loom weight. The hole is full of soil	VIId - IA IIB	
1	F 1015-50	Doughnut	Baked clay	3,5	5,5			57+ x		L. 150	Chambon 1984: 76:2 (1510), 6		About half of a baked clay loom weight.	VIId - IA IIB	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
									(1510a), 7 (1510b)				
1	F 1015-51		Baked clay	4,9	6,8			73+ x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Fragment of a loom weight, baked clay	VIId - IA IIB	
1	F 1015-52	Spherical	Baked clay	4,5	6,2			56+ x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Almost half of a baked clay loom weight	VIId - IA IIB	
1	F 1015-53	Doughnut	Baked clay	3,7	5,7			45+ x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		1/3 of a baked clay loom weight	VIId - IA IIB	
1	F 1015-54		Unbaked clay	3,7	4,5			56+ x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		Fragment of a loom weight, unbaked clay	VIId - IA IIB	
1	F 1015-55	Spherical	Baked clay	4,4	6			68+ x		L. 150	Chambon 1984: 76:2 (1510), 6 (1510a), 7 (1510b)		About half of a baked clay loom weight.	VIId - IA IIB	
1	F. 3053	Spherical	Baked clay	4,8	6x6,3		1,1x1,2	148		L. 429	De Vaux 1955: fig. 19.1; Chambon 1984: 76:5 NRb		Spherical baked clay loom weight, irregular. Oval hole with wear traces.	VIId - IA IIB	
1	F 3141-01	Spherical	Unbaked clay	4,9	6,6x6,8		1,5	201		L. 430	Chambon 1984: 76:1	batch of 32 loom weight	Spherical unbaked clay loom weight with deformed hole. Possibly made on purpose. Wear traces near the hole	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-02	Spherical	Unbaked clay	4,7	5,6		1,3	123		L. 430		batch of 32 loom weight	Complete spherical unbaked clay loom weight	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-03	Doughnut	Unbaked clay	4,3	5,3x5,8		1,2	128		L. 430		batch of 32 loom weight	Doughnut-shaped unbaked clay loom weight. Complete	Période VII, II-	IA I Niveau III

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
												430 VIIb - IA IIA	
1	F 3141-04	Doughnut	Baked clay	4	6,1x 5,5		1,5	117		L. 430		batch of 32 loom weight	Doughnut-shaped baked clay loom weight. Almost complete, the hole is filled.	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-05	Doughnut	Baked clay	4,7	6,2x 6,4		1,7	145		L. 430		batch of 32 loom weight	Doughnut-shaped baked clay loom weight. Big hole	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-06	Spherical	Unbaked clay	4,9	6,7			144 +x		L. 430		batch of 32 loom weight	Apparently washed. Mostly missing.	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-07	Spherical	Baked clay	4,7	5,9		1,2	144		L. 430		batch of 32 loom weight	Spherical baked clay loom weight, complete	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-08	Doughnut	Baked clay	4,8	7,1			171		L. 430		batch of 32 loom weight	Spherical baked clay loom weight, complete	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-09	Doughnut	Baked clay	4,5	7,5x 7,1		1,5	201		L. 430		batch of 32 loom weight	Spherical baked clay loom weight, complete	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-10	Spherical	Unbaked clay	4,8	7,4		1,7	180		L. 430		batch of 32 loom weight	Apparently washed. Mostly missing.	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-11	Spherical	Unbaked clay	5,3	5,8		0,7	161		L. 430		batch of 32 loom weight	Spherical unbaked clay loom weight with through hole. Small and irregular hole	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-12	Cylindrical	Unbaked clay	5	5,2		1,6	140		L. 430		batch of 32 loom weight	Cylindrical unbaked clay loom weight. One side of the hole is deformed, almost closed	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-13	Spherical	Unbaked clay	4,7	5,9x 5,7		1,4	122		L. 430		batch of 32 loom weight	Spherical unbaked clay loom weight. Almost complete. The hole is full of soil.	Période VII, II-430 VIIb - IA IIA	IA I Niveau III

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F 3141-14	Doughnut	Unbaked clay	4,2	6,1		1,5	142		L. 430		batch of 32 loom weight	Doughnut-shaped unbaked clay loom weight. Complete	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-15	Doughnut	Unbaked clay	3,8	6,2x 5,8		1,7	131		L. 430		batch of 32 loom weight	Doughnut-shaped unbaked clay loom weight. Complete	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-16	Doughnut	Unbaked clay	3,9	5,9x 6,2		1,5	153		L. 430		batch of 32 loom weight	Doughnut-shaped unbaked clay loom weight. Complete	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-17	Spherical	Unbaked clay	4,4	5,8		1,4	146		L. 430		batch of 32 loom weight	Spherical unbaked clay loom weight. Complete	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-18	Doughnut	Unbaked clay	4,7	6,6		1,6	163		L. 430		batch of 32 loom weight	Doughnut-shaped unbaked clay loom weight. Complete	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-19	Spherical	Unbaked clay	5	5,9		1	132		L. 430		batch of 32 loom weight	Almost complete spherical unbaked clay loom weight. The hole is full of soil	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-20	Doughnut	Unbaked clay	4,6	6,3		1,7	151		L. 430		batch of 32 loom weight	Doughnut-shaped unbaked clay loom weight. Complete	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-21	Doughnut	Baked clay	5,1	8,1		1,8	213		L. 430		batch of 32 loom weight	Doughnut-shaped baked clay loom weight. Complete	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-22	Doughnut	Baked clay	4,6	7,2		1,5	190		L. 430		batch of 32 loom weight	Doughnut-shaped baked clay loom weight. Complete	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-23	Doughnut	Unbaked clay	4,1	5,8		1,5	116		L. 430		batch of 32 loom weight	Doughnut-shaped unbaked clay loom weight. Complete	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-24	Doughnut	Unbaked clay	4,7	6,8		1,4	185		L. 430		batch of 32 loom weight	Doughnut-shaped unbaked clay loom weight. Almost complete	Période VII, II-430 VIIb - IA IIA	IA I Niveau III

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F 3141-25	Cylindrical	Unbaked clay	5,5	7,3x5,6		1,2x2,1	227		L. 430		batch of 32 loom weight	Cylindrical unbaked clay loom weight. One side of the hole is deformed.	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-26	Spherical	Unbaked clay	4,3	5,9		1x1,8	135		L. 430		batch of 32 loom weight	Spherical unbaked clay loom weight. The oval hole is full of soil	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-27	Doughnut	Unbaked clay	4,6	6,1x6,7			159		L. 430		batch of 32 loom weight	Doughnut unbaked clay loom weight. The oval hole is full of soil	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-28	Doughnut	Unbaked clay	4,4	6,1		1,6	138		L. 430		batch of 32 loom weight	Doughnut-shaped unbaked clay loom weight. Complete	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-29	Spherical	Unbaked clay	5	6,2		1,7	138		L. 430		batch of 32 loom weight	Almost complete spherical unbaked clay loom weight. The hole is full of soil	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-30	Doughnut	Unbaked clay	4,3	6,2		1,7	150		L. 430		batch of 32 loom weight	Almost complete doughnut-shaped unbaked clay loom weight. The hole is full of soil	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-31	Spherical	Unbaked clay	5,1	6,1		1,5	160		L. 430		batch of 32 loom weight	Almost complete spherical unbaked clay loom weight. The hole is full of soil	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F 3141-32	Doughnut	Baked clay	4,6	7,5		1,7	202		L. 430		batch of 32 loom weight	Almost complete baked clay loom weight.	Période VII, II-430 VIIb - IA IIA	IA I Niveau III
1	F. 2349	Cylindrical	Baked clay	5,4	7,2		1,2x1,6	238		L. 308	Chambon 1984, 76:3		ALmost complete baked clay loom weight. Cylindrical hole, well crafted	VIIb - IA IIA	
1	F. 19	Spherical	Baked clay	6,2x5,6	6,6x7		1,4	261		L. 17	Chambon 1984, fig. 76:3NR.			VIId - IA IIB	
1	F. 1368	Spherical	Baked clay		10					L. 158	Chambon 1984, fig. 76:4.	Louvre	Baked clay loomweight, spherical.	VIIb - IA IIA	
1	F. 2611	Spherical	Baked clay		8,5					L. 371	Chambon 1984, fig. 76:5.	Louvre	Baked clay loomweight, spherical.	VIIb - IA IIA	

N.		Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F. 416	Spherical	Baked clay		2,5					L. 68	Chambon 1984, fig. 76:5NR.		Baked clay loomweight, spherical.	VIId - IA IIB	
1	F. 2340	Spherical	Baked clay		7,6					L. 307	Chambon 1984, fig. 76:5NRa.		Baked clay loomweight, spherical.	VIIb - IA IIA	
1	F. 1638	Spherical	Baked clay	6,3	7,2					L. 158	Chambon 1984, fig. 76:8.	Louvre	Baked clay loomweight, spherical.	VIIb - IA IIA	
Unknown context															
1		Spherical	Baked clay	7,6	10		1,9x 2,4	576					Spherical baked clay loom weight. No name		
1	F. 209	Cylindrical	Stone	2,5	5,2		1,4	80,2		C1 -3,5m			Circular stone loom weight. Cylindrical hole, well crafted.		
1	F. 4123	Spherical	Baked clay	4,9	5,9			91,1 +x		L. 652			Spherical baked clay loom weight. Almost half is preserved		
1	F. 4175	Doughnut	Unbaked clay	4,4	8		1,2	254		641, trou avec 4172			Doughnut unbaked clay loom weight. Almost complete. Fragile		
	F. 4175b	Doughnut	Unbaked clay	5,2	7,9		0,8x 1	269					Doughnut unbaked clay loom weight. Almost complete. Fragile		
1	F. 4924	Spherical	White stone	4,5	5,1		0,8	85,5 +x		L. 779			Half of a loom weight. White stone. Tendency to delamination.	Niveau IVa	
1	F 3091	Spherical	White stone	5,4	5,8		0,8	206		Sous 245-246, 1954			Spherical white stone loom weight. Small through hole. The hole is tilted, hence not a mace head.		
1	F 162	Discoid	Baked clay	2,4	8,4		0,6	209		Carrè 2 1946			Disk-shaped baked clay loom weight. Broken, oblique hourglass hole.		
1	F 156	Discoid	Stone	0,7	9,7		0,8	252		Carrè 2 1946			Disk-shaped white stone loom weight. Polished. Flat base made from a pebble. Hourglass hole.		
1	F. 33	Spherical	Baked clay	2,8	8,7		1,7	145 +x		Carrè 1 SW		T 68	Fragment of a spherical loom weight, baked clay. Only one side, with the hole, is preserved.		
1	F. 32	Spherical	Baked clay	4,9	7,2		1,2	236		Carrè 1 SW		T68	Spherical baked clay loom weight, almost complete. Made of two pieces.		
1	F. 265	Cylindrical	Stone	1,9	4,3		nn	30,4 8+x		C1, 37m From same context 264			Fragment of a stone loom weight. Cylindrical, irregular.		
1	F. 210		Stone	1,8x2 ,6	3,5		0,5	35,7 7		C2, -3,50			Irregular loom weight, made from a perforated stone.		

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
Basalt rings													
Early Bronze Age													
1	F. 1194	Cylindrical	Basalt	1,5	3,6		1,2	28,61		L. 108 C6 38,50			Basalt ring with asymmetrical big hole, almost cylindrical.	Eneol. Sup. B	
1	F. 4416	Cylindrical	Basalt	1,8	4,2		1,4	43,3		L. 684			Basalt ring, well crafted. Cylindrical hole. Perforation from both sides	Niveau de l'ancien Bronze période 1	
1	F. 4060	Cylindrical	Basalt	1,6	3,7		1	15,78+x		L. 640			Basalt rings, broken in half. Asymmetrical		
1	F. 3920	Cylindrical	Basalt	1,5	4,3		1,2	21,64+x		L. 606			Basalt ring, broken in half	EBA	
1	F 2969	Cylindrical	Basalt	2,7	4,3		1,5	39,58		L. 254				Bronze Ancien Période 5	
1	F. 827	Cylindrical	Basalt	1,8	3,3		0,9	29,14		L. 86 C 6 C, 39,80, De Vaux			Basalt ring, well crafted. Cylindrical hole	AB II	
1	F. 865	Cylindrical	Basalt	1,3	4,1		1	35,85		L. 97 C3 NE, 38,75		AB interm.	Basalt ring, well crafted. Cylindrical hole. Flatted on both sides	AB interm.	
1	F. 873	Cylindrical	Basalt	1,9	4,3		1,2	53,46		L. 97 C3 NE, 38,75		AB interm.	Basalt ring, well crafted. Cylindrical hole	AB interm.	
1	F. 3899	Cylindrical	Basalt	2,4	3,6		1,1	42,74		L. 605		L. 605 Périodes I-IV, thése P. de Miroschedij	Basalt ring, well crafted. Hourglass hole, polished inside		
1	F. 3898	Cylindrical	Basalt	3,1	5,5		1,7	116		L. 605		L. 605 Périodes I-IV, thése P. de Miroschedij	Basalt ring, big and thick. Hourglass hole. Coarse stone		
Middle Bronze Age													

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F. 4739	Cylindrical	Basalt	1,6	4,3		1,1	38,06		L. 571	Mallet 1973: 17,3. Mallet 1988, fig. 27,3, fig. 27.3 pl. LXXXI.7 (F.3749)		Basalt ring, well crafted. Asymmetrical hourglass hole. Polished inside	MB de Vaux, Période V IIN.BM 571 B,2)	
Late Bronze Age													
1	F. 4352	Cylindrical	Basalt	1,6	3,8		1,2	32,98		Sous 673 inf.			Basalt ring, well crafted.	Période VI Dc	
1	F. 3468	Cylindrical	Basalt	2	4		1,2	37,8		Loc. 489 1955			Basalt ring, well crafted. Quasi-cylindrical hole	Période VI Dce	
1	F. 4714	Cylindrical	Basalt	1,7	4,4		1,1	55		L 728			Basalt ring, well crafted.	Période VI Dce	
1	F. 428	Cylindrical	Basalt	1,5	3,6		1,1	31,53		C8.E 41,50			Basalt ring, well crafted. Cylindrical hole	RB II de Vaux, Période VI JB	
1	F. 189	Cylindrical	Basalt	2,6	4,7		1,3	73,05		C1 -1,75m			Basalt ring, well crafted. Hourglass hole	Période VI Dc	
1	F. 106	Cylindrical	Basalt	1,6	3,8x3,5		1,5	31,73		C4, 0,5-1m			Basalt ring, well crafted. Hourglass hole	Période VI Dc	
Iron Age													
1	F. 384	Cylindrical	Basalt	2,3	3,7		1	44,85		57	Chambon 1984: 75.40		Basalt ring, well crafted. Hourglass hole	VIIb - IA IIA	
1	F. 338	Cylindrical	Basalt	1,5	2,6		0,8	13,6		345		Rom de vaux	Small basalt ring, well crafted. Cylindrical hole	VIId - IA IIB	
1	F. 2423	Cylindrical	Basalt	1,7	4,6		1,2	49,9		332	Chambon 1984: 75.42		Basalt ring, well crafted. Hourglass hole	332 VIId - IA IIB	
1	F. 1535	Cylindrical	Basalt	1,6	4		1,2	26,34+x		Sous 112	Chambon 1984: 75.43		Basalt ring, well crafted with cylindrical hole. Broken in half	VIId - IA IIB	
1	F. 1737	Cylindrical	Basalt	1,7	4		1,2	35,6		151	Chambon 1984: 75.41		Basalt ring, well crafted. Hourglass hole	VIIb - IA IIA	
1	F. 3379	Cylindrical	Basalt	1,75	3,5					L. 451	Chambon 1984: 75.44		Basalt ring, well crafted. Hourglass hole	VIId - IA IIB	
Unknown context													

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F. 4578	Cylindrical	Basalt	1,9	4,3			19,98+x		L. 715			Dark stone spindle whorl (basalt?), broken in half. Wide hole, possibly a loom weight		
1	F. 201	Cylindrical	Basalt	2,3	3,9		1,1	50,6		C2 -2,50m			Basalt ring, well crafted with hourglass hole. Polished inside	Période VI	
1	F. 263	Cylindrical	Basalt	1,4	3,7		1,1	28,48		Sond 36,80		Eneolithique Moyen?	Basalt ring not perfectly round and symmetrical. Well crafted. Hourglass hole		
1	F. 4938	Cylindrical	Basalt	2,8	4,6		1,6	73,6		L. 775			Basalt ring, thick, well crafted. Big quasi-cylidrical hole		
1	F 3149	Cylindrical	Basalt	1,5	4,2		1,2	40		Sous 259 1954					
1	F 5025	Cylindrical	Basalt	1,7	3,7		0,9	35,54		Sous 793			Basalt ring, well crafted. Hourglass hole	T 110	T non sta per tomba
1	F 3748	Cylindrical	Basalt	1,8	4,4		1,2	49,22					Basalt ring, well crafted. Hourglass hole, off-centered.		
1	F. 262	Cylindrical	Basalt	1,8	4		1,2	43,85		Sond. 37,00			Basalt ring, well crafted. Hourglass hole		

Bone Spatulae and Beaters

Early Bronze Age

1	F 1181	Spatula	Bone	12	1,9	0,4				L. 107 ou108 C3 SW 37,50			Bone spatula. Almost complete. One end with a triangulat point, the other missing. One side is polished, the other has cancellus bone exposed, smoothed toward the point. Smoothed edges near the tip.	Eneol. Sup.	
1	F. 4110	Spatula	Bone	6,1	1	0,3				Sous 609			Bone spatula made from a narrow rib. Triangula point. Smoothed on one side, less on the edges and on the other side. Many parallel scratches on the tip. One end is broken.	Ancien Bronze période 3	
1	F 1161	Beater	Bone	8,3	2,5 testa 1,7 corpo	2 testa 1,6 corpo				L. 99 maison de potier C8 N 38,75		AB I	Whole bone tooled to get a sharp point. Not particularly smooth	AB I	
1	F 876	Beater	Bone	8,3	2,5 testa, 1,8	1,5 testa, 1,2				L. 93 C3 N.38,75		AB interm	Whole bone tooled to get a sharp point. Not particularly smooth	AB interm	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
				corpo	corpo								
1	F. 3267	Beater	Bone	8	1,8	0,5				L. 276			Bone point without the handle. Almost flat on the preserved end. The tip is polished but not lucid.	Bronze Ancien Période 2	
1	F. 3983	Beater	Bone	6,9	1,3	0,6				L. 620			Bone point without the handle. Smoothed. Some carvings on the surface with no defined pattern.	Bronze Ancien Période 3	
1	F. 4241	Beater	Bone	8	1	0,6				L. 637 démilition			Bone point broken in several parts.	Bronze Ancien Période 3	
1	F. 4247	Spatula	Bone	8,8	1,7	0,9				L. 673			Bone point broken in several parts.	Niveau de l'ancien Bronze période 1	
1	F 4236	Spatula	Bone	4,3	1,2	0,3				L. 671		L. 671 RB 1961, pl. XXXIII	Smal triangular point bronken near one end. One side and the edges are smooth. The other side has cancellus bone exposed, rough.	De Vaux Ancien Bronze période 1	
1	F 4226	Spatula	Bone	8,4	1,9	0,3				L. 671		L. 671 in RB 1961, pl. XXXIII	Bone spatula with a long point. One end is missing and smoothed alongside the edge. The other side has cancellus bone exposed, smoothed toward the point, rough on the other part. Many scratches on the surface	De Vaux Ancien Bronze période 1	
1	F. 4202	Spatula	Bone	5,9	2	0,3				L. 659			Bone spatula with a slightely concave point. One side and the edges polished, lower part has cancellus bone exposed, smoothed. The surface near the point is polished.	Niveau de l'ancien Bronze période 1	
1	F. 4108	Spatula	Bone	4,8	1,2	0,4				L. 639			Bone spatula with a long broken point. Smoothed on edges and on one side. The other has rough cancellus bone exposed. Smoothing is better as getting closer to the point.	Bronze Ancien Période 3	
1	F. 4026	Spatula	Bone							L. 617 dans canal			4 fragments, possibly of the same spatula. Lont point, other end is missing. The spatula is long and narrow. On side is smoot, the other has cancellus bone exposed, rough. Curved point.	Bronze Ancien Période 3	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F. 3985	Spatula	Bone	6,9	2,2	0,3				L. 622			Bone spatula with long and rounded point. Smooth on one side and on the edges. The lower part has cancellus bone exposed, rough also near the point.	Bronze Ancien Période 3	
1	F. 4426	Spatula	Bone	5,8	7,7	0,3				L. 685			Bone point of a spatula, broken in 2 pieces. Long point. Smoothed on one side and on the edges. The other side has cancellus bone exposed, smoothed toward the point, rough elsewhere.	Niveau de l'ancien Bronze période 1	
1	F. 4334	Spatula	Bone	10	1,9	0,2				L. 673			Bone spatula without the tip. The othe end is rounded. Smoothe on one side and on the edges. The other side has cancellus bone exposed, ruined.	Niveau de l'ancien Bronze période 1	
1	F. 5014	Spatula	Bone	8,9	1,3	0,3				L. 776			Narrow bone spatula. Complete. Long point while the other end is flat. One side is smoothed, the other has cancellus bone exposed, slightly concave and smooth.	Niveau de l'ancien Bronze période 1	
1	F. 269	Spatula	Bone	6,9	1,8	0,4				Sond 37,50		Période de Vaux AB, Période I-IV?	Bone spatula with trangulat tip. On side is smoothed, the other has cancellus bone exposed. Dirty. Possibly it was smoothed on the tip on both sides.		
1	F 3234	Spatula	Bone	6,6	2,3	0,3				L. 268 démolition de mur sud			Bone spatula with long sharp point. Broken at one end. Smoothed on one side and on the edges, the other side has cancellus bone exposed, smoothed near the point, rough elsewhere.	Bronze Ancien Période 3	
1	F 3233	Spatula	Bone	11	18	0,4				L. 268 démolition du mur S			Long and narrow bone spatula. Complete. The other end has just roughly tooled. Smoothed on one side, the other has cancellus bone exposed, smoothed near the point. Deep scratches near the point.	Bronze Ancien Période 3	
1	F 3211	Spatula	Bone	5,6	2,2	0,2				Sous 268			Fragment of a bone spatula with triangular point. Thin, with one side smoothed. The other has cancellus bone exposed, smoothed near the point.	Bronze Ancien Période 3	
1	F. 4969	Beater	Bone	13	2	1,3				L. 778			Bone cut in half and roughly sharped. Polished but not smoothed.	EB/MB	
1	F 3026	Spatula	Bone	6,2	2,3	0,4				L. 271			Frafment of a bone spatula. Only the long point is preserved. Polished on ne side, the other has cancellus bone exposed, not well smoothed. Dirty.	Bronze Ancien Période 3	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F. 3699	Beater	Bone	8,4	1,3	2,1				L. 561			Complete pin beater. One end is untooled while the other has been cut, polished.	Dernier Niveau de l'ancien Bronze	
1	F. 290	Beater	Bone	8,7	1,5	1,3				C1 37,50		Eneol.	Whole bone with well crafted point. Polished surface with foulings.		
1	F. 279	Beater	Bone	8,2	1,9	1,5				Sond 36,20	De Vaux 1947, pl. XII.	Eneol. Période I-IV	Whole bone with well crafted point. It has foulings.		
1	F 4196	Spatula	Bone	9,7	2	0,3				L. 665			Bone spatula with long triangulat point. The other end is missing. Concave. One side is polished, the other has cancellus bone exposed, lucid and rough. Smoothed edges	Ancien Bronze période 1	
Middle Bronze Age															
1	F. 4968	Beater	Bone	10	1,2	0,9				L. 778			Bone cut in half. Smoothed	BA/BM	
1	F 554	Beater	Bone	6,2	0,9	0,5				C7 SW 41,20			Fragment of a bone with long and thin point. Many oblique signs on the surface	MB IIB oui	
1	F. 4144	Spatula	Bone	7,2	1,8	0,5				Sous 634			Bone spatula with long broken point. The other end is broken. Polished on one side and on the edges, the other has cancellus bone exposed. Smoothed near the point, rough elsewhere	Période V IIN.BM 245 (B,2)	
1	F. 4242	Spatula	Bone	7,2	2,2	0,2				L. 584 nettoyage			Peculiar bone spatula. Edges are damaged, so it's hard to say what the original shape was. Possibly it was polished on one side, the other with cancellus bone exposed	BM	
1	F 3890	Spatula	Bone	8,2	1,9	0,3				L. 600	Mallet 1973: 22,1. Mallet 1988, fig. 32.1, pl. LVXXXIII, 4.	Période V IIN.BM 600(B,1 ou av.)	Long point, probably belonging to a polished spatula	BM	
1	F 3835	Spatula	Bone	6,9	1,8	0,5				L. 596	Mallet 1973: 22.5. Mallet 1988: fig. 32,5.		Long point, probably belonging to a polished spatula	Période V, IIN.BM 596 (B 1ou2)	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F 4790	Spatula	Bone	8,5	2,2	0,4				Sous 737			Bone spatula partially polished. Smoothed on the point.	Période V, IIS-JM	
1	F. 3656	Beater	Bone	7,1	1,3	0,8				Tombe U(4)		Niveau de Vaux 4	Bone polished point. Sharp tip.		
1	F. 5049	Spatula	Bone	8	1,7	0,3				L. 778			Bone spatula/pin beater, broken at both ends. Polished on both sides. No wear traces, as brand new	BA/BM	
1	F 3780	Beater	Bone	7,2	2,7	1,7				Sous 574	Mallet 1973: 22.11. Mallet 1988, fig. 32,11, pl. LVXXXIII, 20.		Cut bone to gat a sharp point. Polished	Période de Vaux MB, Période V IIN.BM 576 (B,3)	
1	F 3834	Beater	Bone	11	1,4	0,4				L. 596	Mallet 1973: 22.9. Mallet 1988, fig. 32,9, pl. LVXXXIII, 18.		Bone point broken into three pieces but complete. Thin and polished point	Période V IIN.BM 596 (B2 ou1)	
1	F 3687	Beater	Bone	8,5	2,3	1,3					Mallet 1973: 22.14. Mallet 1988: fig. 32.14		Whole bone tooled on the point. Cut to get a this point. Polished. The shape suggests it could be useful for delicate works.	(MB) Période V IIN.BM 511 (B,3)	
1	F 3743	Beater	Bone	7,8	2	2,1				L. 569	Mallet 1973: 22.10. Mallet 1988, fig. 32,10, pl. LVXXXIII, 13.		Whole bone partially tooled to get a point. Almost entirely polished. Possibly a pin beater.	MB de Vaux, Période V, IIN.BM 569 (B.2)	
1	F 4676	Beater	Bone	6,2	1,3	0,5				L. 719			None point broken at one end. Polished. Wear traces on one side.	De Vaux MB, III-719	
Late Bronze Age															

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F. 4291	Spatula	Bone	8,4	1,2	0,3				Sous 654			Bone spatula. Complete even if broken in many pieces. Triangular point. One side is polished, the other not. Smoothed edges	Période de Vaux RB, période VI Dc. Scavo 1950.	
1	F. 4356	Beater	Bone	7,1	1,6	0,8				Sous 679			Borer	Période VI Dc	
1	F 3638	Beater	Bone	8	2	1,5				Sous 539			Whole bone tooled to get a point. Almost entirely polished. Possibly a pin beater.	Période VI Dce	Période VII I-68, VIId - IA IIB
1	F 3456	Beater	Bone	6,9	2	1,4				L. 457			Whole bone tooled to get a point. Almost entirely polished. Possibly a pin beater.	Période VI Dc	
1	F 3648	Beater	Bone	7,2	1,5	1				L. 530			Whole bone tooled to get a point. Almost entirely polished. Damaged	Période VI Dce	
1	F 4719	Beater	Bone	5,8	1,6	1,2				L. 729			Bone point ruined on the lower side.	Période VI Dc	
1	F 4637	Beater	Bone	8	1,3	0,8				L. 723			Bone point, long and narrow. Damaged on the lower side.	Période VI Dc	
Iron Age															
1	F 2431	Beater	Ivory	4,2	1,5	0,2				L. 342, N5b Est	Chambon 1984, 73:13	Periode du Fer II Niveau 2	Bone point. Long and polished on both sides. Smoothed edges	FE (de Vaux), Niveau 2, Période VII, II-342 VIId - IA IIB	
1	F 2375	Spatula	Ivory	6,5	2	0,1				L. 322	Chambon 1984, 73:14		Bone spatula, partially preserved. The preserved end is rounded, the other one is missing.	Période VII II-322, VIIe - IA IIC	
1	F 1529	Spatula	Ivory	7,5	3,5	0,2				L. 151	Chambon 1984, 73:15. De Vaux 1951, pl. XVII:7.		Bone spatula, almost complete. The preserved end is rounded, the other one is missing but was probably rounded too.	Période VII II-151, VIId - IA IIB	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F. 4213	Spatula	Bone	4,8	1,8	0,4				Sous 644			Bone spatula with trangular concave tip. One side is smoothed, the other is rough. Smoothed edges	Période VII II-419, VIIb - IA IIA	
1	F. 4141	Spatula	Bone	5,9	1,4	0,3				Sous 626			Bone spatula with a long point well preserved. One end is missing. Polished on both sides, one has cancellus bone exposed. Smoothed.	Période VII II-150, VIId - IA IIB	
1	F. 4102	Spatula	Bone	5	2,2	0,3				Sous 628			Fragment of a bone point, possibly belonging to a wide spatula. Polished on one side and on the edges. The other has cancellus bone exposed, smoothed near the point.	Période VII II-173, VIIb - IA IIA	
Unknown context															
1	F. 4217	Spatula	Bone	5,3	2	0,3				Sous 653			Three fragments of bone spaulas. One has a smoothed end, one is knife-shaped and thick edges. Measures refer to the biggest fragment.		
1	F 4224	Spatula	Bone	4,7	2	0,2				Sous 653			Bone spatula with a well crafted triangular point. Both sides and edges are smoothed. The other side has cancellus bone exposed, smoothed.		
1	F. 4134	Spatula	Bone	6	1,1	0,3				L. 650			Bone spatula with triangular point, made from a narrow rib. Smoothed on both sides, broken at one end.		
1	F. 4125	Beater	Bone	4	1,1	0,2				L. 652			Fragment of a bone triangular point, possibly belonging to a spatula of long-and-narrow family. Damaged but smoothed		
1	F. 4095	Beater	Bone	4,5	1,6	0,3				Sous 622			Triangular bone point, sharp. One side anf the edges are smoothed. The other side has cancellus bone exposed, polished near the point.	Bronze Ancien Période 3	
1	F. 3975	Spatula	Bone	8,5	2	0,3				Sous 566			Bone spatula with pen-nib point. One edge looks like it has been broken in ancient times, for the fracture is smoothed too. Lower side has cancellus bone exposed, rough. Many scratches on the point.		

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F. 4279	Spatula	Bone	3,8	1,3	0,3				L. 674			Bone point of a spatula, long and narrow. Polished on both sides and edges.		
1	F. 4517	Spatula	Bone	12	1,7	0,4				L. 701			Bone spatula, sharpened at both ends. One side is smoother than the other.		
1	F. 4841	Spatula	Bone	ca 25	ca 2,5					L. sous 734			Long bone spatula, broken. Rough. Natular finishing on upper side, sharp edges. The other side has cancellus bone exposed, rough.		
1	F. 4949	Spatula	Bone	12	1,5	0,4				L. 789			Long and narrow bone spatula. Broken. Polished on one side and partially on the other, where it has cancellus bone exposed. More polished near the broken end.		
1	F. 4930	Spatula	Bone	7,3	1,7	0,3				L. 783			Long point spatula, broken along edges and at one end. One side is smother than the other that has cancellus bone exposed, more polished near the point		
1	F. 4915	Spatula	Bone	6,8	1,5	0,2				L. 772			Pen-nib point spatula. Only the point is preserved. Very sharp. Broken along the edge. One side is smoother tha the other side that has cancellus bone exposed. They are more and more smooth as approaching to the point.		
1	F. 4847	Spatula	Bone	10	1,6	0,5				L. 736			Bone spatula (?) without both ends. Made from a whole bone cut in half. Sharp edges.		
1	F 3212	Spatula	Bone	9,9	1,9	0,4				Sous 268			Bone spatula with triangular point. One side is polished, the other side has cancellus bone exposed, rough. Smoother on the point.		
1	F 3083	Spatula	Bone	6,3	1,4	0,3							Long and narrow bone spatula with long point. Broken at one end. Polished on one side, The other side has cancellus bone exposed, polished. Deep scratches on the surface		
1	F 3301	Spatula	Bone	5,1	1,4	0,3				Sous 280			Fragment of a bone spatula with lond point. Polished on both sides. One side has cancellus bone exposed		
1	F 3228	Spatula	Bone	6,7	1,9	0,4				Sous 269			fragment of a bone spatula with triangular point. Slightly concave, smoothed edges with cancellus bone exposed, rough.		

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F 3236	Spatula	Bone	6,5	1,9	0,3				sous 265			Frafment of a bone spatula. Only the long point is preserved. Polished on one side, The other side has cancellus bone exposed, rough		
1	F 1187	Spatula	Bone	5,3	1,5	0,3				L. 107			Fragment of a bone spatula. Only the long point is preserved. Very rounded. Polished on one side, The other side has cancellus bone exposed, smoothed.		
1	F. 4183	Beater	Bone	7,3	1,4	0,7				Sous 652			Bone point with epyphisis. Possibly a borer. Polished just near the point.		
1	F. 4290	Beater	Bone	8,4	1,4	0,8				Sous 637		T85	Possibly a borer. Sharp point		
1	F. 4292	Beater	Bone	9,7	2	0,6				Sous 654			Bone pin beater almost complete. Big, damaged in several areas, but with lucid wear traces		
1	F. 4294	Beater	Bone	6,4	1,5	0,8				Sous 643			Small bone pin beater. Many wear traces on the polished surface.		
1	F. 5094	Beater	Bone	4,7	1,2	0,5				L. 805			Polished point. Sharp and lucid.		
1	F. 4950	Beater	Bone	8	1,7	0,5				L. 789			Whole bone cut and sharped. One end is missing. Smooth		
1	F 3150	Beater	Bone	6,3	2	1,7				Sous 254			Whole bone, short, cut and tooled to get a point. Smoother near the point.		
1	F 2877a	Beater	Bone	12	1,5 x0,9	0,8				Est de 221			Whole bone, long and narrow, tooled only at the point. Cut trasversely to get a smoothed and thin point. The shape suggests it could be useful for delicate works.		

Needles

Early Bronze Age

1	F 3148		Bone	5,7	0,2x 0,3					L. 267			Probably the tip of a bone needle. Polished.	Bronze Ancien Période 5	
1	F 1167		Bone	7,1	0,5					L. 105 C8 N 38			Probably the tip of a bone needle. Polished.	Eneol. Sup. B	
1	F. 866		Bone	5,8	0,3					L. 97. C3 NE, 38,75		AB interm	Probably the tip of a bone needle. Polished.	AB interm	
1	F. 4017		Bone	3,5	0,9	0				L. 618 dans briques écroulées			Bone needle with flat head and circular hole. Broken	Bronze Ancien Période 3	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F. 4599	Bone	3	1,5	1				L. 718		De Vaux Chalcolithique supérieur	Bone needle with flat head and circular hole. Broken	BA	
1	F. 5029	Bone	9	0,3					L. 776			Bone needle with a small hole. Flatted eye.	Niveau de l'ancien Bronze période 1	
1	F. 5018	Bone	3,2	0,8	0				L. 555			Eye needle with incomplete hole. Flat head	BA/BM	
1	F. 229	Bone	8,2	0,7x 0,5					C2 -3,50		Période de Vaux AB, Période I-IV?	Bone needle without eye		
Middle Bronze Age														
1	F 2814	Bronze	8,8	0,3					Sotto 364 (=394)		MB/RB Niv. 4	Thin bronze needle. Complete. The eye is formed by bending the upper part of shaft on itself.	Période V	
1	F 2914	Bronze	11,1	0,2					L. 245	Mallet 1973: 21,3. Mallet 1988: 31,3.	From the same locus one spindle whorl	Thin bronze needle. Complete. Slightly bended	BM (B,2)	
1	F. 4827	Bone	6	0,5x 0,3					L. 721 démolit.		From the same locus conical loom weights	Small bone needle with rectangular and flatted head. Complete	période V	
1	F. 4874	Bone	6,2	0,3					L. sous 751		Fron the same locus one perforated sherd	Part of a bone object, maybe a needle. Broken. No hole	période V	
1	F. 3705	Bone	5,2	0,3x 0,4					L. 568			Probably the tip of a bone needle	BM Mallet	
Late Bronze Age														
1	F 2115	Bronze	11,9	0,2					sotto 149 (=229)			Thin bronze needle, slightly bended with eye preserved. The eye is some cm below the top. Possibly a toggle pin	Période VI	
1	F 2121	Bronze	8,4	0,2					Sotto 206 (=231)			Thin bronze needle. Broken near the eye	Période VI	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F 2745	Bronze	l 5,8	0,3					Sotto 306 (=376)		RB Niv. 4	Fragment of the point of a bronze needle	Période VI	
1	F 329	Bronze	8,1	0,2					C3 SW			Thin bronze needle, slightly bended with eye preserved. The eye is some cm below the top.	Période VI	
1	F 2744	Bronze	6,7	0,2					Sotto 306 (=376)		RB Niv. 4	Thin bronze needle. Broken near the eye	Période VI	
1	F 2800	Bronze	9	0,3					Sotto 306 (=376)		RB Niv. 4	Thin bronze needle, bended and damaged. Corroded near the eye	Période VI	
1	F. 191	Bone	4,1	0,8					C1, -2,50 m			Short bone needle without the point. Wide and flat with circular hole	Période VI	
1	F 3494	Bronze	10,4	0,2					Sous 489		From the same Locus one basalt ring	Bronze needle broken near the eye. Very thin	Période VI	
1	F 3419	Bronze	9,5	0,2					Sous 458		From the same Locus one spindle whorl	Bronze needle. Complete. Bended, The eye is a hole in the body	Période VI	
1	F 3541	Bronze	11,8	0,3					Sous 233			Bronze needle. Complete. Bended, The eye is a hole in the body	Période VI	
1	F 3524	Bronze	7	0,25					Sous 482			Bronze needle broken near the eye. Bended.	Période VI	
1	F 3584	Bronze	4,4	0,2					Sous 474			Bronze needle without the tip. Bended. The eye is formed by bending the shaft on itself	Période VI	
1	F 4671	Bronze	13,8	0,25					L. 723		From the same Locus a beater	Long bronze needle with a big, thin eye	Période VI	
Iron Age														
1	F. 3381	Bronze	4,7	0,4					#	Chambon 1984, 71:30.		Short and thick bronze needle, complete.	VII b II-448	
1	F. 2345	Bronze	l 15,6	0,4					L4d (sud) L. 307	Chambon 1984: 71,18		Long bronze needle with eye. Bended	VIIb - IA IIA	
1	F. 2747	Bronze	7,4	0,25					Sotto 352 W, =372	Chambon 1984: 72,5	Fe niveau 3	Bronze needle. Broken. The eye is formed by bending the shaft on itself	VIIb - IA IIA	
1	F. 2412	Bronze	8,2	0,2					N5b, NW, Loc. 345	Chambon 1984: 72,8	From the same Locus one basalt ring	Thin bronze needle. Complete. The eye is formed by hammering and punching the shaft.	VIId - IA IIB	

N.	Typology	Material	H	D	Thickness	Hole	Weight	Level	Bibliography	Notes	Description	Dating	IAA
1	F. 2419		Bronze	9,2	0,4					N5b, SE, L. 339	Chambon 1984: 72,7	FE niveau 2	Big bronze needle. Complete. The eye is formed by bending the shaft on itself	VIId - IA IIB	
1	F. 403		Bronze	8,3	0,5					L. 68	Chambon 1984: 71,31	Fe I	Big bronze needle without eye. Due to its rectangular section, possibly not a needle.	VIId - IA IIB	
1	F. 423		Bronze	8,5	0,3					L. 71	Chambon 1984: 71,6	Fe I	Thin bronze needle. Bended to 90°. The eye is formed by bending the shaft on itself	VIIb - IA IIA	
1	F. 2987		Bronze	6,5	0,3					L. 419	Chambon 1984: 72,4	FE I Niveau III	Thin bronze needle, broken and bended. The eye is formed by bending the shaft on itself	VIIb - IA IIA	
1	F. 4142		Bone	4,5	1,3	0				L. 150			Bone bodkin with circular hole. Flat	VIId - IA IIB	
Unknown context															
1	F. 4136		Bone	4,9	0,6x 0,3					L. 654			Possibly the tip of a bone needle. Polished	VIIb - IA IIA?	
1	F. 5015		Bronze	11,7	0,3					L. 555 déblais			Bronze needle. Complete. Weel crafted, probably late.		

8.5 KAHUN

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Spindles												
1	AN 1889.119 8A	spindle		wood	12	0,9				Middle Kingdom	Spindle preserved for only part of the lenght, broken at both ends.	Ashmolean
		spindle whorl	cylindrical	wood	2	4,7		0,7	19,7		Cylindrical spindle whorl, complete. Heavily encrusted on one surface, quite clean the other and with clear traces of manufacture.	
		fibres		flax							Several threads wrapped around the shaft under the spindle whorl, some very fine, some doubled. They all appear quite worn. They show all a S-twist, one is certainly plied.	
1	30.a	spindle		wood	38,3	1,13			37	Middle Kingdom	Wooden spindle, complete. Tapering toward the point. Top with long spiral groove.	Man
		spindle whorl	cylindrical	wood	2,4	5,2		1,04			Cylindrical spindle whorl, near the top. Highly damaged and hole broadened on both sides. Some thread stuck in the hole.	
		fibres		flax							Thread in the hole, not clearly visible.	
1	30.b	spindle		wood	23,7	1,46			32	Middle Kingdom	Wooden spindle, complete. Top with a long and deel spiral groove. Tapering toward the point. Some areas of the shaft appear damaged.	Man
		spindle whorl	cylindrical	wood	2,65	4,98		1,04			Cylindrical spindle whorl, near the top of the spindle. Well shaped, slightly encrusted on the upper surface. Hole slightly warped.	
		Fibres		flax							Several coils of thread around the shaft under the spindle whorl. It is S, 2s. Quite worn. One knot is also present. Angle of twist of the best preserved point is between 39 and 46°. Thread diameter between 0,4 and 0,5 mm.	
	30.c.1	spindle		wood	34,3	0,86			14+ x	Middle Kingdom	Wooden spindle, complete. Top with a long and deel spiral groove. Tapering toward the point. Some areas of the shaft appear encrusted.	Man

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
		spindle whorl	cylindrical	wood	1,48	4,3		0,84			Cylindrical spindle whorl, half preserved. Heavily encrusted on upper and lower sides.	Man
	30.c.2	spindle		wood	12,6	0,95			18		Middle Kingdom	Wooden spindle, broken at both ends. Slghtly covered by a patina on the surface.	Man
		spindle whorl	cylindrical	wood	1,61	4,66		0,8				Cylindrical spindle whorl, complete. Covered by a thick layer of encrustation.	
1	30.c.3	spindle		wood	24,7	1,19			41		Middle Kingdom	Wooden spindle broken at the point, top preserved a very well crafted spiral groove. Well preserved wood, but slightly worn where thread was wound up.	Man
		spindle whorl	cylindrical	wood	3,1	4,8		1,1				Wooden spindle whorl, complete. Thick and well shaped. Covered by patina and encrustations on all sides.	
1	30.c.4	spindle		wood	13,2 -x	1			24+ x		Middle Kingdom	Wooden spindle, broken. Long spiral groove which makes almost two laps. Spindle whorls much more lower than the groove, probably not in original position.	Man
		spindle whorl	cylindrical	wood	2	5		1,1				Cylindrical spindle whorl, complete. Traces of fire on one side. Covered by a thin patina on all sides. Hole broadened and warped.	
	30.c.5	spindle		wood							Middle Kingdom		Man
		spindle whorl		wood							Middle Kingdom		
	30.c.6	spindle		wood							Middle Kingdom		Man
		spindle whorl		wood							Middle Kingdom		
	30.c.7	spindle		wood							Middle Kingdom		Man
		spindle whorl		wood							Middle Kingdom		
	30.c.8	spindle		wood							Middle Kingdom		Man
		spindle whorl		wood							Middle Kingdom		
	30.c.9	spindle		wood							Middle Kingdom		Man

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
		spindle whorl		wood						Middle Kingdom		Man
	30.c.10	spindle		wood						Middle Kingdom		Man
		spindle whorl		wood						Middle Kingdom		
1	686.d	spindle		wood	16,8	0,92			20		New Kingdom XX dyn.	Wooden spindle broken at both ends.	Man
		spindle whorl	cylindrical	wood	1,63	4,85		0,84				Cylindrical spindle whorl, complete. Well shaped and preserved. Covered by a thin patina on all sides. Lower side of the hole slightly warped.	
1	UC7310a	spindle		wood	23,7	0,97			9,34		Late Middle Kingdom	Wooden spindle, complete but damaged. Lond and deep spiral groove at the top, shaft tapering toward the point.	Petrie
1	UC7310b	spindle		wood	21,8	0,93			3,96		Late Middle Kingdom	Wooden spindle, broken. Top missing and quite damaged. Tapering toward the point.	Petrie
1	UC7306i	spindle		wood	23,7	1,27			31		Late Middle Kingdom	Wooden spindle, complete. One end preserves a long and well carved spiral groove and the other tapers to the point.	Petrie
		spindle whorl	cylindrical	wood	3,1	4,4		1,36 x1,19				Cylindrical spindle whorl, quite thick. Well preserved wood, with traces of incrustation on both sides, especially on the upper part, and on part of the shaft. Traces of fibers visible on the incrustated surface. Irregular hole.	
1	UC7306ii	spindle		wood; linen	22,9	0,8			28		Late Middle Kingdom	Wooden spindle, almost complete but broken along the spiral groove at the top. Modern flax spun by Ivor Willard of Passemore Edwards Museum, 1983.	Petrie
		spindle whorl	cylindrical	wood	3,2	4,6		0,95				Cylindrical spindle whorl, complete. Very thick and with worn surfaces.	
1	UC7307a	Spindle		wood	9,87	0,88 x1			27,7		Late Middle Kingdom	Wooden spindle, broken just beneath spindle whorl. Top with a spiral groove and traces of fibres.	Petrie
		spindle whorl	cylindrical	wood	2,92	4,87		0,84 x 0,99				Cylindrical spindle whorl, very thick. Slightly chipped. One side covered by incrostation, the other clear.	

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC7307b	Spindle		wood	9,45	1,1			25,75		Late Middle Kingdom	Wooden spindle, broken just beneath spindle whorl. Top with a spiral groove	Petrie
		spindle whorl	cylindrical	wood	3	4,96						Cylindrical spindle whorl, very thick. Worn surface. One side covered by a thick incrustation, the other clear.	
1	UC7307c	Spindle		wood	10,37	0,98			18,29		Late Middle Kingdom	Wooden spindle, broken just beneath spindle whorl. Top with a spiral groove. Good quality wood, different from that of the whorl.	Petrie
		spindle whorl	cylindrical	wood	3	4,65		0,98				Cylindrical spindle whorl, very thick. Worn surface. One side covered by a thick incrustation, the other clear.	
1	UC7307d	spindle		wood	11,36	1,18			27,58		Late Middle Kingdom	Wooden spindle, broken just beneath spindle whorl. No groove.	Petrie
		spindle whorl	cylindrical	wood	2,3	5,18		1,15				Cylindrical spindle whorl, not particularly thick. Well preserved wood, no traces of incrustation, only a light patina. Irregular hole.	
1	UC7307e	spindle		wood	11,26	1,15			4,83 +x		Late Middle Kingdom	Wooden spindle, broken just beneath spindle whorl. Top with a spiral groove	Petrie
		spindle whorl	cylindrical	wood	2,52	4,84		1,06	21,44			Cylindrical spindle whorl, complete. Well preserved wood with only a thin patina on the surface. Hole very warped. Mark on the side of the whorl.	
1	UC7307f	Spindle		wood	11,07	0,99			21,94		Late Middle Kingdom	Wooden spindle, partially preserved. Top with long spiral groove, very well crafted.	Petrie
		spindle whorl	cylindrical	wood	2,94	4,98		0,97				Cylindrical spindle whorl, not particularly thick. Well preserved wood, with traces of incrustation. Irregular hole.	
1	UC7307g	spindle		wood	13	0,94			24,68		Late Middle Kingdom	Wooden spindle, broken just beneath spindle whorl. Top with a spiral groove	Petrie
		spindle whorl	cylindrical	wood	2,75	4,61		1,08				Cylindrical spindle whorl, complete. Well preserved wood with thin layer of a patina on both sides. Hole very warped.	
1	UC7307h	spindle		wood	8,14	0,99			3,16 +x		Late Middle Kingdom	Fragment of a wooden spindle with long spiral groove preserved. Place of whorl (not preserved) evident on the shaft.	Petrie
1	UC7308a	spindle		wood	9,54	0,77			11,31			Wooden spindle broken at both ends.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
		spindle whorl	cylindrical	wood	1,14	4,44		0,7			Late Middle Kingdom	Small and thin spindle whorl, very damaged. Wood very different than other whorls, more compact.	
1	UC7308b	spindle		wood	10,68	0,81			12,03		Late Middle Kingdom	Wooden spindle,broken. At the top a v-shape notch.	Petrie
		spindle whorl	cylindrical	wood	1,4	4,37		0,7				Small and thin spindle whorl, very damaged.	
1	UC7308c	spindle		wood	8,9	0,95			14,79		Late Middle Kingdom	Wooden spindle, broken beneath spindle whorl. Preserved end is flat with v-shape notch. Light wood, tends to delaminate.	Petrie
		spindle whorl	cylindrical	wood	1,58	4,77		0,76				Cylindrical spindle whorl, complete. Quite thick, well preserved wood, compact. Wooden manufacture visible on the surface. Hole broadened and warped.	
1	UC59380a	spindle		wood	20,3	1,12			29,9		Late Middle Kingdom	Wooden spindle, almost complete. Top with a spiral groove, shaft thickening in the middle and tapering toward the point which is missing. .	Petrie
		spindle whorl	cylindrical	wood	2,54	5		1,08				Cylindrical spindle whorl, complete. Upper surface covered by patina, lower by a thick layer of encrustation.	
1	UC59380b	spindle		wood	24,6	1,08			21,45			Wooden spindle, complete. One end rounded, the other pointed, central part thickened. Top with a spiral groove. Badly damaged by insects. Traces of fibres on the shaft.	Petrie
		spinde whorl	cylindrical	wood	1,83	4,84		0,82 x0,7				Cylindrical spindle whorl, complete but damaged by insects. White dots on the surface, possibly a mould.	
1	UC59380c	spindle		wood	17,3	0,92			13,33			Wooden spindle, broken at the lower end. Top with a roughly cut notch.	Petrie
		spindle whorl	cylindrical	wood	1,55	4,58		0,74 x0,82				Cylindrical spindle whorl, complete. Heavily encrusted on the upper surface, clean on the lower one. Quite warped.	
1	EA50979	spindle		wood	12,2	0,8			38,01	Cartwright 1998: 99	Ficus sycomorus	Wooden spindle with a groove for fastening fibres covered by a second spindle whorl. Broken beneath spindle whorls.	BM

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
	EA50979 b	spindle whorl	cylindrical	wood	2,2	4,4		1,2			Pinaceae family, probably Abies sp.	Cylindrical spindle whorl, complete. Both whorls are well attached to the shaft, even if spindle becomes difficult to use. Encrusted surface.	
	EA50979 c	spindle whorl	cylindrical	wood	2,3	4,7		1,2			Ficus sycomorus	Cylindrical spindle whorl, complete. Encrusted on the lower surface. Incised X mark on the side.	

Spindle whorls													
1	AN 1889.1198B	Spindle whorl	cylindrical	wood	1,8	5		0,5	8,5		Middle Kingdom	Cylindrical spindle whorl, chipped and cracked. Soft wood, quite worn. Small hole, highly ruined.	Ashmolean
1	AN 1889.1198C	Spindle whorl	cylindrical	wood	1,6	4,6		0,6	11,1		Middle Kingdom	Cylindrical spindle whorl, slightly chipped on the side. Cut from a small branch. Soft wood, better preserved than B. tree ring well visible. Hole warped probably by wedges.	Ashmolean
1	AN 1889.1198D	Spindle whorl	cylindrical	wood	2,2	4,8		0,8	11,5		Middle Kingdom	Cylindrical spindle whorl, complete, with a small fragment of spindle inside the hole. Dirty surface, not encrusted but just dirty.	Ashmolean
1	AN 1889.1203	Spindle whorl	dome	limestone	2,3	6,5		1x1,2	98,3	Petrie, Kahun, Gurob and Hawara, pp. 27-28.	Middle Kingdom	Very large and short spindle whorl, well shaped, chipped in several areas. No wear traces are clearly detectable. Smooth surface.	Ashmolean
1	AN 1889.1204	Spindle whorl	conical	limestone	3,2	4,5		0,7x0,8	65	Petrie, Kahun, Gurob and Hawara, pp. 27-28.	Middle Kingdom	Conical shaped limestone spindle whorl, chipped on one side and near the upper hole. Traces of manufacture highly visible, not polished. Wear traces on the upper hole.	Ashmolean
1	EA70885	Spindle whorl	cylindrical	wood	2,4	3,8		0,9	10,16	Cartwright 1998: 99 (listed as 70585)	Pinaceae family, probably *Abies* sp.	Cylindrical spindle whorl, complete. Quite thick, good quality wood even if worn on one side. Warped hole.	BM
1	EA70884	Spindle whorl	cylindrical	wood	2,5	4,7		1,1	20,45	Cartwright 1998: 99.	Pinaceae family, probably *Abies* sp.	Cylindrical spindle whorl, complete. Well shaped, encrusted on both sides. Incised cross shaped mark.	BM

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	EA70883	Spindle whorl	cylindrical	wood	2,3	5,2		1,2	12,51	Cartwright 1998: 99.	Ficus sycomorus	Cylindrical spindle whorl, complete. Encrusted on all sides and quite worn and damaged by insects. Incised cross-shaped mark.	BM
1	EA70889	Spindle whorl	cylindrical	wood	2,4	4,5		1,2	18,71	Cartwright 1998: 99.	Pinaceae family, probably *Abies* sp.	Cylindrical spindle-whorl, complete. Thick, well shaped but not perfectly rounded. Hole very warped. On one surface traces of manufacture are visible. Partially encrusted. Incised mark.	BM
1	EA70888	Spindle whorl	cylindrical	wood	2,6	4,4		0,9	16,65	Cartwright 1998: 99.	Pinaceae family, probably *Abies* sp.	Cylindrical spindle whorl, complete. Quite thick, with traces of encrustation on all sides. Signs of manufacture on one sides. Incised mark.	BM
1	EA70887	Spindle whorl	cylindrical	wood	2,8	5,4		1,2	22,6	Cartwright 1998: 99.	Pinaceae family, probably *Abies* sp.	Cylindrical spindle whorl, complete. Quite thick, traces of manufacture on one side. Hole warped on one side probably by wedges. Partially encrusted. Incised mark.	BM
1	EA70886	Spindle whorl	cylindrical	wood	2,4	4,1		1,2	13,78	Cartwright 1998: 99.	Pinaceae family, probably *Abies* sp.	Cylindrical spindle whorl, complete. Quite thick, worn on one side. Warped hole. Incised mark.	BM
1	EA70882	Spindle whorl	cylindrical	wood	3	4,8		1,1	29,6	Cartwright 1998: 99.	Pinaceae family, probably *Abies* sp.	Cylindrical spindle whorl, complete. Quite thick and well shaped. On one side shows traces of manufacture, on the other a thin layer of patina. Well rounded hole, only partially warped. Incised mark.	BM
1	30.c.11	Spindle whorl	cylindrical	wood	0,97	3,7		0,3x 0,38	5,2		Middle Kingdom	Cylindrical spindle whorl, complete. Quite small with a small hole. Different type of cut and wood from other whorls. Very well shaped.	Man
1	30.c.12	Spindle whorl	cylindrical	wood	2,62	5,2		1,3	23,8		Middle Kingdom	Cylindrical spindle whorl, complete. Large and thick, with large and cylindrical hole. Slightly warped.	Man
1	UC7309a	Spindle whorl	cylindrical	wood	2,32	4,7		1,08	15,08		Late Middle Kingdom	Cylindrical spindle whorl, complete. Covered by a thin layer of patina. Hole warped probably by the use of wedges.	Petrie
1	UC7309b	Spindle whorl	cylindrical	wood	2,52	4,4		1,07	17,58		Late Middle Kingdom	Cylindrical spindle whorl, complete. Covered by a thin layer of patina. Hole slightly warped probably by the use of wedges.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC7309c	Spindle whorl	cylindrical	wood	2,47	4,6		1,08	18,5		Late Middle Kingdom	Cylindrical spindle whorl, complete. Slightly encrusted on both sides. One hole on the surface, probably caused by an insect.	Petrie
1	UC7309d	Spindle whorl	cylindrical	wood	2,09	4,8		1,16	15,78		Late Middle Kingdom	Cylindrical spindle whorl, complete. Good quality, compact wood. Slightly encrusted on one surface, the other appears worn. Hole slightly warped.	Petrie
1	UC7309e	Spindle whorl	cylindrical	wood	2,54	4,7		1,09	16,14		Late Middle Kingdom	Cylindrical spindle whorl, complete. Good quality, compact wood. Slightly encrusted on one surface, the other appears worn. Hole slightly warped but not due to wedges.	Petrie
1	UC7309f	Spindle whorl	cylindrical	wood	2,84	5,2		1,04	23,56		Late Middle Kingdom	Cylindrical spindle whorl, complete, very well shaped and preserved. Covered by a thin layer of patina. One side with evident signs of manufacture. Hole warped probably by the use of wedges.	Petrie
1	UC7309g	Spindle whorl	cylindrical	wood	2,25	5,5		1,21	23,75		Late Middle Kingdom	Large, cylindrical spindle whorl, complete. One side quite whorn. Traces of encrustation on the surface. Warped hole, not due to wedges.	Petrie
1	UC7309h	Spindle whorl	cylindrical	wood	2,37	4,5		1,32	13,61		Late Middle Kingdom	Small cylindrical spindle whorl, complete. Quite thick and well preserved. Traces of manufacturing on ine surface. Hole completely warped by wedges.	Petrie
1	UC7309i	Spindle whorl	cylindrical	wood	1,85	4,5		0,83	9,92		Late Middle Kingdom	Small cylindrical spindle whorl, complete. Surface covered of scratches, possibly signs of manufacture. No traces of patina or encrustation. Small and warped hole.	Petrie
1	UC7309l	Spindle whorl	cylindrical	wood	2,65	4		1,18	12,79		Late Middle Kingdom	Cylindrical spindle whorl, complete. Small, thick, quite well preserved. Thick layer of encrustation on both sides.	Petrie
1	UC7309m	Spindle whorl	cylindrical	wood	2,74	4,2		1,02	12,51		Late Middle Kingdom	Cylindrical spindle whorl, complete. Small, thick, very well preserved. Traces of manufacture on one side. Hole warped by use of wedges.	Petrie
1	UC7309n	Spindle whorl	cylindrical	wood	2,5	4,5		1,26	15,08		Late Middle Kingdom	Cylindrical spindle whorl, complete. Quite small, thick and well preserved. Covered by a thick layer of encrustation on both sides. Hole warped by use of wedges.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC7309o	Spindle whorl	cylindrical	wood	1,76	4		0,79	7,86		Late Middle Kingdom	Cylindrical spindle whorl, complete. Small and clean, with incisions on one surface, possibly signs of manufacture; on the other side, hole completely damaged and oval.	Petrie
1	UC7309p	Spindle whorl	cylindrical	wood	1,83	4,2		0,8	8,15		Late Middle Kingdom	Cylindrical spindle whorl, complete. Small and clean, with traces of manucture on one side.	Petrie
1	UC7309q	Spindle whorl	cylindrical	wood	2,25	3,4		1,05	8,8		Late Middle Kingdom	Cylindrical spindle whorl, complete. Small, thick and well preserved. Covered by a thick layer of encrustation on both sides.	Petrie
1	UC7310c	Spindle whorl	cylindrical	wood	1,44	3,9		0,85	6,83		Late Middle Kingdom	Cylindrical spindle whorl, complete. Very worn and with warped hole.	Petrie
1	UC7310d	Spindle whorl	Conical truncated	wood	2,47	5x4,12		1,03 x1,1	21,09		Late Middle Kingdom	Conical truncated spindle whorl, complete. Damaged in several points, especially on the hole. Woodknot on the side. Traces of encrustation.	Petrie
1	UC7310e	Spindle whorl	Conical truncated	wood	2,35	4,8x4,26		1,06	15,92		Late Middle Kingdom	Conical truncated spindle whorl, complete. Perfectly shaped. Encrusted on one side.	Petrie
1	UC7310f	Spindle whorl	cylindrical	wood	2,62	4,3		1,06	16,04		Late Middle Kingdom	Cylindrical spindle whorl, complete. Well preserved, traces of manufacture on both sides. Slightly encrusted on one side.	Petrie
1	UC7310g	Spindle whorl	cylindrical	wood	2,37	4,7		1,3	14,99		Late Middle Kingdom	Cylindrical spindle whorl, complete. Worn and rotten wood.	Petrie
1	UC7310h	Spindle whorl	cylindrical	wood	2,42	4,6		1,4	13,78		Late Middle Kingdom. K28	Cylindrical spindle whorl, complete. Well preserved but warped hole. Covered by a thin layer of patina.	Petrie
1	UC7310i	Spindle whorl	cylindrical	wood	2,7	4,7		1,25	18,91		Late Middle Kingdom	Cylindrical spindle whorl, complete. Quite well preserved but hole slightly warped. Covered by a whitish patina.	Petrie
1	UC7310l	Spindle whorl	cylindrical	wood	2,3	5,31 x5,01		1,19 x1,23	15,95		Late Middle Kingdom	Cylindrical spindle whorl, complete. Slightly diagonal sides. Hole slightly warped. Traces of encrustation on the side.	Petrie
1	UC7310 m	Spindle whorl	cylindrical	wood	2,13	5		1,19	19,03		Late Middle Kingdom	Cylindrical spindle whorl, complete. Very well preserved, hole warped. Covered by a thin layer of patina.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC7305	Spindle whorl	cylindrical	limestone	3,5	4,4		1,28	84,25		Late Middle Kingdom	Domed limestone spindle whorl. Very thick and flattened top.	Petrie
1	UC7311a	Spindle whorl	cylindrical	wood	2,67	4,1		0,8x0,7	15,64		Late Middle Kingdom	Cylindrical spindle whorl, complete. Well preserved. One side encrusted and the other covered by a thin patina.	Petrie
1	UC7311b	Spindle whorl	cylindrical	wood	2,49	4,27x4,54		1,17	13,39		Late Middle Kingdom	Cylindrical spindle whorl, complete. Quite well preserved, traces of encrustation on both sides. Warped hole.	Petrie
1	UC7311c	Spindle whorl	cylindrical	wood	2,5	4,6		1,31x1,1	17,24		Late Middle Kingdom	Cylindrical spindle whorl, complete. Quite well preserved, traces of patina on both sides. Warped hole.	Petrie
1	UC7311d	Spindle whorl	cylindrical	wood	2,36	4,2		0,87	13,47		Late Middle Kingdom	Cylindrical spindle whorl, complete. Quite well preserved, traces of patina on both sides. Warped hole.	Petrie
1	UC7311e	Spindle whorl	cylindrical	wood	1,04	3,99x4,1		0,38	5,45		Late Middle Kingdom	Small and thin cylindrical spindle whorl, complete. Small hole. Traces of a pinkish material on the surface.	Petrie
1	UC7311f	Spindle whorl	cylindrical	wood	1,56	5,03x5,18		0,59	14,78+x		Late Middle Kingdom	Cylindrical spindle whorl, complete. Small fragment of spindle inside the hole and traces of a thread (modern?). Quite well preserved. Whitish substance on the surface.	Petrie
1	UC7470ii	Spindle whorl	Dome	wood	1,1	6,93x6,45		0,72	20,48		Late Middle Kingdom	Dome spindle whorl, complete. Very smoothed wood, completely diffent from other whorls. Very large and thin. Lid?	Petrie
1	UC7470	Spindle whorl	Dome	wood	0,68	6,1		0,46	13		Late Middle Kingdom	Dome spindle whorl, complete. Very smoothed wood, completely diffent from other whorls. Very large and thin. Hole neatly cut, no traces of wear or wedges. Lid?	Petrie
1	UC7471	Lid	Discoid	wood	1,07	6,1		0,4	19,88		Late Middle Kingdom	Wooden disc with a circular area roughly cut out, remains of central peg. lid?	Petrie
1	UC7283		conical	wood	5,59	8,5		1,19	92,79		Middle Kingdom	Not a spindle whorl	Petrie
1	UC7304	Spindle whorl?	Dome	limestone	3,3	6,6		0,9x1,1	137		Late Middle Kingdom	Domed limestone spindle whorl, complete. Very large and heavy. Hole slightly larger on the base, upper side with wear traces. Thin radian incisions on the base. ; slight incised marks on base.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC63840 i	Spindle whorl	cylindrical	wood	2,7	4,8		1	20,5		Late Middle Kingdom	Cylindrical spindle whorl, well shaped with one side of the hole well rounded and the other warped by wedges. On one side two small holes and a woodknot. Deeply incised mark.	Petrie
1	UC63840 ii	Spindle whorl	cylindrical	wood	2,6	4,7		1,15 x1,2	13		Late Middle Kingdom	Cylindrical spindle whorl, one surface and side completely worn with traces of a whitish substance (paint or mould?). Other surface less worn and with no traces of this substance.	Petrie
1	UC63840 iii	Spindle whorl	cylindrical	wood	2,8	5,2		1,2x 1,3	23,1		Late Middle Kingdom	Cylindrical spindle whorl, well shaped with holes slighly warp (like it was used with a rope, but it is probably an error of cut since it is deeper inside the hole). Quite well preserve with just small traces of dirt and a whitish substance. Incised mark on the side.	Petrie
1	UC63840 iv	Spindle whorl	cylindrical	wood	2,5	4,7		1,19 x0,9	15,6		Late Middle Kingdom	Cylindrical spindle whorl, not perfectly rounded, clean surfaces, side dirty. Two vertical incisions on the side might be marks. Some traces of manufacture are also detectable on one surface. Hole completely warp at both ends.	Petrie
1	UC63840 v	Spindle whorl	cylindrical	wood	2,39	5,2		1,17 x1,2 4	21,7		Late Middle Kingdom	Cylindrical spindle whorl, well shaped, different wood with clear wood rings. Some signs of manufacture are also detectable. Traces of wedges are visible. Two parallel lines incised on the side might be a mark. Wood perfectly preserved	Petrie
1	UC63840 vi	Spindle whorl	cylindrical	wood	2,6	5,3		1,09 x0,9 5	16,6		Late Middle Kingdom	Cylindrical spindle whorl, well shaped, low quality wood, completely worn and with several holes made by insects. Two marks scratch on the side.	Petrie
1	UC63840 vii	Spindle whorl	cylindrical	wood	2,56	4,8x 4,9		1,2x 1,17	17,8		Late Middle Kingdom	Cylindrical spindle whorl, well shaped but oval, good quality of wood, well preserved. Quite dirty on all the surfaces. Hole warp by wedges. Two marks seem to have been scratched on the side, very thin lines.	Petrie
1	UC63840 viii	Spindle whorl	cylindrical	wood	2,9	5,1x 5,25		1,2x 1,4	28		Late Middle Kingdom	Cylindrical spindle whorl, well shaped but oval, good quality of wood with wood rings still visible. Surfaces are clean. Big hole, specially on one side, quite warp. Mark incised on side.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC63840 ix	Spindle whorl	cylindrical	wood	2,5	4,9		1,3	20		Late Middle Kingdom	Cylindrical spindle whorl, well shaped, worn surfaces. Wood rings very visible. One surface is more dirty than the other. Big hole with worn *holes.* Mark incised on the side.	Petrie
1	UC63840 x	Spindle whorl	cylindrical	wood	2,6	4,6x 4,26		1,19 x1	17,9		Late Middle Kingdom	Cylindrical spindle whorl, quite well shaped but oval, one surface is perfectly clean as if recut recently. Side and the other surface are more dirty. Hole tapering towards one end completely warp. Deep mark incised on the side.	Petrie
1	UC63840 xi	Spindle whorl	cylindrical	wood	2,6	4,4		9,6x 10,1	17		Late Middle Kingdom	Cylindrical spindle whorl, very well shaped, all surfaces are dirty. Tapering hole perfectly round. Mark on the side, very lightly incised.	Petrie
1	UC63840 xii	Spindle whorl	cylindrical	wood	2,7	5		9x1	27,5		Late Middle Kingdom	Cylindrical spindle whorl, very well shaped. All surfaces are slightly dirty but some signs of manufacture are detectable. Tapering hole well rounded with just a few signs of wedges on the smaller side. Mark on the side, very lightly incised.	Petrie
1	EA50972	Spindle whorl	cylindrical	wood	2,5	5,1		1,3	23,31	Cartwright 1998: 98	Pinaceae family, probably *Abies* sp.	Cylindrical spindle-whorl, complete. Wood very damaged with traces of burnt spots.	BM
1	EA50971	Spindle whorl	cylindrical	wood	2,3	5,1		1,2	19,85	Cartwright 1998: 98	Pinaceae family, probably *Abies* sp.	Cylindrical spindle-whorl, slightly larger at one side. Hole larger on one side (1,4), probably due to use of wedges. Traces of manufacture.	BM
1	EA50973	Spindle whorl	cylindrical	wood	2,5	4,4x 4,8		0,8	14,58	Cartwright 1998: 98	Pinaceae family, probably *Abies* sp.	Cylindrical spindle-whorl, complete. Quite thick, damaged by insects and covered by encrustation. Hole warped by wedges.	BM
1	EA50974	Spindle whorl	cylindrical	wood	2,3	5,1		1,2	13,64	Cartwright 1998: 98	Probably *Ficus Sycomorus*	Cylindrical spindle whorl, complete. Very worn wood with traces of burnt spots. Cylindrical hole, quite clear-cut. Incised mark on the side.	BM
1	EA50975	Spindle whorl	Conical truncated	wood	2,6	4,6x 5,4		1,1	26,53	Cartwright 1998: 98	Pinaceae family, probably *Abies* sp.	Conical truncated spindle whorl, complete. Warped hole due to wedges. Incised mark on the side.	BM
1	EA50977	Spindle whorl	cylindrical	wood	2,7	5,2		1,1	22,56	Cartwright 1998: 98	*Ficus sycomorus*	Cylindrical spindle whorl, complete. Very worn, damaged by insects. Incised mark on the side.	BM

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	EA50976	Spindle whorl	cylindrical	wood	2,3	5,1		1,2	17,82	Cartwright 1998: 98	Pinaceae family, probably *Abies* sp.	Cylindrical spindle whorl, complete. Encrusted on all sides. Incised mark on the side.	BM
1	EA50978	Spindle whorl	cylindrical	wood	2,7	4,9		1,3	20,71	Cartwright 1998: 98	Pinaceae family, probably *Abies* sp.	Cylindrical spindle whorl, complete. Thin layer of patina on one side. Burnt spots. Incised mark on the side.	BM
Spinning bowls													
1	431	spinning bowl		pottery	13	base 4,6 bordo rim				Kahun, Gurob and Hawara.pl. XIII, 58. Griffith, A S. 1910. Catalogue of Egyptian Antiquities of the XII and XVIII Dynasties from Kahun, Illahun and Gurob.p. 41. Early Mediterranean Migrations, p. 28.	Middle Kingdom	Pottery bowl with two loops fixed in the bottom but not joining together. Complete, just chipped on the rim. Under the loops wear traces due to thread rubbing are not visible but can be felt. Slightly leaning.	Manchester
1	UC6665	spinning bowl and wooden models	model	wood	1,4	3,2					Middle Kingdom. From Lahun West Hill Tomb N17, the only burial equipped with wooden models at Lahun.	Small model of a spinning bowl with two loops on the bottom and a hole to fix it to the workshop model (not preserved).	Petrie
Fibres													

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	56.21.335	thread		linen								Knotted lenght of natural flax mixed with red and black wool. Linen threads are of two types. One type is S, 2s quite worn with traces of probable splicing. Another fragment was spun S, 2z and some fibers were not spun or twisted at all. Knots are also presents. Thread diameter varies a lot, between 0,4 and 0,8 mm, because it is highly worn.	WM
1	56.21.333	thread		linen								Similar to 335. Knotted lenght of natural flax mixed with few black wool. Linen threads are of two types. One type is S, 2s, quite worn with visible splicing points. Another fragment was spun S, 2z. Thread diameter varies a lot, between 0,38 and 0,7 mm, because it is highly worn.	WM
1	56.21.332	thread		linen								Ball of yarn made of unspun flax which is mixed with other spun threads, much more worn. Fibers were joint using splicing in z direction and twisted in s direction. Fibers appear darker and more shiny than threads. Several different threads are included, the thicker has a Z-ply with three or more s-spun threads. The other threads appear as S, 2s. Threads diameter varies a lot from point to point, due to their preservation. The thinner thread has a diameter of 0,4 mm (35.5°), the thicker 1 mm (35°).	WM
1	56.21.334	thread		linen								Ball of yarn of extremely fine linen, extremely worn. Some fibers are present on the surface, both unspun flax (?) and red wool. On one side there is an orange stain. It seems that under the threads were thicker threads and a sort of padding. Thread appear S-ply, single twist not visible. Thread diameter varies a few, between 0,2 and 0,25. Angle of twist ° and 45°, definetely tight. between	WM

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	693	yarn	linen						Griffith 1910, 61.	New Kingdom (XVIII-XIX dyn)	Length of fine, natural-coloured flax thread, knotted at both ends. Matassa di filo (sembra preparato per la tintura) di coloore arancionato, binato ma finissimo. Forse fili diversi, alcuni singoli, altri binati. Spettacolare. Quelli che sembrano fili chiaramente binati sono punti di splicing.	Man
1	6194	artefact	leather/ wool	4,3 X1. 2						Middle Kingdom	Piece of leather, twisted as if to form part of a handle; mingled with this is a fragment of dark blue wool. Objects 6171 to 6195 were found together.	Man
	114.b.i	fibres	wool						Griffith 1910, 19. Cooke 1993, 14.	Medieval	Weavers' refuese. Combings of wool, blue red and whiite.	Man
	114.b.ii	fibres	wool							Medieval	Woolen fibres	Man
	114.c	fibres	wool							Medieval	Woolen fibres	Man
	114.d	fibres	wool							Medieval	Woolen fibres	Man
	114.d.i	fibres	wool							Medieval	Woolen fibres	Man
	114.d.iia	fibres	wool							Medieval	Woolen fibres	Man
	114.d.iib	fibres	wool							Medieval	Woolen fibres	Man
	114.e.i	fibres	wool							Medieval	Woolen fibres	Man
	114.e.i	fibres	wool							Medieval	Woolen fibres	Man
1	114.e.iii	textile	wool/lin en						Griffith 1910 p. 19.	Medieval?	Dark blue wool fragments which are less than 1 cm sq.	Man
1	114.e.iv	fibres	wool/lin en						Griffith 1910 p. 19.	Medieval?	Dark blue wool fragments which are less than 1.5 cm sq.	Man
	114.f	textile	linen								Linen textile wound up, with woolen fibres on the surface.	Man
	114 A	Fur									Fur	Man
1	114.i.a.i	ball of threads	linen						Griffith 1910 p. 19.	Middle Kingdom	Small ball of yarn very, fine but highly worn. S-plied where visible.	Man
1	114.i.a.ii	ball of threads	linen						Griffith 1910 p. 19.	Middle Kingdom	Small ball of yarn very, fine but highly worn. S-plied where visible.	Man
1	114.i.i	ball of threads	linen						Griffith 1910 p. 19.	Middle Kingdom		Man
1	114.i.ii	ball of threads	linen						Griffith 1910 p. 19.	Middle Kingdom	Ball of unspun yarn, fibres spliced and prepared for actual spinning or plying.	Man

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	114.i.iv	ball of threads		linen						Griffith 1910 p. 19.	Middle Kingdom	Threads wound around tow, possibly part of a net since knots are present.	Man
1	114.i.ix	ball of threads		linen						Griffith 1910 p. 19.	Middle Kingdom	Small ball of thread, core not visible. Yarn highly worn, s-twist where visible.	Man
1	114.i.vii	ball of threads		linen						Griffith 1910 p. 19.	Middle Kingdom	Gomitolo di filo non filato ma sono preparato per la filatura tramite splicing.	Man
1	114.i.x	ball of threads		linen						Griffith 1910 p. 19.	Middle Kingdom	Ball of unspun yarn, fibres spliced and prepared for actual spinning or plying.	Man
1	114.i.xi	ball of threads		linen	5,4x 4					Griffith 1910 p. 19.	Middle Kingdom	Thick yarn wound around a pottery sherd. Z-cabled.	Man
1	114.i.xii	ball of threads		linen						Griffith 1910 p. 19.	Middle Kingdom	Group of different yarns, some very fine. Some are clearly z-spun, S-plied.	Man
1	114.i.viii	ball of threads		linen						Griffith 1910 p. 19.	Middle Kingdom	Small ball of yarn, core not visible. Yarn very worn, where visible s-twist.	Man
	114.I.ii	thread		linen								Remains of a yarn, completely worn.	Man
	114.I.2.ii	ball of threads		linen								Ball of yarn made of at least two different threads. A darker one S, 2s; a lighter one Z, 2s.	Man
	114.I.xvi	thread										Bag full of a mixture of threads, soil and wood.	Man
1	694.a	yarn		flax						Griffith 1910 p. 61.	New Kingdom (XVIII-XIX dyn)	Skein of linen threads, different between each other. Mostly S, 2s, some Z, 2s.	Man
1	694.b	yarn		flax						Griffith 1910 p. 61.	New Kingdom (XVIII-XIX dyn)	Knotted end of a length of natural-coloured flax thread, with some red thread also knotted in it. S-plied.	Man
1	695.a	ball of threads		linen					94	Griffith 1910 p. 61.	Middle Kingdom	A large ball of finely twisted linen thread, with part of a netting needle stuck in it. S-plied.	Man
1	695.b	ball of threads		linen						Griffith 1910 p. 61.	Middle Kingdom	A large ball of finely twisted linen thread, s-spun, S-plied.	Man
1	695.c	ball of threads		linen						Griffith 1910 p. 19.	Middle Kingdom	A large ball of finely twisted linen thread, s-spun, S-plied.	Man
1	695.d	ball of threads		linen						Griffith 1910 p. 19.	Middle Kingdom	Textile wound around thick and coarse threads (?) and pottery fragments.	Man
1	UC7509a	bunches		flax	19					Cartwright 1998: 101.	Late Middle Kingdom	Five strips of flax fibre for the preparation of linen yarn	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC7509b	bunches		flax	23					Cartwright 1998: 101.	Late Middle Kingdom	Five strips of flax fibre for the preparation of linen yarn	Petrie
1	UC7509c	bunches		flax	17					Cartwright 1998: 101.	Late Middle Kingdom	Five strips of flax fibre for the preparation of linen yarn	Petrie
1	UC7509d	bunches		flax	12					Cartwright 1998: 101.	Late Middle Kingdom	Five strips of flax fibre for the preparation of linen yarn	Petrie
1	UC7509e	bunches		flax	14					Cartwright 1998: 101, 109.	Late Middle Kingdom	Five strips of flax fibre for the preparation of linen yarn	Petrie
1	UC7511	balls		linen		3,9				Cartwright 1998: 101, 109.	Late Middle Kingdom	Ball of yarn wound around a pottery sherd. 5 Z-cabled threads, single twist s.	Petrie
1	UC7511 ii	balls		linen		3,6				Cartwright 1998: 101.	Late Middle Kingdom	Ball of yarn, S, 4s.	Petrie
1	UC7511			linen							Late Middle Kingdom	Knotted skein of yarn. S, 2s.	Petrie
1	UC7511			linen							Late Middle Kingdom	Skein of yarn, S-plied, very worn.	Petrie
4	UC8496 A i a	bunches		flax								Knotted bunches of flax; from a batch of plant material UC 8496 divided into two parts, A retained in Petrie Museum, B sent to Kew for identification, 1973 and never come back.	Petrie
	UC8496 A i b	bunches		flax								Knotted bunches of flax; from a batch of plant material UC 8496 divided into two parts, A retained in Petrie Museum, B sent to Kew for identification, 1973 and never come back.	Petrie
	UC8496 A i c	bunches		flax								Knotted bunches of flax; from a batch of plant material UC 8496 divided into two parts, A retained in Petrie Museum, B sent to Kew for identification, 1973 and never come back.	Petrie
	UC8496 A iii	thread		goat hair							Roman or later	Red yarn made of short and thick fibres	Petrie
	UC8496 A ii	thread		goat hair							Roman or later	Undyed yarn made of short and thick fibres	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
	UC8496 A iv	piece of bronze		bronze							Unknown purpose, put in box with 8496 A i-iii	Petrie
Weights												
1	EA67669	net sinker	semi-discoid	limestone	6,5	10,8		1,9	439		Middle Kingdom	Limestone net-sinker; two bore-holes. Traces of thread rubbing near holes. Deep groove on the base.	BM
1	37	Weight	discoid elliptical	clay	10	9,5	4,6		457		Middle Kingdom	Discoid elliptical weight, pierced at the top. Complete, made of unfired clay. Quite flattish, not possible to make it stand.	Man
1	UC7352	net sinker	central groove	limestone	5,76	5,54	4,11		140		Middle Kingdom	Limestone net sinker, quire crumbling. Incised groove around it.	Petrie
2	UC7353 i	net sinker	central groove	limestone	5,8	3,7	2,8		70,8		Middle Kingdom	Limestone net sinker. Very deep and large groovs, crudely cut, while the other groove is slightly incised.	Petrie
	UC7353 ii	net sinker	central groove	limestone	6,54	4,5x 1,9	2,3		68		Middle Kingdom	Limestone net sinker with two parallels groove around the body and a third lenghtwise. Groove crudely made. Other scratchings on the surface. Soft stone, they might have been cuased by the thread rubbing.	Petrie
1	UC16752	net sinker	central groove	limestone	6,7	4,9	2,8		138		Middle Kingdom	Grooved limestone fishing-net weight. One long and largee groove lenghwise. Nicely shaped. Groove made with a sharp tool, but on one side are visible signs of the thread rubbing.	Petrie
Heddle jacks												
1	EA70881	heddle jack	model	wood	8,4	3,7			40,06	Cartwright 1998: 99.	Pinaceae family, probably *Abies* sp.	Model of heddle jack. Height flat support 4,5, with irregular surface. Head roughly cut, base quite flat. Proto-canaanite inscription.	BM
1	50.a	heddle jack		wood	36,8	base 8,8	waist 4,75		473		Middle Kingdom	Heddle jack, complete. Not polished. Base irregular, it cannot stand erect. Height flat support from base 20,1. Rim slightly higher. Good quality wood, light and resistant.	Man

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	50.b	heddle jack		wood	36,9	base 7,16	waist 4		270		Middle Kingdom	Heddle jack, almost complete but part of the shaft missing and decayed wood. Support for heddle slightly diagonal toward the half. Height support 20,1 cm, but very different from 50.a.	Man
1	50.c	heddle jack		wood	32	base 6,7	waist 5,4		563		Middle Kingdom	Heddle jack, complete. Not polished. Base irregular, it cannot stand erect. Height flat support from base 18,7. Rim slightly higher. Good quality wood, heavy and resistant.	Man
1	50.d	heddle jack		wood	29,8	base 6,5	waist 4,3		340		Middle Kingdom	Heddle jack, complete. Not polished. Base irregular, it cannot stand erect. Height flat support from base 19,5. Rim slightly higher. Good quality wood, heavy and resistant.	Man
1	UC7278	heddle jack		wood	ca 30	base 7,58	waist 4,07		375	Petrie 1927 *Objects of Daily Use.* 48 (no. 138)	Late Middle Kingdom	Heddle jack, complete. Not polished. Base irregular, it cannot stand erect. Height flat support from base 19. Rim slightly higher. Good quality wood, heavy and resistant. Triangle incised on the back.	Petrie
1	UC7279	heddle jack		wood	ca 25,5	base 8,58	waist 6,54		274	Petrie 1927, 48 (no. 132)	Late Middle Kingdom	Wooden heddle jack, surface worn at base of notch, used as a mallet to beat on a peg. Light wood. Height flat support 15,7.	Petrie
1	UC7280	heddle jack		wood	ca 34,7	base 7,14	waist 3,94		281	Petrie 1927, 48 (no. 134)	Late Middle Kingdom	Heddle jack, complete. Not polished. Slim waist. Height flat support from base 21,8. Rim slightly higher.	Petrie
1	UC7281	heddle jack		wood	ca 27,2	base 5,9	waist 3,4			Petrie 1927, 48 (no. 135)	Late Middle Kingdom	Heddle jack, incomplete. Lower part missing, split vertically. Polished on the top. Height of flat support 18,3.	Petrie
1	UC7282ii	heddle jack	model	wood	7,98	2,22			11,14		Late Middle Kingdom	Model of heddle jack. Height flat support 5,56. Head roughly cut, base quite flat.	Petrie
1	UC7291	heddle jack		wood	ca 24,7	base 8x6				Petrie 1927, 48 (no. 136)	Late Middle Kingdom	Heddle jack, complete. Height flat support 16,6. Used as a mallet to beat on a peg. Rectangular mark on one side.	Petrie
1	UC 16704	heddle jack	model	wood	8,98	2,51			28,38		Late Middle Kingdom	Model of heddle jack. Height flat support 6,82.	Petrie
1	UC 16705	heddle jack	model	wood	6	1,38 x2			7,34	Petrie 1927, 48 (no. 131)	Late Middle Kingdom	Model of heddle jack. Height flat support 4,39. it cannot stand erect.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC59022	heddle jack		wood	ca 30 cm	6,3			451		Late Middle Kingdom	Heddle jack, complete. Big and heavy, worn wood. Height flat support 20,5	Petrie
1	UC59021	heddle jack model	model	wood	11,97	3,9			46,4		Late Middle Kingdom	Model of heddle jack, complete. Height flat support 8,4.	Petrie
2	UC7282	heddle jack	model	wood	11,6	3,38			39		Late Middle Kingdom	Model of heddle jack made of wood (soft and light). No wear traces are visible. (on pencil written T2 66 Kahun). Height flat support 7,9	Petrie
	UC7282 ii	heddle jack	model	wood	8	2,1			11,2		Late Middle Kingdom	Wooden model of heddle jack. Soft and light wood. No wear traces are detectable. There was a written on pencil but is not possible to read it anymore. Height flat support 5,5.	Petrie
1	UC16703	heddle jack		wood	27,4	10x 5,9			710		Late Middle Kingdom	Wooden heddle jack, complete. very thick. Wooden surface very worn. It stands erect but leaning towards the front, as the support for heddle. No traces of a more damaged or worn part at the base. Height flat support 18,5.	Petrie
Bone spatulae and needles													
1	56.21.363	Spatula		bone	16,2	1,2	0,38					Bone spatula, long and narrow, broken. One end missing, point preserved. Peculiar shape. Not cut in half. Cancellous bone partially visible where bone is more worn.	WM
1	56.12.362	Spatula		bone	9,8	0,7	0,2					Bone spatula (?), long and narrow. One end with an elongated point, the other broken. Lower side of point extremely polished and smoothed.	WM
1	56.21.361	Spatula		bone	7,5	1,7	0,19					Bone spatula, complete. One flat end, the other with a triangular point. Central part of lower side highly polished, slightly less near the point. Cancellous bone not smoothed near the flat end. Spatola corta intera con punta triangolare e altra estremità piatta. P	WM
1	61	netting needle		wood	14,8	0,82				Griffith 1910, 14.	Middle Kingdom	A netting needle, split at both ends for netting, to a depth of 3.0 cm.	Man

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	97	needle		Bird Bone, Reed, Linen, Copper Alloy, Wood						Griffith 1910, 18.		Needle case, consisting of a hollow bird bone with reed and textile bound around it. Contains a threaded copper needle and a wooden pin or bodkin. Thick thread, Z-cabled (3 yarns), each S-plied, s-spun.	Man
1	233.a	needle		bronze	8,7	0,2				Griffith 1910, 29.	Middle Kingdom	Bronze needle, broken at eye.	Man
1	233.b	needle		bronze	7,8	0,23				Griffith 1910, 29.	Middle Kingdom	Bronze needle, broken at eye.	Man
1	233.c	needle		bronze	8,3	0,18				Griffith 1910, 29.	Middle Kingdom	Bronze needle, complete. Oval hole made by punching the upper part of the shaft.	Man
1	233.d	needle		bronze	8,7	0,21				Griffith 1910, 29.	Middle Kingdom	Bronze needle, broken at eye.	Man
1	233.e	needle		bronze	9,62	0,21				Griffith 1910, 29.	Middle Kingdom	Bronze needle, almost complete, point chipped. Oval hole made by punching the upper part of the shaft.	Man
1	233.f	needle		bronze	6,2	0,15				Griffith 1910, 29.	Middle Kingdom	Bronze needle, broken and bent. Eye not preserved.	Man
1	233.g	needle		bronze	0,66	0,18				Griffith 1910, 29.	Middle Kingdom	Bronze needle, broken at both ends. Possibly two eyes were originally present.	Man
1	233.h	needle		bronze	0,6	0,23				Griffith 1910, 29.	Middle Kingdom	Bronze needle (?), broken at one end, the other possibly with a small spatulated end.	Man
1	233.i	needle		bronze	0,75	0,14				Griffith 1910, 29.	Middle Kingdom	Bronze needle, broken at eye.	Man
1	233.j	needle		bronze	4,72	0,13				Griffith 1910, 29.	Middle Kingdom	Fragment of needle point.	Man
1	233.k	needle		bronze	8,26	2,54				Griffith 1910, 29.	Middle Kingdom	Bronze needle, complete. Round hole made by punching the upper part of the shaft.	Man
1	233.l	needle		bronze						Griffith 1910, 29.	Middle Kingdom	Two fragments of a needle, one with traces of a broken eye.	Man
1	233.m	needle		bronze	8,87	0,18				Griffith 1910, 29.	Middle Kingdom	Bronze needle, complete. Round hole made by punching the upper part of the shaft.	Man
1	233.n	needle		bronze	0,76	0,26				Griffith 1910, 29.	Middle Kingdom	Bronze needle, complete. Round hole made by punching the upper part of the shaft.	Man
1	233.o	needle		bronze							Middle Kingdom	Copper needle, with eye at one end for threading.	Man
1	233.p	needle		bronze							Middle Kingdom	Copper needle, with eye at one end for threading.	Man

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	233.q	needle		bronze	9,4	2,1				Griffith 1910, 29.	Middle Kingdom	Bronze needle, complete and wavy. Round hole made by punching the upper part of the shaft.	Man
1	233.r	needle		bronze	8,8	1,53				Griffith 1910, 29.	Middle Kingdom	Bronze needle, complete. Oval hole made by punching the upper part of the shaft.	Man
1	233.s	needle		bronze	8,7+ x	0,24				Griffith 1910, 29.	Middle Kingdom	Bronze needle, broken at the point. Round hole made by punching the upper part of the shaft, the other side almond shape.	Man
1	233.t	needle		bronze	8,2	0,25				Griffith 1910, 29.	Middle Kingdom	Bronze needle, complete. Round hole made by punching the upper part of the shaft, the other side almond shape.	Man
1	233.u	needle		bronze							Middle Kingdom	Copper needle, with eye at one end for threading.	Man
1	233.v	needle		bronze							Middle Kingdom	Copper needle, with eye at one end for threading.	Man
1	233.w	needle		bronze		0,12				Griffith 1910, 29.	Middle Kingdom	Bronze needle, complete but bent. Round hole made by punching the upper part of the shaft.	Man
1	233.x	needle		bronze	6,3	0,25				Griffith 1910, 29.	Middle Kingdom	Bronze needle, complete but bent. Round hole made by punching the upper part of the shaft.	Man
1	233.1	needle		bronze	6,7	0,21					Middle Kingdom	Bronze needle, complete. Round hole made by punching the upper part of the shaft.	Man
1	233.2	needle		bronze	9	0,2					Middle Kingdom	Bronze needle, complete. Round hole made by punching the upper part of the shaft.	Man
1	233.3	needle		bronze	8,7	0,22					Middle Kingdom	Bronze needle, complete and wavy. Round hole made by punching the upper part of the shaft.	Man
1	233.4	needle		bronze	9,2	0,22					Middle Kingdom	Bronze needle, broken at the point. Round hole made by punching the upper part of the shaft.	Man
1	233.5	needle		bronze	8,7	0,15					Middle Kingdom	Bronze needle, broken at eye and chipped at the point.	Man
1	6192.a	needle		bronze	9	0,3					Middle Kingdom	Bronze needle, complete, quite thick. Eye preserved but manufacture not detectable.	Man
1	6192.b	needle		bronze	8,9	0,2					Middle Kingdom	Bronze needle, complete. Round hole puched through the shaft.	Man
1	695.a.i	Spatula		bone	4,4	0,7	0,17				Found with 695.a	Fragment of bone spatula with elongated point, with evident wear traces.	Man

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC7377 i	needle		bronze	5,58	0,23				Late Middle Kingdom	Small bronze needle, complete. Round hole made by punching the upper part of the shaft.	Petrie
1	UC7377 ii	needle		bronze	8,9	0,19				Late Middle Kingdom	Long and thin bronze needle, complete. Round hole made by punching the upper part of the shaft.	Petrie
1	UC7377 iii	needle		bronze	9	0,29				Late Middle Kingdom	Long and thin bronze needle, eye missing. Slightly curved.	Petrie
1	UC7377i v	needle		bronze	6,22	0,2				Late Middle Kingdom	Bronze needle, broken at eye.	Petrie
1	UC7262i	needle		bronzo	7,65	0,34				Late Middle Kingdom	Small bronze needle, complete. Round hole made by punching the upper part of the shaft.	Petrie
1	UC7262ii	needle		bronze	8,4	0,24				Late Middle Kingdom	Small bronze needle, point missing. Round hole made by punching the upper part of the shaft.	Petrie
1	UC7262ii i	needle		bronze	9	0,2				Late Middle Kingdom	Bronze needle, complete. Quadrangular head. Round hole made by punching the upper part of the shaft.	Petrie
1	UC7262i v	needle		bronze	9,2	0,22				Late Middle Kingdom	Small bronze needle, complete. Round hole made by punching the upper part of the shaft. Point extremely thin.	Petrie
1	UC7260	needle		bronze	7,6	0,15			Petrie 1890, 28, pl.XVII, 14	Late Middle Kingdom	Long and thin bronze needle. Slightly curved. Round hole made by punching the upper part of the shaft.	Petrie
1	UC7261i	needle		bronze	8,4	0,16				Late Middle Kingdom	Long and thin bronze needle. Round hole made by punching the upper part of the shaft.	Petrie
1	UC7261ii	needle		bronze	8,5	0,19				Late Middle Kingdom	Long and thin bronze needle, point missing. Round hole made by punching the upper part of the shaft.	Petrie
1	UC7261ii i	needle		bronze	9,06	0,19				Late Middle Kingdom	Long and thin bronze needle, complete. Round hole made by punching the upper part of the shaft.	Petrie
1	UC7261i v	needle		bronze	9,68	0,16				Late Middle Kingdom	Long and thin bronze needle, complete. Round hole made by punching the upper part of the shaft.	Petrie
1	UC7261v	needle		bronze	10,14	0,16				Late Middle Kingdom	Long and thin bronze needle, complete. Round hole made by punching the upper part of the shaft.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC7261vi	needle		bronze	10,18	0,21					Late Middle Kingdom	Long and thin bronze needle, complete. Round hole made by punching the upper part of the shaft.	Petrie
1	UC28273	netting needle		wood	21	1,43				Cartwright 1998: 101, 108.	Dynasty 12?	Wooden netting needle ? Bound round with thread in a complicated arrangement; both ends incomplete, one charred. Thread appear as modern, H. Granger-Taylor suppose has a late date. S-twisted and 7 Z-plied.	Petrie
1	UC7255	needle		bronze	10	0,14					Dynasty 12	Copper needle, thickness 1.3 cm. Very long and thin with tiny eye.	Petrie
1	UC7256	needle		bronze	8,9	0,15					Late Middle Kingdom	Very thin copper needle with small eye pierced on the shaft.	Petrie
0	UC7257	needle		bronze	8,4	0,3					Late Middle Kingdom	Bronze needle, complete. Round hole made by punching the upper part of the shaft.	Petrie
0	UC7258	needle		bronze	7,8	0,26					Late Middle Kingdom	Bronze needle, complete. Round hole made by punching the upper part of the shaft.	Petrie
1	UC7259	needle		bronze	11,8	0,3					Late Middle Kingdom	Bronze needle, complete. Round hole made by punching the upper part of the shaft.	Petrie
1	UC7264	netting needle		wood						Petrie 1927, 53, pl.LXVI, 130.	Late Middle Kingdom	Wooden netting needle with mark incised on the surface.	Petrie
1	AN 1889.1202	weaver's slay		wood	18,8	2,7	0,8			Petrie 1890, 27-28.	Middle Kingdom	Flat piece of wood, rounded at one end, pointed at other.	Ashmolean

8.6 GUROB

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Spindles												
1	UC7812a	Spindle		wood	16,9	0,83			23,32	Thomas 1981, 38.		Spindle shaft, broken at the thicker end, the other is rounded and preserves traces of encrustation and of fibres.	Petrie
1	UC7812b	Pin		wood	10,66	0,65			1,78			Wooden pin with a pointed end and partially covered by an incised decoration.	Petrie
1	UC7812c	Spindle		wood	23,8	0,46		0,37	2,24			Extremely thin wooden shaft, complete. One end is rounded and immediately below a notch for the thread is preserved, the other end is pointed.	Petrie
1	UC7810	Spindle		wood	24	1,04		0,88	36	Thomas 1981, 38.		Wooden spindle, broken in the upper part, the other end is pointed. Shaft thickens in the middle.	Petrie
		spindle whorl	Conical truncated	wood	2,8	5,5		0,8				Conical truncated spindle whorl, complete. Well shaped and well preserved. Partially covered by a thin layer of patina.	
1	UC7814ia	Spindle		wood	13,6	0,74		0,74	20,62	Thomas 1981, 38.		Shaft broken at around half of the lenght (presumably) and extremely worn. Covered by a thick layer of encrustation in several areas.	Petrie
		spindle whorl	cylindrical	wood	2,21	4,58		0,7				Cylindrical spindle whorl, complete. Well shaped but slightly ruined. Upper surface covered by a thick layer of encrustation, same type found on Deir el-Medina spindle whorls.	
1	UC7814ib	Spindle		wood	4,05			0,58	21,06			Small fragment of spindle preserved inside double spindle whorl.	Petrie
		spindle whorl	Conical truncated	wood	1,84	4,66						Large spindle whorl, complete. Conical truncated shape. Clean surfaces.	
		spindle whorl	Conical truncated	wood	1,39	3,68						Smaller spindle whorl, complete. Conical truncated shape. Clean surfaces. Traces of manufacture visible on the upper (?) surface.	
1	UC7814iii	Spindle		wood	3,73	0,64			10,88			Part of shaft broken immediately under the spindle whorl. Upper tip preserved and rounded, with a cylindrical groove incised.	Petrie
		spindle whorl	cylindrical	wood	1,48	4,44		0,77				Cylindrical spindle whorl, complete. Well shaped and well preserved. Upper surface and side covered by spots of encrustation. Lower surface clean with evident traces of manufacture.	

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC7814iij	Spindle		wood	4,73	0,72			17,64			Part of shaft broken immediately under the spindle whorl. Upper tip preserved and rounded, with a cylindrical groove incised.	Petrie
		spindle whorl	cylindrical	wood	1,79	5,12		1,1				Cylindrical spindle whorl, complete. Well shaped and well preserved. Upper surface and side covered by spots of encrustation. Chipped on one side.	
1	UC7809	spindle		wood	24,5	0,41		0,3	5,04	Thomas 1981, 38, pl. 5.		Complete spindle with whorl. Long and thin shaft, hard and perfectly preserved wood, with a small spiral notch to fasten the fibres. Shaft slightly thicker in the middle.	Petrie
		spindle whorl	dome	wood	1,4	2,06						Domed spindle whorl, complete. Hard wood perfectly preserved. Very small and light.	
1	523	spindle		wood	24,7	0,76			26	Griffith 1910, 48.		Long and thin shaft of a spindle, almost complete. The upper part seems burnt and does not preserve the notch. The other end is pointed.	Man
		spindle whorl	cylindrical	wood	1,83	5,03		0,65 x0,76				Cylindrical spindle whorl, complete. Well shaped but not polished, traces of manufacture are visible on the lower surface. Partially encrusted on all sides. Warped hole.	
1	524.a	spindle		wood	14,25	0,96			19	Griffith 1910, 48.		Shaft broken at both ends. It tends to thicken toward one of the broken end, the one without whorl.	MaN
		spindle whorl	cylindrical	wood	1,81	4,53		0,8				Cylindrical spindle whorl, complete. Well shaped and clean, cut from a quite large branch.	
1	524.b	spindle		wood	10	0,7			14			Shaft broken few cm under the spindle whorl. The upper end still preserves part of the groove for the fibres, but it is partially broken.	MaN
		spindle whorl	cylindrical	wood	1,8	4		0,66				Cylindrical spindle whorl, complete. Well shaped but partially cracked. Upper surface covered by a thin layer of encrustation, which is much more thick on the lower side.	
1	524.c	spindle		wood	19,1	0,99			14			Shaft broken on the upper part, where the notch should be. The other end tapers toward a point but is partially missing.	Man
		spindle whorl	cylindrical	wood	2	4,8		0,8				Cylindrical spindle whorl, complete. Well shaped and well preserved. Covered by a thin patina on all sides.	
1	526.a	Spindle		wood	10,4 +x	0,8		0,65	14,9 +x	Griffith 1910, 48.		Part of a wooden spindle, 1/3 of lenght preserved. Quite worn surface, on the preserved end a groove was probably present.	Man

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
		spindle whorl	conical	wood	1,87	4,3x 4,7						Conical spindle whorl, slightly oval, complete. A thin layer of patina on the surface.	
		thread		linen								Large quantity of linen thread wound around the shaft in two different points, under the spindle whorl and on the lower end of the shaft. Mostly unspun, but a worn yarn (Z, 2z) is visible.	
1	526.b	Spindle		wood	5,53 +x	0,4			11+ x			Small fragment of wooden spindle broken at both ends. Spindle whorl still present.	Man
		spindle whorl	conical		2,38	4,56		0,57				Conical spindle whorl, complete. Well made but worn on the upper surface. Covered by a thin layer of patina.	
1	526.g	Spindle		wood	5,57	0,57			4,5+ x			Small fragment of wooden spindle, broken beneath the spindle whorl. Very thin shaft. Spiral groove still preserved immediately above whorl. Other end tends to slightly thicken and shows traces of burnt.	Man
		spindle whorl	conical	wood	1,78	2,45		0,36 x0,4 6				Conical spindle whorl, complete and well preserved. A large burnt area is present.	
1	526.i	Spindle		wood	23,2	0,94			16+ x			Wooden spindle, almost complete, one end missing. Shaft thickening towards a point, near which whorl is placed (contrary to normal position). No groove is present. Hard and good quality wood, very well preserved. Possible low whorl spindle?	Man
		spindle whorl	conical	wood	2,17	3,52		0,57				Conical spindle whorl, complete and well preserved. Perfectly cylindrical hole, while shaft on which it is placed would better fit a conical hole.	
1	526.l	Spindle		wood	23,3	0,54			8			Wooden spindle, complete, perfectly preserved. Very thin shaft, one end with a small notch, the other pointed. Shaft thickens in the middle, tapers towards the pointed end.	Man
		spindle whorl	conical	wood	1,92 2	2,48		0,37 x0,4 2				Conical spindle whorl, complete and well preserved. Thin traces of polishing visible on the surface.	
1	526.m	Spindle		wood	33,4	0,88			24			Wooden spindle, almost complete. Chipped at the grooved end. Shaft slightly thicker on the middle, tapers towards the point. Small traces of encrustation on the lower part of the shaft.	Man
		spindle whorl	dome	wood	2,04	4,5x 4,9		0,61 x0,7 5				Dome spindle whorl, slightly chipped on the side. Encrusted on the surface.	

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	526.n	Spindle		wood	26	0,67			20			Spindle almost complete, point missing. Upper part of the shaft presents a small notch. Shaft tapers towards the missing point.	Man
		spindle whorl	conical	wood	2,7	3,77		0,6				Conical spindle whorl, complete. Surface covered by a thick layer of encrustation and damaged by insects. Wedge on the upper side of the hoe, traces of fibres/yarn near the lower side, on the shaft.	
1	526.o	Spindle		wood	21	0,57			22			Wooden spindle, complete. Thin shaft, quite short, with a small notch on the upper end. Modern thread wound around the shaft.	Man
		spindle whorl	conical	wood	2,69	4,91		0,55				Large, conical spindle whorl, complete. Some incisions on the base, but not pertaining to a mark.	
1	526.p	Spindle		wood	19,3	0,6			16			Wooden spindle almost complete, chipped at the top. Shaft tapering towards the other end, which is pointed.	Man
		spindle whorl	conical	wood	2,28	3,84		0,63				Conical spindle whorl, complete and well preserved. Traces of encrustation on the dome. Wedge in the upper side of the hole.	
1	526.q	Spindle		wood									Man
1	526.r	Spindle		wood									Man
1	527	spindle		wood	18,3	0,55			14	Griffith 1910, 48.	New Kingdom (XVIII-XIX dyn)	Wooden spindle, broken at both ends but preserved for almost all lenght. Beneath the whorl, some thread wound around the shaft is preserved. Most of the fibres appear as not spun, but at least a thread with s-twist is visible. Covered by encrustation.	Man
		spindle whorl	conical truncated	wood	1,67	4,2x 3,1		0,2x 0,7				Conical truncated spindle whorl, complete and well preserved. Covered by encrustation on all sides.	
1	UC27873 iii a	spindle		wood	17,8	0,94			4,5	Thomas 1981, 35.	New Kingdom	Part of shaft of a spindle (very likely) tapering towards the point which is ruined. Other end missing. Good quality wood, well preserved.	Petrie
1	UC27873 iii b	spindle		wood	17,8	0,87			4,1	Thomas 1981, 35.	New Kingdom	Part of shaft of a spindle (very likely) tapering towards the point which is ruined. Other end missing. Good quality wood, well preserved. Very similar to a.	Petrie
1	UC27873 iii c	spindle		wood	23,9	0,77			7,6	Thomas 1981, 35.	New Kingdom	Shaft of a spindle missing the point. The other end is flat and preserves the notch to fasten fibres. Good quality wood, well preserved. Slightly darker spot where whorl was probably originally placed. Spot is 2,3 cm long and shaft	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
											diameter in this point ranges between 0,5 to 0,63 cm. Shaft thickens towards the broken point.	
1	UC27873 iii d	spindle		wood	23,2	0,87			5,5	Thomas 1981, 35.	New Kingdom	Complete shaft of a spindle without whorl and without a notch for fastening the thread. Good quality wood, well preserved. Point is slightly chipped. Slightly darker spot where whorl was probably originally placed. Spindle whorl was at least 2 cm thick.	Petrie
1	UC27873 iii e	spindle		wood	31,5	1			8,5	Thomas 1981, 35.	New Kingdom	Wooden spindle, broken at the upper part of the shaft. Notch not preserved. Very well preserved wood, shaft tapers towards the preserved end, which is pointed.	Petrie
Spindle whorls													
1	UC7812d	Spindle whorl	dome	wood	2,06	3,63		0,65	9,29			Dome spindle whorl, complete. Well shaped, triangular hole at the base with incisions, probably linked to process of manufacture. Concentric signs on the dome.	Petrie
1	UC7812e	Spindle whorl	conical	wood	2,29	4,03		0,6	10,75			Conical spindle whorl, complete. Hole slightly damaged by wedges at the base, smaller than on the upper side. Large lateral hole on the dome.	Petrie
1	UC7812f	Spindle whorl	dome	wood	2,43	4,17		0,57	13,42			Dome spindle whorl, complete. Hole slightly larger at the base (0,64). Well polished on all surfaces.	Petrie
1	UC7812g	Spindle whorl	dome	wood	2,61	3,39		0,65	10,8			Dome spindle whorl, complete. Base roughly polished. Worn near the upper side of the hole.	Petrie
1	UC7812h	Spindle whorl	dome	wood	2	4,17		0,53	10,86			Dome spindle whorl, complete. Well polished on all surfaces.	Petrie
1	UC7812i	Spindle whorl	dome	wood	1,91	2,97		0,4	0,71			Dome spindle whorl, complete. Small and highly worn.	Petrie
1	UC7812j	Spindle whorl	dome	wood	2,49	3,36		0,45	9,64			Dome spindle whorl, complete. Well shaped, flat base polished with traces of manufacture.	Petrie
1	UC7812k	Spindle whorl	dome	wood	1,95	3,64		0,64	6,66			Dome spindle whorl, complete. Quite large, wood very worn.	Petrie
1	UC7812l	Spindle whorl	dome	wood	1,95	3,95		0,62	6,56			Dome spindle whorl, partially broken.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC7812m	Spindle whorl	conical	wood	2,36	4,14		0,61	4,17			Conical spindle whorl, complete. Well shaped, large crack at the base. Hole slightly larger at the base. Upper side of the hole with evident signs of manufacture.	Petrie
1	UC7812n	Spindle whorl	conical	wood	2,17	3,8		0,61	6,06			Conical spindle whorl, part of the dome missing.	Petrie
1	UC7812o	Spindle whorl	dome	wood	1,93	3,18		0,42	5,54			Dome spindle whorl, partially damaged on the dome and very worn.	Petrie
1	UC7812p	Spindle whorl	dome	wood	1,29	3,59		0,7	2,19 +x			Dome spindle whorl, very warp and damaged.	Petrie
1	UC7812q	Spindle whorl	dome	wood	2,27	3,31		0,39	7,02			Dome spindle whorl, slightly chipped on the side. Hole slightly larger at the base.	Petrie
1	UC7812r	Spindle whorl	dome	wood	1,19	3,48		0,56	4,41			Dome spindle whorl, very worn and with a lateral hole. Full of soil.	Petrie
1	UC7812s	Spindle whorl	dome	wood	1,76	3,32		0,59	2,62			Dome spindle whorl, complete. Base roughly shaped.	Petrie
1	UC7812t	Spindle whorl	dome	wood	1,58	2,26		0,4	2,65			Tiny dome spindle whorl, complete. Small fragment of spindle inside the hole. Roughly shaped.	Petrie
1	UC7812u	Spindle whorl	dome	wood	1,56	2,42		0,48	0,4			Dome spindle whorl, complete. Small, very well shaped and polished.	Petrie
1	UC7812w	Spindle whorl	dome	wood	2,17	2,47		0,44	5,72			Dome spindle whorl, complete. Quite small, perfectly shaped and polished. Hole slightly worn on the upper side. Wear traces?	Petrie
1	UC7812x	Spindle whorl	dome	wood	1,91	2,51		0,43	5,68			Dome spindle whorl, complete but very worn.	Petrie
1	UC7812y	Spindle whorl	dome	wood	1,95	2,44		0,43	4,56			Dome spindle whorl complete. Small, with a fragment of spindle inside the hole. Worn surface.	Petrie
1	UC7814iia	Spindle whorl	cylindrical	wood	1,84	4,77		0,58	15,45	Thomas 1981, 39.	New Kingdom	Cylindrical spindle whorl, complete. Very well shaped, wood well preserved and clean.	Petrie
1	UC7814iib	Spindle whorl	cylindrical	wood	1,71	4,94		0,61	13,6		New Kingdom	Cylindrical spindle whorl, complete. Very well shaped, wood quite worn and cracked. Clean surfaces.	Petrie
1	UC7814iic	Spindle whorl	cylindrical	wood	1,82	4,49		1,33	0,78		New Kingdom	Cylindrical spindle whorl, complete. Hole on the side. Clean surfaces.	Petrie
1	UC7814iid	Spindle whorl	cylindrical	wood	2,18	4,67		0,81	17,26		New Kingdom	Cylindrical spindle whorl, complete. Very well shaped, covered by a thick layer of encrustation.	Petrie
1	UC7814iie	Spindle whorl	cylindrical	wood	1,77	4,63		0,72	15,75		New Kingdom	Cylindrical spindle whorl, complete. Very well shaped, covered by a thin layer of encrustation.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC7814iif	Spindle whorl	cylindrical	wood	1,64	4,48		0,77	10,5		New Kingdom	Cylindrical spindle whorl, complete. Well shaped but worn wood, especially on one side.	Petrie
1	UC7814iig	Spindle whorl	cylindrical	wood	1,71	4,5		0,75	16,36		New Kingdom	Cylindrical spindle whorl, chipped. Well shaped and clean.	Petrie
1	UC7814iih	Spindle whorl	cylindrical	wood	2,42	4,29		0,89	12,78		New Kingdom	Cylindrical spindle whorl, complete. Well shaped but worn and encrusted.	Petrie
1	UC7814iik	Spindle whorl	cylindrical	wood	1,63	4,58		0,78	13,3		New Kingdom	Cylindrical spindle whorl, complete. Well shaped but worn wood.	Petrie
1	UC7814iil	Spindle whorl	cylindrical	wood	1,61	4,82		0,72	13,02		New Kingdom	Cylindrical spindle whorl, complete. Well shaped with evident traces of manufacture.	Petrie
1	UC7814iim	Spindle whorl	cylindrical	wood	2,04	4,82		0,85	20,14		New Kingdom	Cylindrical spindle whorl, complete. Well shaped with evident traces of manufacture.	Petrie
1	UC7814iin	Spindle whorl	cylindrical	wood	2,18	4,9		0,76	19,73		New Kingdom	Cylindrical spindle whorl, complete. Well shaped and clean.	Petrie
1	UC7814iio	Spindle whorl	cylindrical	wood	2,73	5,42		1,37	26,39		New Kingdom	Cylindrical spindle whorl, complete. Well shaped and very large.	Petrie
1	AN 1889.1199A	Spindle whorl	conical	wood	2,2	5		0,8	15,6			Conical wooden spindle whorl, highly worn.	Ashmolean
1	AN 1889.1199B	Spindle whorl	conical truncated	wood	2,4	5,6		1x1,1	32,1			Conical truncated spindle whorl, well preserved but cracked. Lots of signs on the basis, I don't think they have been don for working but rather for decoration. Mark on one side. Very dense and heavy wood.	Ashmolean
1	AN 1889.1199C	Spindle whorl	conical	wood	spindle 2,31,6	3,8		0,7	4,7			Wooden conical spindle whorl, quite ruined, small fragment of a spindle inside.	Ashmolean
1	AN 1889.1199D	Spindle whorl	dome	wood	1,5	2,2		0,3x0,4	3,2			Small wooden spindle whorl, good quality wood but not so dark like that of the Petrie museum. Upper hole chipped like stone examples.	Ashmolean
1	AN 1889.1199E	Spindle whorl	conical	wood	2	3,7		0,6	10,3			Large conical spindle whorl, well preserved, clear cut hole.	Ashmolean
1	AN 1889.1199F	Spindle whorl	dome	wood	1,35	2,5		0,4	1,8			Small wooden spindle whorl from Gurob, good wood but not so dark like that of the Petrie museum. Upper hole chipped, like stone examples. Soft wood.	Ashmolean
1	AN 1889.1199G	Spindle whorl	dome	wood	1,5	2,2		0,3	1,4			Small wooden spindle whorl from Gurob, soft wood and squeezed. Completely warp.	Ashmolean

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	525.a	Spindle whorl	cylindrical	wood	2,19	4,28		0,7x 0,8	15,3	Griffith 1910, 48.		Cylindrical spindle whorl, complete. Well shaped, one side covered by a thick layer of encrustation, less thick on the other side.	Man
1	525.b	Spindle whorl	cylindrical	wood	1,49	4,8x 4,6		0,8x 0,96	12,3			Cylindrical spindle whorl, complete. Large lateral crack. Conical hole warped by wedges. Covered by a thin patina on all sides.	Man
1	525.c	Spindle whorl	cylindrical	wood	1,83	4,72		0,8	12,9			Cylindrical spindle whorl, complete. Highly worn wood, encrusted on one side, covered by a thin patina on the other.	Man
1	525.d	Spindle whorl	cylindrical	wood	1,74	4,72		0,67 x0,7 4	14,3			Cylindrical spindle whorl, complete. Well shaped and well preserved. Covered by a thin layer of patina and by a spot of thick encrustation, rich of vegetable fibres and possibly a thread.	Man
1	525.e	Spindle whorl	cylindrical	wood	2	5,4		0,7	12,8 +x			Cylindrical spindle whorl, broken on one side. Completely clear wood but quite worn.	Man
1	525.f	Spindle whorl	cylindrical	wood	2,6	4,9		0,97	22			Cylindrical spindle whorl, complete. Quite worn surface, but traces of manufacture still detectable.	Man
1	525.g	Spindle whorl	cylindrical	wood	1,21	4		0,8	6,7			Cylindrical spindle whorl, complete. Well shaped and preserved. Covered by a thin patina on all sides.	Man
1	525.h	Spindle whorl	cylindrical	wood	1,46	4,83		0,8	12,7			Cylindrical spindle whorl, complete. Small fragment of spindle preserved inside the hole. One side encrusted. Cut from the middle of a small branch.	Man
1	525.i	Spindle whorl	cylindrical	wood	1,92	4,3		0,59 x0,6 7	12			Cylindrical spindle whorl, complete. Well shaped and preserved. Covered by a thin layer of patina on both surfaces, not on the side.	Man
1	525.l	Spindle whorl	cylindrical	wood	2,45	4,65		0,9	18,7			Cylindrical spindle whorl, complete. Small fragment of spindle inside the hole. One side covered by a thick layer of encrustation, the other by a thin patina.	Man
1	525.m	Spindle whorl	cylindrical	wood	1,42	5,25		0,8	10,1			Cylindrical spindle whorl, complete. Hole incomplete (?). Second, off centre hole possibly caused by insects. One side encrusted, all the others covered by a thin patina.	Man
1	525.n	Spindle whorl	cylindrical	wood	2,18	5,24		0,7x 0,87	25,7			Cylindrical spindle whorl, complete. Small fragment of spindle inside the hole. Well preserved but cracked. Covered by a thin layer of patina. Cut from the middle of a small branch.	Man

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	525.o	Spindle whorl	cylindrical	wood	1,37	5,5		0,7	16,3			Cylindrical spindle whorl, complete. Small fragment of spindle inside the hole. Well preserved but cracked. Covered by a thin layer of patina. Cut from the middle of a small branch.	Man
1	525.p	Spindle whorl	cylindrical	wood	1,67	4,8		0,8	8,9			Cylindrical spindle whorl, complete. Wood quite worn, covered by a thin layer of encrustation. Cut from a quite large branch.	Man
1	526.c	Spindle whorl	conical	wood	2,43	4,11 x3,78		0,62	6,5			Conical spindle whorl, complete. Extremely worn and cracked.	Man
1	526.d	Spindle whorl	conical	wood	2,24	3,38		0,53	9			Conical spindle whorl, chipped on the side. Upper side of the hole very worn, possibly wear traces (?). Lower side neatly cut.	Man
1	526.e	Spindle whorl	conical	wood	1,39	4		0,72	7,4			Conical spindle whorl, complete. Quite flat. Upper side of the hole slightly worn, lower side neatly cut. Thick encrustation on the lower side with fibres (hair?) embedded.	Man
1	526.f	Spindle whorl	conical	wood	1,68	2,39		0,53	5,3			Conical/dome spindle whorl, complete. Well shaped and well preserved except at the top, which is highly worn and possibly flattened.	Man
1	526.h	Spindle whorl	conical	wood	1,36	4,21		0,78 x0,85	6,7			Conical spindle whorl, quite flat. Highly worn and chipped. Conical hole larger at the base.	Man
1	528.a	Spindle whorl	conical	wood	2,14	3,6		0,61	9	Griffith 1910, 48.		Conical spindle whorl, complete. Highly worn wood, base covered by a thick layer of encrustation.	Man
1	528.b	Spindle whorl	conical	wood	1,98	2,45		0,44	4,6	Griffith 1910, 48.		Conical spindle whorl, complete. Very well shaped and preserved although severel cracks are present.	Man
1	528.c	Spindle whorl	conical	wood	1,76	2,6		0,4x 0,42	2,9	Griffith 1910, 48.		Conical spindle whorl, broken on one side. Completely blackened by fire.	Man
1	528.d	Spindle whorl	conical	wood	1,36	2,42		0,37	3,3	Griffith 1910, 48.		Conical spindle whorl, complete. Well shaped and well preserved. Small fragment of spindle inside the hole (0,3x1,6).	Man
1	528.e	Spindle whorl	dome	wood	1,54	2,1x 2,3		0,47	3,6	Griffith 1910, 48.		Dome spindle whorl, complete. Very well preserved, slightly oval.	Man
1	528.f	Spindle whorl	dome	wood	1,28	2,58		0,36 x0,41	4,3	Griffith 1910, 48.		Dome spindle whorl, complete. Well shaped and well preserved. Very good quality wood. Traces of manufacture visible at the base.	Man
1	528.g	Spindle whorl	conical	wood	2,4	4x3,5		0,7	6,5	Griffith 1910, 48.		Conical spindle whorl, complete but very worn and damaged. Traces of encrustation.	Man

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	528.h	Spindle whorl	conical	wood	2,59	3,8		0,6	9,9	Griffith 1910, 48.		Conical spindle whorl, complete. Quite well preserved even if slightly warped. Covered by encrustation and a whitish patina. Hole with soil. Fragment of thin spindle.	Man
1	528.i	Spindle whorl	conical	wood	1,75	3,5x 3,2		0,4x 0,43	4,3	Griffith 1910, 48.		Conical spindle whorl, complete but quite damaged and warped. Highly worn wood.	Man
1	528.l	Spindle whorl	conical	wood	1,6	2,6		0,39 x0,4 4		Griffith 1910, 48.		Conical spindle whorl, complete. Very well shaped and preserved. High quality wood.	Man
1	529.a	Spindle whorl	dome	Limesto ne	2	7,63		0,87	133, 2	Griffith 1910, 49.		Limestone spindle-whorl, with four radial lines roughly incised from the centre as decoration. Quite flattish. Very large and heavy. Upper hole worn but no wear traces are detectable.	Man
1	529.b	spindle whorl	dome	Limesto ne	2,1	6		0,74 x0,9	81,8	Griffith 1910, 49.		Limestone spindle-whorl, almost complete with small chippings. Radial lines incised on the dome. Hole slightly conical, larger at the base of the whorl. Wear traces on the upper side of the hole.	Man
1	529.c	spindle whorl	conical	Limesto ne	2,98	6		1x1, 2	88,4	Griffith 1910, 49.		Limestone spindle-whorl, conical, with several irregular lines incised from the centre. Very worn on the upper side.	Man
1	529.d	spindle whorl	conical	Limesto ne	2,57	4,51		0,69 x0,7 9	57,7	Griffith 1910, 49.		Limestone spindle-whorl, conical and complete. Very well shaped and polished. Both sides of hole show small chippings.	Man
1	529.e	spindle whorl	conical	Limesto ne	3,78	5,5x 5,2		0,73 x1,1	112, 3	Griffith 1910, 49.		Limestone spindle-whorl, conical, with two incised lines. Quite oval in shape. Lots of chippings near upper side of the hole, probably linked to process of manufacture. Conical hole, larger at the base.	Man
1	529.f	spindle whorl	dome	Limesto ne	2,54	5,7x 5,9		0,96	84,9	Griffith 1910, 49.		Limestone spindle-whorl, dome shaped, with numerous lines deeply incised and a spiral line running around the base. Complete, slightly shipped. Perfectly flat base. Upper side of the hole worn, with wear traces, while lower side is neatly cut.	Man

Fibres

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	AN 1889.118 2 A	textile	linen	4					Petrie 1890, 35.	New Kingdom	Ball of textile with fringes. Quite coarse textile, dense tabby weave. S, 2s threads on the textile, one thread Z-plied between fringes, most of fringes unplied.	Ashmolean
1	AN 1889.118 2 B	ball of yarn	linen	4					Petrie 1890, 35.	New Kingdom	Coarse textile which is attached to or surround a ball of yarn. Textile: s-cabled. Ball of yarn made of very fine threads s-spun (0,15 mm), mixed with few S-plied yarns (0,3 mm).	Ashmolean
1	AN 1889.118 2 C	balls of threads	linen	4					Petrie 1890, 35.	New Kingdom	Ball of yarn made of very fine threads mixed with few plied threads and at least one thick and cabled thread. Extremely fine yarns, s-spun (0,08 mm), S-plied yarns (0,2 mm), Z-cabled yarn very worn (0,84 mm).	Ashmolean
1	AN 1889.118 2 D	balls of threads	linen-wool	4					Petrie 1890, 35.	New Kingdom	Ball of yarn which mixed different threads and different materials (probably unspunwool). Most of the ball is made of very thin s-spun threads (0,08 mm), but several S-plied (0,26 mm) and S-cabled threads (0,56 mm) are also present. At least a Z-plied thread is recognizable.	Ashmolean
2	502.a	ball of threads	linen						Griffith 1910, 47.	New Kingdom	Ball of yarn, well preserved. Thick thread, Z-cabled (0,75 mm). Catalogue says that one of the two balls contains a bone spatula, but it was not present.	Man
	502.b	ball of threads	linen						Griffith 1910, 47.	New Kingdom	Ball of yarn, well preserved. Thick thread, z-spun and Z-plied, but also some thicker Z-cabled threads (0,87 mm).	Man
1	496.a	net/net sinker	linen/clay						Griffith 1910, 46.	New Kingdom	Fishing net, z-cabled. Catalogue affirms that a mud net sinker is attached to the net, but it is no longer visible.	Man
1	500.a	ball of threads	linen						Griffith 1910, 46.	New Kingdom	Rove of flax, fibres prepared for spinning and with evident spliced fibres. Well preserved. Spliced fibres are single s and plied S.	Man
1	500.b	flax fibres	flax						Griffith 1910, 46.	New Kingdom	Knotted piece of flax fibres.	Man
1	500.c	yarn	flax						Griffith 1910, 46.	New Kingdom	Length of flax fibre wound around a piece of pottery (three fragments). Several different threads some S-plied, other 2S, 4S. Large cabled thread with Z-twist.	Man
13	503.a	ball of threads	flax						Griffith 1910, 47.	New Kingdom	Ball of threads partially wound around a piece of fabric, tabby weave. Mostly S-spun, very thin (0,17 mm) and not plied, some Z-plied.	Man

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
	503.b	ball of threads		flax						Griffith 1910, 47.	New Kingdom	Well preserved ball of yarn but single threads appear quite worn. S-spun, S-pliedomitolo ben preservato anche se il filo appare più consumato. Binato a S, torsione singola non visibile.	Man
	503.c	ball of threads		flax						Griffith 1910, 47.	New Kingdom	Well preserved ball of yarn, very fine threads all s-spun. Orange colour.	Man
	503.d	ball of threads		flax						Griffith 1910, 47.	New Kingdom	Linen threads of light blue colour. Most of them are s-spun (0,22 mm) and left unplied, while others are S-plied (0,37 mm).	Man
	503.e	ball of threads		flax						Griffith 1910, 47.	New Kingdom	Ball of yarn very worn. Some yarn are s-spun but not plied, others are S-plied. Mixed with coarse fibres.	Man
	503.f	ball of threads		flax						Griffith 1910, 47.	New Kingdom	Ball of yarn, quite worn. Most of the yarn are very thin, s-spun, some are S-plied. One is Z-cabled.	Man
	503.g	ball of threads		flax						Griffith 1910, 47.	New Kingdom	Ball of whitish yarn, very worn and fluffy and covered by another thread, darker and better preserved. Both are s-spun. White thread has various thickness, where measurable is 0,38 mm. Darker thread is 0,23 mm.	Man
	503.h	ball of threads		flax						Griffith 1910, 47.	New Kingdom	Whitish ball of yarn, very worn and fluffy. Mixed with other threads, better preserved. All are s-spun, some very fine, some coarser, some s-plied.	Man
	503.i	ball of threads		flax						Griffith 1910, 47.	New Kingdom	Whitish ball of yarn, very worn and fluffy. Covered by a finer (0,23 mm), brownish thread. S-spun and in some cases S-plied.	Man
	503.j	ball of threads		flax						Griffith 1910, 47.	New Kingdom	Ball of yarn. Whitish thread, very fine but worn. Mixed with different threads and fibres. Where visible, s-spun and S-plied thread. At least another thread z-spun ans Z-plied.	Man
	503.k	ball of threads		flax						Griffith 1910, 47.	New Kingdom	Ball of yarn. Whitish thread, very fine but worn. Mixed with different threads and fibres. Where visible, s-spun and S-plied thread.	Man
	503.l	ball of threads		flax						Griffith 1910, 47.	New Kingdom	Ball of yarn made of brownish threads. Well preserved. s-spun and S-plied.	Man
	503.m	ball of threads		flax						Griffith 1910, 47.	New Kingdom	Ball of yarn made of brownish threads. Well preserved. s-spun and S-plied.	Man

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
	503.n	ball of threads		flax						Griffith 1910, 47.	New Kingdom	Ball of yarn made of whitish threads. Very worn and extremely fine. Wound arond tow. S-spun.	Man
1	UC27884 i		linen						Gur ob	Thomas 1981, 39.	New Kingdom	Hank of flax of worn fibres and some threads. Threads are very thick, s-spun and S-plied.	Petrie
1	UC27884 ii		linen						Gur ob	Thomas 1981, 39.	New Kingdom	String. Final twist Z.	Petrie
1	UC27883 i	skein	linen						Gur ob	Thomas 1981, 39.	New Kingdom	Skein of linen threads, quite fine but very different from each other. S-spun.	Petrie
1	UC27883 ii	skein	linen;wood						Gur ob	Thomas 1981, 39.	New Kingdom	Skein of linen threads, partially wound around a reed. Made of different threads. S-spun and S-plied.	Petrie
1	UC27883 iii	skein	linen						Gur ob	Thomas 1981, 39.	New Kingdom	Skein of string. Cabled, final twist S.	Petrie
1	UC27882 i	ball of thread	linen						Gur ob	Thomas 1981, 39.	New Kingdom	Ball of yarn, extremely fine (0,1 mm). Very worn thread, s-spun, and in one case S-plied.	Petrie
2	UC27882 iia-b	ball of threads	linen						Gur ob	Thomas 1981, 39.	New Kingdom	Two ball of threads, made of very mixed materials. A) small ball of threads, made of s-spun, S-plied yarns, closed by a thick, Z-cabled, completely worn yarn. B) larger ball of threads, made by a thick, Z-cabled, completely worn yarn (possibly the same used for fastening A), mixed with s-spun and S, 2s threads.	Petrie
4	UC27882 iii	ball of threads	linen						Gur ob	Thomas 1981, 39.	New Kingdom	Four ball of yarns, very badly preserved and subjected to degradation. Impossible to separate and analyse without further compromising them. All are s-spun and S-plied (thickness 0,5 mm). One seem wounded around a sherd.	Petrie
1	UC27882 iv	ball of threads	linen						Gur ob	Thomas 1981, 39.	New Kingdom	Ball of yarn well preserved, although yarn appear worn in several points. Made of different type of threads (th. 0,8-1,1 mm). S-spun, threads, S, 2s threads, mostly S-cabled. Several knots visible. Is it possible that form a sort of net?	Petrie
Weights													
1	UC7937	net sinker		lead	0,6	1,52		0,6x 0,57	5,7	Petrie 1917, 49,10. Thomas 1981, 32, pl. 1.	Dynasty 18	Lead netsinker, domed ring.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC28274	net sinker		Limestone	4,84	2,53			28,88	Thomas 1981, 32.		Limestone net sinker. Oval pebble with a large and deep groove around waist.	Petrie
4	UC7938	net sinker		lead						Thomas 1981, 32, pl. 1.			
1	UC7939	net sinker		lead						Thomas 1981, 32.			

Needles and spatulae

1	AN 1890.1006A	bobbin		bone	7,2	0,4				Petrie 1891, 18. Gasperini 2018, 215, 234-5.	New Kingdom (Seti II)	Bobbin, function not clear. Short bone stick with a flat end and the other round or slightly pointed, with a through hole. Bone blackened by fire. Group 1 .	Ashmolean
1	AN 1890.1006B	bobbin		bone	7,2	0,5	0,4			Petrie 1891, 18. Gasperini 2018, 215, 234-5.	New Kingdom (Seti II)	Bobbin, function not clear. Chipped at the basis, burnt at the top. Group 1	Ashmolean
1	AN 1890.1006C	bobbin		bone	7,3	0,5				Petrie 1891, 18. Gasperini 2018, 215, 234-5.	New Kingdom (Seti II)	Bobbin, function not clear. Burnt at the top. Group 1	Ashmolean
1	AN 1890.1006D	bobbin		bone	7	0,5				Petrie 1891, 18. Gasperini 2018, 215, 234-5.	New Kingdom (Seti II)	Bobbin, function not clear. Bone blackened by fire. Group 1 .	Ashmolean
1	AN 1890.1006E	bobbin		bone	7,2	0,4				Petrie 1891, 18. Gasperini 2018, 215, 234-5.	New Kingdom (Seti II)	Bobbin, function not clear. Bone blackened by fire. Group 1 .	Ashmolean
1	AN 1890.1006F	bobbin		bone	7,1	0,5				Petrie 1891, 18. Gasperini 2018, 215, 234-5.	New Kingdom (Seti II)	Bobbin, function not clear. Bone blackened by fire. Group 1 .	Ashmolean
1	AN 1890.1006G	bobbin		bone	1,8	0,7				Petrie 1891, 18. Gasperini 2018, 215, 234-5.	New Kingdom (Seti II)	Fragment of one end of a bobbin, function not clear. Group 1	Ashmolean
1	AN 1890.1006H	bobbin		bone	4,5	0,6				Petrie 1891, 18. Gasperini 2018, 215, 234-5.	New Kingdom (Seti II)	Half of a bobbin, function not clear. Bone blackened by fire. Group 1 .	Ashmolean
1	AN 1890.1006I	bobbin		bone						Petrie 1891, 18. Gasperini 2018, 215, 234-5.	New Kingdom (Seti II)	group 1. Two fragments of bobbins. A) 3,5 B) 3,1	Ashmolean
1	AN 1890.1006J	bobbin		bone	3,9	0,5	0,5			Petrie 1891, 18. Gasperini 2018, 215, 234-5.	New Kingdom (Seti II)	Fragment of one end of a bobbin, function not clear. Group 1	Ashmolean

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC7720	Needle		bronze	7,81	0,29					From Gurob Tomb 125 (Brunton excavations).	Bronze needle, complete. Hole made perforating the shaft from one side to the other.	Petrie
1	UC7795i	Needle		bronze	10,4	0,23				Thomas 1981, 40, pl. 6.	Dynasty 18	Bronze needle, complete. Hole made perforating the shaft from one side to the other. Cleaned and treated.	Petrie
1	UC7795ii	Needle		bronze	9,6	0,3				Thomas 1981, 40, pl. 6.	Dynasty 18	Bronze needle, complete. Hole made perforating the shaft from one side to the other. Cleaned and treated.	Petrie
1	UC7797i	Needle		bronze	11,5	0,27				Thomas 1981, 40, pl. 6.	Dynasty 18	Bronze needle, complete. Hole made perforating the shaft from one side to the other. Cleaned and treated.	Petrie
1	UC7797ii	Needle		bronze	10,7	0,26				Thomas 1981, 40, pl. 6.	Dynasty 18	Bronze needle, complete. Hole made perforating the shaft from one side to the other. Cleaned and treated.	Petrie
1	UC7797iii	Needle		bronze	10,5	0,22				Thomas 1981, 40, pl. 6.	Dynasty 18	Bronze needle, complete. Hole made perforating the shaft from one side to the other. Cleaned and treated.	Petrie
1	UC7797iv	Needle		bronze	10,4	0,27				Thomas 1981, 40, pl. 6.	Dynasty 18	Bronze needle, complete. Hole made perforating the shaft from one side to the other. Cleaned and treated.	Petrie
1	UC7798i	Needle		bronze	9	0,12				Thomas 1981, 40, pl. 6.	Dynasty 18	Bronze needle, complete. Very thin shaft. Hole made perforating the shaft from one side to the other. Cleaned and treated.	Petrie
1	UC7798ii	Needle		bronze	10,1	0,19	Head 0,24 x0,2			Thomas 1981, 40, pl. 6.	Dynasty 18	Bronze needle, complete. Hole made perforating the shaft from one side to the other. Cleaned and treated.	Petrie
1	UC7798iii	Needle		bronze	10,7	0,2				Thomas 1981, 41, pl. 6.	Dynasty 18	Bronze needle, complete. Perfectly straight shaft. Hole made perforating the shaft from one side to the other. Cleaned and treated.	Petrie
1	UC7798iv	Needle		bronze	10,6	0,116				Thomas 1981, 41, pl. 6.	Dynasty 18	Bronze needle, complete. Very long and thin shaft. Eye missing. Cleaned and treated.	Petrie
1	UC7799 I	Needle		bronze	4,86	2,36	0,2			Thomas 1981, 41.	Dynasty 18	Long shaft of bronze, warp, no indication that an eye was present.	Petrie
1	UC7799 II	Needle		bronze	4,26	0,96	0,2				Dynasty 18	Long shaft of bronze, broken on one end, bent, no indication that an eye was present.	Petrie
1	UC7799 III	Needle		bronze	2,9	0,36	0,2				Dynasty 18	Small part of bronze needle, broken, point missing, eye present but closed by ossidation.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC7799 IV	Needle		bronze	2,62	0,39	0,14				Dynasty 18	Long shaft of bronze, broken on one end, bent, no indication that an eye was present.	Petrie
1	UC7799 V	Needle		bronze	8,5	0,12					Dynasty 18	Long shaft of bronze, broken on one end, bent to form a hook, no indication that an eye was present.	Petrie
1	UC7799 VI	Needle		bronze	6,1	0,18					Dynasty 18	Long shaft of bronze, probably a needle with point still present. Eye missing.	Petrie
1	UC7799 VII	Needle		bronze	10	0,14					Dynasty 18	Needle, complete and cleaned. Partially broken eye.	Petrie
1	UC7799 VIII	Needle		bronze	9,6	0,14					Dynasty 18	Bronze needle, complete. Hole made perforating the shaft from one side to the other. Cleaned and treated.	Petrie
1	UC7799 IX	Needle		bronze	10,3	0,25					Dynasty 18	Bronze needle, complete. Hole made perforating the shaft from one side to the other. Cleaned and treated.	Petrie
1	UC7799 X	Needle		bronze	10,7	0,22					Dynasty 18	Bronze needle, eye missing. Cleaned and treated.	Petrie
1	UC7799 XI	Needle		bronze	10,7	0,22					Dynasty 18	Bronze needle, eye missing. Cleaned and treated.	Petrie
1	UC7799 XII	Needle		bronze	8,7	1,48					Dynasty 18	Bronze needle, complete. Hole made perforating the shaft from one side to the other. Cleaned and treated.	Petrie
1	UC7799 XIII	Needle		bronze	9	1,82					Dynasty 18	Bronze needle, complete. Hole made perforating the shaft from one side to the other. Cleaned and treated.	Petrie
1	UC7799 XIV	Needle		bronze	7,9	0,14					Dynasty 18	Bronze needle, complete. Hole made perforating the shaft from one side to the other. Cleaned and treated.	Petrie
1	UC7799 XV	Needle		bronze	5,5	0,2					Dynasty 18	Short bronze needle, eye missing. Cleaned and treated.	Petrie
1	UC7799 XVI	Needle		bronze	6,7	1,64					Dynasty 18	Bronze needle, eye missing. Cleaned and treated.	Petrie
1	UC7799 XVII	Needle		bronze	0,6	0,33					Dynasty 18	Part of a thick shaft of bronze.	Petrie
1	UC7799 XVIII	Needle		bronze	5,2	0,15					Dynasty 18	Part of a thin shaft of needle. Both ends broken.	Petrie
1	UC7799 XIX	Needle		bronze	5,6	0,14					Dynasty 18	Part of a thin shaft of needle. Point preserved, eye missing.	Petrie
1	UC7799 XX	Needle		bronze	5,1	0,18					Dynasty 18	Part of a thin shaft of needle. Point preserved, eye missing.	Petrie
1	UC7799 XXI	Needle		bronze	7,6	0,18					Dynasty 18	Bronze needle, complete. Hole made perforating the shaft from one side to the other. Cleaned and treated.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC7799 XXII	Needle		bronze	5,2	0,21					Dynasty 18	Part of a thin shaft of needle. Point preserved, eye missing.	Petrie
1	UC7799 XXIII	Needle		bronze	7,3	0,27					Dynasty 18	Part of a thick shaft of bronze. Broken at both ends	Petrie
1	UC7799 XXIV	Needle		bronze	6,4	0,28					Dynasty 18	Thick bronze needle, point missing. Hole made perforating the shaft from one side to the other. Flattened eye.	Petrie
1	UC7799 XXV	Needle		bronze	7,9	0,24					Dynasty 18	Bronze needle, point missing, eye obliterated by obsidation.	Petrie
1	UC7799 XXVI	Needle		bronze	6,3	0,21					Dynasty 18	Bronze needle, point preserved, eye missing.	Petrie
1	UC7799 XXVII	Needle		bronze	7	0,13					Dynasty 18	Bronze needle, point preserved, eye missing.	Petrie
1	UC7799 XXVIII	Needle		bronze	7,2	0,14					Dynasty 18	Bronze needle, point preserved, eye missing.	Petrie
1	UC7799 XXIX	Needle		bronze	6,1	0,23					Dynasty 18	Bronze needle, complete, eye obiterated by obsidation.	Petrie
1	UC7799 XXX	Needle		bronze	8,25	0,23					Dynasty 18	Bronze needle, complete. Hole made perforating the shaft from one side to the other.	Petrie
1	UC7799 XXXI	Needle		bronze	5,9	0,14					Dynasty 18	Bronze needle, point preserved, eye missing.	Petrie
1	UC7799 XXXII	Needle		bronze	0,71	0,2					Dynasty 18	Bronze shaft broken at both ends.	Petrie
1	UC7799 XXXIII	Needle		bronze	9,7	0,2					Dynasty 18	Bronze needle, point preserved, eye missing.	Petrie
1	UC7799 XXXIV	Needle		bronze	8,8	0,16					Dynasty 18	Bronze needle, point preserved, eye missing.	Petrie
1	UC7799 XXXV	Needle		bronze	8,4	0,23					Dynasty 18	Needle, complete, eye obiterated by obsidation.	Petrie
1	UC7799 XXXV	Needle		bronze	7,9	0,24					Dynasty 18	Needle, point missing, eye obliterated by obsidation.	Petrie
1	UC7799 XXXVI	Needle		bronze	9	0,32					Dynasty 18	Bronze needle, complete. Hole made perforating the shaft from one side to the other.	Petrie
1	UC7799 XXXVII	Needle		bronze	8,4	0,18					Dynasty 18	Bronze needle, complete. Hole made perforating the shaft from one side to the other.	Petrie
1	UC7799 XXXVIII	Needle		bronze	8	0,23					Dynasty 18	Bronze needle, complete. Hole made perforating the shaft from one side to the other.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC7799 XXXIX	Needle		bronze	8,9	0,14					Dynasty 18	Bronze needle, complete. Long and thin shaft. Hole made perforating the shaft from one side to the other. Cleaned and treated.	Petrie
1	UC7799 XL	Needle		bronze	9,1	0,19					Dynasty 18	Needle, almost complete, just a little fragment of the point missing. Eye closed by obsidation.	Petrie
1	UC7799 XLI	Needle		bronze	10	0,17					Dynasty 18	Long and thin needle, complete but quite ruined along the shaft. Hole made perforating the shaft from one side to the other.	Petrie
1	UC7799 XLII	Needle		bronze	10,9	0,22					Dynasty 18	Bronze needle, complete. Hole made perforating the shaft from one side to the other.	Petrie
1	UC7799 XLIII	Needle		bronze	10,6	0,15					Dynasty 18	Long and thin needle, complete, cleaned with eye partially broken.	Petrie
1	UC7799 XLIV	Needle		bronze	9,9	0,2					Dynasty 18	Needle, small round eye. Near the point a thick layer of obsidated bronze, point probably broken but not detectable.	Petrie
1	UC7799 XLV	Needle		bronze	11,3	0,18					Dynasty 18	Long and thin needle, complete. Eye completly closed by obsidation, recognizable just for being flattened.	Petrie
1	UC7799 XLVI	Needle		bronze	10	0,49					Dynasty 18	Thick shaft of bronze, probably not a needle.	Petrie
1	UC7799 XLVII	Needle		bronze	4,6	0,32					Dynasty 18	Bronze point. Broken.	Petrie
1	UC7799 XLVIII	Needle		bronze	4,56	0,15					Dynasty 18	Part of a needle shaft, broken at both ends.	Petrie
1	UC7799 XLIX	Needle		bronze	4,6	0,17					Dynasty 18	Part of a needle shaft, broken at both ends.	Petrie
1	UC7799 L	Needle		bronze	4,4	0,23					Dynasty 18	Bronze point, broken, probably of a needle.	Petrie
1	UC7799 LI	Needle		bronze	4	0,18					Dynasty 18	Part of a needle shaft, broken at both ends.	Petrie
1	UC7799 LII	Needle		bronze	4	0,15					Dynasty 18	Part of a needle shaft, broken at both ends.	Petrie
1	UC7799 LIII	Needle		bronze	3,3	0,19					Dynasty 18	Part of a needle shaft, broken at both ends.	Petrie
1	UC7799 LIV	Needle		bronze	3	0,22					Dynasty 18	Part of bronze quadrangular shaft. Broken at both ends.	Petrie
1	UC7799 LV	Needle		bronze	2,9	0,17					Dynasty 18	Bronze point, quadrangular section and flattened point.	Petrie
1	UC7799 LVI	Needle		bronze	2,1	0,22 x0,19					Dynasty 18	Part of bronze quadrangular shaft. Broken at both ends.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	AN 1890.1084	Needle		bronze	13,5	0,4	0,3			Gasperini 2018, 249.	Burnt group 3	Long and thick "needle", flat with oval section. Flattened head with a round eye.	Ashmolean
1	AN 1890.1085	Needle		bronze	7,9	0,2				Gasperini 2018, 249.	Burnt group 3	Long and quite thin needle with broken eye.	Ashmolean
1	AN 1890.1124	Needle		bronze	10,4	0,15				Petrie 1891, 17-18, pl. XVIII 36, 37. Gasperini 2018, 126.	Burnt group 4, Ramesses II	Long and thin needle with a round eye perforated from one side. Very sharp point.	Ashmolean
1	AN 1890.1125	Needle		bronze	12,1	0,2				Petrie 1891, 17-18, pl. XVIII 36, 37. Gasperini 2018, 126.	Burnt group 4, Ramesses II	Very long and quite thin needle with a sharp point and a rounded eye perforated from one side.	Ashmolean
1	AN 1890.1126	Needle		bronze	9,4	0,2				Petrie 1891, 17-18, pl. XVIII 36, 37. Gasperini 2018, 126.	Burnt group 4, Ramesses II	Long and thin needle with an oval eye perforated from one side.	Ashmolean
1	UC7806	netting needle		wood	23,3	1,4x 0,8x 1,2	0,94 x0,8 x0,9 3			Thomas 1981, 43.	Dynasty 18	Wooden netting needle, complete and quite big. Not perfectly smoothed inside "tweezers".	Petrie
1	UC7712i	Spatula		osso	9,65	1,74	0,29			Thomas 1981, 41, pl. 7.	Dynasty 18	Bone spatula, almost complete. Small chipping on the point. One end has a pen-nib point, the other is rounded. Upper side highly polished, lower side covered by deep parallel marks. Cancellous bone exposed only at the rounded end.	Petrie
1	UC7712ii	Spatula		osso	9,3	2,44	0,23			Thomas 1981, 41.	Dynasty 18	Bone spatula, almost complete. Small chipping on the point. One end has a pen-nib point, the other is flat. Upper side highly polished, lower side with cancellous bone exposed in several points.	Petrie
1	UC7712iii	Spatula		osso	10,97	2,85	0,54			Thomas 1981, 41.	Dynasty 18	Bone spatula, broken. Small chipping on the point. One end has a pen-nib point, the other is missing. Upper side highly polished, lower side with cancellous bone completely exposed and not smoothed.	Petrie
1	UC7712iv	Spatula		osso	9,81	2,41	0,44			Thomas 1981, 41.	Dynasty 18	Bone spatula, broken. Small chipping on the point. One end has a pen-nib point, the other is missing. Upper side highly polished, lower side with cancellous bone completely exposed and not smoothed.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC7712v	Spatula		osso	9,4	2,03	0,39			Thomas 1981, 41.	Dynasty 18	Bone spatula, almost complete. Small chipping on the point. One end has a pen-nib point, the other is diagonally cut. Upper side highly polished, lower side with cancellous bone exposed in several points, but very smoothed.	Petrie
1	UC7712v i	Spatula		osso	8,4	1,9	0,2-0,3			Thomas 1981, 41.	Dynasty 18	Wear marks	Petrie
1	UC7712v ii	Spatula		osso	7,5	1,8	0,2-0,3			Thomas 1981, 41.	Dynasty 18	Wear marks near the pointed end	Petrie
1	UC7712v iii	Spatula		osso	7,8	1,7	0,2-0,3			Thomas 1981, 41.	Dynasty 18	Wear marks.	Petrie
1	UC7712i x	Spatula		osso	7,6	2	0,2-0,3			Thomas 1981, 41.	Dynasty 18	Wear marks.	Petrie
1	UC7712x	Spatula		osso	8,8	1,2	0,2			Thomas 1981, 41.	Dynasty 18	Partly cracked and pointed end broken. Wear marks.	Petrie
1	UC7712x i	Spatula		osso	9	1,1	0,1			Thomas 1981, 41.	Dynasty 18	Pointed end broken. Wear marks.	Petrie
1	UC7712x ii	Spatula		osso	6	1,1	0,1			Thomas 1981, 41.	Dynasty 18	End of the point missing.	Petrie
1	UC7712x iii	Spatula		osso	10,9	2,2	0,2			Thomas 1981, 42.	Dynasty 18	Pointed end broken. Wear marks.	Petrie
1	UC7712x iv	Spatula		osso	11,5	1,9	0,1			Thomas 1981, 42.	Dynasty 18	Crudely shaped. Wear traces near the edges. Point missing.	Petrie
1	UC7712x v	Spatula		osso	10,3	1,2	0,1			Thomas 1981, 42.	Dynasty 18	Rounded end chipped. Diagonal traces on one side.	Petrie
1	UC7712x vi	Spatula		osso	16,5	1,2	0,2			Thomas 1981, 42.	Dynasty 18	Rounded end missing. Diagonal wear marks visible on both sides.	Petrie
1	UC16768 i	Spatula		bone	8,6	2,6	0,32			Thomas 1981, 42.	Dynasty 12?	Bone spatula, broken at one end, the other is a pen-nib point but chipped. Polished on one surface, while the other is covered by wear traces. In some point highly wear cancellous bone is exposed.	Petrie
1	UC16768 ii	Spatula		bone		3,37	0,19			Thomas 1981, 42.		Bone spatula, very thin, pen-nib point bu broken, and broken on all other sides. On the bottom cancellous bone completely exposed and not wear.	Petrie
1	UC16768 iii	Spatula		bone	6,5	2,3	0,29			Thomas 1981, 42.		Broken bone spatula, only part of the pen-nib point preserved. Parallel lines on the point, over and side, but underneath cancellous bone exposed and not polished.	Petrie
1	UC16768 iv	Spatula		bone	7,9	2,3	0,26			Thomas 1981, 42.		Fragment of a bone spatula broken at both ends. On the upper surface parallel lines due	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
											to the bone structure, on the botton cancellous bone and wear traces on the opposite part from the point.	
1	UC16768 v	Spatula		bone	6,9	2	0,24			Thomas 1981, 42.		Bone spatula, almost complete, point chipped. One end has an elongated point, pen-nib shape, the other has a sort of triangular form. Quite short. Lower surface completed cover of wear signs, generally long, thin and parralel lines. Cancellous bone only partially exposed due to more intense use on that point (polished part is at a higher level than cancellous bone).	Petrie
1	UC16768 vi	Spatula		bone	13	2,27	0,3			Thomas 1981, 42.		Broken spatula witha thin and long point still preserved. One side is polishe, the other is not clear since it seem broken and cancellous bone came to light. But point is worn and seems that it has always been like that.	Petrie
1	UC16768 vii	Spatula		bone	8,5	1,17	0,17			Thomas 1981, 42.		Long and narrow bone spatula, almost complete, point chipped. Wear traces not clear. Polished on both sides.	Petrie
1	UC16768 viii	Spatula		bone	21,3	1,54	0,34			Thomas 1981, 42.		Long and narrow bone spatula, almost complete, broken in two pieces and point missing. Ricurva. One side polishe with a large number of wear signs, the other one has cancellous bone exposed, but smooth, completely obliterated near the preserved end.	Petrie
1	UC16768 ix	Spatula		bone	9,8	1	0,15			Thomas 1981, 42.		Long and narrow bone spatula, broken at both ends, ricurva. Both surfaces are polished but has clearly visible signs of wear.	Petrie
1	UC16768 x	Spatula		bone	6,1	1,21	0,23			Thomas 1981, 42.		Long and narrow bone spatula, boroken at both ends, ricurva. Upper surfaces is polished, the other has cancellous bon exposed, but quite smooth	Petrie
1	UC16768 xi	Spatula		bone	6,61	0,98	0,14			Thomas 1981, 42.		Long and narrow bone spatula, broken at both ends, flat. Both surfaces are polished but has clearly visible signs of wear.	Petrie
1	UC16768 xii	Spatula		bone	7,74	1	0,19			Thomas 1981, 42.		Long and narrow bone spatula, broken in two pieces, one end missing and the other is rounded. Polished on both sides. No signs of wear.	Petrie
1	UC16768 xiii	Spatula		bone	6,1	1	0,18			Thomas 1981, 42.		long and narrow bone spatula, triangular point. Polished on the upper surface, on the lower surface cancellous bone has been	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
											obliterated by use and is quite completely disappeared	
1	UC16768 xiv	Spatula		bone	6,7	1,6	0,24			Thomas 1981, 42.		Long point of a bone spatula, broken. Upper surface is polishe, lower surface has cancellous bone exposed, but quite smooth.	Petrie
1	UC16768 xv	Spatula		bone	11,4	2,1	0,35			Thomas 1981, 42.		Bone spatula, broken in two parts and missing one end. Peculiar shape, with a long point. Both surface are polished, the lower one has cancellous bone exposed but almost cancelled by wear. Edges completely blunt.	Petrie
1	UC16768 xvi	Spatula		bone	12,6	1,7	0,31			Thomas 1981, 42.		Broken bone spatula, both ends are missing. Upper surface polished, but with wear traces near the broken point. Lower surface with worn cancellous bone. Two small cuts on one side.	Petrie
1	UC16768 xvii	Spatula		bone	9,7	2,22	0,29			Thomas 1981, 42.		Fragment of a bone spatula, One side is polished but covered of signs and the other has cancellous bone exposed, not smooth.	Petrie
1	UC16768 xviii	Spatula		bone	7,7	1,9	0,39			Thomas 1981, 43.		Bone spatula, broken at one end, long point. Thick and ricurva. One side is polished and the other has cancellous bone exposed, especially in the central area were friction could not reach it.	Petrie
1	UC16768 xix	Spatula		bone	8,4	1,6	0,52			Thomas 1981, 43.		Long and thick point of a bone spatula, polished on one side, the other has cancellous bone exposed, which is slightly smoother near the point.	Petrie
1	UC16768 xx	Spatula		bone	5,6	1,7	0,34			Thomas 1981, 43.		Fragment of a bone spatula, one side is smooth and the other has cancellous bone exposed.	Petrie
1	UC16768 xxi	Spatula		bone	4,6	1,7	0,29			Thomas 1981, 43.		Small fragment of a bone spatula, one side is smooth and the other has cancellous bone almost completely obliterated and wear signs.	Petrie
1	UC16768 xxii	Spatula		bone	5,4	1,3	0,22			Thomas 1981, 43.		Fragment of a bone spatula, polished on one side while the other has cancellous bone exposed. Quite smooth.	Petrie
1	UC16768 xxiii	Spatula		bone	3,4	1,5	0,2			Thomas 1981, 43.		Thin fragment of a bone spatula, polishe on one side, the other with smooth cancellous bone.	Petrie
1	UC16768 xxiv	Spatula		bone	3,4	1,2	0,2			Thomas 1981, 43.		Small fragment of a bone spatula, one side is polished, the other has cancellous bone exposed	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	UC16768 xxv	Spatula		bone	2,5	1,6	0,32			Thomas 1981, 43.		Small fragment of a bone spatula, both ends are missing but side are preserved. Smooth on both surfaces, on the lower one cancellous bone is appearing.	Petrie
1	UC7713	Spatula		wood	8,4	1,6	0,49			Thomas 1981, 43.		Wooden spatula, complete. Shape is similar to bone examples, convex as ribs. Slightly thicker that those made of bone. Parallel striations due to wear on both sides.	Petrie
1	56.20.149	Spatula		bone	9	1,87	0,24					Bone spatula, complete. One end with a pen-nib point, the other flat. Both sides polished, one with several parallel wear marks.	WM
1	56.24.366	Spatula		bone	10	2,51	0,33					Bone spatula, broken and worn. Point probably pen-nib in origin. Lower side with cancellous bone exposed and not smoothed.	WM
1	56.21.364	Spatula		bone	12,2	2	0,47					Bone spatula, quite complete, chipped in several points. One end with a long and thin pen-nib point, the other flat. Upper side polished, lower side with cancellous bone exposed, not smoothed.	WM
1	56.21.365	Spatula/beater		bone	10,7	2,58	0,7					Bone spatula/beater, elongated point, convex. Broken. Cancellous bone exposed inside concave surface. Smoothed edges and point.	WM
1	555.i	Spatula		bone	10,8	3,42	0,25					Bone spatula, one end with a pen-nib point, the other missing. Upper side polished, lower side with cancellous bone exposed, not smoothed (except on the point).	Man
1	555.ii	Spatula		bone	8,8	2,3	0,26					Bone spatula, one end with a pen-nib point, the other rounded. Upper side polished, lower side polished but cancellous bone exposed near the rounded end. Parallel marks due to wear on the surface.	Man
1	555.iii	Spatula		bone	8,9	2	0,26					Bone spatula, one end with a pen-nib point, the other rounded. Upper side polished, lower side polished but cancellous bone exposed near the rounded end and in the middle. Parallel marks due to wear on the surface.	Man
1	555.iv	Spatula		bone	8,4	2	0,28					Bone spatula, point missing, the other end round but chipped. Upper side polished, lower side with cancellous bone exposed but quite smoothed.	Man
1	555.v	Spatula		bone	12	1,8	0,57					Bone spatula, one end with a triangular point, the other rounded. Upper side polished but damaged, lower side with cancellous bone exposed.	Man

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	555.vi	Spatula		bone	11,8	1,7	0,4					Bone spatula, one end with a triangular point, the other missing. Upper side polished, lower side with cancellous bone exposed and not smoothed.	Man
1	555.vii	Spatula		bone	9,4	2,7	0,27					Bone spatula, complete but pen-nib point chipped. The other end is rounded. Both sides polished, cancellous bone almost disappeared on the lower side. Traces of a glossy substance on the surface with vegetable fibres embedded.	Man
1	555.viii	Spatula		bone	12,6	2,55	0,32					Bone spatula, almost complete but damaged on the side and on the upper surface. One end with a pen-nib point, the other quite rounded. Upper side with polished surface, lower side with cancellous bone exposed but smoothed. Spot with thick wear traces.	Man
1	555.ix	Spatula		bone	10,4	1,85	0,25					Bone spatula, elongated point, other end missing. Polished on the upper side, lower side with cancellous bone exposed but smoothed.	Man
1	555.x	Spatula		bone	6,7	1,84	0,1					Bone spatula, one end with a pen-nib point, the other missing. Polished on both sides. Very thin and delicate spatula.	Man
1	555.xi	Spatula		bone	8	1,7	0,22					Bone spatula, complete. One end with a pen-nib point (slightly chipped), the other well rounded. Polished on both sides, but on the lower side, cancellous bone is clearly evident where surface is less worn by use.	Man
1	555.xii	Spatula		bone	6,4	1,8	0,35					Small bone spatula, complete. One end with a triangular point, the other rounded. Quite thick and solid. Upper side polished, lower side with cancellous bone exposed and not smoothed.	Man
1	555.xiii	Spatula		bone	9,7	2,25	0,27					Bone spatula, highly damaged. One end with a chipped pen-nib point, the other missing. Upper side quite polished, lower side with cancellous bone partially exposed and partially obliterated by use.	Man
1	555.xiv	Spatula		bone	10,89	2,3	0,27					Bone spatula, complete. One end with thin, long, pen-nib point, the other roughly rounded. Upper side polished, lower side with cancellous bone almost obliterated by use.	Man
1	555.xv	Spatula		bone	12,2	2,42	0,35					Bone spatula, almost complete. One end with a chipped pen-nib point, the other roughly	Man

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
											rounded. Upper side well polished, lower side with cancellous bone almost obliterated by use. Parallel striation visible on lower side and on the point.	
1	555.xvi	Spatula		bone	6,5	2,38	0,3				Bone spatula, broken. One end with a chipped pen-nib point, the other missing. Upper side well polished, lower side with cancellous bone almost obliterated by use.	Man
1	555.xvii	Spatula		bone	7,7	1,19	0,25				Fragment of bone spatula with triangular point. Quite polished by use.	Man
1	555.xviii	Spatula		bone	14,6	1,7	0,3				Long and narrow bone spatula, complete. One end with a pen-nib point, the other rounded. Surface highly damaged. Convex rib. Upper side polished, lower side with smoothed cancellous bone exposed, almost obliterated in the central part.	Man
1	555.xix	Spatula		bone	5,3	2,6	0,4				Fragment of a bone spatula with broken pen-nib point.	Man
1	555.xx	Spatula		bone	5,6	1,2	0,36				Small fragment of a pen-nib point with evident parallel striation due to wear.	Man
1	555.xxi	Spatula		bone	8,9	1,54	0,26				Bone spatula, highly damaged, one end rounded, the other incomplete. Upper side polished, lower side with cancellous bone exposed except in the central part, where it has been obliterated by use.	Man
1	555.xxii	Spatula		bone	13,2	2,13	0,41				Bone spatula, one end with a pen-nib point, the other broken. Upper side polished, lower side with cancellous bone exposed and not smoothed.	Man
1	555.xxiii	Spatula		bone	9,6	2,9	0,3				Fragment of bone spatula, both ends missing. Upper side polished, lower side with cancellous bone exposed and not smoothed.	Man
1	555.xxiv	Spatula		bone	7,83	1,3	0,24				Small bone spatula, very well shaped. One elongated point, other end rounded. Both sides polished and covered by parallel striation due to wear.	Man
1	555.xxv	Spatula		bone	11,47	1,7	0,25				Bone spatula, complete, both ends rounded. Both sides polished, worn especially near one edge.	Man
1	555.xxvi	Spatula		bone	7,8	1,38	0,2				Bone spatula, both ends missing. Polished on both sides.	Man
1	555.xxvii	Spatula		bone	19,3	2,1	0,3				Very long bone spatula, complete but broken in three pieces. One end with a triangular	Man

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
											point, the other roughly rounded. Damaged surface. Lower side with cancellous bone exposed, partially smoothed. Wear traces evident on all surface, especially on the centre of lower side.	
1	555.xxviii	Spatula		bone	7	1,3	0,3					Elongated point of a spatula, broken. Very well polished on both sides.	Man
1	555.xxix	Spatula		bone	9,8	2,7	0,7					Fragment of a point of spatula. Not cut in half, where broken canceloous bone is clearly visible. Wear traces visible on the point.	Man
1	555.xxx	Spatula		bone	7,3	1,42	2,1					Small bone spatula, complete. One triangular point, other end rounded. Polished on both sides.	Man
1	555.xxxi	Spatula		bone	7,9	1,7	0,17					Small bone spatula, complete. One end with a pen-nib point, the other rounded. Upper side polished, the other with cancellous bone partially exposed (and not smoothed) and partially obliterated by wear (especially in the central part). It clearly shows that cancellous bone was left untreated and when smoothed, it is due to wear.	Man
1	555.xxxii	Spatula		bone	8,1	1,3	0,34					Fragment of bone spatula, well polished on the upper side, lower side with cancellous bone partially disappeared.	Man
1	555.xxxiii	Spatula		bone	6,6	1,3	0,15					Small bone spatula, complete. One end with a triangular point, the other end rounded. Highly polished on the upper side, less on the lower side, especially near the rounded end.	Man
1	555.a	Spatula		bone	10,7	1,84	0,24		Griffith 1910, 51. Petrie 1891, pl. XVIII n. 21.			Bone spatula, long and narrow, broken at both ends and on the side. Upper side quite polished, lower side with smoothed cancellous bone exposed.	Man
1	555.a.ii	Spatula		bone	7,5	1,58	2,24		Griffith 1910, 51. Petrie 1891, pl. XVIII n. 21.			Small bone spatula, complete, slightly chipped on one side. Both ends are rounded. Polished on both sides and covered by parallel striations due to wear. 5 small notches on one edge.	Man
1	555.b.i	Spatula		bone	2,4	0,9	0,17		Griffith 1910, 51. Petrie 1891, pl. XVIII n. 21.			Small fragment of bone spatula, both ends missing.	Man
1	555.b.ii	Spatula		bone	6	1,1	0,2					Bone spatula with one end rounded, the other missing. Upper side quite polished, lower side with cancellous bone exposed.	Man
1	555.b.iii	Spatula		bone	6,3	1,25	0,22					Bone spatula, both ends missing. Highly polished on both sides.	Man

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
1	555.b.iv	Spatula		bone	5,9	1,9	0,35					Bone spatula, broken at both ends. Upper side and edges well polished, lower side with cancellous bone exposed but smoothed.	Man
1	555.b.v	Spatula		bone	6,67	1,8	0,39					Bone spatula, one end rounded, the other missing. Surface quite rough, but were traces well detectable. Lower side with cancellous bone exposed, partially obliterated near one edge.	Man
1	555.b.vi	Spatula		bone	7,5	1,1	0,2					Bone spatula, long and narrow. One end rounded, the other missing. Polished on both sides.	Man
1	555.b.vii	Spatula		bone	10,3	0,9	0,2					Bone spatula, one end rounded, the other missing. Long and narrow. Polished on both sided.	Man
1	555.b.viii	Spatula		bone	10,6	1,23	0,2					Bone spatula, long and narrow. One end rounded, the other missing. Polished on both sides.	Man
1	555.b.ix	Spatula		bone	10,4	1,2	0,2					Bone spatula, long and narrow. One end with a triangular point, the other missing. Polished on both sides.	Man
1	555.b.x	Spatula		bone	8,8	1,73	0,32					Bone spatula, long and narrow. One end with a triangular point, the other missing. Upper side polished, lower side with cancellous bone exposed, more polished near the preserved point.	Man
1	555.b.xi	Spatula		bone	12	1,12	0,17					Bone spatula, complete. Long and narrow, with a triangular point and the other end rounded. Well polished on both sides.	Man
1	555.b.xii	Spatula		bone	10,9	1	0,16					Bone spatula, both ends rounded. Upper side well polished, lower side polished near the ends, less in the middle. cancellous bone partially visible.	Man
1	555.b.xiii	Spatula		bone	14,8	1,6	0,2					Bone spatula, both ends rounded. Upper side well polished, lower side polished near the ends, less in the middle. cancellous bone partially visible. Very curved.	Man
1	EA90071	spatula		bone	14,8	1	0,2					Bone spatula, long and narrow. One end slightly pointed, the other rounded. Extremely polished on both sides. Cosmetic spatula?	BM

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Other tools												
1	522	weaving comb		wood	12,5	10				Griffith 1910, 49.	New Kingdom (?)	Wooden weaving-comb, used to card the flax fibres (?). The wide, flat end is cut into 18 teeth.	Man
1	530	warp spacer		wood	24	2,7	2,9x 2,7			Griffith 1910, 49.	New Kingdom (XVIII-XIX dyn)	Part of a warp spacer, used to set the spacing of the yarn on a loom. Broken at both ends. Groove distance variable, on average 0,75. 27 grooves in total.	Man
1	UC7807	warp spacer		wood	57,5					Thomas 1981, 39.			Petrie
1	UC7808	weaver's slay			106					Thomas 1981, 40.		Broken in three pieces	Petrie
1	UC7824	weaver's slay			40					Thomas 1981, 40.		Broken	Petrie
1	UC27867	rod		wood						Thomas 1981, 35.		Possibly used to support the loom.	Petrie
1	UC7926	peg		wood						Thomas 1981, 39.		Possibly used to support the loom.	Petrie

8.7 DEIR EL-MEDINA

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Spindles												
S. 07526/001	Spindle		Wood	16	1			16			Wooden spindle, point broken. Top with a spiral groove. Linen threads (one S-plyed and one Z-plied) around the top, with a wooden peg to secure the knot. Cylindrical spindle whorl at the top of the shaft, surface with encrustation and white spots.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.5	5.1		0.9x1					
S. 07526/002	Spindle		Wood	19	0.9						Wooden spindle, point broken. Top with a spiral groove. Cylindrical spindle whorl set on the middle of the shaft.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.5	5.3		0.9	19				
S. 07526/003	Spindle		Wood	24.9	0.9			15			Wooden spindle broken at one end, the other tapered to a point. Cylindrical spindle whorl near the preserved point, coarse and irregular.	New Kingdom
	Spindle whorl	Cylindrical	Wood	0.9	5.1		0.9					
S. 07526/004	Spindle		Wood	32.4	0.9			21			Wooden spindle with almost entire length preserved, but both ends chipped. Cylindrical spindle whorl near one end	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.5	4.9		0.8					
S. 07526/005	Spindle		Wood	16.6	1			22			Wooden spindle broken at the bottom, while the other one has a groove. Cylindrical spindle whorl near the top of the shaft, well-shaped, with traces of encrustation. Spindle and spindle whorl have burnt marks.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.6	5.3		1					
S. 07526/006	Spindle Spindle whorl		Wood	10.8	0.9			10			Wooden spindle broken at the bottom, while the other one has a groove. Cylindrical spindle whorl, well-shaped, near the top of the shaft. On the lower surface, there are some black lines, probably painted.	New Kingdom
		Cylindrical	Wood	1.3	4.5		0.9					
S. 07526/007	Spindle		Wood	21	0.8			15			Wooden spindle broken at the top, while the other end has a tapered point.	New Kingdom

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
	Spindle whorl	Cylindrical	Wood	1.2	5.8		0.8x0.9				Cylindrical spindle whorl, near the bottom end. Well-preserved and clean, longitudinal cut of a quite large log/branch	
S. 07526/008	Spindle		Wood	22	0.9			13			Wooden spindle broken at the top, while the other end has a tapered point. Cylindrical spindle whorl, near the bottom end. Both shaft and whorl have traces of encrustation.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.3	4.5		0.9x0.8					
S. 07526/009	Spindle		Wood	16.3	1			15			Wooden spindle broken at the top, while the other end has a tapered point. Cylindrical spindle whorl, attached near the bottom end. Shaft with traces of encrustation, whorl with yellowish spots on the side. Whorl is made from quite a large log/branch. Very clear wood vases on its surface.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.2	5.7		1x0.9					
S. 07526/010	Spindle		Wood	11	0.9			13			Wooden spindle broken at one end, while the other end has a large rounded point. There are no traces of the groove to fasten the thread. Cylindrical spindle whorl very encrusted on the entire surface and placed near the preserved end	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.6	4.8		0.9					
S. 07526/011	Spindle		Wood	14	0.8			12			Wooden spindle, broken at both ends, but at the top there are traces of the groove to fasten the thread. Cylindrical spindle whorl at the top of the shaft; upper surface encrusted, lower surface with a slight coating of foreign material.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1	4.9		0.7x0.8					
S. 07526/012	Spindle		Wood	10.9	0.9			10			Wooden spindle, broken at both ends. Cylindrical spindle whorl at one end of the shaft. Spindle and spindle whorl poorly preserved, probably due to insect damage.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.6	4.9		0.9					
S. 07526/013	Spindle		Wood	10.2	0.9			15			Wooden spindle broken at the top (?) while the other end tapers to a well-shaped point. Cylindrical spindle whorl near the preserved point. Spindle and spindle whorl slightly encrusted.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.9	5		0.9x0.8					
S. 07526/014	Spindle		Wood	9.8	0.8			20			Wooden spindle, broken at the bottom. Flat top is well-preserved, with a deep groove for fastening the thread. Cylindrical spindle whorl near the top of the shaft, encrusted on the upper surface.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.8	4.8		0.8					

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 07526/015	Spindle		Wood	14.7	1.1			20			Wooden spindle, broken at the bottom. Top with a groove to fasten the thread but which is covered by a thick layer of encrustation; encrusted material covers also remains of fibres which are slightly visible. Cylindrical spindle whorl placed near the top of the shaft, very encrusted and with white spots.	New Kingdom
	Spindle whorl	Cylindrical	Wood	2.1	5		1.1					
S. 07526/016	Spindle		Wood	11	1.1			20			Wooden spindle broken at the bottom. Top with a break along the groove used to fasten the thread, but a thick layer of encrustation covers it; it also covers remains of fibres, slightly visible. Cylindrical spindle whorl near the top of the shaft, encrusted on its upper surface.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.6	5.3		1.1					
S. 07526/017	Spindle		Wood	10.7	0.8			10			Wooden spindle broken at both ends. Cylindrical spindle whorl placed near one of the broken ends, heavily encrusted on the upper surface. Small and well-shaped.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.3	4.1		0.8					
S. 07526/018	Spindle		Wood	13.8	1			18			Wooden spindle broken at the bottom. Top with groove covered by a thick layer of encrustation, where there are impressions of fibres. Cylindrical spindle whorl, encrusted on the upper surface.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.7	4.8		0.9x1					
S. 07526/019	Spindle		Wood	10.6	0.9			18			Wooden spindle broken at both ends. Cylindrical spindle whorl near one of the broken ends, slightly encrusted on both surfaces.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.3	5.5		0.8x0.9					
S. 07526/20	Spindle		Wood	18	0.9			21			Wooden spindle broken at the bottom. Cylindrical spindle whorl placed near the top of the shaft, with a thick layer of encrustation on the upper surface. Lower surface clear with marks from manufacture. Inside the hole, there are visible traces of vegetal fibres, which appear on all sides of the hole.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.6	5.6		0.9					
S. 07526/021	Spindle		Wood	16.4	1			16			Wooden spindle broken at both ends. Cylindrical spindle whorl, very thin and well-shaped, placed at the top of the shaft.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1	5.5		1					

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 07526/022	Spindle		Wood	14.5	0.9			19			Wooden spindle broken at the bottom. Top with a groove highly encrusted and with traces of fibres. Cylindrical spindle whorl at the top of the shaft, well-shaped and with a thick layer of encrustation. There are traces of pink paint (?).	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.5	5.1		0.9					
S. 07526/023	Spindle		Wood	27.4	1.3			23			Wooden spindle broken at one end, while the other end, only partially preserved, is thick and rounded. Cylindrical spindle whorl placed near the middle of the shaft with a thin layer of patina. On the shaft, under the spindle whorl, there is an incised mark.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.2	5		1x1.1					
S. 07526/025	Spindle		Wood	14.8	1			22			Wooden spindle, broken at both ends. Cylindrical spindle whorl covered with a thin layer of patina on both sides.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.5	5.3		1					
S. 07526/026	Spindle		Wood	12.5	1			18			Wooden spindle broken at the bottom, while the other end is flat with a groove to fasten the thread. Near the groove, the shaft is heavily encrusted. Cylindrical spindle whorl near the top of the shaft, with a thick layer of encrustation on the upper surface and on the side.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.6	5.4		1					
S. 07526/027	Spindle		Wood	20.3	0.9			19			Wooden spindle almost complete, part of the shaft is missing, but the entire length is preserved. Flat top with a long spiral groove. The shaft is encrusted and has a thread stuck in the hole of the spindle whorl. The thread is made of linen, is plyed and has an S-twist. On the shaft, there are traces of burning. Cylindrical spindle whorl, well-shaped, near the top of the spindle	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.5	5.5		0.9					
S. 07526/028	Spindle		Wood	7.6	0.9			8.8			Wooden spindle missing the lower end, while the top is rounded and has a spiral groove. Cylindrical spindle whorl, very worn, placed near the top of the shaft. Both shaft and spindle whorl bear traces of encrustation.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.1	4.4		0.9					
S. 07526/029	Spindle		Wood	7.7	0.9			10.5			Wooden spindle broken at both ends. Cylindrical spindle whorl, which should	New Kingdom

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
	Spindle whorl	Cylindrical	Wood	1.2	5.1		0.8				have been near the top of the shaft. Both shaft and spindle whorl have traces of encrustation.	
S. 07526/030	Spindle		Wood	7.7	1.1			16			Wooden spindle broken at both ends. Cylindrical spindle whorl, which should have been near the top of the shaft. Both shaft and spindle whorl have traces of encrustation.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.6	5.2		1.1x1					
S. 07526/031	Spindle		Wood	5.1	0.9			16			Wooden spindle broken at the end of the shaft, while the top is flat and it presents a cylindrical groove. Shaft is broken immediately under the spindle whorl; on the side of the whorl there are two incisions. Furthermore, the spindle whorl has two cracks across it, one of which is very deep and almost arrives at its hole	New Kingdom
	Spindle whorl	Cylindrical	Wood	5	0.8		0.9					
S. 07526/032	Spindle		Wood	6.4	0.9			16			Wooden spindle broken at the bottom, while top is flat and has a groove. Under the spindle whorl, around the shaft, is still preserved part of a linen yarn: it is S-plyed, its single twist is not visible. Beside the yarn, there are also non-spun fibres. A cylindrical spindle whorl sits near the top of the shaft; it has a break across it and traces of yellow paint (?) on its upper surface	New Kingdom
	Spindle whorl	Cylindrical	Wood	5.8	0.9		0.9					
S. 07526/033	Spindle		Wood	14.6	0.7			13			Wooden spindle broken at the bottom, top rounded with a groove to fasten the thread. On the upper part of the shaft there is a thread which holds a wooden peg; yarn isplied with a Z-twist, direction of single twist is not visible. Cylindrical spindle whorl placed near the top of the shaft, with a whitish layer of encrustation on the upper surface, while the lower surface is clean. It is secured to the spindle by fibres and/or wooden fragments visible inside the hole.	New Kingdom
	Spindle whorl	Cylindrical	Wood	4.5	1.5		0.7					
S. 07526/034	Spindle		Wood	17.4	0.9			18			Wooden spindle broken at the bottom, with rounded top and groove to fasten the thread. Near the top, under the spindle whorl, there is a single thread, S-plied, single twist not visible. A cylindrical spindle whorl is placed near the top of the	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.4	5.3		0.9					

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
											shaft, with a thick layer of encrustation on its upper surface, while the lower surface is clean with an incised mark.	
S. 07526/035	Spindle		Wood	15	0.9			15			Wooden spindle broken at the bottom. Top was likely broken in ancient times, as a thread is fastened to the break; this thread holds a wooden peg and is S-plied, single twist not visible. The yarn is quite encrusted and partly stuck in the hole of the spindle whorl. Cylindrical spindle whorl placed near the top of the shaft, with a thick layer of encrustation on the upper surface, while lower surface and side show a thin layer of patina. From the lower side of the hole emerges a yarn.	New Kingdom
	Spindle whorl	Cylindrical	Wood	5.2	1.1		0.9					
S. 07526/036	Spindle		Wood	13.3	0.9			15			Wooden spindle broken at the bottom, with flat top and an incised groove. Cylindrical spindle whorl near the top of the shaft, small and thick, with a lateral break, and a very worn surface.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.7	4.4		0.8x0.9					
S. 07526/037	Spindle		Wood	12.9	1			15			Wooden spindle broken at the bottom, with a flat top and an incised groove. Cylindrical spindle whorl placed near the top of the shaft, with upper surface covered by a thick coat of encrustation.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.4	4.8		0.9x1					
S. 07526/038	Spindle		Wood	14.4	0.9			16			Wooden spindle broken at the bottom, with a flat top and a groove to fasten the thread. Shaft grows thicker towards the break. Cylindrical spindle whorl placed near the top of the shaft, with the upper surface covered by a thick layer of encrustation with whitish efflorescence.	
	Spindle whorl	Cylindrical	Wood	1.8	5.1		0.9					
S. 07526/039	Spindle		Wood	15.7	0.9			16			Wooden spindle broken at the bottom, with a flat top and an incised groove. On the shaft, under the spindle whorl, there are traces of unspun fibres, which make two complete rotations, but there is no twist seen in them. Cylindrical spindle whorl placed near the top of the shaft, with the upper surface highly encrusted. Deep break on the side	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.3	4.8		0.9					

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 07526/040	Spindle		Wood	11.7	0.8			14			Wooden spindle broken at the bottom, with rounded top and incised groove. Cylindrical spindle whorl near the top of the shaft, not encrusted.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.8	5.5		0.8					
S. 07526/041	Spindle		Wood	10	0.8			12			Wooden spindle broken at the bottom, with a flat top and an incised groove. On the shaft a mark is incised. A cylindrical spindle whorl is set near the top of the shaft; encrusted on the upper surface	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.2	4.8		0.8					
S. 07526/042	Spindle		Wood	9.7	0.9			13			Wooden spindle broken at both ends with fibre traces on the shaft. Cylindrical spindle whorl near the top (?) of the shaft, with one surface covered by a thick layer of encrustation.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.4	4.8		0.9					
S. 07526/043	Spindle		Wood	9.4	0.9			18			Wooden spindle broken at both ends. Cylindrical spindle whorl, with one surface covered by a thick layer of encrustation.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.8	5.3		0.8x0.9					
S. 07526/044	Spindle		Wood	8.9	0.7			16			Wooden spindle broken at both ends. Cylindrical spindle whorl attached, with one surface covered by a thick layer of whitish encrustation.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.6	5.2		0.7					
S. 07526/045	Spindle		Wood	15.4	1.2			16			Wooden spindle broken at the bottom, with flat top and an incised groove. Cylindrical spindle whorl near the top of the shaft covered by a thin patina	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.4	5.2		1.2					
S. 07526/046	Spindle		Wood	19	1			17			Wooden spindle broken at the bottom, while top is broken along the groove used to fasten the thread. Cylindrical spindle whorl near the top of the shaft, with a large hole on the side, probably produced by insects.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.6	5.4		0.9x1					
S. 07526/047	Spindle		Wood	21.4	1			14			Wooden spindle almost complete, point missing, while top is broken along the groove to fasten the thread. A cylindrical spindle whorl is placed near the top of the shaft, with clean surfaces and four radial incisions on its lower side.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.1	5.1		1					

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 07526/048	Spindle		Wood	21.7	1			14			Wooden spindle broken at the bottom, with rounded top and a groove to fasten the yarn. Cylindrical spindle whorl on the top of the shaft; on the lower surface there is a mark.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.4	5.5		0.9x1					
S. 07526/049	Spindle		Wood	5.4	1			17			Wooden spindle broken at both ends. Cylindrical spindle whorl highly worn but clear of encrustation. On one side there are traces of a pinkish paint.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.8	5.3		1					
S. 07526/050	Spindle		Wood	5.7	0.8			14.4			Wooden spindle broken immediately under the spindle whorl, flat top preserved with an incised groove to fasten the thread. Cylindrical spindle whorl placed near the top of the shaft, quite thick and with a thin layer of patina on the lower surface.	New Kingdom
	Spindle whorl	Cylindrical	Wood	2.1	4.5		0.8					
S. 07526/051	Spindle		Wood	11.1	1.2			14			Wooden spindle broken at the bottom, with flat top and incised groove. Cylindrical spindle whorl placed near the top, covered by a thin layer of patina.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.5	6.1		0.8					
S. 07526/052	Spindle		Wood	11	0.9			15			Wooden spindle broken at the bottom, with flat top and incised groove. Cylindrical spindle whorl placed near the top, covered by a thin layer of patina. Small wedges of wood in the hole which fastens the spindle whorl.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.6	5.1		0.9					
S. 07526/053	Spindle		Wood	7.6	0.7			12			Wooden spindle broken at both ends. Cylindrical spindle whorl, quite thick and clean. Wood slightly warped	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.9	4.8		0.7					
S. 07526/054	Spindle		Wood	8.9	0.8			12.8			Wooden spindle whorl broken at the bottom, with rounded but chipped top and an incised groove to fasten the threads. Cylindrical spindle whorl placed near the top of the shaft, quite encrusted and with a mark incised on the lower surface.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.5	5.5		0.8					
S. 07526/055	Spindle		Wood	18	0.9			21			Wooden spindle broken at both ends, but most of its shaft is preserved. At the top, there are still traces of the groove to fasten the fibres. Cylindrical spindle whorl placed	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.5	5.2		0.9					

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
											near the top of shaft, quite encrusted on its whole surface.	
S. 07526/056	Spindle		Wood	11	0.8			14			Wooden spindle broken at one end, while the other ends with a sharp point. Spindle whorl placed near the break and has two short incised lines on one surface.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.5	5		0.8					
S. 07526/057	Spindle		Wood	19.1	0.8			22			Wooden spindle broken at both ends, the upper one along the groove to fasten the thread. Cylindrical spindle whorl placed near the top of the shaft, slightly encrusted and with a lateral break	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.3	4.4		0.8					
S. 07526/058	Spindle		Wood	10.9	0.9			13			Wooden spindle broken at the bottom, with rounded top and an incised spiral groove to fasten the fibres. Cylindrical spindle whorl placed near the top of the shaft, covered by a very thin patina. On the lower surface some marks (?) are incised	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.1	5.8		0.9					
S. 07526/059	Spindle		Wood	11.4	0.7			11			Wooden spindle broken at the bottom, with rounded top and a spiral groove to fasten the thread. Cylindrical spindle whorl placed near the top of the shaft, covered by a thin layer of patina. On the lower surface there are traces of the manufacturing process.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.2	4.2		0.6					
S. 07526/060	Spindle		Wood	16.9	0.9			16			Wooden spindle broken at both ends, but most of the shaft probably preserved. Cylindrical spindle whorl placed near one end of the shaft, covered by a thin layer of patina and with a lateral break. Hole warped on its edges. Flax fibres are visible in the lower part of the hole.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.3	5.7		0.9					
S. 07526/061	Spindle		Wood	21.7	0.9			13			Wooden spindle broken at the bottom, with rounded top and a very well-preserved spiral groove. Shaft almost complete. Cylindrical spindle whorl placed near the top of the shaft, covered by a thin layer of patina on the upper surface and with a lateral break.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.3	5.2		0.9					
S. 07526/062	Spindle		Wood	15.4	0.8			15			Wooden spindle broken at one end, the other seems to finish with a sharp point. Cylindrical spindle whorl placed near	New Kingdom

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
	Spindle whorl	Cylindrical	Wood	1.5	4.8		0.8				sharp tip and covered by a thin layer of patina. On this side there is an incised mark.	
S. 07526/063	Spindle		Wood	11.7	1			16			Wooden spindle broken at the bottom, while top is flat with an incised groove on it. Cylindrical spindle whorl placed near the top of the shaft; on the lower surface, there is an incised mark	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.6	4.6		0.9					
S. 07526/064	Spindle		Wood	6.8	0.8			12			Wooden spindle broken at the bottom, with rounded top and spiral groove. Cylindrical spindle whorl placed near the top of the shaft covered by a thin layer of patina.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.4	4.9							
S. 07526/065	Spindle		Wood	9.2	1			15			Wooden spindle broken at both ends. Near one of the break there is an incised mark. Cylindrical spindle whorl placed near the top of the shaft encrusted on the upper surface with whitish material. Between shaft and spindle whorl there are traces of vegetable fibres	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.4	5.5		1					
S. 07526/066	Spindle		Wood	11.4	0.8			17			Wooden spindle broken at the bottom, while the other end is rounded, with a spiral groove, but highly encrusted. Cylindrical spindle whorl placed near the top of the shaft with a thick layer of encrustation on the upper surface. Some incisions (wear marks?) on the lower surface.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.8	5.2		0.8					
S. 07526/067	Spindle		Wood	10	1			18			Wooden spindle broken at the bottom with a rounded end with an incised spiral groove. Cylindrical spindle whorl placed near the top of the shaft, slightly encrusted and cracked	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.9	5.1							
S. 07526/068	Spindle		Wood	6.6	0.9			10.5			Wooden spindle broken at both ends. Cylindrical spindle whorl, large and flat, with some marks on one surface, some of them covered by a whitish substance.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.1	5.1		0.9					
S. 07526/069	Spindle		Wood	9.9	0.9			14			Wooden spindle broken at the bottom, with flat top and an incised spiral groove. Wood perfectly preserved. Cylindrical spindle whorl placed near the top of the	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.2	5.4		0.7					

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
											shaft covered by a thin patina and some traces of a pinkish paint	
S. 07526/070	Spindle		Wood	15.6	1			15			Wooden spindle broken at both ends, with rounded top and spiral groove. Thick traces of encrustation on the top. Cylindrical spindle whorl placed near the top of the shaft, encrusted on the upper surface	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.5	4.8		1					
S. 07526/071	Spindle		Wood	8.6	0.9			14			Wooden spindle broken at both ends. Cylindrical spindle whorl placed near the top of the shaft with encrustation on the upper surface	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.5	5.6		0.7					
S. 07526/072	Spindle		Wood	8.8	0.8			12			Wooden spindle broken at the bottom, while the other end is slightly pointed and has a small groove to fasten the thread. Cylindrical spindle whorl placed near the top of the shaft with lateral breaks. Encrusted on the upper surface.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.8	4		0.8					
S. 07526/073	Spindle		Wood	3.9	0.8			8.5			Wooden spindle broken at the bottom immediately under the spindle whorl, with a flat top and a groove to fasten the thread. Cylindrical spindle whorl, large and flat, encrusted on the upper surface. On the lower surface are traces of painted radial lines	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.1	5.3		0.8					
S. 07526/074	Spindle		Wood	22	1			18			Complete wooden spindle, pointed bottom and rounded top. On the top, there is a long spiral groove. Cylindrical spindle whorl placed near the top of the shaft	New Kingdom
	Spindle whorl	Cylindrical	Wood	2.1	5		1					
S. 07526/075	Spindle		Wood	12.7	1			17			Wooden spindle broken at the bottom, while top is rounded with a spiral groove. Cylindrical spindle whorl placed near the top of the shaft. Cylindrical spindle whorl, not very well shaped, is completely clean and with a mark incised on the lower surface.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.4	5.5		1					
S. 07526/076	Spindle		Wood	18.8	0.8			14			Wooden spindle broken at the top (probably), while the other end tapered to a rounded point. Cylindrical spindle whorl placed almost at the middle of the	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.1	4.6		0.8					

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
											surviving length of the shaft, quite near to the point. Small hole on one surface	
S. 07526/077	Spindle		Wood	14.6	0.9			16			Wooden spindle broken at both ends. Cylindrical spindle whorl placed near the top of the shaft (only partly preserved) with encrustation on the upper surface	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.2	5.2		0.9					
S. 07526/078	Spindle		Wood	14.2	0.9			18			Wooden spindle broken at the bottom, with rounded top and an incised spiral groove. Cylindrical spindle whorl placed near the top of the shaft, with a very thick layer of encrustation, which partly covers the upper part of the shaft too.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.2	5.1		0.9					
S. 07526/079	Spindle		Wood	7.8	0.7			15			Wooden spindle broken at the bottom, with a very well-preserved flat top and a spiral groove. Cylindrical spindle whorl, not perfectly rounded, placed near the top of the shaft and slightly encrusted on the upper surface.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.4	5.3		0.7					
S. 07526/080	Spindle		Wood	10.3	0.8			13			Wooden spindle broken at the bottom, with top that still preserves the groove to fasten the thread. Wood very worn. Cylindrical spindle whorl placed near the top of the shaft, chipped laterally.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.3	4.9		0.8					
S. 07526/081	Spindle		Wood	8.5	0.7			9			Wooden spindle broken at both ends. Well-shaped cylindrical spindle whorl.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.3	4.6		0.7					
S. 07526/082	Spindle		Wood	11.1	0.9			8			Wooden spindle broken at the bottom, while top is partially broken along the spiral groove. This groove still preserves some vegetable fibres and threads under a layer of encrustation. Cylindrical spindle whorl placed near the top of the shaft, upper surface encrusted, lower surface clean with traces of manufacture and three small holes (probably caused by insects).	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.4	5.4		0.9					
S. 07526/083	Spindle		Wood	8.6	0.8			13			Wooden spindle broken at the bottom, with rounded top and large, spiral groove	New Kingdom

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
	Spindle whorl	Cylindrical	Wood	1.4	5.3		0.8				to fasten the thread. Cylindrical spindle whorl placed near the top of the shaft with a thin patina on its surface.	
S. 07526/084	Spindle		Wood	9	0.7			9.8			Wooden spindle broken at the bottom, with a flat top and a groove. Cylindrical spindle whorl placed near the top of the shaft, one face encrusted, the other covered by a thin patina.	
	Spindle whorl	Cylindrical	Wood	1.4	4.4		0.7					
S. 07526/085	Spindle		Wood	4.6	0.8			15			Wooden spindle broken at the bottom, immediately under the spindle whorl, rounded top with a groove. Cylindrical spindle whorl placed near the top of the shaft, with a very thick layer of encrustation, which covers its upper surface and part of the shaft. Traces of fibres under the encrustation and a small fragment of wood attached to it. Lower surface covered with just a thin patina	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.4	5.2		0.8					
S. 07526/086	Spindle		Wood	12.2	0.7			11.7			Wooden spindle broken at the bottom and rounded top with spiral groove, which is much encrusted. Traces of vegetable fibres under the encrustation. Cylindrical spindle whorl placed near the top of the shaft, with a thick layer of encrustation on the upper surface, while a thin patina covers the lower surface	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.5	4.6		0.7					
S. 07526/087	Spindle		Wood	10.2	0.9			18.5			Wooden spindle broken at the bottom, with a flat top and a cylindrical groove. Cylindrical spindle whorl once placed at the top of the shaft (there is still an area of different colour on the wood), now near the break. Surfaces quite clean.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.6	5.4		0.9					
S. 07526/088	Spindle		Wood	13	0.7			15			Wooden spindle broken at both ends. Cylindrical spindle whorl placed near one of the breaks in the shaft and slightly encrusted.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.2	5.6		0.7					
S. 07526/089	Spindle		Wood	10	0.7			12			Wooden spindle broken at both ends. Cylindrical spindle whorl placed near one of the breaks in the shaft, clean but extremely worn. Incised mark on one surface.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.1	5.5		0.7					

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 07526/090	Spindle		Wood	8.2	0.8			11			Wooden spindle broken at the bottom, with rounded top and spiral groove to fasten the thread. The shaft's wood has been extracted from a large log, which is evident from the growth rings. Cylindrical spindle whorl placed near the top of the shaft, with clear surfaces.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.4	5		0.8					
S. 07526/091	Spindle		Wood	9.7	0.8			16			Wooden spindle broken at the bottom, with flat top and a spiral groove. Wood and top well preserved. Cylindrical spindle whorl placed near the top of the shaft, with the upper surface quite worn.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.4	5.3		0.8					
S. 07526/092	Spindle		Wood	17.8	1			21			Wooden spindle broken at the bottom, with a flat top, partially broken along the groove. Covered by a thick layer of encrustation. Cylindrical spindle whorl placed near the top of the shaft, very encrusted on the upper surface, less on the lower	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.6	5.1		0.8					
S. 07526/093	Spindle		Wood	21	1			20			Wooden spindle broken and cracked at the bottom, with a flat top and a long, almost vertical, groove. Cylindrical spindle whorl placed near the top of the shaft, with a thick layer of encrustation.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.7	5.7		0.9x1					
S. 07526/094	Spindle		Wood	15	0.9			19			Wooden spindle broken at the bottom, with a flat top and a small groove. Cylindrical spindle whorl placed near the (probable) centre of the shaft, with a large lateral break. A thick layer of encrustation covers the upper surface while the lower surface is clean.	New Kingdom
	Spindle whorl	Cylindrical	Wood	1.7	5.6		0.9					
S. 07526/095	Spindle		Wood	18.4	1.1			19			Wooden spindle broken and cracked at the bottom, with a flat top and a spiral groove. The spindle has been extracted from a large log, there are 3-4 visible rings. Cylindrical spindle whorl placed near top of the shaft, highly worn. Spindle and spindle whorl are made of different woods.	
	Spindle whorl	Cylindrical	Wood	1.8	5.4		0.9x1					
S. 07526/096	Spindle		Wood	11.3	1.1			17			Wooden spindle broken at the bottom, with a rounded top and a spiral groove. Cylindrical spindle whorl placed near the top of the shaft. Mark on the upper surface	
	Spindle whorl	Cylindrical	Wood	1.6	5.4		0.9					

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 07526/097	Spindle		Wood	9.5	1			15			Wooden spindle broken at the bottom, with a flat top and a spiral groove. Cylindrical spindle whorl placed near the top of the shaft, clean and with evident wood pores.	
	Spindle whorl	Cylindrical	Wood	1.2	5.5		0.9					
S. 07526/098	Spindle		Wood	8.1	1.1			11			Wooden spindle broken at both ends. Cylindrical spindle whorl, quite irregular in shape with whitish encrustation on the surface.	
	Spindle whorl	Cylindrical	Wood	1.4	4.7		1					
S. 07526/099	Spindle		Wood	9.8	1			15			Wooden spindle broken at the bottom end, with a rounded top and a spiral groove. Head covered by encrustation and whitish efflorescence. Cylindrical spindle whorl placed near the top of the shaft. On the upper part of the shaft there is a thread preserved for a few centimetres, which continues in the hole of the spindle whorl. Thread is S-plyed.	
	Spindle whorl	Cylindrical	Wood	1.7	4.9		0.9					
S. 07526/100	Spindle		Wood	8.9	1			13			Wooden spindle broken at the bottom, with an incomplete top and a spiral groove. Cylindrical spindle whorl placed near the top of the shaft, quite clean and with visible wood pores.	
	Spindle whorl	Cylindrical	Wood	1.5	4.8		0.8x0.9					
S. 07526/101	Spindle		Wood	5.6	1.1			16			Wooden spindle broken at both ends. Cylindrical spindle whorl, well-shaped, with one encrusted side and the other one clean.	
	Spindle whorl	Cylindrical	Wood	1.5	5.4		0.9x1.1					
S. 07526/102	Spindle		Wood	3.8	0.8			13			Wooden spindle broken at the bottom, with a flat top and a spiral groove. Cylindrical spindle whorl placed near the top of the shaft, with the upper surface very encrusted. On the lower surface a mark is incised. Chipped on the side.	
	Spindle whorl	Cylindrical	Wood	1.1	5.1		0.8					
S. 07526/103	Spindle		Wood	4.2	0.8			12			Wooden spindle broken at both ends, but a spiral groove is preserved. Cylindrical spindle whorl placed near the top of the shaft, chipped on the side. The upper surface is encrusted while the lower one is clean and wood pores are visible	
	Spindle whorl	Cylindrical	Wood	1.5	5		0.8					

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 07526/104	Spindle		Wood	5.8	0.9			13			Wooden spindle broken at both ends. Cylindrical spindle whorl slightly encrusted on both sides.	
	Spindle whorl	Cylindrical	Wood	1.2	5.7		0.9					
S. 07526/105	Spindle		Wood	5.7	0.8			12			Wooden spindle broken at the bottom, with a rounded top and a spiral groove. Domed spindle whorl, with large and thick engraving on the lower surface, along the external diameter. It is placed near the top of the shaft. Upper part of the spindle and spindle whorl show a thick layer of encrustation, from which traces of fibres appear. In the hole there are wedges to fasten the spindle whorl to the shaft.	
	Spindle whorl	Cylindrical	Wood	2.1	4.8		0.9					
S. 07526/107	Spindle		Wood	3.7	0.6			14.5			Wooden spindle broken at the bottom, with a rounded top and a spiral groove. Cylindrical spindle whorl, roughly cut, placed near the top of the shaft. Encrusted on the upper surface, clean on the other side with evident traces of manufacture.	
	Spindle whorl	Cylindrical	Wood	1.6	5		0.6					
S. 07526/108	Spindle		Wood	21.1	1.1			19			Wooden spindle, complete. Flat top with a very long spiral groove to fasten fibres and a pointed end. Shaft shows several spots, probably due to mold. Cylindrical spindle whorl, remarkably worn, placed near top of the shaft, with encrustations on the upper surface and several holes probably caused by insects. Inside the hole, there are wedges and remains of threads. On the side of the spindle whorl a textile fragment is preserved, probably attached by encrustation. It measures 1.72x1.91 cm, it is a tabby weave with a count of 13x10 threads per cm.2. Thread is S-twist	
	Spindle whorl	Cylindrical	Wood	2.2	5.8		1.3x1.1					
S. 07526/109	Spindle		Wood	25.5	0.9			21			Wooden spindle broken at the bottom, with a flat top and a spiral groove. Shaft almost complete. Cylindrical spindle whorl placed near the top of the shaft, with both surfaces covered by a thin patina.	
	Spindle whorl	Cylindrical	Wood	1.3	5.6		0.8x0.9					
S. 07527/05	Spindle		Wood	7	1.1			19			Wooden spindle broken at the bottom near the spindle whorl, with a flat top and a	

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
	Spindle whorl	Cylindrical	Wood	1.9	5.2		1.1				spiral groove. Cylindrical spindle whorl placed near the top of the shaft, with encrusted upper surface and a mark incised on the lower surface.	
S. 07527/08	Spindle		Wood		0.8			15			Small fragment of wooden spindle broken at both ends. Cylindrical spindle whorl with lateral crack filled by a little wooden peg. Other smaller cracks are also present. Mark incised on the lower surface.	
	Spindle whorl	Cylindrical	Wood	1.2	5.4		0.8					
S. 07527/12	Spindle		Wood	4.6	0.8			10.7			Wooden spindle broken at the bottom, immediately under the spindle whorl, with a rounded top and a spiral groove. Cylindrical spindle whorl placed near the top of the shaft, with encrusted upper surface and several marks incised on the lower surface.	
	Spindle whorl	Cylindrical	Wood	1.7	5		0.8					
S. 07527/15	Spindle		Wood	5.1	1			15			Wooden spindle broken at the bottom, immediately under the spindle whorl, with cracked top and a spiral groove. Cylindrical spindle whorl placed near the top of the shaft, with worn upper surface and a lotus flower incised on the lower surface	
	Spindle whorl	Cylindrical	Wood	1.7	4.9		1					
S. 07528/049	Spindle		Wood	3.2	0.7			11			Small fragment of wooden spindle broken at both ends. Cylindrical spindle whorl, well-shaped, with one surface more encrusted than the other one.	
	Spindle whorl	Cylindrical	Wood	1.3	5		0.7					
S. 07528/052	Spindle		Wood	nn	nn			11			Small fragment of wooden spindle broken at both ends. Cylindrical spindle whorl, well-shaped, with one surface encrusted	
	Spindle whorl	Cylindrical	Wood	1.4	5.1							
S. 07528/054	Spindle		Wood	1.8	0.9			13			Small fragment of wooden spindle broken at both ends. Cylindrical spindle whorl, warped, with a long radial crack to the central hole. Covered by a thin patina.	
	Spindle whorl	Cylindrical	Wood	1.8	5.3		0.9					
S. 07528/065	Spindle		Wood	2.2	0.9			11			Small fragment of spindle broken at both ends. Cylindrical spindle whorl covered by encrustation.	
	Spindle whorl	Cylindrical	Wood	1.6	5		0.9					

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 07528/067	Spindle		Wood	nn	nn			13			Cylindrical spindle whorl with a fragment of spindle preserved inside the hole. Encrusted surface with whitish efforescences.	
	Spindle whorl	Cylindrical	Wood	5.2	1.2		0.8					
S. 07528/069	Spindle		Wood	2.3	0.9			14			Small part of wooden spindle broken at both ends. Cylindrical spindle whorl covered on one surface by encrustation and whitish efflorescences	
	Spindle whorl	Cylindrical	Wood	1.3	5.3		0.9					
S. 07528/071	Spindle		Wood	nn	0.9			8			Small fragment of spindle broken at both ends. Cylindrical spindle whorl with long radial fracture, covered by a thin patina	
	Spindle whorl	Cylindrical	Wood	1.1	5.4		0.9					
S. 07528/072	Spindle		Wood	3.4	0.9			11			Small fragment of wooden spindle broken at both ends with traces of a spiral groove. Cylindrical spindle whorl, complete, covered by encrustation.	
	Spindle whorl	Cylindrical	Wood	1.1	5.5		0.9					
S. 07528/080	Spindle		Wood	1.3	0.9			13			Small fragment of wooden spindle broken at both ends. Cylindrical spindle whorl covered by encrustation	
	Spindle whorl	Cylindrical	Wood	1.5	5.1		0.9x0.7					
S. 07528/084	Spindle		Wood	1.4	0.9			12			Small fragment of wooden spindle broken at both ends. Cylindrical spindle whorl encrusted on one side, covered by a thin patina and whitish efflorescence on the other. Incised mark.	
	Spindle whorl	Cylindrical	Wood	1.4	4.9		0.9					
S. 07528/085	Spindle		Wood	3.3	0.7			14			Small fragment of wooden spindle broken at both ends. Cylindrical spindle whorl, warped, with a radial crack to the hole.	
	Spindle whorl	Cylindrical	Wood	2	4.5		0.7					
S. 07528/086	Spindle		Wood	3.7	1.1			16			Small fragment of wooden spindle with a groove for fastening the fibres still preserved. Cylindrical spindle whorl encrusted on the surface, with traces of vegetable fibres inside the hole.	
	Spindle whorl	Cylindrical	Wood	1.7	5.8		1x1.1					
S. 07528/087	Spindle		Wood	2.4	1			12				

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
	Spindle whorl	Cylindrical	Wood	1	5.4		0.9				Small fragment of wooden spindle broken at both ends. Cylindrical spindle whorl with traces of manufacture	
S. 07528/088	Spindle		Wood	2.8	1			9			Small fragment of wooden spindle broken at both ends. Cylindrical spindle with lateral crack and encrusted surface	
	Spindle whorl	Cylindrical	Wood	1	5.2		1.4					
S. 07528/090	Spindle		Wood		0.8			11.6			Small fragment of wooden spindle broken at both ends. Cylindrical spindle whorl, warped, with traces of encrustation	
	Spindle whorl	Cylindrical	Wood	1.9	4.9		0.8					
S. 07528/091	Spindle		Wood	5.2	1.1			17			Fragment of wooden spindle broken at both ends. Cylindrical spindle whorl, warped, with traces of encrustation.	
	Spindle whorl	Cylindrical	Wood	1.7	5.6		0.9					
S. 07528/094	Spindle		Wood	4	0.7			5.7			Small fragment of wooden spindle broken at both ends. Cylindrical spindle whorl, warped, with traces of encrustation. Five thin radial lines incised near the edge, perhaps a mark	
	Spindle whorl	Cylindrical	Wood	1	4.7		0.7					
S. 07528/095	Spindle		Wood	3.5	0.9			21.8			Small fragment of wooden spindle broken at both ends. Cylindrical spindle whorl slightly encrusted	
	Spindle whorl	Cylindrical	Wood	1.8	5.2		0.9					
S. 07528/097	Spindle		Wood	3.1	0.9			13			Small fragment of wooden spindle broken at both ends. Cylindrical spindle whorl with a thin layer of encrustation.	
	Spindle whorl	Cylindrical	Wood	2	4.8		0.9					
S. 07528/098	Spindle		Wood	1	0.6			11			Small fragment of wooden spindle broken at both ends. Cylindrical spindle whorl with a radial crack.	
	Spindle whorl	Cylindrical	Wood	1.9	4.9		0.6					
S. 07528/100	Spindle		Wood	3.4	0.7			13.8			Small fragment of wooden spindle broken at both ends. Cylindrical spindle whorl covered by a thick layer of encrustation on one side while the other is clean.	
	Spindle whorl	Cylindrical	Wood	1.6	5.2		0.7					

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 07528/101	Spindle		Wood	2.5	0.9			14.8			Small fragment of wooden spindle broken immediately under the spindle whorl. Top preserved with groove to fasten fibres. Cylindrical spindle whorl with encrustation and two radial cracks.	
	Spindle whorl	Cylindrical	Wood	1.3	5.5		0.9					
S. 07528/102	Spindle		Wood	3.8	0.7			14.6			Small fragment of wooden spindle broken at both ends. Cylindrical spindle whorl with a thin layer of patina, made of different wood from that of the shaft.	
	Spindle whorl	Cylindrical	Wood	1.5	5		0.7					
S. 09978/1	Spindle		Wood	20.3	1			20			Wooden spindle, well-preserved, with only the bottom missing. Flat top with a coarse groove with which to fasten fibres. Cylindrical spindle whorl, thicker than most others. It shows a crack on the side with a peg in it, probably an ancient restoration. Wooden wedges are quite visible, which fasten the whorl to the shaft. Under one wedge a thread is caught, it is S-plyed.	
	Spindle whorl	Cylindrical	Wood	1.9	4.4		1					
S. 09978/2	Spindle		Wood	12.5	0.9			11			Wooden spindle broken at both ends. Cylindrical spindle whorl covered by a whitish substance on one surface and on the side.	
	Spindle whorl	Cylindrical	Wood	1.6	5.1		0.9					
S. 09978/4	Spindle		Wood	15.8	0.8			14			Wooden spindle badly preserved. Tapering towards one end with no traces of the groove. Cylindrical spindle whorl with some cracks and holes. Surface covered by encrustation and a white-yellowish substance. On one side an incised mark is present. Whorl complete but not firmly fastened on the shaft.	
	Spindle whorl	Cylindrical	Wood	2.1	4.9		0.8					
S. 09978/5	Spindle		Wood	27	1			24			Wooden spindle well preserved. Flat top with a spiral groove to fasten the thread. It is covered by a thick layer of encrustation which leaves the groove clean. Cylindrical spindle whorl placed near top of the shaft and covered by a thick layer of encrustation and whitish efflorescence.	
	Spindle whorl	Cylindrical	Wood	1.4	5.4		1					
S. 09978/6	Spindle		Wood	17.4	0.9			15			Wooden spindle broken at the bottom, with flat top and a spiral groove to fasten the thread. Cylindrical spindle whorl	

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
	Spindle whorl	Cylindrical	Wood	1.4	5.5		0.9				placed near the top of the shaft and deep lateral break. Upper surface encrusted, lower surface quite clean. Hole of the whorl irregular and it is fastened to the shaft with wooden wedges and vegetable fibres.	
S. 09978/7	Spindle		Wood	35.8	1.2			27			Wooden spindle, complete and well-preserved. Flat top with a spiral groove to fasten the thread, while the other end tapers to a point. Traces of brown encrustation are preserved on the top, on the shaft and inside the groove. A cylindrical spindle whorl is placed near the top of the shaft, is chipped and with a lateral hole.	
	Spindle whorl	Cylindrical	Wood	1.4	4.6		1.2					
S. 09978/8	Spindle		Wood	23.8	0.8			22			Wooden spindle broken at the bottom. Pointed top with a spiral groove to fasten the thread. Both spindle and spindle whorl are covered by a thick layer of encrustation. Cylindrical spindle whorl placed near the top of the shaft with a small hole on the lower surface.	
	Spindle whorl	Cylindrical	Wood	1.6	5.4		0.8					
S. 09978/9	Spindle		Wood	19.9	1			16			Wooden spindle, badly preserved and broken at the bottom. Flat top with a spiral groove to fasten the thread. Cylindrical spindle whorl placed near the top of the shaft, the whorl has a large lateral break and a hole.	
	Spindle whorl	Cylindrical	Wood	1.3	5.4		1					
S. 09978 /1 (bis)	Spindle		Wood	30.5	1.1			34	Donadoni Roveri 1988, 109. Donadoni Roveri, 2001, 18. Donadoni Roveri, 1987, 188, tav. 260		Wooden spindle, badly preserved and broken at the bottom. Flat top with a spiral groove to fasten the thread. Two spindle whorls are attached to the shaft, but it is not possible to determine if one was added at a later time, but it is highly probable. Spindle whorl 1: cylindrical, upper surface encrusted, side and lower surface only partially encrusted. Placed near the top of the shaft. Spindle whorl 2: cylindrical, warped hole but without wedges. Upper surface clean, lower surface and side encrusted (normally the contrary is seen).	
	Spindle whorl	Cylindrical	Wood	1.8	4.8		0.8					
	Spindle whorl	Cylindrical	Wood	1.5	6		1.05					

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 09978/4 bis	Spindle		Wood	25.7	1			18	Donadoni Roveri 1988, 109. Donadoni Roveri, 2001, 18. Donadoni Roveri, 1987, 188, tav. 260.		Wooden spindle broken at one end while two spindle whorls are attached at the other end, which tapers to a point. Two spindle whorls are preserved but probably did not originally belong to this spindle. Shaft quite encrusted. Spindle whorl 1: cylindrical with a warp hole without wedges to adapt it to the shaft. Several breaks are present, one filled with a whitish substance. Spindle whorl 2: cylindrical but very warped, hole is not in the centre and it is deformed, probably by previous wedges, here not present. Encrustation not present but surface covered by areas of whitish efflorescence.	
	Spindle whorl	Cylindrical	Wood	1.2	4.7		0.9x0.8					
	Spindle whorl	Cylindrical	Wood	0.9	3.8x4		0.9x1					
S. 09978 /3 bis	Spindle		Wood	32.4	1.1			37	Donadoni Roveri 1988, 109. Donadoni Roveri, 2001, 18. Donadoni Roveri, 1987, 188, tav. 260		Wooden spindle slightly chipped at the top along the groove used to fasten the thread and also at the bottom, which is rounded and not pointed. Shaft is encrusted with two breaks, perhaps due to a restoration. It shows two spindle whorls on the shaft, one in the original position, near the groove, the other one probably added at a later time. Spindle whorl 1: cylindrical, fastened to the shaft with wooden wedges. A light patina covers all sides and whitish efflorescences are present on the upper surface. Spindle whorl 2: cylindrical, hole irregular. It shows encrustation on all sides and a lateral break. Lower surface is much more worn than the upper.	
	Spindle whorl	Cylindrical	Wood	1.1	5.4		0.9					
	Spindle whorl	Cylindrical	Wood	2	5.1		1.1					
S. 09978/5 bis	Spindle		Wood	37.2	1.1			31	Donadoni Roveri 1988, 109. Donadoni Roveri, 2001, 18. Donadoni Roveri, 1987, 188, tav. 260.		Wooden spindle, complete. Flat top with a spiral groove to fasten fibres and tapered towards the bottom. Both spindle whorls are placed near top of the shaft and cover the groove. Shaft slightly encrusted. Spindle whorl 1: cylindrical with irregular hole. Very encrusted on all sides, especially the lower one (in contrast to the other objects). Lateral break with wooden peg. Spindle whorl 2: cylindrical, complete, with a thin patina on all sides.	
	Spindle whorl	Cylindrical	Wood	1.6	4.7		0.8					
	Spindle whorl	Cylindrical	Wood	1.7	4.7		1					

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 09978/2	Spindle		Wood	34	0.9			30	Donadoni Roveri 1988, 109. Donadoni Roveri, 1987, 188, tav. 260.		Wooden spindle broken and chipped at the bottom. Rounded top with a spiral groove, very well shaped. Spindle whorls do not seem to belong to this shaft but to be added at a later time. Spindle whorl 1: cylindrical, with one side of the hole large and irregular, while the other side is regular. All sides slightly encrusted with a lateral break. Spindle whorl 2: cylindrical, with a chipped side. Small holes on all surfaces, perhaps caused by insects, and a lateral break. Lower surface with an incised cross.	
	Spindle whorl	Cylindrical	Wood	1.5	5.5		1.3					
	Spindle whorl	Cylindrical	Wood	1.2	5.3		1.1					
S. 07526/024	Spindle		Wood	8.4	1			3.1			Wooden spindle broken at the bottom, while top is flat and has a deep spiral groove.	
S. 07526/106	Spindle		Wood	10.2	0.9			2.8			Wooden spindle broken at both ends.	

Spindle whorls

S. 07527/01	Spindle whorl	Cylindrical	Wood	1.3	5		0.7	7			Cylindrical spindle whorl partially broken. Clean surfaces with a mark incised on one side.	
S. 07527/02	Spindle whorl	Cylindrical	Wood	1.1	5		0.9	8.3			Cylindrical spindle whorl, complete, with an incised mark on one surface. One surface encrusted the other covered by a patina. One side of the hole is warped.	
S. 07527/03	Spindle whorl	Cylindrical	Wood	1.2	6		0.8	17			Cylindrical spindle whorl with an incised mark on one surface. On the same side there are several thin incised lines, but no precise sign is recognizable. One side of the hole is warped (same side of mark).	
S. 07527/04	Spindle whorl	Cylindrical	Wood	1.3	5.4		0.7	8			Cylindrical spindle whorl, complete, with a mark on one side and a lateral break. Covered by a thin patina.	
S. 07527/06	Spindle whorl	Cylindrical	Wood	1.8	5.1		0.8	11.9			Cylindrical spindle whorl with an incised mark on one side and several small notches on theopposite surface. Clean surface. Cut from the central part of a tree trunk.	

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 07527/07	Spindle whorl	Cylindrical	Wood	1.7	5.5		0.9	15.8			Cylindrical spindle whorl, complete, with three marks incised on one side; the other surface is covered by a thin patina	
S. 07527/09	Spindle whorl	Cylindrical	Wood	1.9	5.1		1	17			Cylindrical spindle whorl, complete, with marks on both sides. One surface encrusted.	
S. 07527/10	Spindle whorl	Cylindrical	Wood	1	5.4		0.6	8			Cylindrical spindle whorl, complete, with a mark incised on one side. Surface clean and hole warped.	
S. 07527/11	Spindle whorl	Cylindrical	Wood	1.2	6.2		0.8	18			Cylindrical spindle whorl, complete, with several marks incised on one side. Warped hole and holes caused by animals. Both surfaces are clean.	
S. 07527/13	Spindle whorl	Cylindrical	Wood	1.3	4.9		0.8	10.4			Cylindrical spindle whorl, complete, with marks on one side. Surfaces not encrusted but with traces of burning.	
S. 07527/14	Spindle whorl	Cylindrical	Wood	1.7	4.9		0.9	13.3			Cylindrical spindle whorl with a mark incised on one side and on the same side several thin incised lines. Tree rings visible, cut from a large trunk.	
S. 07528/001	Spindle whorl	Cylindrical	Wood	1.3	5.4		0.8	13			Cylindrical spindle whorl with a radial break which continues to the hole. On the surface there are dots of a thick whitish substance, perhaps stucco or paint.	
S. 07528/002	Spindle whorl	Cylindrical	Wood	1.4	5.1		1x0.8	13			Cylindrical spindle whorl chipped laterally. Encrusted on one surface, the other shows traces of manufacture.	
S. 07528/003	Spindle whorl	Cylindrical	Wood	1.6	5.1		0.7x0.8	13			Cylindrical spindle whorl, complete, with several holes probably caused by insects.	
S. 07528/004	Spindle whorl	Cylindrical	Wood	1.7	4.4		0.7x0.9	11			Cylindrical spindle whorl, complete, covered by a thin patina.	
S. 07528/005	Spindle whorl	Cylindrical	Wood	1.5	5.7		0.9x1.1	18			Cylindrical spindle whorl, complete, with several holes probably caused by insects.	
S. 07528/006	Spindle whorl	Cylindrical	Wood	1.2	5.5		1x1.1	16			Cylindrical spindle whorl, complete. One side show traces of a whitish substance. Warped hole.	
S. 07528/007	Spindle whorl	Cylindrical	Wood	1.6	5.3		0.6	13			Cylindrical spindle whorl with oval hole.	

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 07528/008	Spindle whorl	Cylindrical	Wood	1.1	5.4		0.9	13.7			Cylindrical spindle whorl with deep lateral break which continues to the central hole. Whitish efflorescence is present on both sides.	
S. 07528/009	Spindle whorl	Cylindrical	Wood	1.3	6		0.9	18			Cylindrical spindle whorl, complete, well preserved and well-shaped. One side is covered by a thin patina.	
S. 07528/010	Spindle whorl	Cylindrical	Wood	1.5	5.3		0.7	11			Cylindrical spindle whorl, complete, badly preserved, with small lateral breaks.	
S. 07528/011	Spindle whorl	Cylindrical	Wood	1.6	5		0.9x1	10			Cylindrical spindle whorl, complete, well preserved with both surfaces slightly encrusted.	
S. 07528/012	Spindle whorl	Cylindrical	Wood	1.7	5.4		1	12			Cylindrical spindle whorl broken in two parts, badly restored with glue.	
S. 07528/013	Spindle whorl	Cylindrical	Wood	1.9	5.1		0.8	14			Cylindrical spindle whorl, complete but slightly warped, one surface covered by a thin patina.	
S. 07528/014	Spindle whorl	Cylindrical	Wood	1.6	5.9		1	15			Cylindrical spindle whorl, complete, with several holes probably caused by insects; warped hole.	
S. 07528/015	Spindle whorl	Cylindrical	Wood	1.5	5.9		0.9	13			Cylindrical spindle whorl, complete, well-polished on both sides. One surface shows traces of brown encrustation, while the other may have yellowish paint.	
S. 07528/016	Spindle whorl	Cylindrical	Wood	1.6	5.1		0.7	13			Cylindrical spindle whorl with lateral crack. One surface is covered by a thick layer of encrustation, the other one by patina.	
S. 07528/017	Spindle whorl	Cylindrical	Wood	1.4	4		0.7x1	15			Cylindrical spindle whorl with lateral crack. One surface is covered by a thick layer of encrustation, the other by a thin patina.	
S. 07528/018	Spindle whorl	Cylindrical	Wood	1.7	5.3		0.7x1.1	15			Cylindrical spindle whorl with lateral crack. One side is encrusted.	
S. 07528/019	Spindle whorl	Cylindrical	Wood	1.2	4.8		0.5x0.7	11			Cylindrical spindle whorl, complete, with one surface covered by a thin layer of patina, the other one is encrusted and shows incised marks.	
S. 07528/020	Spindle whorl	Cylindrical	Wood	1.2	5.9		1	14			Cylindrical spindle whorl, chipped, with a lateral break which continues to the central hole and another smaller fracture. One side is covered by a thin patina, the other one is	

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
											encrusted and shows thin incisions, but no precise pattern is visible.	
S. 07528/021	Spindle whorl	Cylindrical	Wood	1.9	4.5		1	10			Cylindrical spindle whorl with a deep fracture which continues to the central hole, which is quite warped near this crack. One surface is slightly encrusted, the other one shows whitish efflorescence near the hole.	
S. 07528/022	Spindle whorl	Cylindrical	Wood	1	5.6		0.7	9			Cylindrical spindle whorl, complete, well-shaped, but badly preserved and one surface highly worn. Clean and made of an unusual type of wood.	
S. 07528/023	Spindle whorl	Cylindrical	Wood	1.1	6.1		0.7	13			Cylindrical spindle whorl, complete, with one surface highly encrusted, the other one with a thin patina.	
S. 07528/024	Spindle whorl	Cylindrical	Wood	1.6	5.8		0.7	14			Cylindrical spindle whorl, complete, with one side covered by a thick layer of encrustation.	
S. 07528/025	Spindle whorl	Cylindrical	Wood	1.3	5.2		0.7	14			Cylindrical spindle whorl, complete, with one side covered by encrustation and the other clean, with wood vases evident.	
S. 07528/026	Spindle whorl	Cylindrical	Wood	1.9	4.9		0.9	12			Cylindrical spindle whorl, complete, with one side covered by a thick layer of encrustation, the other one by a thin patina.	
S. 07528/027	Spindle whorl	Cylindrical	Wood	1	5.6		1	9			Cylindrical spindle whorl, complete and clean.	
S. 07528/028	Spindle whorl	Cylindrical	Wood	1.3	6.2		0.8	18.7			Cylindrical spindle whorl, complete, with both sides covered with a thin patina and whitish encrustation.	
S. 07528/029	Spindle whorl	Cylindrical	Wood	1.6	5.4		0.9	17			Cylindrical spindle whorl with deep lateral crack. One side is encrusted and covered by a thick layer of whitish encrustation.	
S. 07528/030	Spindle whorl	Cylindrical	Wood	1.6	5.8		1x1.2	17			Cylindrical spindle whorl with one side covered by a thick layer of encrustation and the other one by a thin patina.	
S. 07528/031	Spindle whorl	Cylindrical	Wood	1.6	5.1		0.9x0.7	12			Cylindrical spindle whorl with two deep lateral cracks, which continue to the central hole. Worn surfaces and a yellowish spot on one side.	
S. 07528/032	Spindle whorl	Cylindrical	Wood	1.7	5.4		0.9	14			Cylindrical spindle whorl, complete, with one surface clean and the other covered by a thin patina.	

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 07528/033	Spindle whorl	Cylindrical	Wood	1.2	5.2		0.9	13			Cylindrical spindle whorl with a deep lateral break. One side is covered by a thin patina and the other is clean.	
S. 07528/034	Spindle whorl	Cylindrical	Wood	1.2	5.6		0.9	11			Cylindrical spindle whorl, broken, with the two fragments now poorly attached with glue. Worn and badly preserved.	
S. 07528/035	Spindle whorl	Cylindrical	Wood	1.6	4.5		0.7x0.9	10			Cylindrical spindle whorl, complete. One surface and side are covered by brown encrustation, the other surface by greyish encrustation.	
S. 07528/036	Spindle whorl	Cylindrical	Wood	1.2	5.8		0.9	13			Cylindrical spindle whorl, complete but quite worn. Elliptical, warped hole on both sides and surface covered by traces of encrustation.	
S. 07528/037	Spindle whorl	Cylindrical	Wood	1.4	5.7		0.9x1.1	14			Cylindrical spindle whorl, complete, with a warped polygonal hole, probably due to the insertion of several wedges.	
S. 07528/038	Spindle whorl	Cylindrical	Wood	1.3	5.7		0.7	15			Cylindrical spindle whorl, slightly warped. It does not show traces of encrustation but spots of patina on the surface. One side has a knot. It was made from a longitudinal cut of a log.	
S. 07528/039	Spindle whorl	Cylindrical	Wood	1.3	6		0.7	15			Cylindrical spindle whorl with small lateral break. One side is covered by a thick layer of encrustation, the other one by patina. On this side, traces of manufacture are visible as well as the wood vases.	
S. 07528/040	Spindle whorl	Cylindrical	Wood	1.7	4.6		0.7	11			Cylindrical spindle whorl, small and thick, completely preserved. One side is covered by a thick layer of encrustation.	
S. 07528/041	Spindle whorl	Cylindrical	Wood	1.3	5.6		1	13			Cylindrical spindle whorl, complete, one side covered by a thick layer of encrustation, the other one clean and with marks from its manufacture.	
S. 07528/042	Spindle whorl	Cylindrical	Wood	1.6	4.8		0.6	11			Cylindrical spindle whorl very well preserved. One side is covered by a thin layer of encrustation.	
S. 07528/043	Spindle whorl	Cylindrical	Wood	1.6	5.7		0.8	15			Cylindrical spindle whorl with a deep lateral crack. One side is covered by a thick layer of encrustation and a break “stopped” by a wooden peg, perhaps an ancient attempt of restoration. Hole is warped, worn by usage and wedges.	

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 07528/044	Spindle whorl	Cylindrical	Wood	1.3	5.5		0.9	16			Cylindrical spindle whorl with a deep lateral break. Badly preserved with darkened spots and whitish efflorescence. Different wood from other spindle whorls. One side shows signs of manufacture.	
S. 07528/045	Spindle whorl	Cylindrical	Wood	1.4	5		0.9	11			Cylindrical spindle whorl with a small lateral fracture. One side is covered by a thick layer of encrustation and its hole is warped by ancient wedges.	
S. 07528/046	Spindle whorl	Cylindrical	Wood	1.2	5.1		0.5x0.7	12			Cylindrical spindle whorl, complete, with small hole. One side is covered by a thick layer of encrustation and whitish efflorescence. It shows also probable traces of yellowish paint.	
S. 07528/047	Spindle whorl	Cylindrical	Wood	1.2	4.8		0.8x0.6	7			Cylindrical spindle whorl with a lateral break and highly worn surfaces. One side is covered by a thin patina. Hole is warped by ancient wedges.	
S. 07528/048	Spindle whorl	Cylindrical	Wood	1.8	5.1		0.8	16			Cylindrical spindle whorl with lateral crack and traces of encrustation.	
S. 07528/050	Spindle whorl	Cylindrical	Wood	1.7	4.7		1	11			Cylindrical spindle whorl with a deep lateral crack which continues to the hole. One side is covered by a thick layer of encrustation.	
S. 07528/051	Spindle whorl	Cylindrical	Wood	1.5	5.8		0.9	16			Cylindrical spindle whorl, complete, with whitish encrustation on both surfaces. Traces of a yellowish paint (?) are visible on one surface and on side. On the same surface are present traces of burning.	
S. 07528/053	Spindle whorl	Cylindrical	Wood	1.7	4.9		0.9x0.8	9			Cylindrical spindle whorl, complete, with traces of encrustation.	
S. 07528/055	Spindle whorl	Cylindrical	Wood	1.2	6.1		1	15			Cylindrical spindle whorl, complete and with encrusted surfaces. Hole is highly warped on one side probably due to ancient wedges.	
S. 07528/056	Spindle whorl	Cylindrical	Wood	1.6	5.4		1x0.8	17			Cylindrical spindle whorl with a thick layer of encrustation and traces of yellowish paint (?).	
S. 07528/057	Spindle whorl	Cylindrical	Wood	1.2	5.4		0.7	12			Cylindrical spindle whorl with small lateral crack which originates from the central hole. Highly worn surfaces with traces of encrustation.	

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 07528/058	Spindle whorl	Cylindrical	Wood	1.4	5.2		0.9	10			Cylindrical spindle whorl, broken on one side with traces of encrustation.	
S. 07528/059	Spindle whorl	Cylindrical	Wood	1.1	6		1.1x1.3	12			Cylindrical spindle whorl with lateral breaks and holes caused probably by insects. Central hole quite irregular. Both surfaces are covered by thick layer of encrustation and on one side there are spots of a whitish substance.	
S. 07528/060	Spindle whorl	Cylindrical	Wood	1.3	5.1		0.6	9			Cylindrical spindle whorl, complete, with small, warped and off-center hole. Covered with encrustation.	
S. 07528/061	Spindle whorl	Cylindrical	Wood	1.4	5.1		1	11			Cylindrical spindle whorl, warped and badly preserved. Warped hole due to ancient wedges.	
S. 07528/062	Spindle whorl	Cylindrical	Wood	1.3	4.8		0.6	12			Cylindrical spindle whorl with lateral breaks. One side is covered by a thick layer of encrustation.	
S. 07528/063	Spindle whorl	Cylindrical	Wood	1.4	5.3		0.9	13			Cylindrical spindle whorl completely ruined with a big central hole, and a smaller on the surface, probably caused by insects.	
S. 07528/064	Spindle whorl	Cylindrical	Wood	0.9	3.8		0.5	4			Cylindrical spindle whorl, small and ruined or worn, with an oval central hole.	
S. 07528/066	Spindle whorl	Cylindrical	Wood	1.7	4.9		0.5	11			Cylindrical spindle whorl with deep lateral break which continues to the central hole. One surface is covered by a thick layer of encrustation.	
S. 07528/068	Spindle whorl	Cylindrical	Wood	1.3	5.9			16			Cylindrical spindle whorl, unfinished. One side shows signs of the preparation for making the central hole.	
S. 07528/070	Spindle whorl	Cylindrical	Wood	1.8	5.6		0.9	18			Cylindrical spindle whorl with lateral break. One side shows traces of encrustation.	
S. 07528/073	Spindle whorl	Cylindrical	Wood	1.6	4.4		1	7			Small cylindrical spindle whorl, badly preserved, with yellowish traces on both surfaces around its hole, and other holes likely caused by insects.	
S. 07528/074	Spindle whorl	Cylindrical	Wood	1.4	5.7		0.6	16			Cylindrical spindle whorl, well-preserved. Encrusted on both surfaces.	
S. 07528/075	Spindle whorl	Cylindrical	Wood	1.6	5.3		0.7	14			Cylindrical spindle whorl, quite worn but without encrustation.	

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 07528/076	Spindle whorl	Cylindrical	Wood	1.6	4.9		0.9	12			Cylindrical spindle whorl, complete, heavily encrusted.	
S. 07528/077	Spindle whorl	Cylindrical	Wood	1.5	5.5		1	15			Cylindrical spindle whorl with yellowish traces on the surface and other traces of encrustation. Oval hole.	
S. 07528/078	Spindle whorl	Cylindrical	Wood	1.2	4.9		0.7	9			Cylindrical spindle whorl, badly preserved, with lateral breaks and encrustation.	
S. 07528/079	Spindle whorl	Cylindrical	Wood	0.9	4		0.6	6.6			Small spindle whorl, complete, with four radial lines painted with a pink colour.	
S. 07528/081	Spindle whorl	Cylindrical	Wood	1.6	5		1	16			Cylindrical spindle whorl broken and now composed of two fragments.	
S. 07528/082	Spindle whorl	Cylindrical	Wood	1.4	5.2		1	10			Cylindrical spindle whorl, slightly warped, with lateral breaks. Encrustations and whitish efflorescence on the surface.	
S. 07528/083	Spindle whorl	Cylindrical	Wood	1.5	5.2		0.9	10			Cylindrical spindle whorl badly preserved and made of a dark wood.	
S. 07528/089	Spindle whorl	Cylindrical	Wood	1.4	5.1		0.9x0.7	14			Cylindrical spindle whorl, complete, with traces of encrustation on one side.	
S. 07528/092	Spindle whorl	Cylindrical	Wood	1.1	4.2		0.5	8			Cylindrical spindle whorl, complete, with heavy encrustation on the surface.	
S. 07528/093	Spindle whorl	Cylindrical	Wood	1.6	3.9		0.6	8			Cylindrical spindle whorl decorated by four radial lines painted in black and another line decorates the external edge.	
S. 07528/096	Spindle whorl	Cylindrical	Wood	1.3	4.9		0.7	15			Cylindrical spindle whorl with a deep lateral fracture and a thick layer of encrustation.	
S. 07528/099	Spindle whorl	Cylindrical	Wood	1.3	4.7		0.8	8.3			Cylindrical spindle whorl only partially preserved with side chipped. Warped hole likely due to ancient wedges. One hole on the surface. Both sides are covered by whitish efflorescence.	
S. 07528/103	Spindle whorl	Cylindrical	Wood	1	5.6		0.9	9			Cylindrical spindle whorl, complete, with small lateral break and free of encrustation. Irregular central hole.	
S. 07528/104	Spindle whorl	Cylindrical	Wood	1.1	5.5		0.7	12			Cylindrical spindle whorl, complete, with warped central hole probably due to ancient wedges. Clean surfaces.	
S. 07528/105	Spindle whorl	Cylindrical	Wood	1.2	5.1		0.7	11			Cylindrical spindle whorl, complete, with one surface covered by encrustation and an incised mark. Highly worn.	

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 07528/106	Spindle whorl	Cylindrical	Wood	1.5	5.8		0.9	17			Cylindrical spindle whorl with lateral breaks and encrusted on the surface. Two radial lines are painted in black.	
S. 07528/107	Spindle whorl	Cylindrical	Wood	1.7	4.7		0.9	12			Cylindrical spindle whorl, complete, encrusted on the surface and with cross-shaped incisions.	
S. 07528/108	Spindle whorl	Cylindrical	Wood	1.6	5.8		0.8x1	17			Cylindrical spindle whorl, complete, encrusted on the surface and with incised marks near the edge.	
S. 07528/109	Spindle whorl	Cylindrical	Wood	1.6	5.1		0.7	12			Cylindrical spindle whorl, warped and partially missing, likely due to insects. Central hole warped by ancient wedges. Different wood, more compact.	
S. 07528/110	Spindle whorl	Cylindrical	Wood	1.2	4.6			5			Cylindrical spindle whorl completely lacking the central part, probably due to insects. Traces of encrustation are also present.	
S. 07528/111	Spindle whorl	Cylindrical	Wood	1.6	4.9		0.9	10			Cylindrical spindle whorl, encrusted on the surface and with small holes probably caused by insects.	
S. 07528/112	Spindle whorl	Cylindrical	Wood	1.2	5.4		0.8	8			Cylindrical spindle whorl only partially preserved probably due to insects.	
S. 07528/113	Spindle whorl	Cylindrical	Wood	1.5	5.6		0.6	9			Cylindrical spindle whorl, complete, encrusted and with a small perforation likely caused by insects.	
S. 07528/114	Spindle whorl	Cylindrical	Wood	1.3	4.3		0.5	9			Cylindrical spindle whorl, complete and well- preserved. Encrusted on the surface.	
S. 07528/115	Spindle whorl	Cylindrical	Wood	1.6	4.2		0.x0.5	7			Truncated cone spindle whorl, complete, with marks from its manufacture on the surface.	
S. 07528/116	Spindle whorl	Cylindrical	Wood	1.2	4.4			3			Small fragment of a cylindrical spindle whorl.	
S. 09978/3	Spindle whorl	Cylindrical	Wood	1.8	4.7		0.8	13			Cylindrical spindle whorl, encrusted on the surface.	
S. 07594/05	Spindle whorl	Dome	Wood	1.8	4.2			13			Dome-shaped spindle whorl, complete and encrusted on the surface. Several concentric lines are incised around the hole. Similar to those of the Roman Period.	
S. 07587/09	Spindle whorl	Cylindrical	Wood	2.5	4						Cylindrical spindle whorl, broken and only partially preserved.	

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Fibres												
S. 9999/1 and 2	Skeins of linen		Linen	19 16	4.5 2.5				Borla, Oliva, 2015, fig. 299.	New Kingdom (?)	Two skeins of linen threads with visible splicing points. Thread is worn in several areas and is losing its twist, which is S-plied. 1) Made up of different threads. The best preserved is z-twist, without plying. Average diameter is 0.9-1 mm, twist angle (where preserved) is 33°. Another thread is S-plied, average diameter is 0.3 mm and twist angle is 30°. 2) Where thread is well-preserved, an S-plied structure is visible with several points of splicing. Very irregular diameter, with an average of 0.7 mm, twist angle between 35 and 38°.	
S. 07792	Skein		Linen	13	7.5	3					Small skein of linen with drier fibres than the others. Made up of several threads, one plied and one single, both with s-twist. Several knots are visible as well as at least three threads but there could be more. Thread 1: Plied thread, average diameter of 0.4 mm, angle 40-45°. Thread 2: Single thread, average diameter 0.3 mm and variable twist angle, due to the poor preservation of the thread. Thread 3: Single thread, average diameter 0.3 mm, twist angle 35°.	
S. 7787	Skein		Flax	7	5.4	2.5					Small and irregular skein of linen thread, which lost its original twist at several points. Might be made up of different threads. S-twist and S-plied (where visible). Average diameter 0.3 mm, twist angle 35° but at several points 45° due to the poor conditions of its preservation.	

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 7791	Ball of yarn		Linen		4				Borla, Oliva, 2015, fig. 299. Donadoni Roveri, 2001, 32.		Linen ball of thread perfectly preserved and tightly wound up. It shows one knot at the end of the yarn and several smaller knots on the inside. Thread is Z-plied, single twist not visible or not present at all. Some splicing points are visible. Thread diameter 0.04 cm, twist angle between 35-40°.	
S. 07788	Ball of yarn		Linen	2	3						Linen ball of yarn wound around tow; composed of several threads around the core, some strictly twisted, others with a very loose twist. All threads are S-twisted, some also S-plied. Some knots are visible at the end of the thread. Threads have a diameter between 0.3 and 0.5 mm, twist angle 35,° in some cases between 45 and 50°.	
S. 07790	Ball of yarn		Linen; pottery	3.5	2	1			D'Amicone 2006, 25.		Small ball of yarn wound around a broken pottery rim. Under the thread, which is perfectly preserved, there are unspun vegetable fibres. Twist is quite tight and is Z-cabled, S-plied. (2S, 4Z), single twist not visible. Thread diameter 0.3-0.4 mm, at some points 0.6 mm; twist angle 35°.	
S. 7789	Ball of yarn		Linen; stone	6.5	5	3			D'Amicone, 2006, 25.		Linen ball of yarn wound around a stone, made up of several different threads, at least one brownish thread and one thicker whitish thread. Both are strictly Z-plied, s-twist (Z, 2s). Whitish thread is loosely spun with a diameter of 0.6-0.7 mm, angle 45-50°. Brownish thread is tightly spun, splicing points and knots are visible; diameter 0.3-0.4 mm, max. 0.6 mm, twist angle 30-35°. It has a lustrous appearance.	
S. 7793	Ball of yarn		Linen; stone	1.2	3.5				Borla, Oliva, 2015, fig. 299.		Small ball of linen yarn wound around a limestone pebble. Thread is tightly twisted and quite even. It is not clear if there are several threads or whether the same thread was broken and wound around the same stone. Single twist not visible, Z-plied. Thread diameter 0.5-0.6 mm, twist angle 35-45°.	

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 7794	Stopper		Vegetable fibres; pottery	2	5						Pottery sherd of rounded shape, probably originally a stopper. Vegetable fibres and short linen threads are wound around it. Threads are Z-twist and S-plied, in one case they are cabled (2Z, 4S), but single twists are not visible. A similar item, S.8185 (not part of this catalogue) shows only folded raw fibres.	
Needles												
S. 08379	Needle case		Bronze; papyrus; vegetable fibres.	14.8	2.8	1.9			Donadoni, 1987, 197, tav. 285. Donadoni Roveri, 2001, 33. Schiaparelli, 1927, 77, fig. 43, 5.	Tomb of Kha (TT8)	Two bronze needles and a small razor fixed in a needle case made of papyrus reeds joined by twine (made of two yarns very loosely S-twist, each of them S-plied, Z-cabled). One of the two needles has preserved a piece of thread in the eye (final twist Z and knotted). Both have small, round eyes.	XVIII dynasty (Amenhotep II-III)
S. 08496	Needle case		Bronze; papyrus	16	4.1	3.3			Schiaparelli, 1927, 77, fig. 43, 5.	Tomb of Kha (TT8)	Four bronze needles fixed in a piece of papyrus reed. Thin and round in section with very small circular eyes.	XVIII dynasty (Amenhotep II-III)
S. 09947	Needle		Bronze	6.3	0.3						Small bronze needle, however no traces of its eye are visible	
S. 09946	Needle		Bronze	10.2	0.2				Donadoni Roveri, 1987, 204, tav. 283.		Long and thin needle, round in section, point and eye perfectly preserved. Extremely small eye.	
S. 09945	Needle		Bronze	12.8	0.2						Long and thin needle with round section, point and eye perfectly preserved	
S. 07619	Needle		Bronze	9.5	0.2						Long and thin needle with round section, point and eye perfectly preserved.	
S. 07796	Bodkin		Wood; linen	9.5	1.2				Borla, Oliva, 2015, fig. 299.		Wooden needle or bodkin with flat head where a quite crude eye is carved. Inside the eye a knotted thread is preserved. Final twist S, each thread made of several threads (at least three single and one double), and twist in Z direction. Single and double threads have an S twist.	

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
S. 07566	Bodkin		Wood	16.5	1.2						Large wooden bodkin, bent and with a round eye.	
S. 09975	Bodkin		Wood	12	1.8						Large wooden bodkin, bent and with a round eye.	

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum

8.8 OTHER SITES

Spindles												
Abydos	UC43262	spindle		wood	3	0,6			7,5		New Kingdom	Small fragment of wooden spindle shaft	Petrie
		spindle whorl	Conical truncated	wood								Wooden conical truncated spindle whorl	

Spindle whorls													
Fayum	UC2530	spindle whorl	spherical	flint	2,25 x1,5	3,73		0,65	34,57	Fayum Kom W	Fayum Neolithic Period	Spindle-whorl; naturally spherical flint nodule. From Fayum Kom W	Petrie
Fayum	UC2931	spindle whorl		limestone	2,2	2,79			12,18 +x	Fayum Kom K	Fayum Neolithic Period	Limestone spindle whorl, half preserved.Surface find from Fayum Kom K.	Petrie
Fayum	UC2930	spindle whorl	Lenticular	limestone	2,64	3,5		0,69 x0,87	44,38	Fayum Kom K	Fayum Neolithic Period	Limestone spindle whorl, lenticular shape. It Shows rotary boring striations. Both sides of hole show wear traces. From Fayum Kom K at strip C 155/2, at depth of 1 ft 2 ins.	Petrie
Fayum	UC2785	spindle whorl		alabaster	3,15	3,23		nn	23,8	Caton-Thompson and Gardner, 1934, 33.	Fayum Kom W, Neolithic period	Alabaster spindle whorl, spherical shape. Well shaped but not polished. No signs of break, retouched also where the break should stay. Probably not a spindle whorl or it never became that. Surface find from Fayum Kom W	Petrie
Fayum	UC2786	spindle whorl	spherical	limestone	2,35	3,27		0,86	19,5+ x	Caton-Thompson and Gardner, 1934, 33	Fayum Neolithic Period. Fayum Kom W, at strip K, site longitude/latitude 10/	Fragment of a limestone spindle whorl, spherical shape.	Petrie
Fayum	UC2787	spindle whorl	spherical	limestone	2,13	4,37			26,9+ x	Caton-Thompson and Gardner, 1934, 33	Fayum Kom W, Neolithic period	Fragment of a limestone (or alabaster?) spindle whorl, possibly unfinished. From Fayum Kom W at strip E, site longitude/latitude 95/2	Petrie
Badari	UC9029	fusaiola	cylindrical	breccia	2,2x 1,8	4,22 x3,8		0,99	50,47		Badarian period, Tomb 24/5152	Cylindrical spindle whorl made of breccia. Hourglass hole, not perfectly rounded.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Hammamiyah	7593	spindle whorl	spherical	Limestone	2,8	3,6		1,4	20,7+x		Hammamiya village, North spur, Badari 2ft level	Limestone spindle whorl, half preserved, spherical shape. One side of the hole shows wear traces, the other is neatly cut.	Manchester
Naqada (exc. South town)	AN 1895.1248	spindle-whorl	dome	chalk	3,1	4,1		1	48,9	Petrie and Quibell 1896, 54.	Predynastic	Dome spindle whorl, made of chalk, almost complete (chipped on one side). Quite well shaped but one side is higher than the other. Worn surface.	Ashmolean
Naqada (exc. South town)	AN 1895.1249	spindle-whorl	dome	limestone	2,3	3,4		1,1	25,2	Petrie and Quibell 1896, 54.	Predynastic	Dome-shaped spindle whorl, well shaped, slightly chipped around upper and lower side of hole. Blackened by heat.	Ashmolean
Naqada (exc. South town)	AN 1895.1250	spindle-whorl	dome	chalk	2,7	3,8		0,9x1	35,1	Petrie and Quibell 1896, 54.	Predynastic	Dome spindle whorl, made of chalk, broken. Surface quite smooth but with irregularities. Slightly conical hole with evidence of vertical cutting, not polished or drilled. Off centre hole.	Ashmolean
Naqada (exc. South town)	AN 1895.1251	spindle-whorl	dome	limestone	2,2	3,5		0,7	26,1	Petrie and Quibell 1896, 54.	Predynastic	Dome spindle whorl, made of limestone, complete. Quite well shaped but not perfectly polished. Wear traces near the upper side of the hole.	Ashmolean
Naqada (exc. South town)	AN 1895.1252	spindle-whorl	dome	limestone	1,7	3,3		0,7x0,8	25	Petrie and Quibell 1896, 54.	Predynastic	Dome shaped limestone spindle whorl, chipped on the lower side. Very well polished. Lower side of the hole clean, upper hole with tiny wear traces.	Ashmolean
Naqada (exc. South town)	AN 1895.1253	spindle-whorl	dome	chalk	2	3,2		0,9	18,3	Petrie and Quibell 1896, 54.	Predynastic	Dome shaped chalk spindle whorl, broken on the side and on the basis. Decorated (?) by two vertical lines close together. Worn surface.	Ashmolean
Naqada (exc. South town)	AN 1896-1908 E1729	spindle-whorl	dome	bone	2,1	2,9		0,9	9,5	Petrie and Quibell 1896, 54.	Predynastic	Domed shaped spindle whorl, cylindrical hole. Surface highly whorn and cancellous bone almost completely exposed. Lots of wear traces on the upper side of hole.	Ashmolean
Naqada (exc. South town)	AN 1896-1908 E1730	spindle-whorl	spherical	stone	3,3	3		1,15	28,9	Petrie and Quibell 1896, 54.	Predynastic	Spherical shaped spindle whorl, highly polished on the surfafe and also inside the hole. Chipped around one of the sides of hole.	Ashmolean
Abydos	AN 1896-1908 E4640	spindle-whorl	spherical	limestone	2,6	3,3x3,7		1x1,15	37,7		OPH 5/7, Predynastic	Spherical shaped spindle whorl, well polished on the surface. Very neatly cut hole, quite worn on the upper side.	Ashmolean

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Abydos	AN 1896-1908 E4640A	spindle-whorl		limestone	3,3	2,1				Predynastic	Yellow limestone. Fragment.	Ashmolean
Hammamiyah	AN 1925.576X	spindle-whorl	dome	limestone	2,2	3		0,9x1	21,9	Brunton and Caton-Thompson 1928, 77-8, 99, pl. LXX.27 n.70.	North spur, surface - 1', Predynastic	Dome-shaped limestone spindle whorl, chipped and worn.	Ashmolean
Hammamiyah	AN 1925.579P	spindle-whorl	cylindrical	limestone	2,7	3,4		nn	19,7+x		Hammamiya North spur, surface - 2'-2'6, Predynastic	Cylindrical spindle whorl made of limestone, half preserved. Not perfectly rounded nor smoothed after cutting.	Ashmolean
Hammamiyah	AN 1925.581BB	spindle-whorl	dome	limestone	2,3	3,5		0,9x1,3	31,4		Hammamiya North spur, surface - 3', Predynastic	Limestone spindle whorl, dome shaped, complete. Not perfecly rounded, conical hole very large at the bottom. Stone surface quite worn, no wear traces are detectable.	Ashmolean
Abydos	EA37271	spindle whorl	dome	limestone	2,49	3,72		1,1	40,53		Predynastic	Limestone model mace-head or spindle-whorl. Dome shaped, upper side of the hole with wear traces.	British
Abydos	EA37272	spindle whorl	dome	limestone	2,35	3,7		0,8	34,83		Predynastic	Limestone model mace-head or spindle-whorl.Dome shaped, chippings near upper side of the hole.	British
Hierakonpolis	E.717	spindle whorl	Conical	Limestone	2	3,7		0,9	28,7	Adams 1995, 162.	T304	Conical spindle whorl made of yellowish limestone. Upper side of the hole very worn.	Garstang
Hierakonpolis	E.739	spindle whorl		Diorite	1	2,9		0,57	6,8+x	Adams 1995, 162.	T304	Oblong object, half preserved. Oval hole, possibly not a spindle whorl. Hard stone, probably granodiorite.	Garstang
Hierakonpolis	E.5378	spindle whorl	dome	limestone	2,6	3,7		0,8x0,9	41,3	Adams 1995, 162.	T304	Dome spindle whorl made of limestone. Well shaped, slightly conical hole. Incised mark "x" shaped on the side.	Garstang
Hierakonpolis	16.11.1906.371	spindle whorl	dome	limestone	2,4	3,9		0,7x0,8	34,2	Adams 1995, 163.		Dome spindle whorl made of limestone, tends to laminated (sandstone?). Worn surface.	Liverpool
Hierakonpolis	16.11.1906.371	spindle whorl	dome	limestone	2,9	4,2		1x1,5	55,4	Adams 1995, 163.		Dome spindle whorl made of limestone. Well preserved, chipped near upper hole. Wear traces only near upper side of the hole.	Liverpool
Hierakonpolis	16.11.1906.371	spindle whorl	dome	limestone	3	3,7		0,84x0,89	34,8	Adams 1995, 163.		Dome spindle whorl made of yellowish limestone. Incised decoration on the surface.	Liverpool

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Hierakonpolis	16.11.1906.371		dome	limestone	3,5	7,4		0,85	196,9	Adams 1995, 163.		Dome object made of limestone, too heavy for a spindle whorl. Badly damaged sides, hole neatly cut.	Liverpool
Abydos	1187	spindle whorl	dome	Limestone	1,88	3,4		0,7x0,9	23,8		Naqada III	Dome spindle whorl made of limestone, complete but chipped on one side.	Manchester
Naqada	2438	spindle whorl	dome	Limestone	2,51	3,54		0,88x1	32,6		Predynastic Period	Dome spindle whorl made of limestone, complete. Upper side of the hole presents wear traces.	Manchester
Naqada	2439	spindle whorl	spherical	pottery	3	3,9		0,9x1	32,8		Predynastic Period	Pottery spindle-whorl, spherical shape. Quite worn.	Manchester
Naqada	2440	spindle whorl	dome	Limestone	3	3,7		0,8x1,06	41,7		Predynastic Period	Dome spindle whorl made of limestone. Upper side of the hole with light wear traces.	Manchester
Ballas	4539	spindle whorl	spherical	Limestone	2,7	2,8		1	25,7		Predynastic Period	Spherical spindle whorl, complete, made of limestone. Well shaped, with cylindrical hole. Wear traces near one side of the hole.	Manchester
Ballas	4540	spindle whorl	cilindrical	Limestone	2,2	3,5		0,96x1,2	30,7		Predynastic Period	Cylindrical spindle-whorl, made of limestone, incised with an 'X' mark. Large, conical hole. Well shaped and complete	Manchester
Ballas	4541	spindle whorl	cilindrical	Limestone	3,3	3,6		1,16	51		Predynastic Period	Cylindrical spindle-whorl, made of limestone. Complete but chipped. Hole slightly off-centre and hourglass.	Manchester
Ballas	4542	spindle whorl	cilindrical	Limestone	3	3,2		1,1	31		Predynastic Period	Limestone spindle-whorl, cylindrical shaped. Quite well shaped, but slightly squared. Large and cylindrical hole.	Manchester
Naqada	4543	spindle whorl	Conical	Limestone	2,2	3,8		0,87 sop 0,73 sot	28,8		Predynastic Period	Conical spindle whorl made of limestone, chipped on the upper side. Hole not straight, with a corner inside. Not a whorl.	Manchester
Ballas	4544	spindle whorl	dome	Limestone	2	3,1		0,87x0,99	21,8		Predynastic Period	Conical spindle whorl made of limestone, complete but chipped. Very well shaped and polished. Hole slightly conical, neatly cut.	Manchester
Ballas	4545	spindle whorl	spherical	Limestone	2,9	3,6		1,1	35,6		Predynastic Period	Spherical spindle whorl made of limestone, complete but chipped. Chip smoothed, possibly during the process of manufacture. Cylindrical hole slightly off -centre, possibly because of the chipping. Neatly cut.	Manchester

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Ballas	4546	spindle whorl	dome	Limestone	2	3,8		0,9x1,1	28		Predynastic Period	Dome spindle whorl made of limestone, complete. Very well shaped, perfectly flat base, scratched surface. Slightly conical hole, neatly cut but with a small step inside. Not a whorl.	Manchester
Ballas	4547	spindle whorl	dome	Limestone	1,64	2,7		5,56x6,9	11,9		Predynastic Period	Dome spindle whorl made of limestone, broken. Quite well shaped, slightly conical hole larger at the base. Lots of wear traces near the upper hole.	Manchester
Hammamiyah	7622	spindle whorl	spherical	Limestone	4,3+x	3,5+x		1	25,7+x		Predynastic Period	Spherical spindle whorl made of limestone, fragmentary.	Manchester
Hammamiyah	7623	ball		clay	4	3,5			41		Predynastic Period	Clay ball, with hole pierced through it. Warp hole. Poorly fired clay.	Manchester
Hammamiyah	7646	spindle whorl	spherical	Limestone	3,7	2,5					Predynastic Period	Limestone spindle-whorl, barrel-shaped.	Manchester
Armant	10678	spindle whorl	dome	Limestone	2,9	4,9		0,9	71,3		Predynastic Period	Limestone spindle-whorl, conical shape, with incised lines, vertically from top to base. Very worn near the upper side of the hole, part of the base broken.	Manchester
Armant	10686	spindle whorl	Conical truncated	wood	1,6	3,8		0,7	7+x		Predynastic Period	Wooden spindle-whorl, with conical truncated shape. Hole appears sharp cornered and therefore never used.	Manchester
Hammamiyah	7578.a	spindle whorl	spherical	Limestone	2,8	3,8		1,1	29,3		Hammamiya.	Spherical spindle whorl made of limestone, half preserved. Well shaped.	Manchester
Naqada/Ballas	8380 .a	spindle whorl	dome	Limestone	2,9	3,63		1,05	19,9+x		Predynastic Period	Dome shaped spindle whorl made of limestone, half preserved. Hole completely diagonal. Well polished surface.	Manchester
Naqada/Ballas	8380 .b	spindle whorl	dome	Limestone	2,69	3,8		0,82	17,7+x		Predynastic Period	Dome shaped spindle whorl, broken in two pieces. Hole appears unfinished and not polished inside. No traces of wear near hole, therefore are not linked to manufacture, rather with usage.	Manchester
Naqada/Ballas	8380 .c	spindle whorl	spherical	Limestone	3,87	3,75		1,01	27,1+x		Predynastic Period	Spherical spindle whorl made of limestone(?), half preserved. Covered by a thick layer of glue or similar material (modern).	Manchester

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Naqada/Ballas	8380 .d	spindle whorl	dome	Limestone	2,23	3,82		0,8	27,2+x		Predynastic Period	Dome spindle whorl made of limestone, broken ar the base. Wear traces near upper side of the hole. Heavy preservation treatment which hide original appearance.	Manchester
Naqada/Ballas	8380 .e	spindle whorl	spherical	Limestone	4,15	4		1,08	48+x		Predynastic Period	Spherical spindle whorl made of limestone, half preserved. Traces of manufacture visible inside the hole. Heavy preservation treatment which hide original appearance.	Manchester
Naqada/Ballas	8380 .f=g	spindle whorl		Limestone	2,57+x	3,67+x		0,99	13,6+x		Predynastic Period	Two fragments of a limestone spindle whorl.	Manchester
Naqada/Ballas	8380 .h	spindle whorl		Limestone	2,15+x	3,32		1,04x0,93	21,2+x		Predynastic or later	Fragment of a limestone spindle whorl, both sides broke, hole slightly conical. Heavy preservation treatment which hide original appearance.	Manchester
Naqada/Ballas	8380 .i	spindle whorl	conical	Limestone	2,34+x	3,75		0,83x0,93	27,9+x		Predynastic or later	Conical spindle whorl made of limestone, very damaged, both bases missing. Conical hole. Heavy preservation treatment which hide original appearance.	Manchester
Unknown	UC15412	spindle whorl	dome	Grey stone	1,27	2,37		0,5x0,63	6,77	Petrie, 1920, pl.XXVI.69	Naqada II	Small dome spindle whorl made of grey stone. Cylindrical hole neatly cut.	Petrie
Unknown	UC15413	spindle whorl	dome	breccia	1,57	3,47		0,75	22,77	Petrie, 1920, pl.XXVI.71	Naqada II	Dome spindle whorl made of breccia. Complete. Very small chippings near the upper side of the hole.	Petrie
Unknown	UC73209a	spindle whorl	dome	steatite	1,63	3,03		0,52x0,57	22,72		Prehistoric Period	Dome spindle whorl made of steatite. Wear traces near upper side of the hole.	Petrie
Unknown	UC73209b	spindle whorl	dome	breccia	1,66	3,14		0,85	21,21		Prehistoric Period	Dome spindle whorl made of breccia, slightly damaged on the side. Hole neatly cut.	Petrie
Unknown	UC73210	spindle whorl	dome	Ivory	1	2,8		0,47	7,16		Prehistoric Period	Dome spindle whorl made of ivory, decorated by small circles with dot in the middle. Radial lines near the hole. Decoration covered by bitumen (?).	Petrie
Unknown	UC73231a	spindle whorl	dome	limestone	2,03	3,4		0,87	19,86		Prehistoric Period	Dome spindle whorl made of limestone, roughly shaped. Polished surface.	Petrie
Unknown	UC73231b	spindle whorl		pebble	2,15	3,1		0,88	24,2		Prehistoric Period	Pebble roughly cut, cylindrical hole.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Badari	UC26744	mace head	dome	limestone	4,37	4,29		1	81,14		Predynastic period	Limestone whorl/mace head. Well polished surface.	Petrie
Badari	UC26876	spindle whorl	dome	limestone	2,58	3,3		1,02	32,97 +x		Predynastic period	Dome spindle whorl made of limestone, chipped on one side. Well crafted even if lopsided.	Petrie
Badari	UC26732	spindle whorl		limestone	3,15	3,86		1,2+ x	28,74 +x		Predynastic period	Half of limestone spindle whorl (?). Well polished, hole slightly hourglass even if perfectly smoothed.	Petrie
Badari	UC26737	?		limestone	2,3	2,9		1,06	22,08	Brunton and Caton Thompson 1928, 45, LVIII,6	Predynastic period	Object made of limestone, centrally pierced. Large and rounded hole.	Petrie
Badari	UC26741	spindle whorl	cylindrical	limestone	2,78	4,3x 4,2		1	73,56			Cylindrical spindle whorl made of limestone, complete. Well polished with cylindrical hole.	Petrie
Badari	UC26742	spindle whorl		limestone	3,58	3,7			20,09 +x		Predynastic period	half of limestone spindle whorl. Surface quite well polished.	Petrie
Gizeh	UC27655	spindle whorl	dome	limestone	3,67	5,22		0,86	107,3 9		protodynastic period - I dynasty	Dome spindle whorl made of limestone, perforated from top, but not all the way through. Unfinished.	Petrie
Naqada	UC4220	spindle whorl	spherical	limestone	3,19	3,9x 3,7		1,05	49,19		Tomb 1483, Naqada I	Spherical spindle whorl made of limestone, complete. Well shaped and quite well polished.	Petrie
Naqada	UC4375	spindle whorl	Conical	limestone	2,5	3,6		0,79	34		Tomb 177, Naqada II	Conical spindle whorl made of limestone, complete. Wear traces near upper side of the hole.	Petrie
Unknown	UC19738	spindle whorl	dome	limestone	1,8	3,75		0,8	10,7+ x	?Level 1'6"	Predynastic period	Dome spindle whorl made of limestone, half missing. Surface quite irregular.	Petrie
Hierakonpolis	UC27531	spindle whorl	conical	pottery	1,19	3,6		0,48	9,5+x		Predynastic period	Conical spindle whorl made of pottery, broken in two parts and chipped. Very ruined near the top. Very interesting concave base, lowering not in the centre. Traces of production (round lines) are visible. Too early to be potter's wheel.	Petrie
Hierakonpolis	AN 1896-1908 E.1727	spindle-whorl	dome	limestone	3,3	4,3		0,8x 1	65,2	Quibell and Green, 1902, 17.	Protodynastic, Temple enclosure, group 150.	Dome-shaped limestone spindle whorl, chipped near the top hole. Off centre hole. Traces of manufacture clearly visible. On the basis it is written hu-dendereh	Ashmolean

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Hierakonpolis	AN 1896-1908 E.1728	spindle-whorl	dome	limestone	3,3	4,5x4,2		1x1,2	62,3	Quibell and Green, 1902, 17.	Protodynastic	Dome-shaped spindle whorl, made of limestone. Oval, well shaped and smooth. Lower hole neatedly cut, upper hole completedely worn. Probably not from Hierakonpolis.	Ashmolean
Hierakonpolis	AN 1896-1908 E.3636	spindle-whorl	dome	limestone	3	4,6		0,8x,9	68,1	Quibell and Green, 1902, 17, 49, pl. LXIII.6	Protodynastic	Dome-shaped spindle whorl, made of limestone, complete. Incised zigzag on side. Well shaped and smooth. Hole neatly cut, no traces of wear.	Ashmolean
Hierakonpolis	AN 1896-1908 E.3637	spindle-whorl	dome	limestone	2,8	3,7		1x1,2	32,9	Quibell and Green, 1902, 17.	Protodynastic	Dome-shaped spindle whorl, made of chalky stone. Quite complete but chipped.	Ashmolean
Hierakonpolis	AN 1896-1908 E.3639	spindle-whorl	dome	limestone	3,7	4,3		0,9	88,3	Quibell and Green, 1902, 17.	Protodynastic, group 59	Dome-shaped spindle whorl, made of limestone, almost complete. Well shaped. Wear traces near the upper hole.	Ashmolean
Hierakonpolis	AN 1896-1908 E.3640	spindle-whorl	dome	limestone	2,6	4,4		1,1x1,3	50,5	Quibell and Green, 1902, 17.	Protodynastic, group 72	Dome-shaped spindle whorl, made of limestone (? chalky stone), chipped on one side. Very worn.	Ashmolean
Hierakonpolis	AN 1896-1908 E.3641	spindle-whorl	dome	limestone	3,1	3,9		0,8x0,9	51,1	Quibell and Green, 1902, 17.	Protodynastic, group 123	Dome-shaped spindle whorl, made of limestone, well shaped. Chipped on the basis and near the upper hole. Polished surface. Wear traces near the upper hole.	Ashmolean
Hierakonpolis	AN 1896-1908 E.3642	spindle-whorl	dome	limestone	3,3	4,3x3,9		0,8x1	70,5	Quibell and Green, 1902, 17.	Protodynastic	Dome-shaped spindle whorl, made of limestone, complete. Storta. Hole off-centre. Base quite ruined. Upper hole quite worn.	Ashmolean
Hierakonpolis	AN 1896-1908 E.3643	spindle-whorl	dome	limestone	3,4	4,3		nn	23,9+x	Quibell and Green, 1902, 17.	Protodynastic, group 216	Dome-shaped spindle whorl, made of limestone, broken, less than a half preserved. Chalky limestone?	Ashmolean
Hierakonpolis	AN 1896-1908 E.3644	spindle-whorl	dome	limestone	3,1	3,9		0,9	33,4+x	Quibell and Green, 1902, 17.	Protodynastic, group 216	Dome-shaped spindle whorl, made of limestone, half preserved. Decorated by three incised lines. Very dirty, surface not clearly visible.	Ashmolean
Unknown	AN 1933.568	spindle-whorl	dome	stone	0,8	3,1		0,5x0,6	14,9		Old Kingdom? Egypt?	Dome spindle whorl made of breccia, complete. Hole off centre, clear cut.	Ashmolean
Hierakonpolis	UC14886/1	spindle whorl	conical	limestone	3,12	5,79		0,98x1,2	89,27		Old Kingdom	Conical pindle whorl, made of limestone, complete. Quite large and heavy. Hole slightly conical, upper side of the hole with wear traces.	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Hierakonpolis	UC14886/2	spindle whorl	dome	limestone	2,55	4,56		1,09 x1,22	48,55		Old Kingdom	Dome-shaped spindle whorl, made of limestone, broken. Hole slightly conical, larger at the base. Well polished.	Petrie
Hierakonpolis	UC14886/3	spindle whorl	dome	limestone	2,4	4,29		0,98 x1,15	60,13		Old Kingdom	Dome-shaped spindle whorl, made of limestone. Hole slightly conical, larger at the base. Well polished. Wear traces near the upper side of the hole.	Petrie
Hierakonpolis	UC14886/4	spindle whorl	conical	limestone	2,6	3,99		0,88 x1	40,59		Old Kingdom	Conical spindle whorl made of limestone, badly preserved. An incisions goes from upper hole to the base.	Petrie
Buhen	UC21289	spindle whorl	cylindrical	wood	1,18	3,67 x4		0,58	2,76		Middle Kingdom	Cylindrical wooden spindle whorl, complete. Slightly warped, very worn.	Petrie
Buhen	UC21290	spindle whorl	cylindrical	wood	1,62	3,95 x3,27		0,76	3,51		Middle Kingdom	Cylindrical wooden spindle whorl, complete. Slightly warped, very worn.	Petrie
Haraga	AN 1914.765	spindle whorl	dome	bone	3,7	7,8		1x1,1	114	Engelbach and Gunn 1923, 10.	Haraga, house ruin 530, dyn XI-XII	Dome spindle whorl made of bone. Dense and heavy, cancellous bone visible on the basis. Clear cut upper hole.	Ashmolean
Haraga	AN 1914.766	spindle whorl	cylindrical	wood	2,7	4,3x 4,5		1,1x 1,3	21,4	Engelbach and Gunn 1923, 10.	Haraga, house ruin 530, dyn XI-XII	Cylindrical spindle whorl made of wood, complete. Different wood from 67 and 68. Complete. Well preserved, quite clear.	Ashmolean
Haraga	AN 1914.767	spindle whorl	cylindrical	wood	2,5	4,4		0,9x 1	15,4	Engelbach and Gunn 1923, 10.	Haraga, house ruin 530, dyn XI-XII	Wooden cylindrical spindle whorl, quite worn, with a lot of encrustation on the surface, all sides.	Ashmolean
Haraga	AN 1914.768	spindle whorl	cylindrical	wood	2,4	4,9		1,2	13	Engelbach and Gunn 1923, 10.	Haraga, house ruin 530, dyn XI-XII	Cylindrical spindle whorl, made of wood, not complete. Soft wood, mark on one side.	Ashmolean
Haraga	AN 1914.769	spindle whorl	cylindrical	wood	2,25	4,1x 4,2		1,1	13,3	Engelbach and Gunn 1923, 10.	Haraga, house ruin 530, dyn XI-XII	Cylindrical spindle whorl made of wood, complete. Soft and light wood, quite cracked. Worn hole, slightly oval.	Ashmolean
Abadiya	AN 1896-1908 E.3141	model mace head		clay	2,9	6,4		1,1x 0,7	76	Petrie 1901,32, pl.V	Abadiya grave B 56	Model of mace head, hole irregularly made. Unfired clay.	Ashmolean
Abydos	AN 1910.515 1	disc		alabaster	0,5	3,9				Naville et al.1914. 37-39	Abydos		Ashmolean

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Abydos	AN 1896-1908 E.2618	spindle whorl		pottery		3	0,8			Randall-McIver et al. 1902, 100	Abydos	Tomb D59	Ashmolean
Armant	10222	Prf. sherd		pottery	0,7	4,25		0,46	14,5		Armant, Predynastic Period	Perforated sherd, well rounded and cylindrical hole. Notes written on surface: II X(?) e 2°x°II/811.	Manchester
Armant	10223	Prf. sherd		pottery	0,8	3,5			10		Armant, Predynastic Period	Perforated sherd, pierced in three places (centre and twice on edge).	Manchester
Armant	10224	Prf. sherd		pottery	0,9	4,1		0,38	14,5		Armant, Predynastic Period	Perforated sherd, hole slightly diagonal.	Manchester
Armant	10225	Prf. sherd		pottery	1,1	4x3,7			19,2		Armant, Predynastic Period	Perforated sherd, not rounded nor smoothed. Unfinished hole.	Manchester
Armant	10226	Prf. sherd		pottery	0,62	4,85			9,7+x		Armant, Predynastic Period	Perforated sherd, half preserved. Well rounded and smoothed edge.	Manchester
Badari	UC20454	Prf. sherd		pottery	0,74	4		0,85	13,7		Badarian period	Pottery whorl, ripple burnished black and red pottery. Not perfectly rounded and different thickness.	Petrie
Badari	UC10673	Prf. sherd		pottery	0,83	3,46		0,45	9,9+x		Badarian period	Perforated pottery sherd, edge rounded, black on one side, brown on the other. Both surfaces have been polished. Hourglass perforation.	Petrie
Badari	EA59665	Prf. sherd		pottery	0,55	5,13 x4,9		0,75	19,67		Badari? Qaw el Kebir? Deposit 5125. Badarian period	Perforated sherd, the edges are roughly chipped and smoothed. Hole made starting from both sides but quite cylindrical.	British
Badari	AN 1925.527	spindle-whorl	disc	pottery	1,2	2,8				Brunton and Caton Thompson 1928, pl. XXVII.			Ashmolean
Badari	AN 1925.531	spindle-whorl	disc	pottery	0,7	3,8				Brunton and Caton Thompson 1928, 13.	Badari area 5700		Ashmolean

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Perforated sherds and other objects												
Fayum Kom W	UC2519	Prf. sherd		pottery	1,17	5,54		0,83	25,1+ x	Caton-Thompson and Gardner, 1934, 33	Fayum Neolithic Period From Fayum Kom W, strip T at latitude/longitude 169/1.	Perforated pottery sherd, quite thick, rough ware. Covered by a modern slip for preservation. Hole not central, made from one side.	Petrie
Badari	UC10530	Prf. sherd		pottery	1,1	3,3x 3		0,36	12,7		Predynastic period	Perforated sherd. Smooth and rounded edges, small hourglass hole. Incision on one surface?	Petrie
Badari	UC10562	Prf. sherd		pottery	0,63	4		0,8	10,6		Predynastic period	Perforated sherd, burnished on both sides (one is black and the other brown). Well rounded.	Petrie
Badari	UC26867	Prf. sherd		pottery	1,1	4,3x 4,7		0,45 x0,7 5	21,09	Brunton and Caton Thompson 1928, 45. LVIII,5.	Predynastic period	Perforated sherd, elliptical hole. Not a spindle whorl.	Petrie
Badari	UC26868	Prf. sherd		pottery	0,84	4,18		0,42	17,09	Brunton and Caton Thompson 1928, 45. LVIII,5.	Predynastic period	Perforated sherd, very well rounded. Hole slightly diagonal but not preventing use as whorl.	Petrie
Badari	UC9614	Prf. sherd		pottery	0,96	9,23		1,45	53,97	Brunton and Caton Thompson 1928, 45. LVIII,6.	Predynastic period	Perforated sherd, half preserved. Perfecly smoothed on all sides. Larger than normal prf. sherds, but thin and light.	Petrie
Badari	UC26733	Prf. sherd		pottery	0,8	3,7		0,45	13,54	Brunton and Caton Thompson 1928, 45. LVIII,6.	Predynastic period	Perforated sherd, quite well rounded, ourglass hole, slightly diagonal.	Petrie
Badari	UC26734	Prf. sherd		pottery	1,15	4,1x 3,8		0,72	21,19		Predynastic period	Perforated sherd, broken. Almost quadrangular with rounded corner, smoothed edges. Cylindrical hole.	Petrie
Badari	UC26739	Prf. sherd		pottery	0,7	4		0,35	12,24		Predynastic period	Perforated sherd, quite well rounded, with small hourglass hole.	Petrie
Ballas	4548	Prf. sherd		pottery	0,6	3,2		0,6	6,8		Ballas, Predynastic Period	Perforated sherd, cylindrical hole.	Manchester
Hammamiya	AN 1925.576W	Prf. sherd		pottery	1	4,2			19,9	Brunton and Caton Thompson 1928, 77-8.	Hammamiya North spur, surface - 1'	Rounded sherd with unfinished perforation on one surface. Sides well smoothed.	Ashmolean

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Hammamiya	AN 1925.578S	Prf. sherd		pottery	1	4,3		0,3	19,8	Brunton and Caton Thompson 1928, 77-8.	Hammamiya North spur, surface - 1'6-2'	edge chipped. Rounded sherd with a very small hole. Edges well rounded.	Ashmolean
Hammamiya	7545	Prf. sherd		pottery	1,6	6,6		1,4	66,3		Hammamiya Predynastic Period	Pottery spindle-whorl, of coarse, slightly baked or sun-dried red-grey clay; disc-shaped. Brutta e grossa, mancante di una parte.	Manchester
Hammamiya	7588	Prf. sherd		pottery	0,6	4,1		nn	12,6		Hammamiya Predynastic Period	Flat clay disc, hollowed in centre on both sides; probably an unfinished spindle-whorl. Black pottery.	Manchester
Hammamiya	7578 .b	Prf. sherd		pottery	1,21	3,39		0,55 x0,74	12,2		Hammamiya, Predynastic Period	Frammento di ceramica triangolare con bel foro conico eseguito forando la gran parte da un lato e in misura minore dall'altra.	Manchester
Hammamiya	UC19706	Prf. sherd		pottery	0,62	5,8x 4,9		0,64	23,5	Hemamieh. North Spur Hemamieh, Hut Circle 248, Area F-G, 1' below wall.	Predynastic period	Perforated pottery sherd. Edges nor rounded or smooth. Sharply cut. Hour glass perforation. Rough village ware	
Hammamiya	UC19734	Prf. sherd		pottery	0,84	3,25		0,58	8,4	North Spur Hemamieh?	Predynastic period	Pottery disc, perforated. red burnished ware. Hour glass perforation. Chipped on one side. Quite rounded.	
Hierakonpolis	UC27530	prf. Sherd	perforated sherd	pottery	0,71	2,4		0,53	4,6+x		Predynastic period	Small pottery fragment, rounded and perforated from one side. Broken in two pieces and a small fragment missing.	
Hierakonpolis	AN 1896-1908 E.361	mace head		alabaster	3,6	3,3		0,8	49,5	Quibell and Green, 1902, pl. XLVIIIa.	Hierakonpolis, Temple enclosure, main deposit	Pear-shaped. Perfectly shaped and polished, completely different surface treatment than other spindle whorls.	Ashmolean
Hierakonpolis	AN 1896-1908 E.365	mace head		limestone	4,1	3				Quibell and Green, 1902, pl. XXVII.27.	Hierakonpolis, Temple enclosure, main deposit	Pear-shaped	Ashmolean
Hierakonpolis	E.718	prf. Sherd		pottery	0,8	4,2		4,7	14,3		Hierakonpolis P33T	Perforated sherd, complete. Central and cylindrical hole. Edges diagonally cut, perfect to be used as a stopper.	Garstang
Hierakonpolis	E.716	spindle whorl		stone							Hierakonpolis T316		Garstang
Naqada	AN 1895.145	model mace head		chalk	1,9	5,9		0,8	43	Petrie et al. 1896, pl. VII.3	Naqada grave 1417	Decorated on both faces with black spots and line	Ashmolean
Naqada	AN 1895.146	model mace head	disc	chalk	1,2	7,3		0,8	58	Petrie et al. 1896, 35, pl. VII.4	Naqada grave 234	Decorated on both faces with cross and spots between arm in black	Ashmolean

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Naqada	AN 1895.147	model mace head		chalk	3,4	8,9		0,7	203	Petrie et al. 1896, 27, pl. VII.5	Naqada grave 824	Decorated on both faces with cross, one arm with diverging sides and spots in other two angles in black. Definitely not a whorl. Hourglass hole.	Ashmolean
Naqada	AN 1895.148	model mace head		chalk	1,7	10,1		0,6x 1,3	122	Petrie et al. 1896, 28, pl. VII.6	Naqada grave 1418	Both faces decorated with black, leaving two white lines on each side of middle. Conical hole.	Ashmolean
Naqada	AN 1895.149	model mace head		chalk	2,2	8,2				Petrie et al. 1896, 35, pl. VII.7	Naqada grave 1443	Both faces decorated with black, with two white stripes left across the middle	Ashmolean
Naqada	AN 1895.150	model mace head		sandstone	2,2	7,8				Petrie et al. 1896, 35.	Naqada grave 1443	Both faces decorated with black, with two white stripes left across the middle	Ashmolean
Naqada	AN 1895.151	model mace head		sandstone	2	8,3		0,8x 0,6	106	Petrie et al. 1896, 28, pl. VII.3	Naqada grave 1418	Both faces decorated with black, with one stripes and many spots in white over the black. Se questi sono i modellini quanto sono grandi quelle vere?	Ashmolean
Naucratis	AN 1886.520 3	prf. Sherd		pottery		4,8	1, 1		29,3		Naucratis	Petrie 1884-5 excav. Pottery rounded disc with two small hole near the edge. Pendant?	Ashmolean
Naucratis	AN 1966.1225	disc		pottery	2,8	3,7	0, 2				Naucratis	Petrie 1884-5 excav.	Ashmolean
Unknown	AN 1933.566	spindle-whorl		limestone	2,9	4,6					Egypt?	Decorated with one incised vertical line	Ashmolean
Weights													
Abydos	AN 1896-1908 E.2712A	Weight		Lead	2,5	1,7	0, 8		13,6	Randall-McIver et al. 1902, 102, pl. XLVIII	Abydos, tomb D119	Tomb D119. Very small lead net sinker, simply folded.	Ashmolean
Abydos	AN 1896-1908 E.2712B	Weight		Lead	1,8	0,9	0, 6		7,2	Randall-McIver et al. 1902,102, pl. XLVIII	Abydos, tomb D119	Tomb D119. Very small lead net sinker, simply folded.	Ashmolean
Abydos	AN 1896-1908 E.2712C	Weight		Lead	1,8	0,8	0, 7		6,4	Randall-McIver et al. 1902, 102, pl. XLVIII	Abydos, tomb D119	Tomb D119. Very small lead net sinker, simply folded.	Ashmolean

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Abydos	AN 1896-1908 E.2712D	Weight		Lead	1,8	0,8	0,6		5,9	Randall-McIver et al. 1902, 102, pl. XLVIII	Abydos, tomb D119	Tomb D119. Very small lead net sinker, simply folded.	Ashmolean
Abydos	UC43099	Weight	Cylindrical	Baked clay	3,4	2,4	1,8		17,6	Petrie 1925	Tomb 798, Dynasty 12	Pottery weight, cylindrical, grooves around circumference near both ends. Traces of wear in the grooves.	Petrie
Armant	10656	Weight	Cylindrical	Baked clay	6,1	2,6			29			Pottery weight, cylindrical, grooves around circumference near both ends and one on the base. Traces of wear in the grooves.	Manchester
Armant	10654.a	Weight		Baked clay	4	2,2	1,7		15,6		AR P 556	Pottery weight, cylindrical grooves around circumference near both ends and between transverse holes (on one side only).	Manchester
Armant	10654.b	Weight		Baked clay	3,6	1,9	1,7		11,7		AR P 557	Pottery weight, cylindrical grooves around circumference near both ends and between transverse holes (on one side only).	Manchester
Armant	10655.a	Weight		Baked clay	3,1	4,5	1,7		26,2			Pottery weight, two small holes and groove at the base.	Manchester
Armant	10655.b	Weight		Baked clay	2,4	3,5	1,5		12,2			Pottery weight, two small holes and groove at the base.	Manchester
Buhen	UC21265	Weight		Sandstone	5,56	4,84 base	3,41		97,07	Emery et al. 1979, *114, Pl. 40*	Middle Kingdom	Loom weight, trapezoidal, yellow sandstone, longitudinal median groove.	Petrie
Buhen	UC21266	Weight		Sandstone	6,42	5,31 base	3,88		166	Emery et al. 1979, *114, Pl. 40*	Middle Kingdom	Loom weight, flattened conical, white sandstone, longitudinal median groove	Petrie
Buhen	UC21267	Weight		Sandstone	6,55	4,2	4,19		110,07	Emery et al. 1979, *114, Pl. 40*	Middle Kingdom	Loom weight, conical, buff sandstone, longitudinal median groove	Petrie
Buhen	UC21268	Weight		Sandstone	7,81	5,53	4,3		191	Emery et al. 1979, *114, Pl. 40*	Middle Kingdom	Loom weight, flattened conical, buff/white sandstone, double crossing median grooves.	Petrie
Buhen	UC21269	Weight		Sandstone	7,15	4,44	3,63		133	Emery et al. 1979, *114, Pl. 40*	Middle Kingdom	Loom weight, flattened conical, buff sandstone, longitudinal median groove	Petrie
Buhen	UC21270	Weight		stone	5,93	3,95	3,62		90,68	Emery et al. 1979, 113, Pl. 40	Middle Kingdom	Loom weight, trapezoidal, brown stone, longitudinal median groove	Petrie
Buhen	UC21271	Weight		Sandstone	6,33	5,28	3,89		125	Emery et al. 1979, *114, Pl. 40*	Middle Kingdom	Loom weight, flattened conical, buff sandstone, longitudinal median groove	Petrie

N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Buhen	UC21272	Weight		Sandstone	6,98	7,26	3,78		241	Emery et al. 1979, *114, Pl. 40*		Loomweight, flattened trapezoidal, buff sandstone, longitudinal median groove	Petrie
Buhen	UC21273	Weight		Sandstone	4,74	3,31	3,33		49,38	Emery et al. 1979, 115, Pl. 41		Loom weight, conical, buff sandstone, four longitudinal quartered grooves	Petrie
Buhen	UC21274	Weight		Limestone	6,94	4,65	3,92		148	Emery et al. 1979, 113, Pl. 40		Loom weight, flattened conical, buff limestone, horizontal groove round top, median groove over the top	Petrie
Buhen	UC21275	Weight		stone	7,53	4,34	3,8		141	Emery et al. 1979, 113, Pl. 40	Middle Kingdom	Loom weight, egg shaped, buff mud, median longitudinal groove	Petrie
Buhen	UC21276	Weight		Limestone	7,03	5,43	3,99		206	Emery et al. 1979, 113.		Loom weight, egg-shaped, buff limestone marked with red paint, median longitudinal groove	Petrie
Buhen	UC21277	Weight		Sandstone	2,28	1,62	1,44		5,77	Emery et al. 1979, 113.	Middle Kingdom	Loom weight, small egg-shaped, buff sandstone, median longitudinal groove. Very small, weight similar to lead examples.	Petrie
Buhen	UC21278	Weight		Limestone	7,48	4,52	4,43		165	Emery et al. 1979, 115.	Middle Kingdom	Loom weight, egg-shaped, white limestone, four longitudinal grooves and part of another. Very irregular	Petrie
Buhen	UC21279	Weight		Sandstone	5,78	4,45	2,77		72,25	Emery et al. 1979, 115, Pl. 41	Middle Kingdom	Loom weight, egg-shaped, flat one side, buff sandstone, cross grooves on rounded side	Petrie
Buhen	UC21280	Weight		Sandstone	5,63	4,22	2,35		85,17	Emery et al. 1979, 114.	Middle Kingdom	Loom weight, brick-shaped, one rounded end, buff sandstone, median longitudinal groove	Petrie
Buhen	UC21281	Weight		Sandstone	4,37	3,88	2,51		43,1	Emery et al. 1979, 115, Pl. 41	Middle Kingdom	Uneven trapezoidal buff sandstone loom weight, grooves divide it into quarters	Petrie
Buhen	UC21282	Weight	Discoid elliptical	Sandstone	7,03	5,1	2,72		131	Emery et al. 1979, 115.	Middle Kingdom	Discoid elliptical sandstone loom weight, narrow at one end with drilled perforation	Petrie
Buhen	UC21283	Weight		Baked clay	9,8	7,42	3,51		232	Emery et al. 1979, 115.	Middle Kingdom	Oval baked pottery weight; one longitudinal median groove, two at a tangent on one side and one deeper short groove on the other side	Petrie
Buhen	UC21284	Weight		Limestone	3,03	2,22	1,72		11,97	Emery et al. 1979, 145, pl. 51.	Middle Kingdom	Small white limestone pyramidal weight. Median vertical groove, longitudinal groove on base and part of side to vertical groove	Petrie
Buhen	UC21285	Weight		Baked clay	8,35	4,6	4,54		184	Emery et al. 1979, 144.	Middle Kingdom	Oval pottery weight. Groove around circumference, 2 pits on one side	Petrie

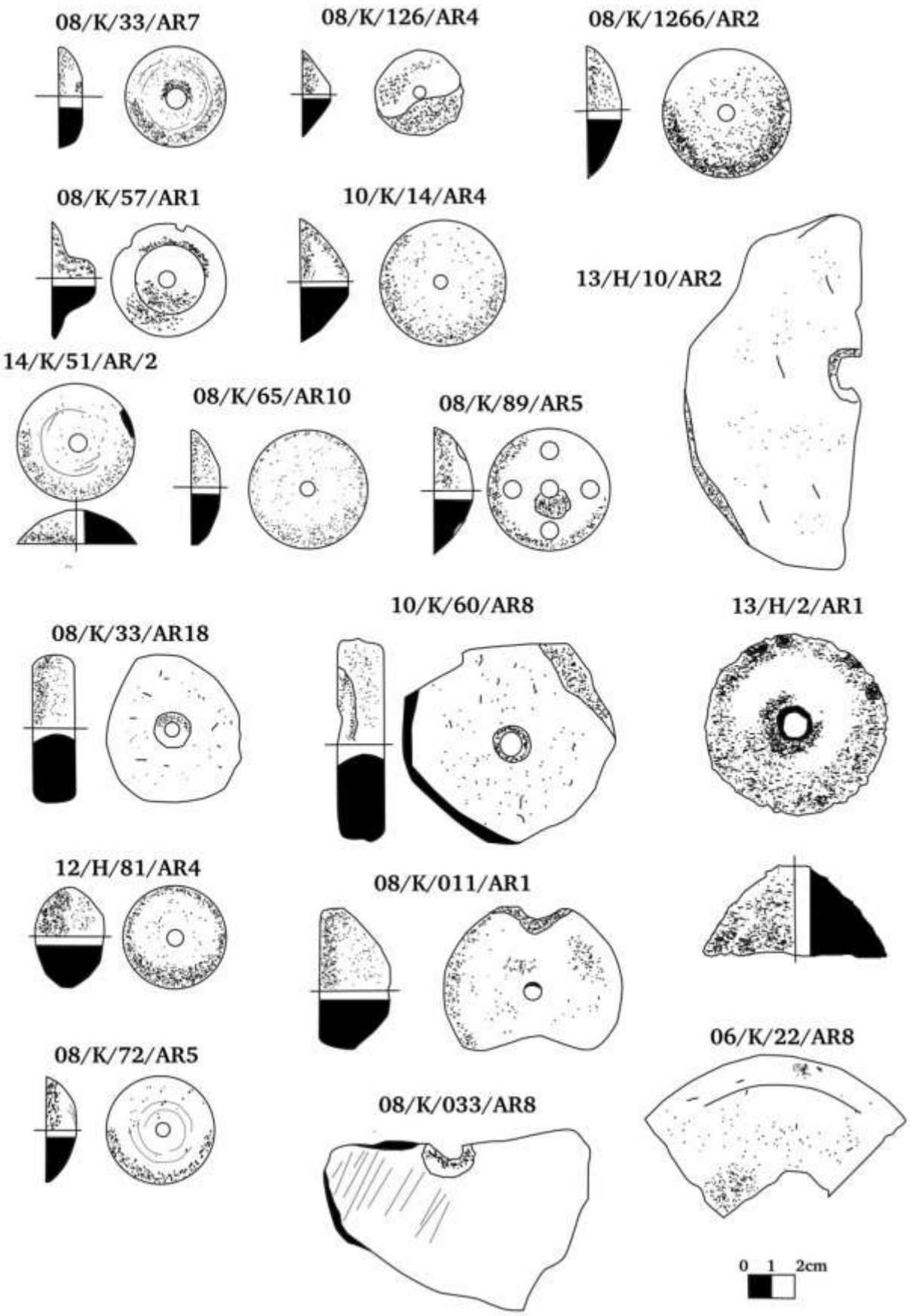
N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Buhen	UC21286	Weight	Discoid elliptical	Baked clay	10,93	9,09	2,83		274	Emery et al. 1979, 112.	Middle Kingdom	Discoid elliptical pottery weight groove over rounded top, perforation below top.	Petrie
Buhen	UC21287	Weight	Discoid elliptical	Mud	8,84	6,5	5,62		287	Emery et al. 1979, 115.	Middle Kingdom	Conical mud loom weight, flat bottom, top pointed, perforation below point.	Petrie
Buhen	UC25858	Weight		Sandstone	70,25	4,78			142		Middle Kingdom	Sandstone oval weight, with two incised grooves, crossing longtitudionally	Petrie
Buhen	UC21329	Weight	Semi-discoid	Baked clay	9,7	5,79	3,4	0,56	187	Emery et al. 1979, 129, pl. 44.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21330	Weight	Semi-discoid	Baked clay	6,46	4,35	2,69	0,6	75,09	Emery et al. 1979, 112.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21331	Weight	Semi-discoid	Baked clay	8,79	5,03	3,08	0,67	100,6	Emery et al. 1979, 112.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21332	Weight	Semi-discoid	Baked clay	6,97	4,18	2,13	0,38	59,01	Emery et al. 1979, 129.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21333	Weight	Semi-discoid	Baked clay	11,17	6,62	3,32	0,49	234	Emery et al. 1979, 127.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21334	Weight	Semi-discoid	Baked clay	6,2	3,9	1,91	0,36	49,61	Emery et al. 1979, 128.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21335	Weight	Semi-discoid	Baked clay	9,44	6,59	4,16	0,64	205	Emery et al. 1979, 127.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21336	Weight	Semi-discoid	Baked clay	6,83	4,64	2,03	0,49	58,74	Emery et al. 1979, 123.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21337	Weight	Semi-discoid	Baked clay	6,41	2,84	3,35	4,24	47,19	Emery et al. 1979, 127.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21338	Weight	Semi-discoid	Baked clay	11,73	9,04	5,12	0,76/1,5	395	Emery et al. 1979, 128.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base. Chipped on one side.	Petrie
Buhen	UC21340	Weight	Semi-discoid	Baked clay	8,38	6,63	3,17	0,74	135	Emery et al. 1979, 127.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21342	Weight	Semi-discoid	Baked clay	6,86	5,13	2,97	0,75	81,79	Emery et al. 1979, 127.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21343	Weight	Semi-discoid	Baked clay	6,45	4,6	2,78	0,53	78,07	Emery et al. 1979, 128.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21344	Weight	Semi-discoid	Baked clay	7,44	4,11	1,98	0,55	54,42	Emery et al. 1979, 127.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21345	Weight	Semi-discoid	Baked clay	6,47	3,15	2,27	0,43	42,29	Emery et al. 1979, 127.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21346	Weight	Semi-discoid	Baked clay	7,44	4,22	2,13	0,53	72	Emery et al. 1979, 130.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie

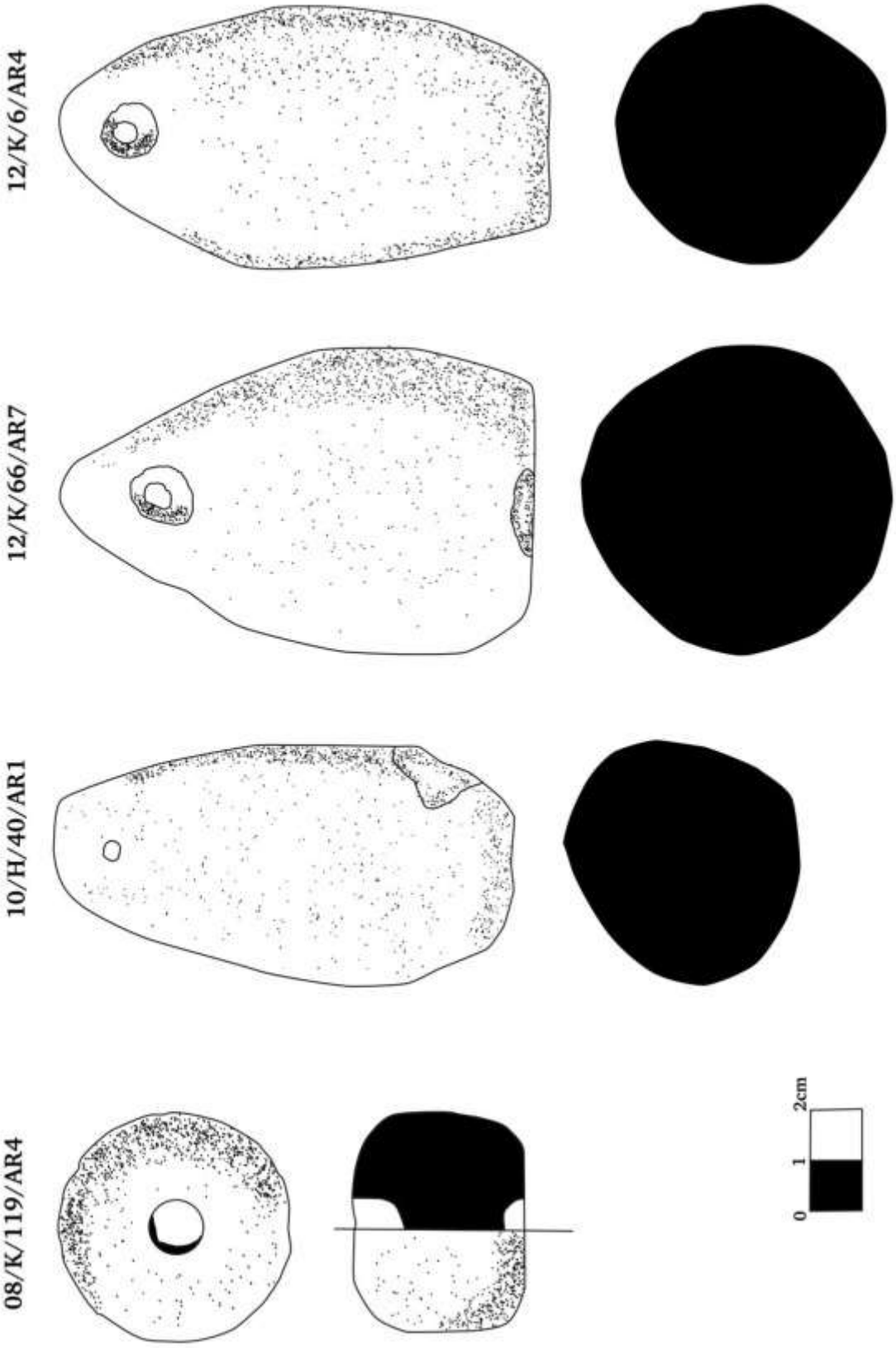
N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Buhen	UC21347	Weight	Semi-discoid	Limestone	5,05	3,09	2,34	0,6	47,17	Emery et al. 1979, 127.	Middle Kingdom	Semi-discoid limestone weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21348	Weight	Semi-discoid	Baked clay	6,67	4,19	2,12	0,41	51,71	Emery et al. 1979, 130.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21349	Weight	Semi-discoid	Baked clay	7,63	4,9	2,79	0,49	87,43	Emery et al. 1979, 129.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base. Very irregular surface.	Petrie
Buhen	UC21350	Weight	Semi-discoid	Baked clay	9,1	6,3	2,81	0,46	162	Emery et al. 1979, 128.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21351	Weight	Semi-discoid	Baked clay	6,75	4,79	2,87	0,7	85,33	Emery et al. 1979, 128.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21352	Weight	Semi-discoid	Baked clay	9,9	6,73	2,8	0,45	170	Emery et al. 1979, 129.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21353	Weight	Semi-discoid	Baked clay	13,05	8,5	40,6	0,54	390	Emery et al. 1979, 129.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21353A	Weight	Semi-discoid	Baked clay	9,47	7,28	5,32	0,7/0,8	271	Emery et al. 1979, 128, *pl. 44.*	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21354	Weight	Semi-discoid	Baked clay	12,95	9,11	5,71	1,8	411	Emery et al. 1979, 128.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21355	Weight	Semi-discoid	Baked clay	12,8	8,67	5,2	1,58	361	Emery et al. 1979, 128.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21356	Weight	Semi-discoid	Baked clay	11,13	6,92	2,8	6,83	173	Emery et al. 1979, 128.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21357	Weight	Semi-discoid	Baked clay	11,19	7,35	3,62	0,8	239	Emery et al. 1979, 128.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21358	Weight	Semi-discoid	Baked clay	11,51	7,79	4,38	0,63	291	Emery et al. 1979, 127.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21359	Weight	Semi-discoid	Baked clay	9,86	7,39	3,6	0,54	221	Emery et al. 1979, 129.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21362	Weight	Semi-discoid	Baked clay	13,08	10,35	5,25	1,44	465	Emery et al. 1979, 129.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21363	Weight	Semi-discoid	Baked clay	9,72	6,37	3,52	0,58	165+x	Emery et al. 1979, 130.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base. Broken.	Petrie
Buhen	UC21364	Weight	Semi-discoid	stone	5,09	5,46	2,98	0,9	98,4	Emery et al. 1979, 129.	Middle Kingdom	Fragment of a semi-discoid weight, one small holes and a deep groove at the flat base. Broken. Traces of rubbing clearly visible on the hole.	Petrie
Buhen	UC21365	Weight		Baked clay	5,8	2,5	1,1	0,26	15,92	Emery et al. 1979, 128 pl. 44.	Middle Kingdom	Oval weight, hole at each end. Surface quite regular and rounded holes.	Petrie

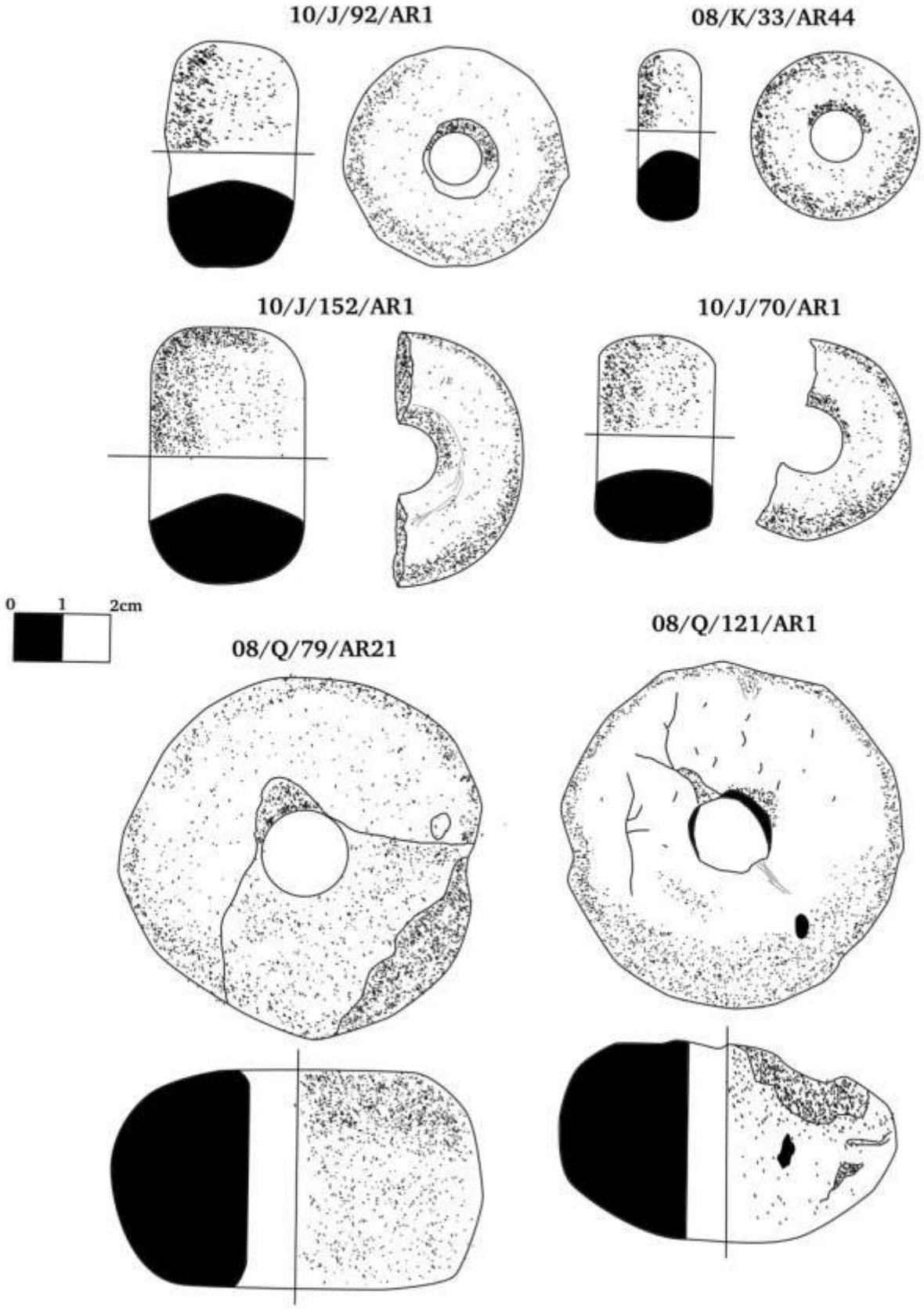
N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Buhen	UC21366	Weight		Clay	5,24	4,1	2,26	0,24	40,66	Emery et al. 1979, 128.	Middle Kingdom	Small fragment of unbaked clay weigh. Very ruined, one hole visible. Base with a groove.	Petrie
Buhen	UC21407	Weight		Limestone	13,75	8,09	7,78		798	Emery et al. 1979, 157, pl. 58	Middle Kingdom	Limestone weight, grooves around circumference near both ends.	Petrie
Buhen	UC21408	Weight		Limestone	7,953	1 12,2	5,29		489	Emery et al. 1979, 157.	Middle Kingdom	Limestone weight, grooves around circumference near both ends. Broken.	Petrie
Buhen	UC21339	Weight		Baked clay	11,23	7,18	3,99	0,85	252		Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21341	Weight		Baked clay	9,27	5,85	3,48	0,65	145		Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Buhen	UC21361	Weight		Baked clay	12,67	8,59	5,25	1	376		Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base. Broken.	Petrie
Buhen	UC21367	Weight	Discoid elliptical	Clay	16,1	8,38	5,1	0,85	530			Discoid elliptical weight, with one hole near the top. Unfired clay.	Petrie
Buhen	UC21262	Weight		Baked clay	6,48	3,58	2,98		68	Emery et al. 1979, 147, Pl. 52		Pottery weight, grooves around circumference near both ends and at the base. Broken.	Petrie
Buhen	UC21263	Weight		Baked clay	7,99	5,349	3,4		127	Emery et al. 1979, 147.		Pottery weight, grooves around circumference near both ends and at the base.	Petrie
Buhen	UC21264	Weight		Sandstone	4,27	5,91	4,04		87,93	Emery et al. 1979, 128.	rotto	Fragment of a weight, rectangular end with groove round it also part of groove along base	Petrie
Buhen	UC21360	Weight		Baked clay	15,05	10,36	5,14	2,08	638	Emery et al. 1979, 128, pl. 103 H-I.	Middle Kingdom	Semi-discoid weight, two small holes and a deep groove at the flat base.	Petrie
Haraga	AN 1914.756	Weight		Limestone	7,3	5,3			172,9	Engelbach and Gunn 1923, 17 pl. XIE	Middle Kingdom. Engelbach 1914 excavations house ruin 530.	Plumb bob	Ashmolean
Haraga	AN 1914.757	Weight		Limestone	4,9	4,6			129,7	Engelbach and Gunn 1923, 17 pl. XIE	Middle Kingdom. Engelbach 1914 excavations house ruin 530.	Plumb bob	Ashmolean
Haraga	AN 1914.758	Weight		Limestone	7	4,7	2			Engelbach and Gunn 1923, 17 pl. XIE	Middle Kingdom. Engelbach 1914 excavations house ruin 530.	Plumb bob	Ashmolean
Memphis	UC47588	Weight		Limestone	4,1	3,4	2,5				Late Period	Loom weight, trapezoidal, limestone, longitudinal median groove.	Petrie

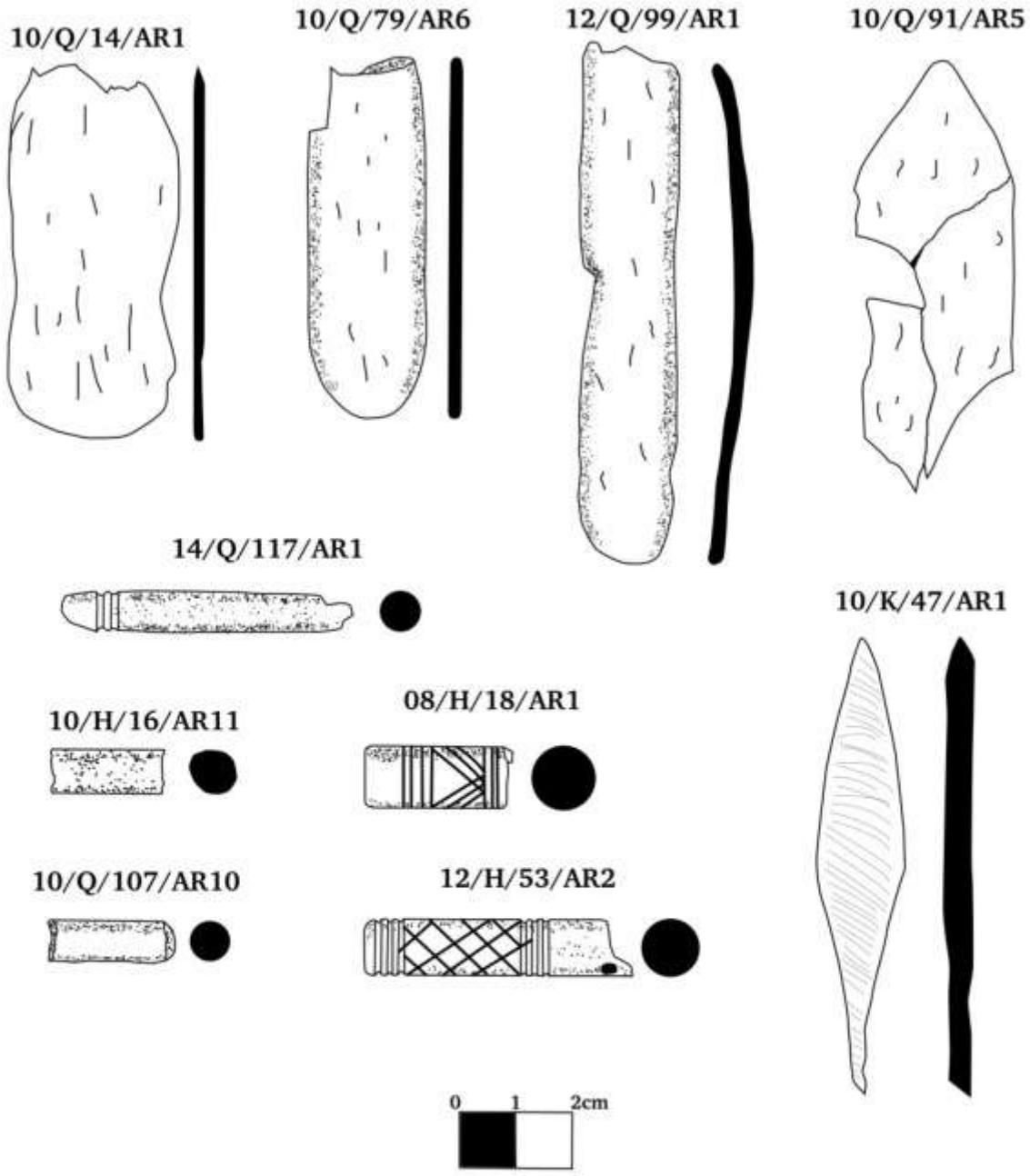
N.	Object	Typology	Material	H	D	Th	Hole	Weight	Bibliography	Notes	Description	Museum
Memphis	UC47589	Weight		Limestone	3,7	1,37	1,38		10,6		Late Period	Loom weight, trapezoidal, limestone, longitudinal median groove.	Petrie
Naucratis	AN 1886.519	disc		Baked clay	8,3	6,4	1,7		88			Semi-discoid weight, two small holes and a deep groove at the flat base. Broken.	Ashmolean

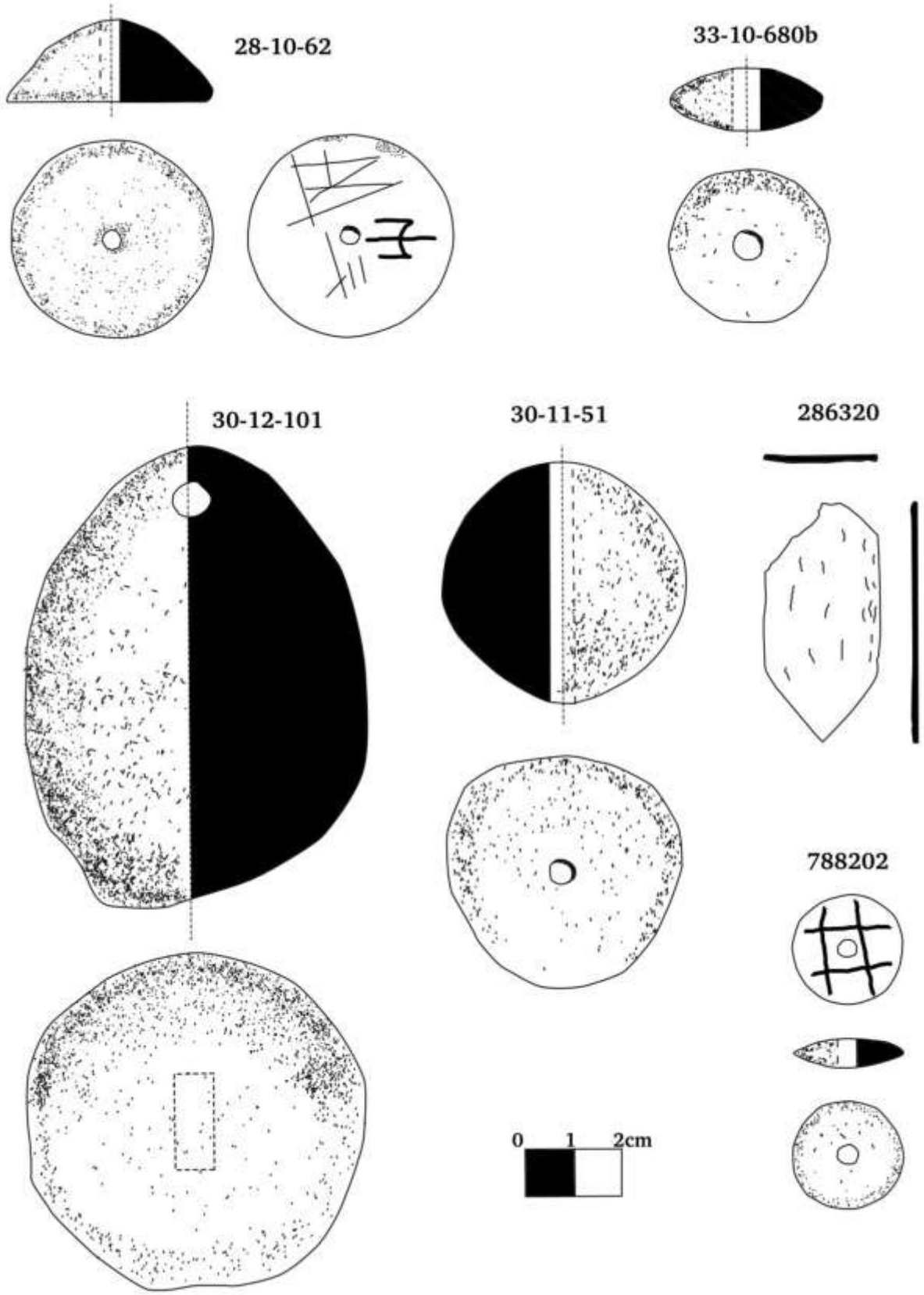
PLATES

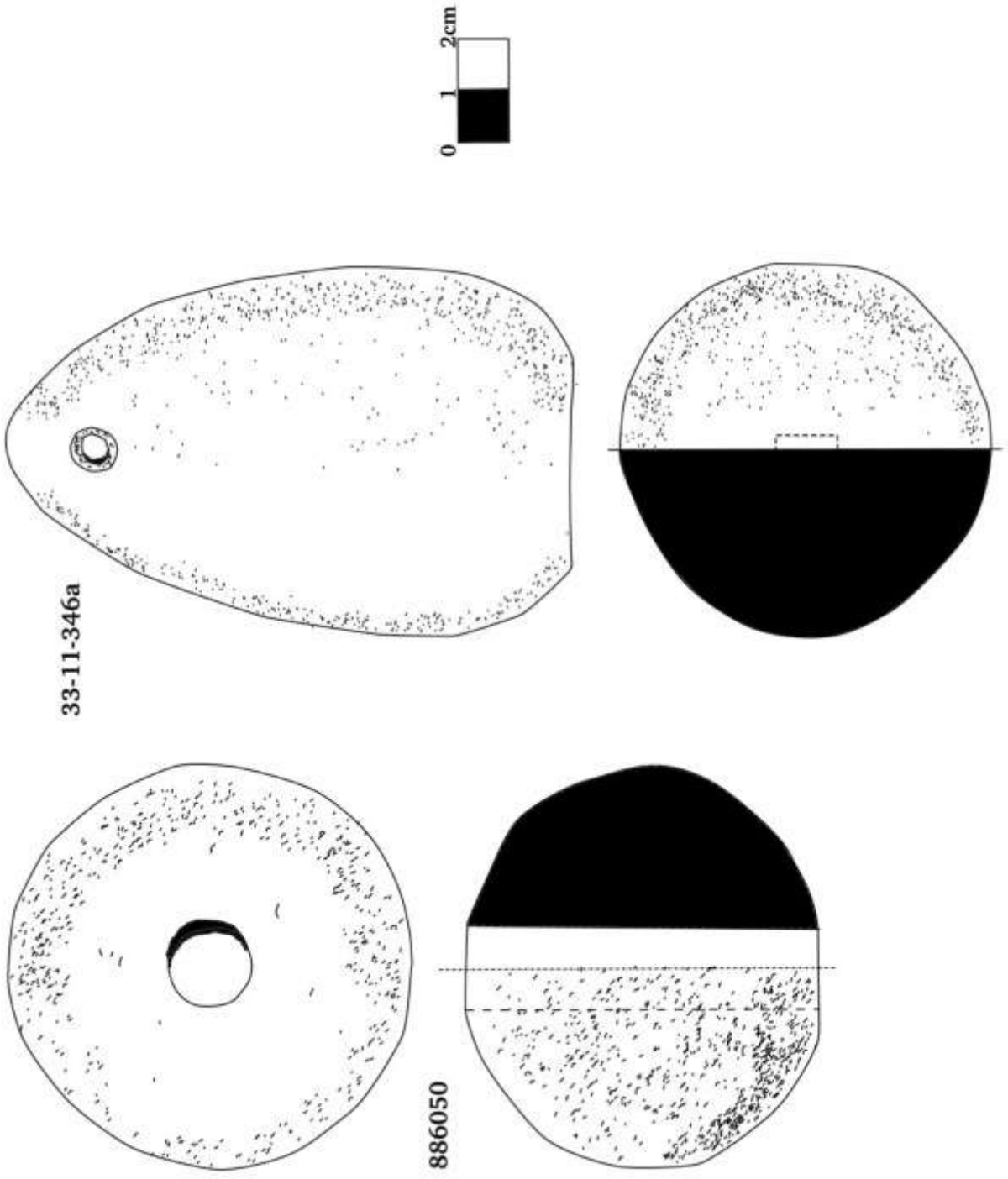

08/K/33/AR7
08/K/126/AR4
08/K/1266/AR2
08/K/57/AR1
10/K/14/AR4
13/H/10/AR2
14/K/51/AR/2
08/K/65/AR10
08/K/89/AR5
10/K/60/AR8
13/H/2/AR1
08/K/33/AR18
12/H/81/AR4
08/K/011/AR1
08/K/72/AR5
06/K/22/AR8
08/K/033/AR8
0 1 2cm

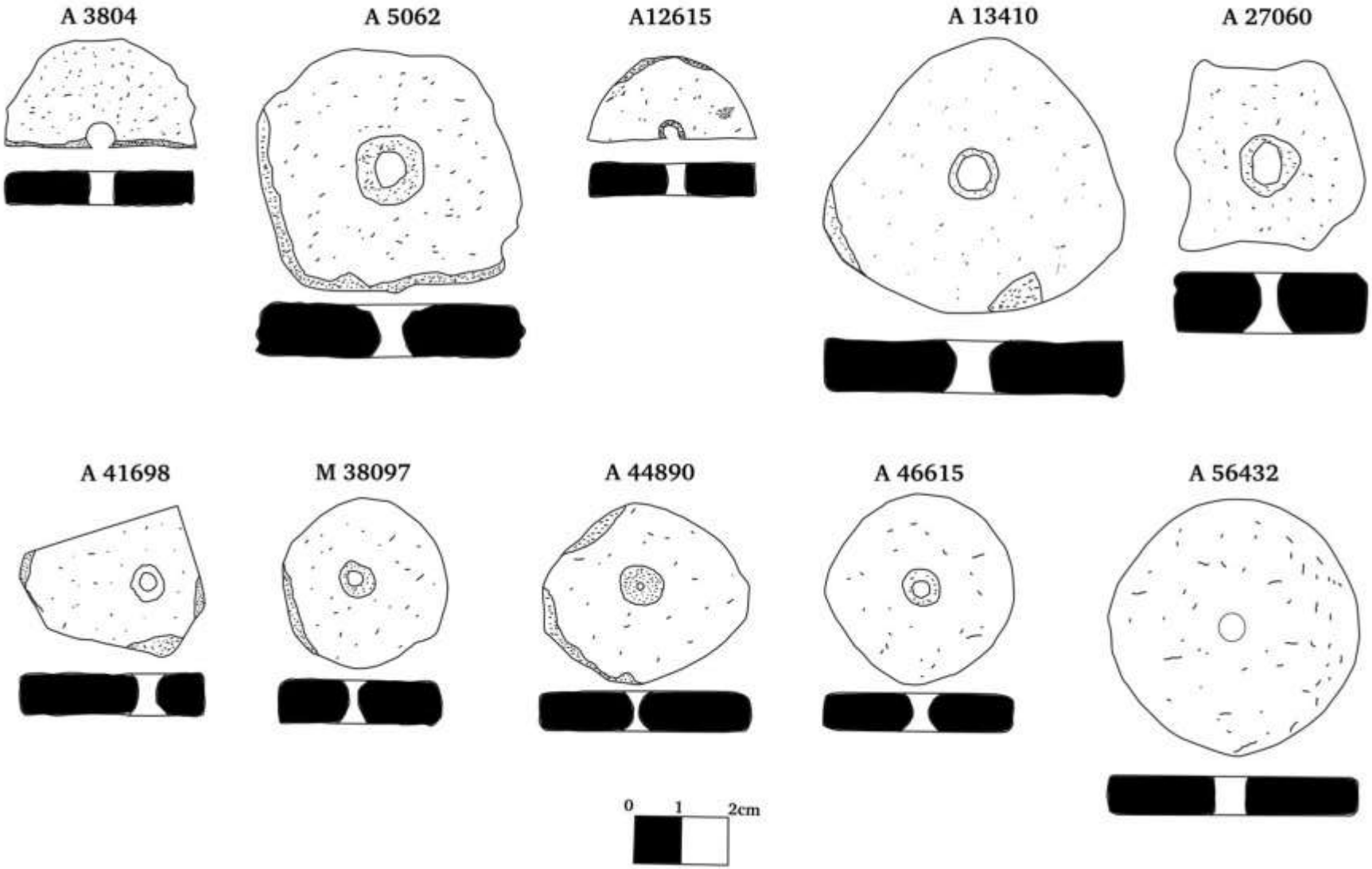

12/K/6/AR4
12/K/66/AR7
10/H/40/AR1
08/K/119/AR4
0
1
2cm


10/J/92/AR1
08/K/33/AR44
10/J/152/AR1
10/J/70/AR1
0 1 2cm
08/Q/79/AR21
08/Q/121/AR1

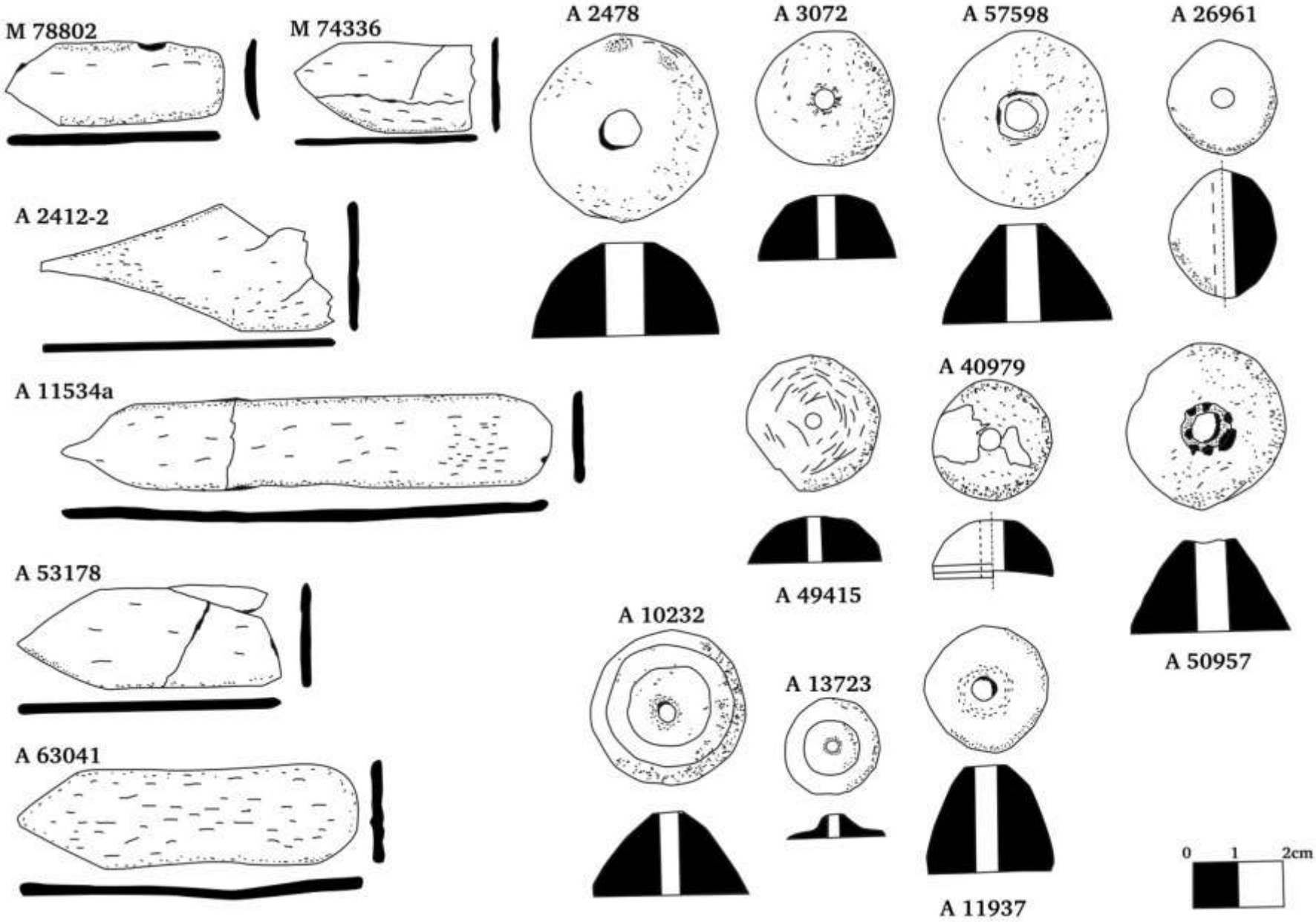

10/Q/14/AR1
10/Q/79/AR6
12/Q/99/AR1
10/Q/91/AR5
14/Q/117/AR1
10/K/47/AR1
10/H/16/AR11
08/H/18/AR1
10/Q/107/AR10
12/H/53/AR2
0 1 2cm


28-10-62
33-10-680b
30-12-101
30-11-51
286320
788202
0 1 2cm

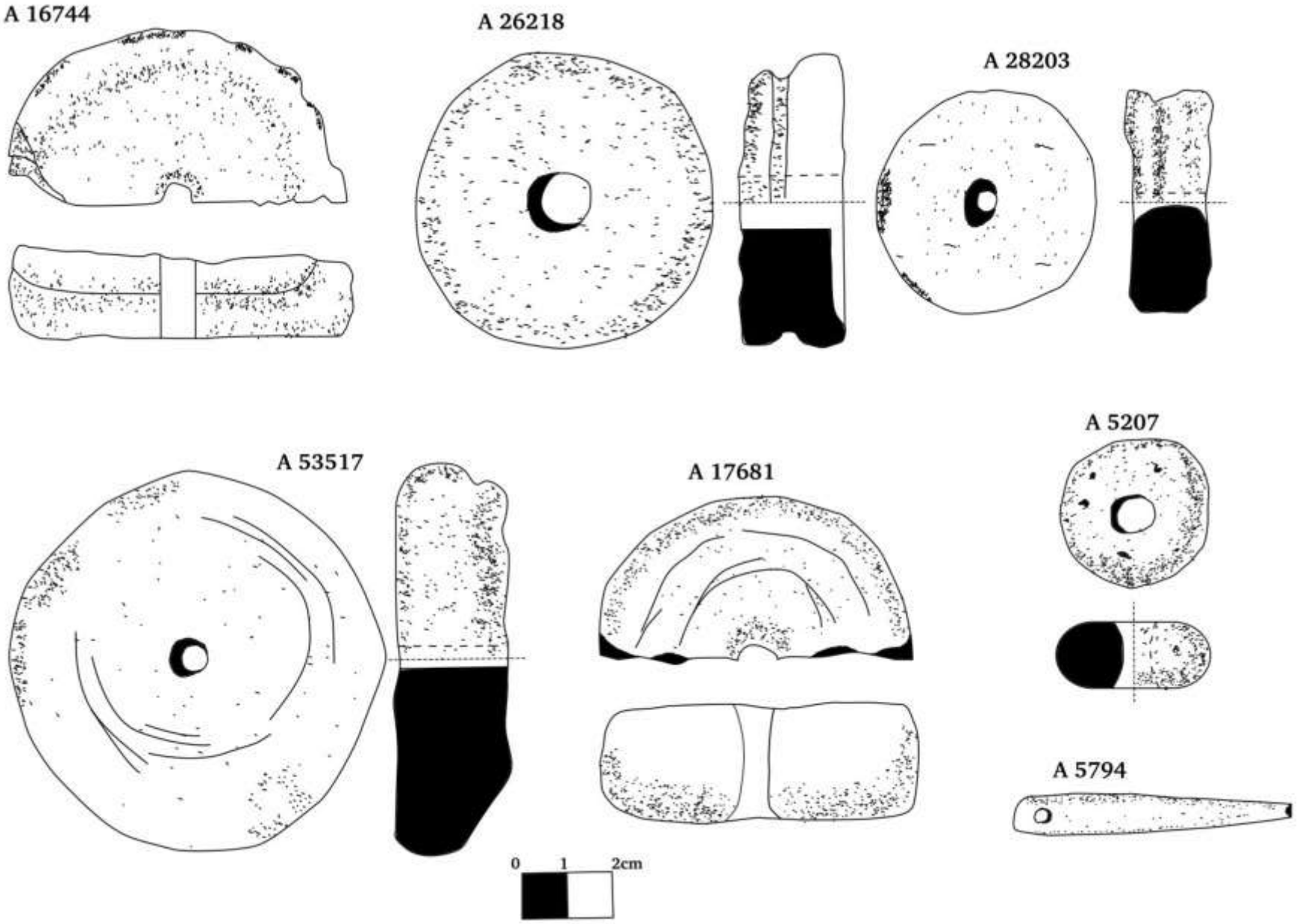

0
1
2cm
33-11-346a
886050

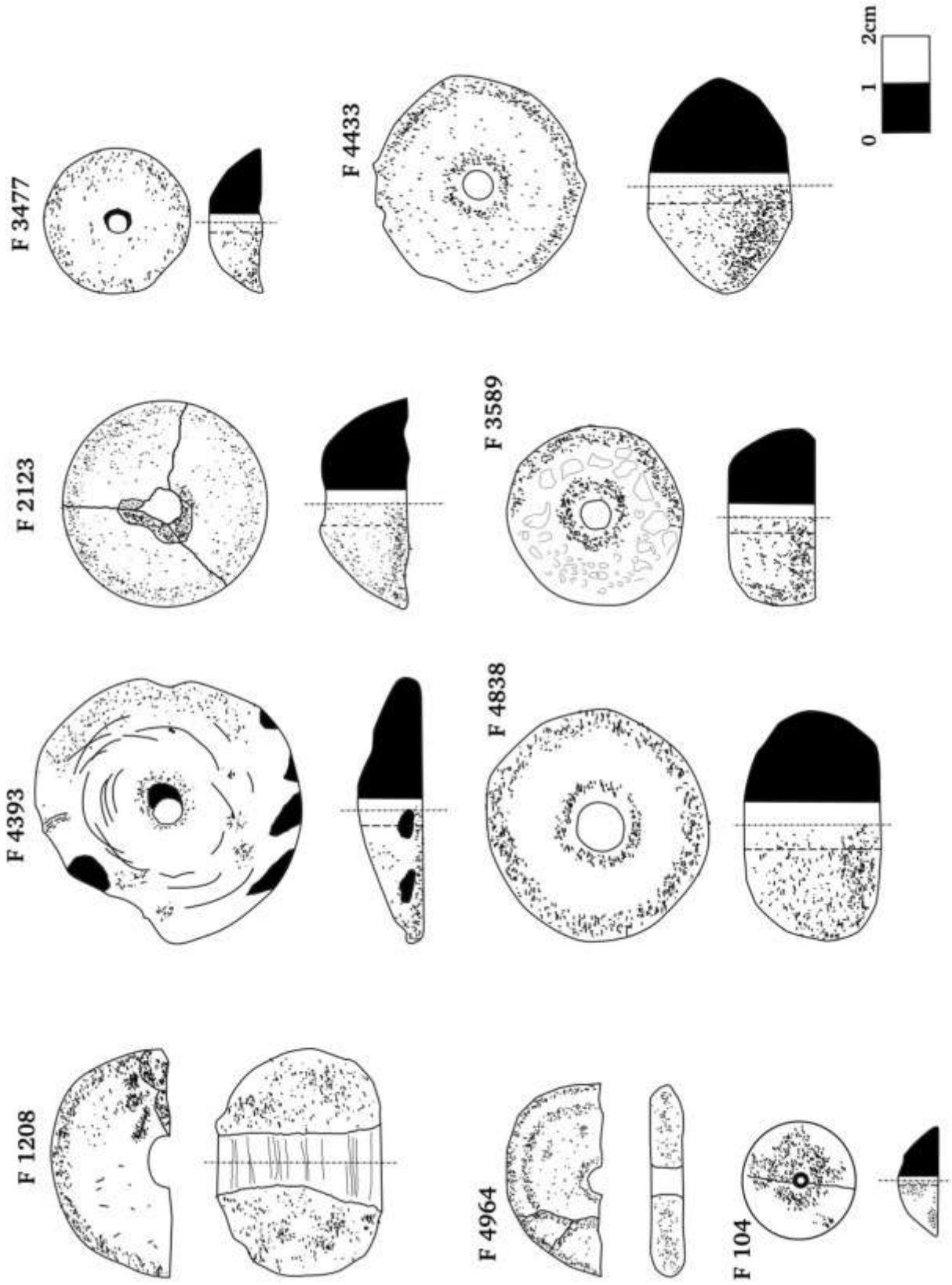

A 3804
A 5062
A12615
A 13410
A 27060
A 41698
M 38097
A 44890
A 46615
A 56432
0 1 2cm

M 74688
M 92956
M 34618
M 93230
M 70416a
M 24766
M 30092
M 75352
M 72359
M 37719
M 34834
0
1
2cm

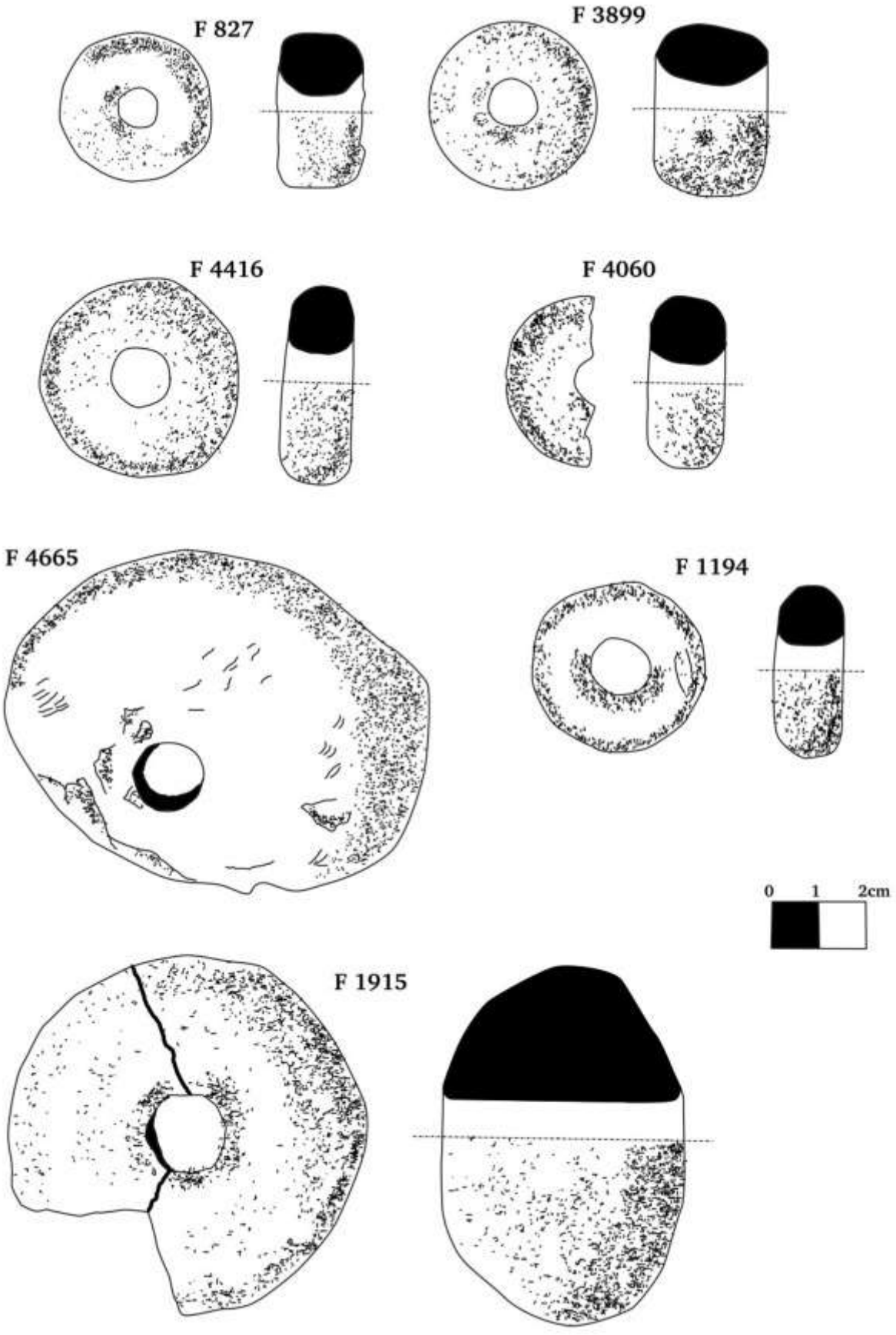

M 78802
M 74336
A 2478
A 3072
A 57598
A 26961
A 2412-2
A 11534a
A 40979
A 53178
A 49415
A 10232
A 13723
A 50957
A 63041
A 11937
0 1 2cm

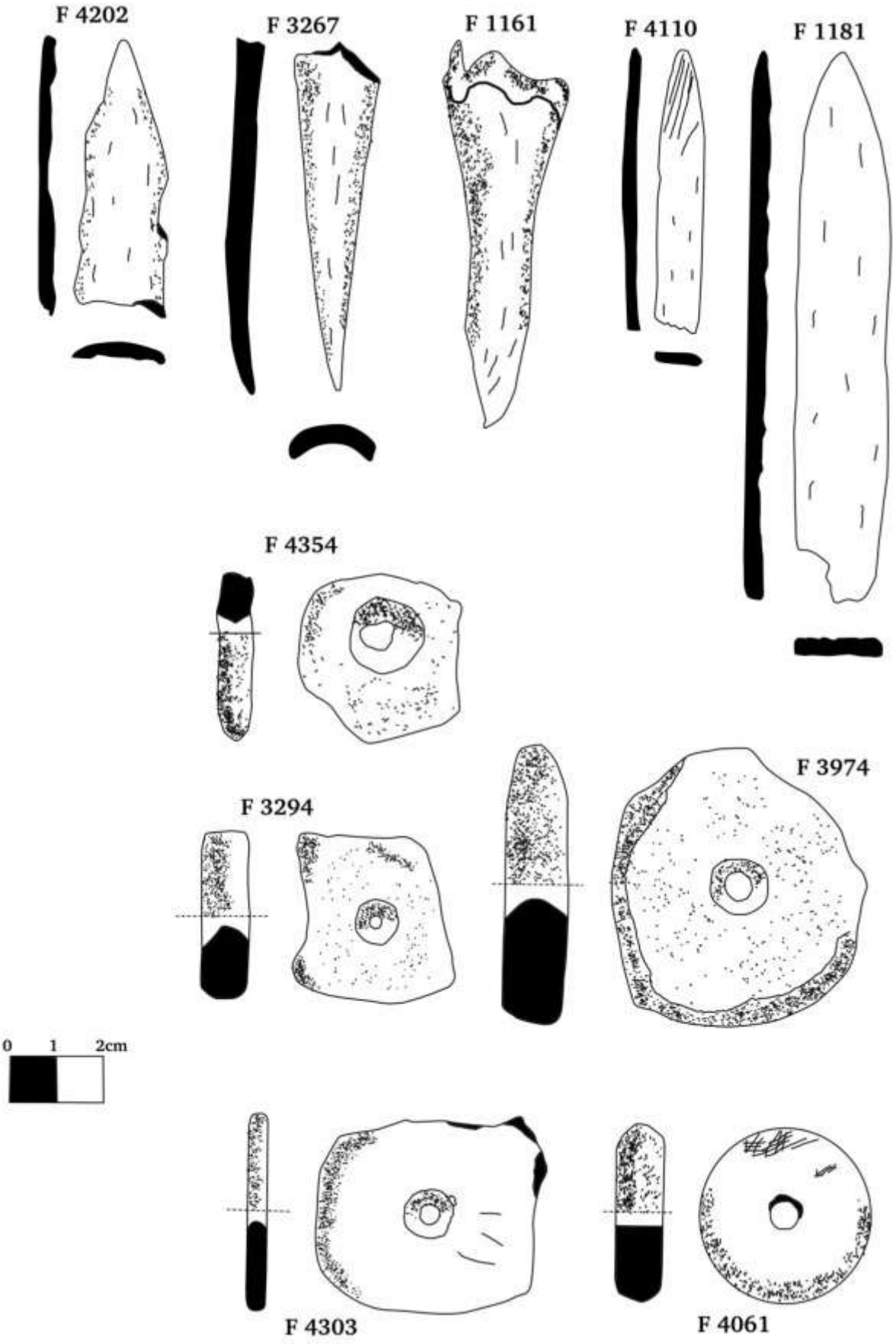
A 14525
A 13059
A 20139
A 12811
0
1
2cm

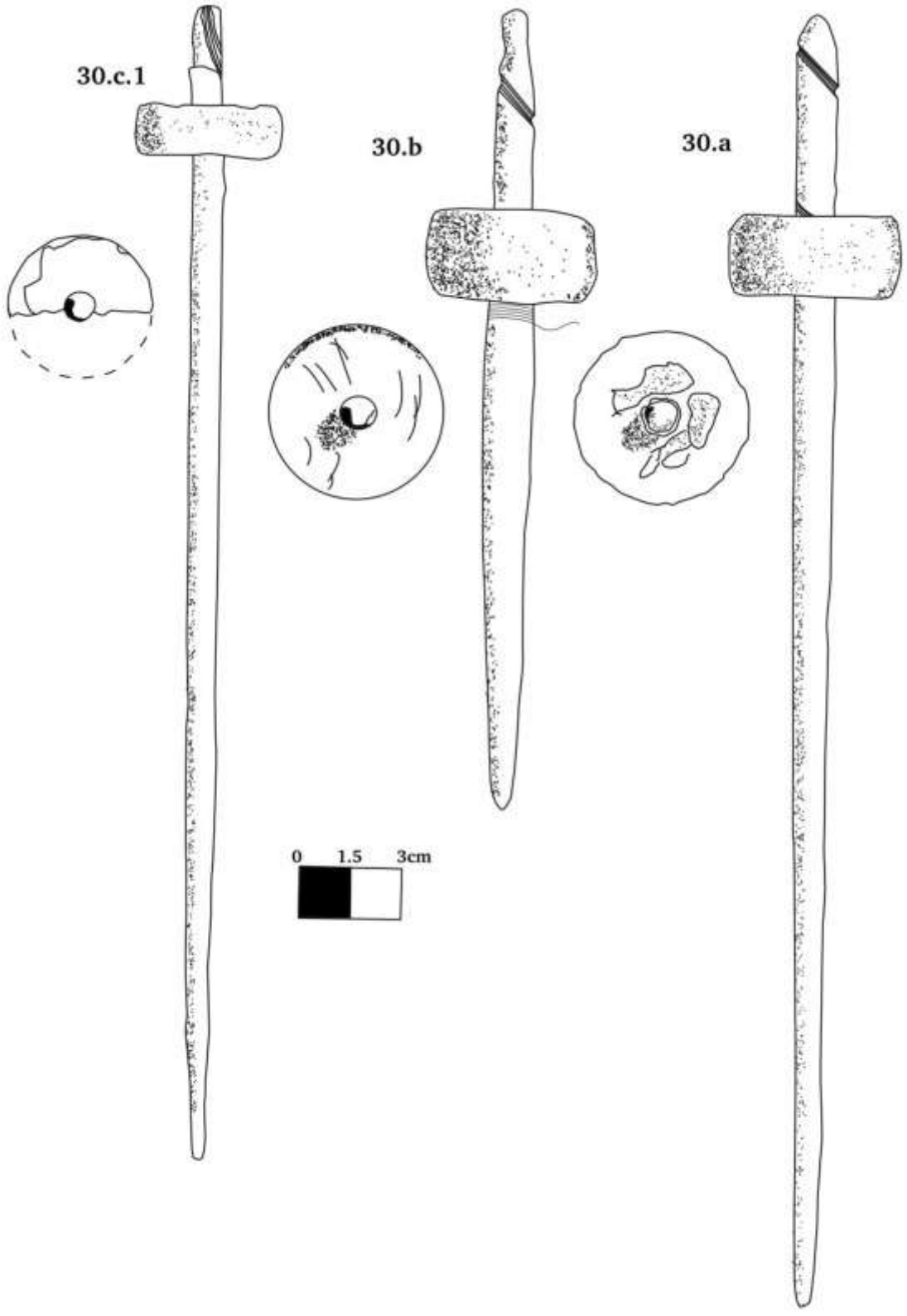

A 16744
A 26218
A 28203
A 53517
A 17681
A 5207
A 5794
0 1 2cm

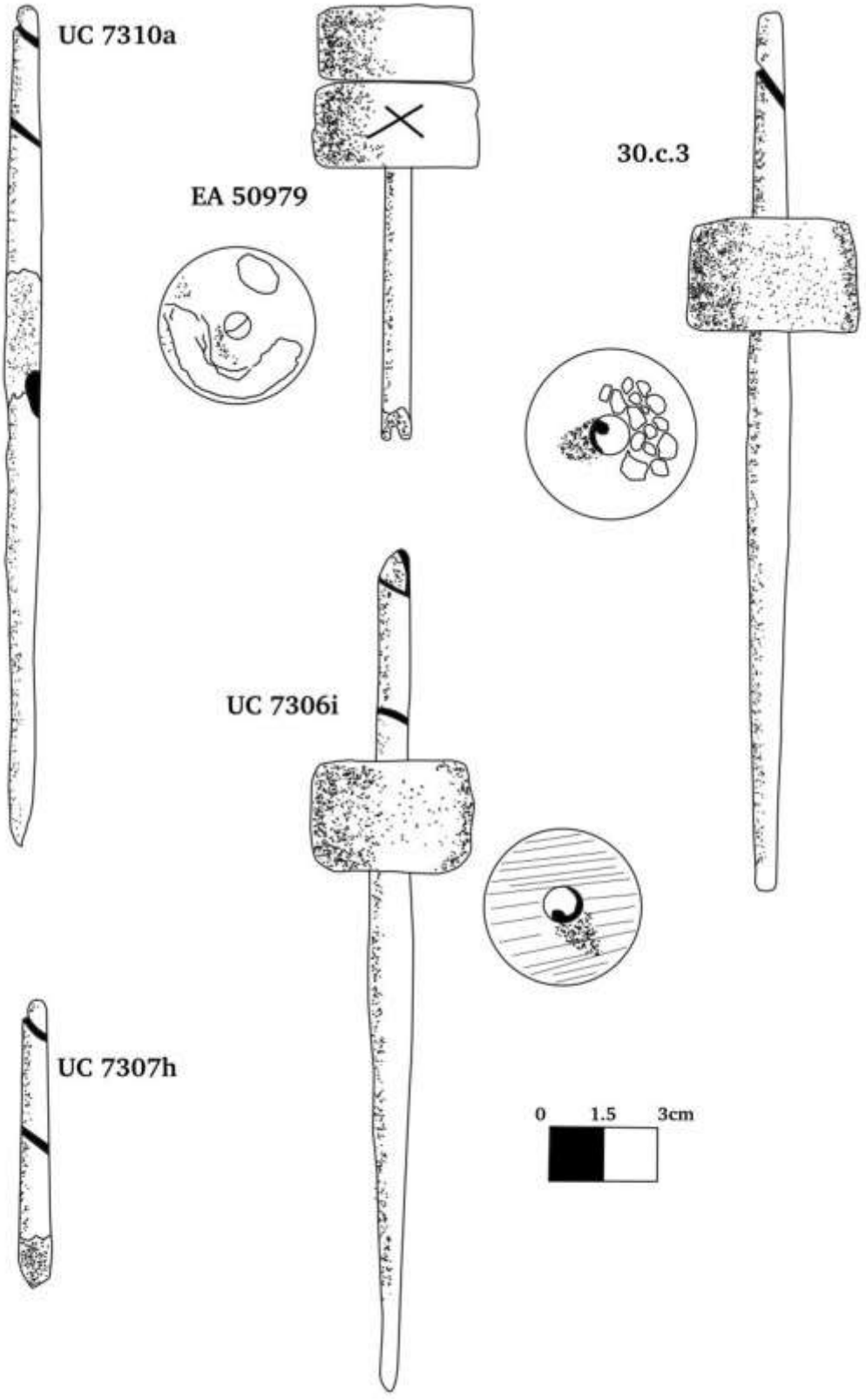

F 3477
F 4433
0 1 2cm
F 2123
F 3589
F 4393
F 4838
F 1208
F 4964
F 104

F 4017
F 2121
F 2814
F 5029
F 4827
F 2936
F 4826
F 3507
F 4074
0
1
2cm

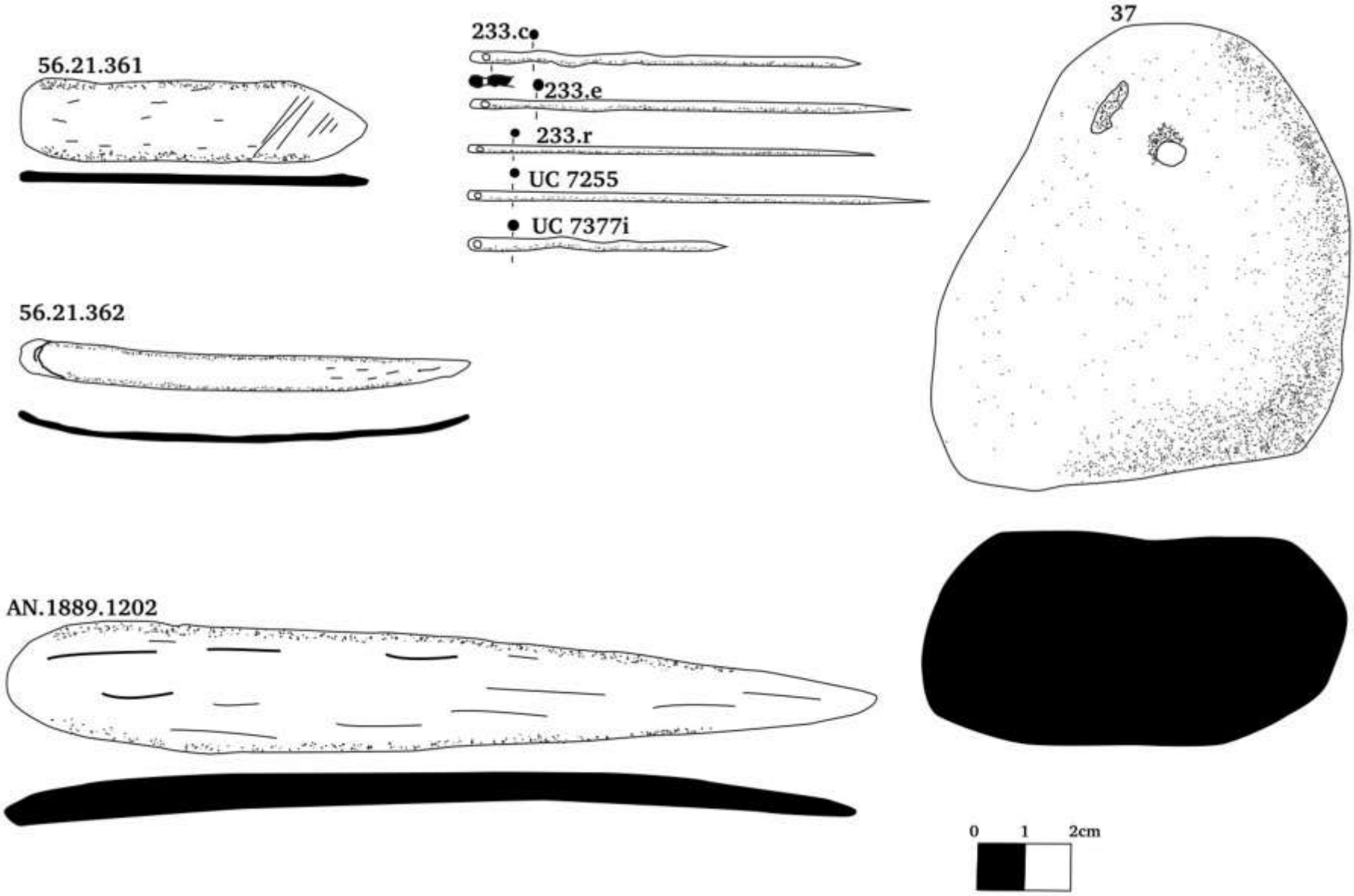

F 827
F 3899
F 4416
F 4060
F 4665
F 1194
0 1 2cm
F 1915

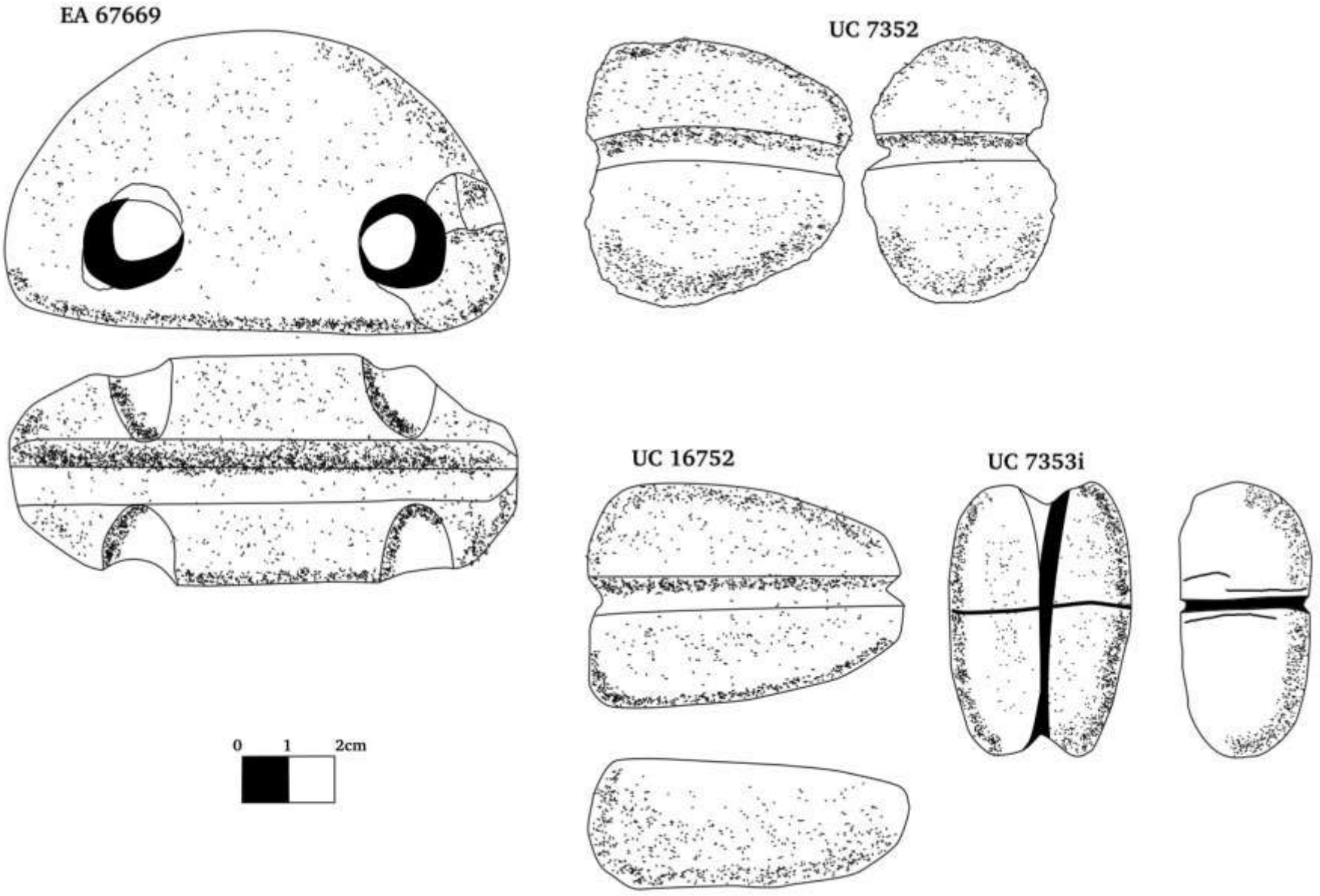

F 4202
F 3267
F 1161
F 4110
F 1181
F 4354
F 3294
F 3974
0 1 2cm
F 4303
F 4061

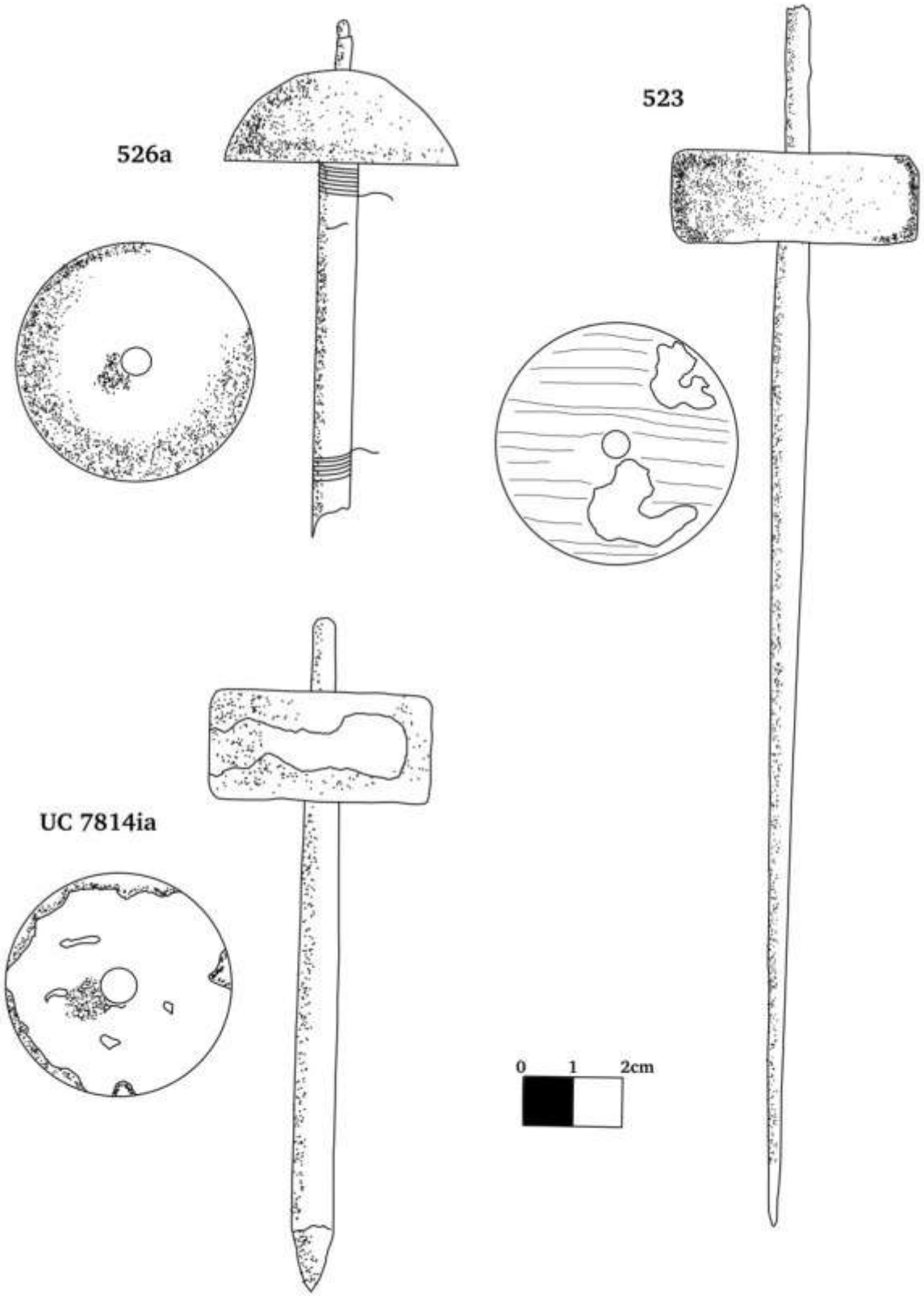

30.c.1
30.b
30.a
0 1.5 3cm

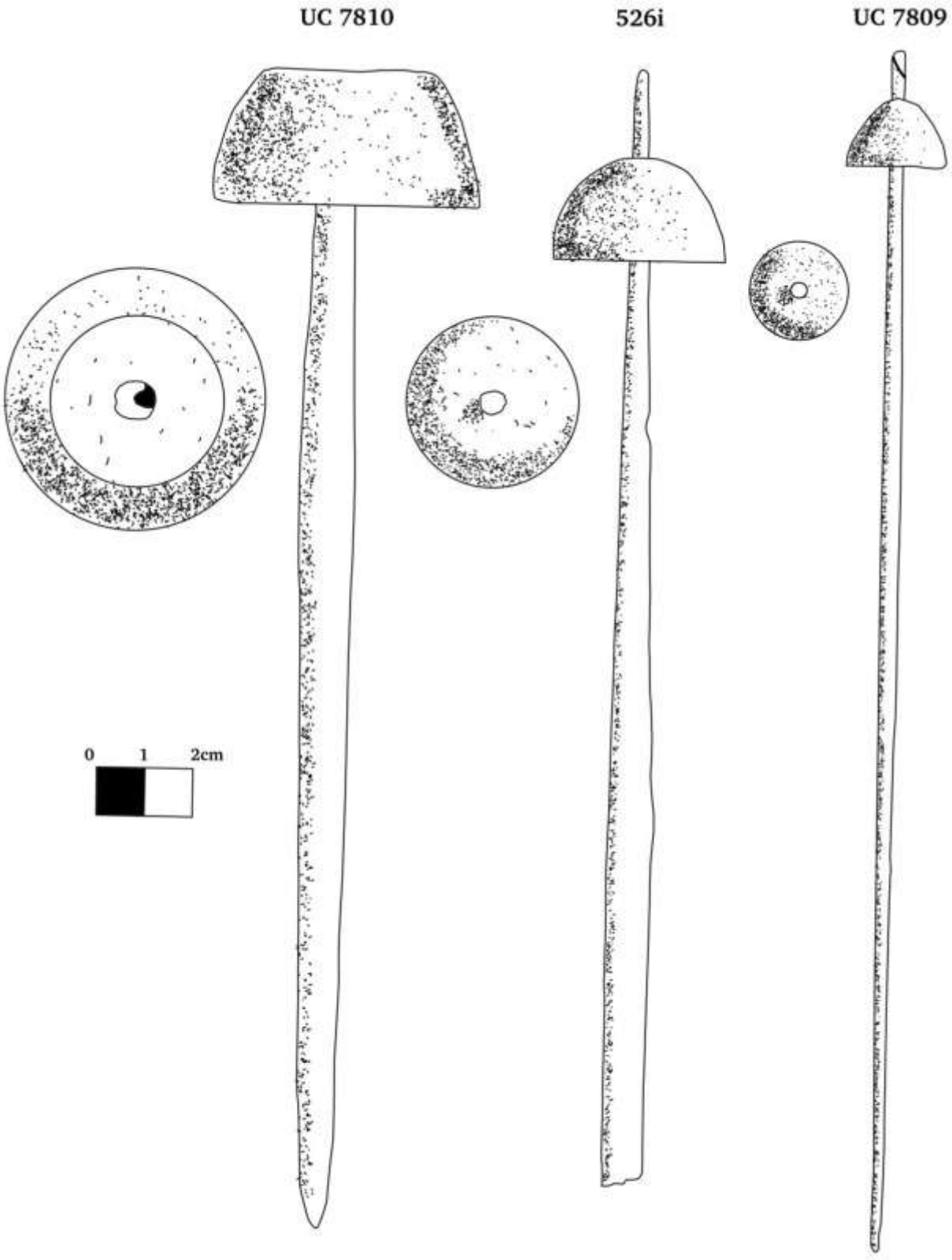

UC 7310a
EA 50979
30.c.3
UC 7306i
UC 7307h
0 1.5 3cm

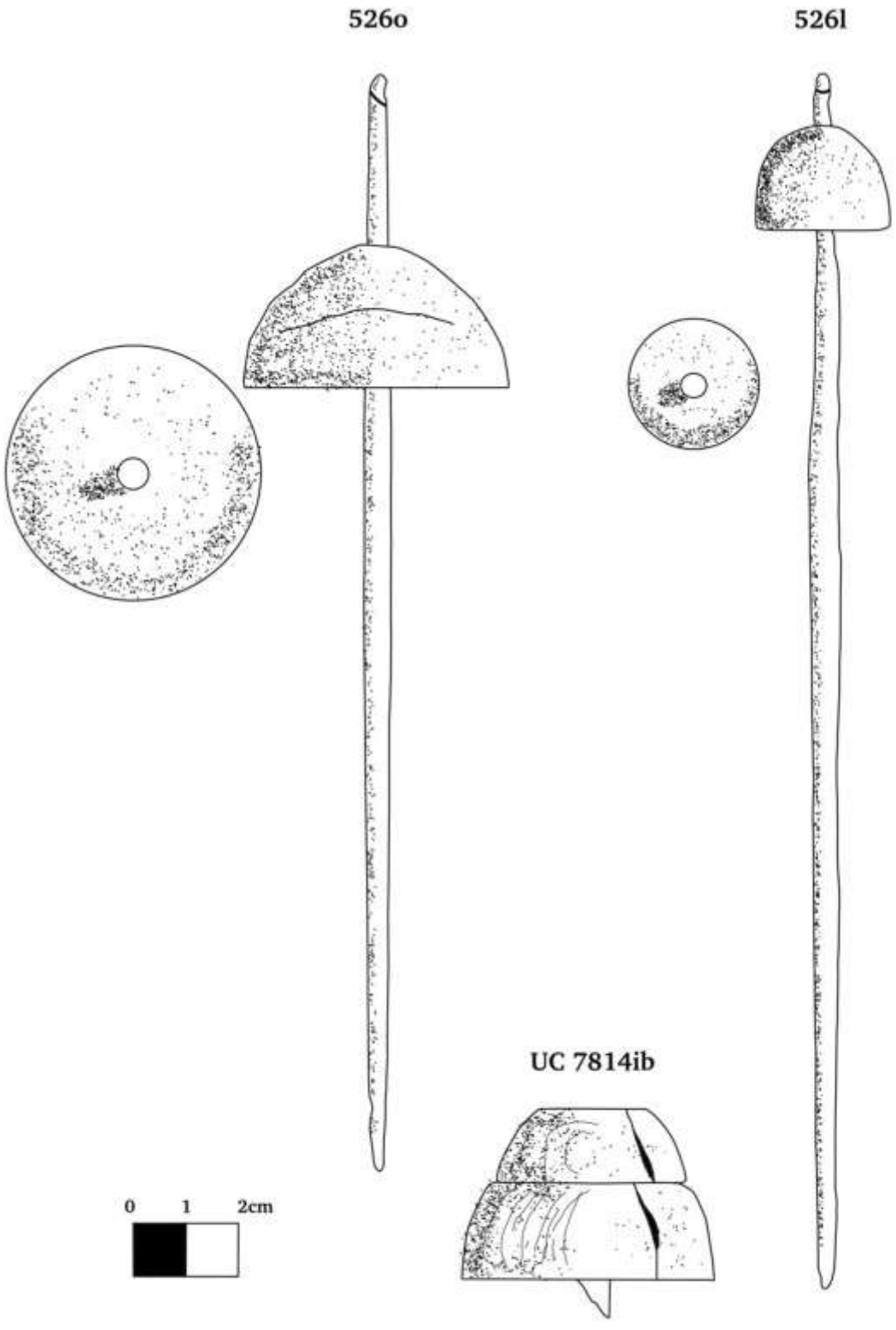
AN.1889.1204
UC 63840i
UC 7309q
UC 7309a
0
1
2cm
UC 7304
AN 1889.1203
UC 7311d
UC 7310d

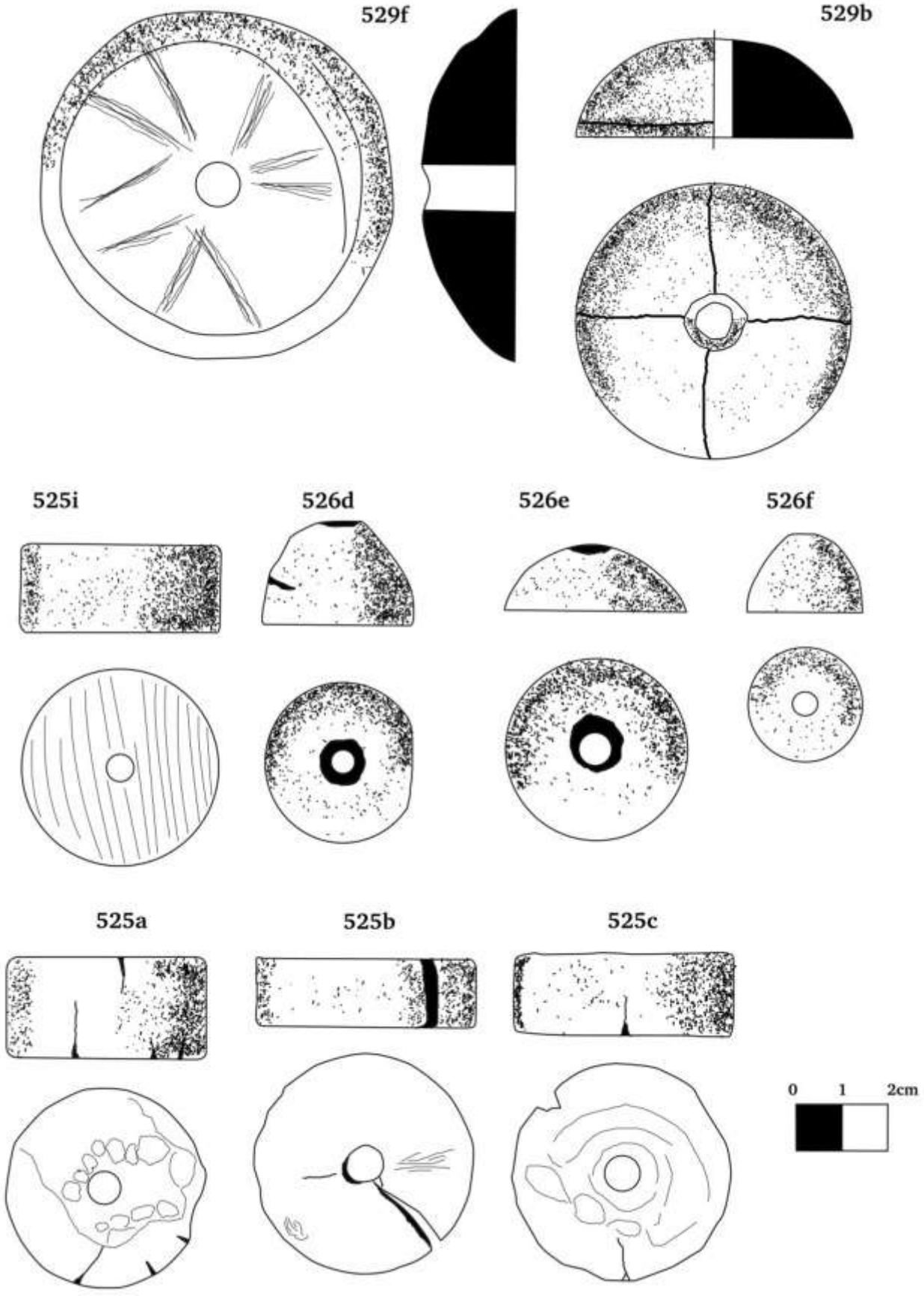

56.21.361
233.c
233.e
233.r
UC 7255
UC 7377i
37
56.21.362
AN.1889.1202
0
1
2cm

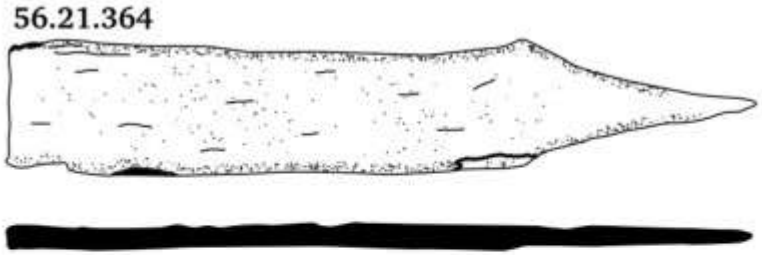

EA 67669
UC 7352
UC 16752
UC 7353i
0 1 2cm

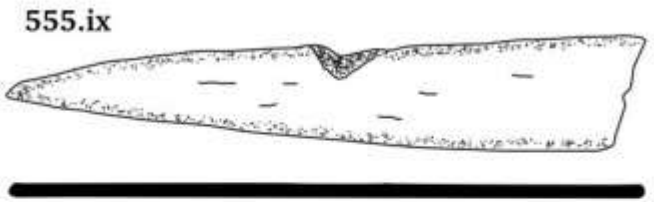

526a
523
UC 7814ia
0 1 2cm

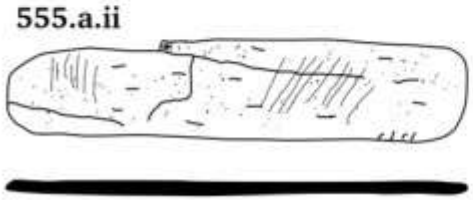

UC 7810
526i
UC 7809
0
1
2cm

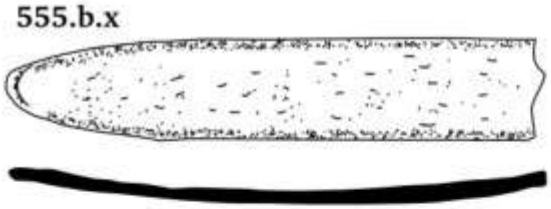

526o
526l
UC 7814ib
0 1 2cm

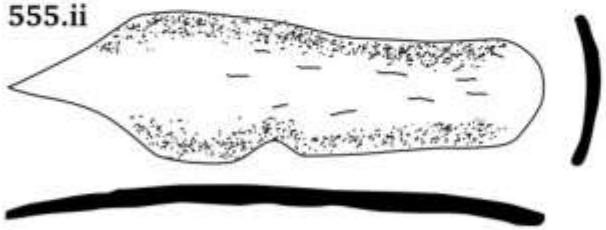

529f
529b
525i
526d
526e
526f
525a
525b
525c
0 1 2cm

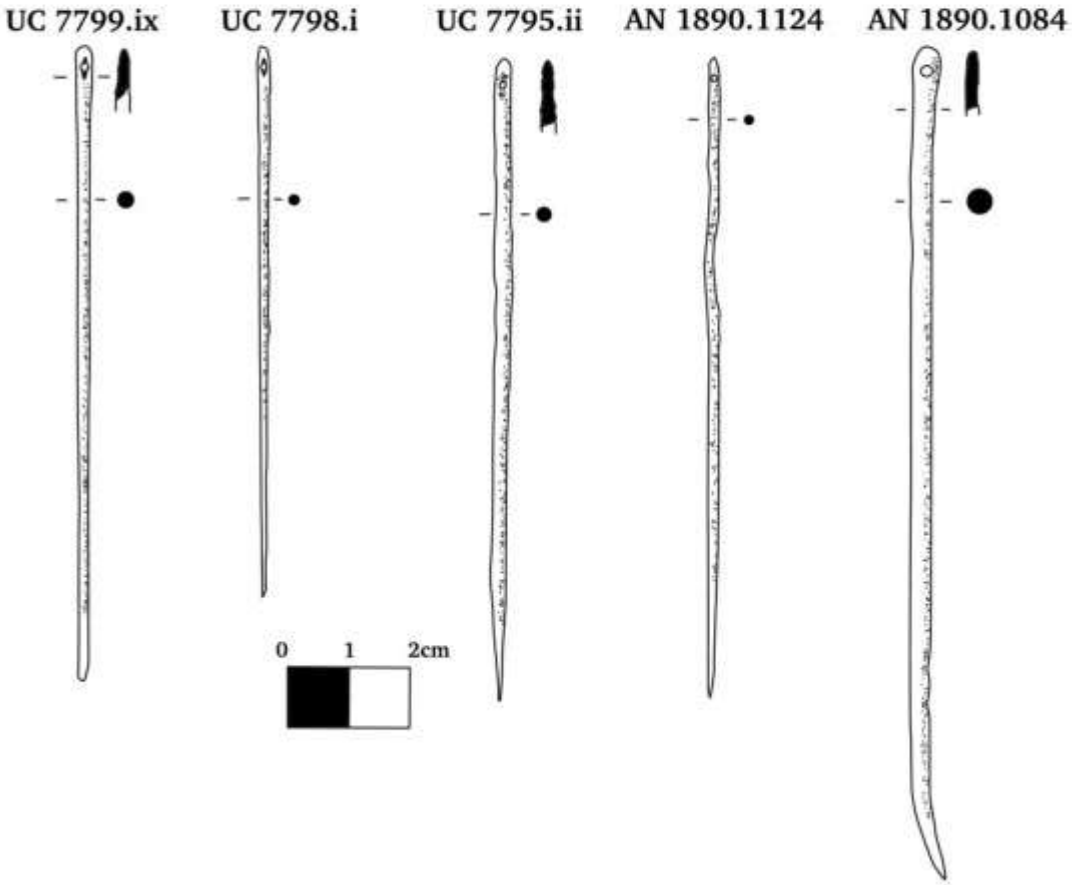

56.21.364

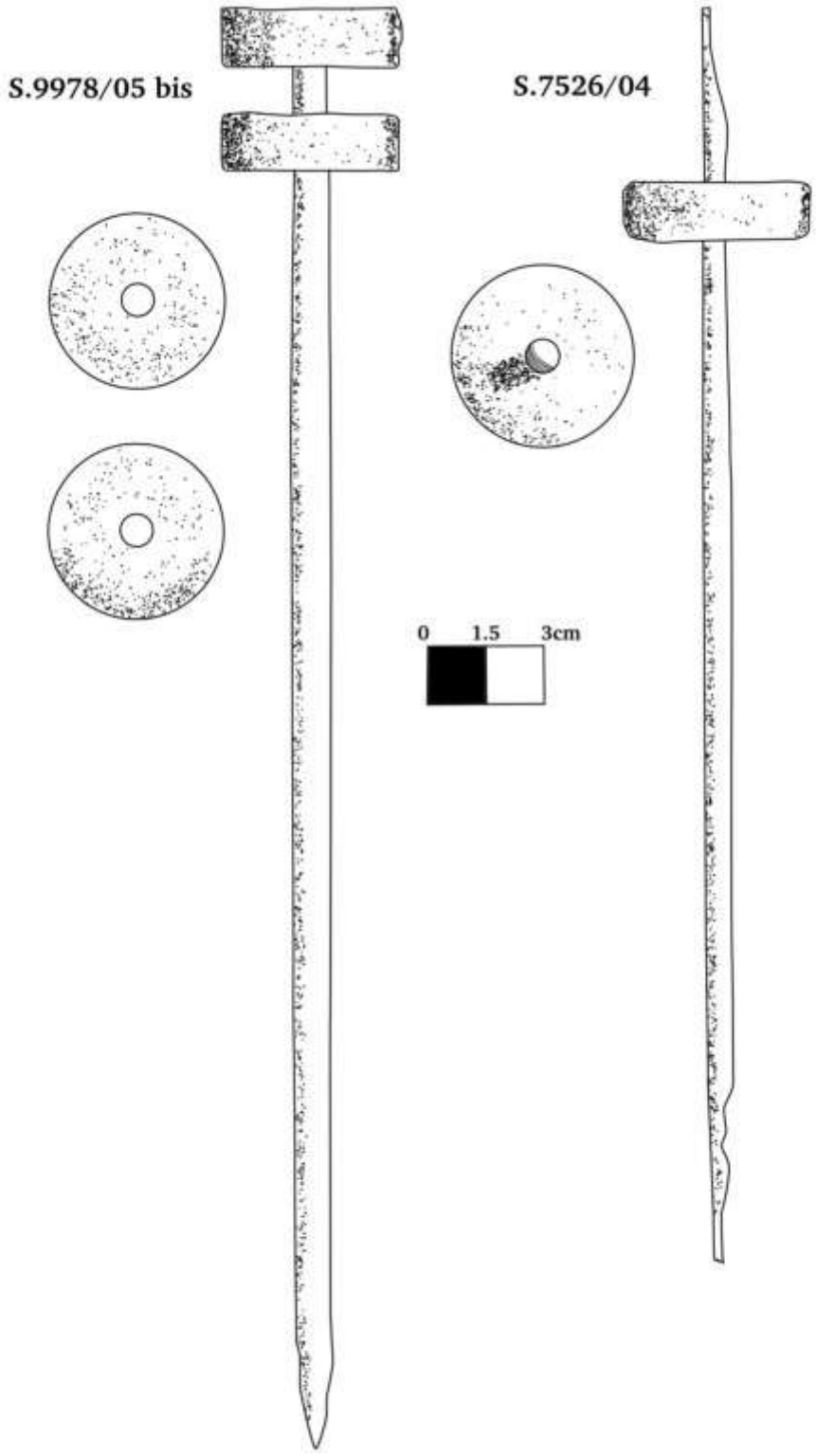

555.ix

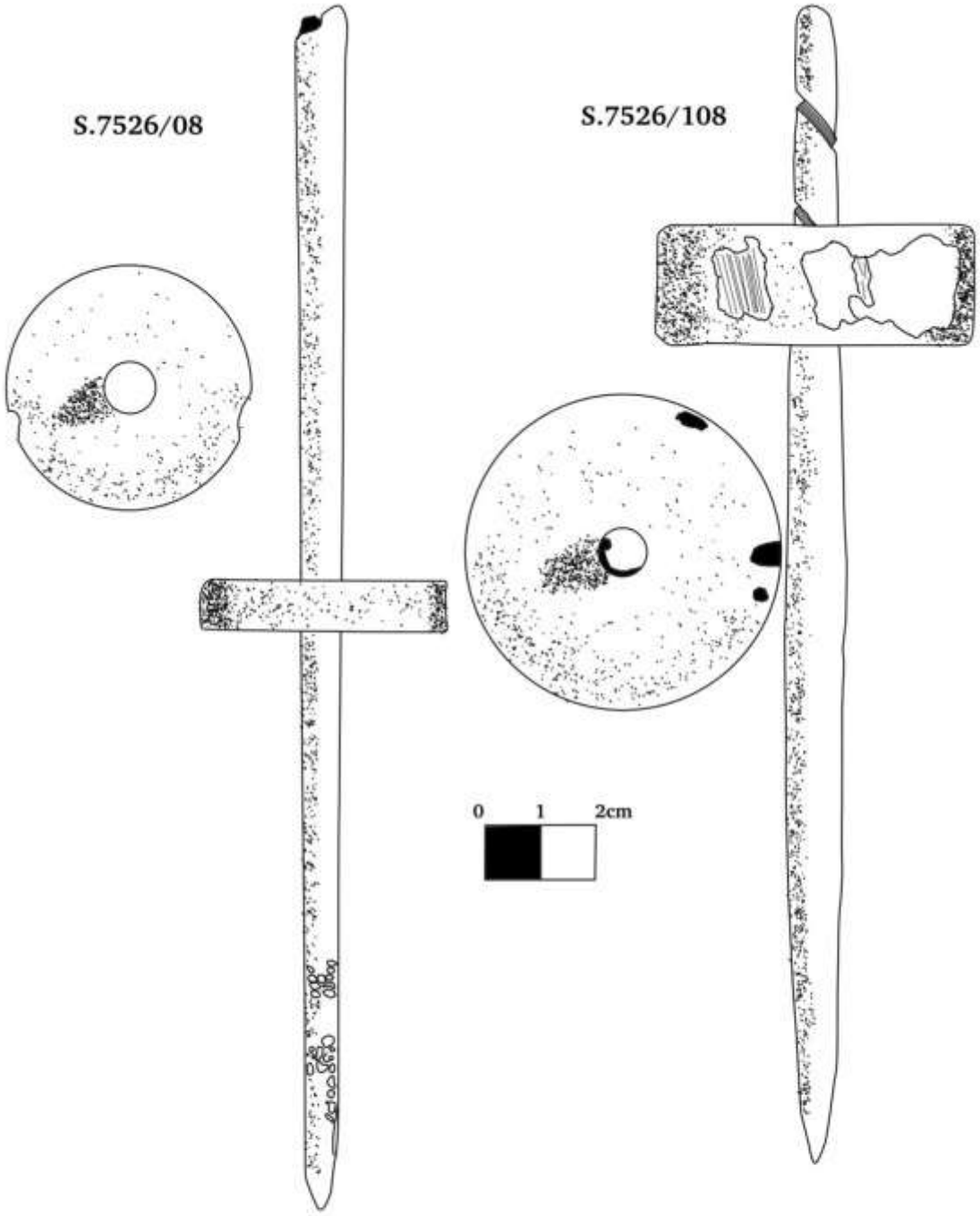

555.a.ii

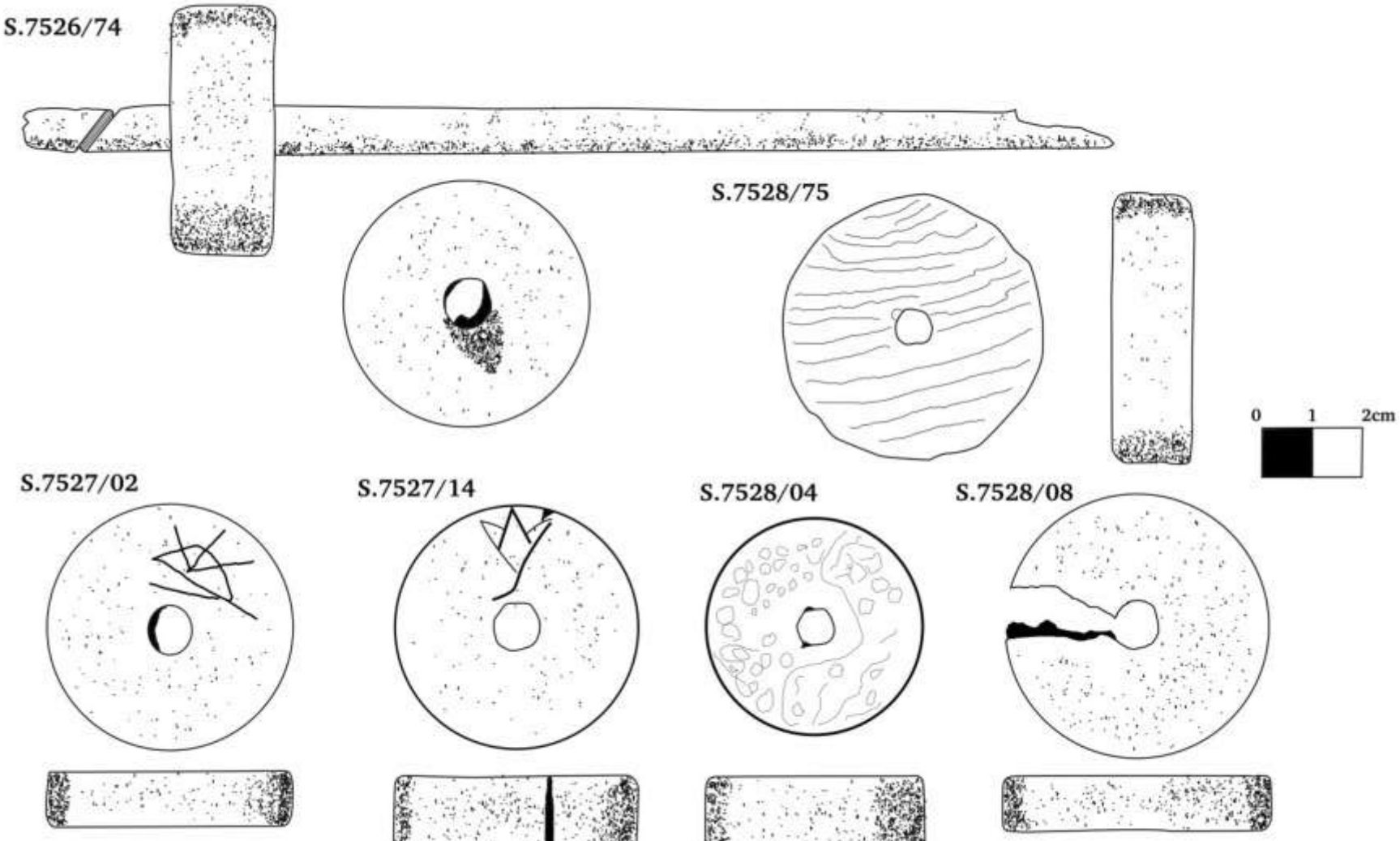

555.b.x

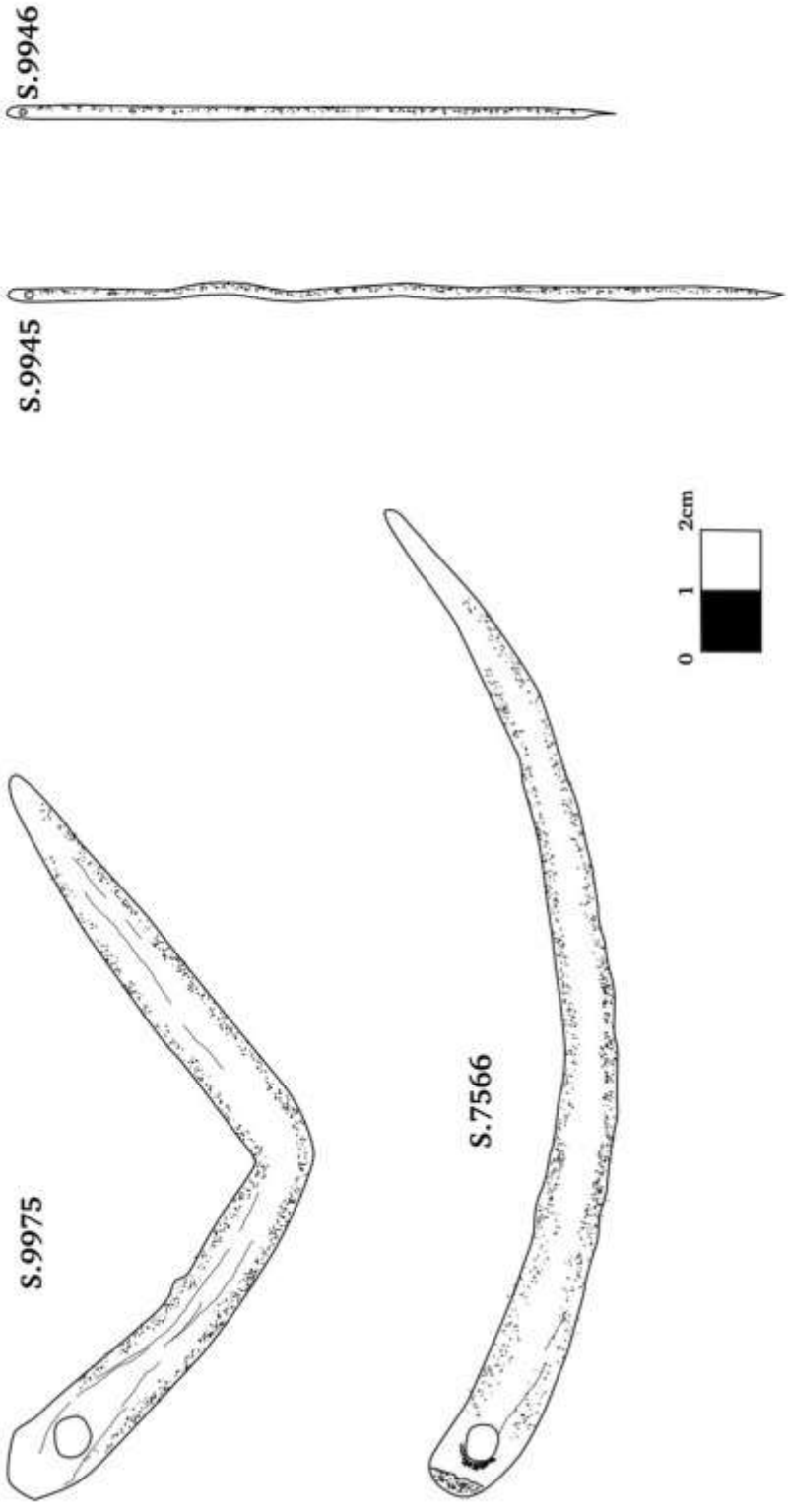

555.ii


UC 7799.ix
UC 7798.i
UC 7795.ii
AN 1890.1124
AN 1890.1084
0
1
2cm


S.9978/05 bis
S.7526/04
0 1.5 3cm


S.7526/08
S.7526/108
0
1
2cm


S.7526/74
S.7528/75
0 1 2cm
S.7527/02
S.7527/14
S.7528/04
S.7528/08


S.9946
S.9945
S.7566
S.9975
0
1
2cm

Estratto per riassunto della tesi di dottorato

Studente: Spinazzi-Lucchesi Chiara Serena Matricola: 987987

Dottorato: Scienze dell'Antichità

Ciclo: XXXI

Titolo della tesi: Textile tools from Egypt and Southern Levant

Abstract: La tesi si è concentrata sullo studio degli strumenti da filatura e tessitura provenienti dal Levante Meridionale (interno e costiero) e dall'Egitto. La cronologia indagata è molto ampia, poiché comprende l'analisi degli oggetti dalla loro comparsa fino all'inizio dell'età persiana. Gli oggetti sono stati studiati da un punto di vista diacronico, per capire l'evoluzione e la continuità d'uso di particolari forme o materiali rispetto ad altri, e sincronico per evidenziare differenze areali e quindi diversi metodi di produzione tessile. I materiali presi in esame includono fibre semilavorate e non, provenienti da contesti archeologici delle due aree, fusi, fusaiole, coppe da filatura, gomitoli, pesi da telaio, aghi, parti di telaio e altri oggetti di più incerta appartenenza alla sfera tessile (frammenti ceramici forati, dischi in pietra, ecc…). Il progetto ha previsto lo studio di lotti di materiali provenienti da siti molto importanti, quali Megiddo, Beth Shean, Tell el-Far'ah Nord e Hazor per il Levante e Kahun, Gurob e Deir el-Medina per l'Egitto e alcuni materiali di siti minori.

The thesis focused on spinning and weaving tools found in Southern Levant and Egypt. The chronology under examination is very wide since it starts from the Neolithic period and ends with the beginning of the Persian era. Objects are investigated diachronically, to understand elements of continuity or changing of materials and shapes through times, as well as synchronically, to highlight differences in distinct geographic areas. Materials analysed include raw and partially prepared fibres, spindles, spindle whorls, spinning bowls, loom weights, needles, hanks of flax, parts of looms and objects of uncertain purpose (i.e. perforated sherds and stone rings). The accomplish this result, groups of objects from relevant sites have been selected, such as Megiddo, Beth Shean, Tell el-Far'ah North, Hazor, Kahun, Gurob and Deir el-Medina. Some materials from other sites have been analysed as well.

Firma dello studente

Università
Ca'Foscari
Venezia

DEPOSITO ELETTRONICO DELLA TESI DI DOTTORATO

DICHIARAZIONE SOSTITUTIVA DELL'ATTO DI NOTORIETA'

(Art. 47 D.P.R. 445 del 28/12/2000 e relative modifiche)

Io sottoscritto Chiara Serena Spinazzi-Lucchesi

nat..a a Venezia (prov. Ve) il 31/03/1985

residente a Moncalieri (TO) in Via Real Collegio n. 18

Matricola (se posseduta) 987987 Autore della tesi di dottorato dal titolo:

Textile Tools from Egypt and Southern Levant

Dottorato di ricerca in Scienze dell'antichità

(in cotutela con .....)

Ciclo XXXI

Anno di conseguimento del titolo 2019

DICHIARO

di essere a conoscenza:

1) del fatto che in caso di dichiarazioni mendaci, oltre alle sanzioni previste dal codice penale e dalle Leggi speciali per l'ipotesi di falsità in atti ed uso di atti falsi, decado fin dall'inizio e senza necessità di nessuna formalità dai benefici conseguenti al provvedimento emanato sulla base di tali dichiarazioni;

2) dell'obbligo per l'Università di provvedere, per via telematica, al deposito di legge delle tesi di dottorato presso le Biblioteche Nazionali Centrali di Roma e di Firenze al fine di assicurarne la conservazione e la consultabilità da parte di terzi;

3) che l'Università si riserva i diritti di riproduzione per scopi didattici, con citazione della fonte;

4) del fatto che il testo integrale della tesi di dottorato di cui alla presente dichiarazione viene archiviato e reso consultabile via Internet attraverso l'Archivio Istituzionale ad Accesso Aperto dell'Università Ca' Foscari, oltre che attraverso i cataloghi delle Biblioteche Nazionali Centrali di Roma e Firenze;

5) del fatto che, ai sensi e per gli effetti di cui al D.Lgs. n. 196/2003, i dati personali raccolti saranno trattati, anche con strumenti informatici, esclusivamente nell'ambito del procedimento per il quale la presentazione viene resa;

6) del fatto che la copia della tesi in formato elettronico depositato nell'Archivio Istituzionale ad Accesso Aperto è del tutto corrispondente alla tesi in formato cartaceo, controfirmata dal tutor, consegnata presso la segreteria didattica del dipartimento di riferimento del corso di dottorato ai fini del deposito presso l'Archivio di Ateneo, e che di conseguenza va esclusa qualsiasi responsabilità dell'Ateneo stesso per quanto riguarda eventuali errori, imprecisioni o omissioni nei contenuti della tesi;

7) del fatto che la copia consegnata in formato cartaceo, controfirmata dal tutor, depositata nell'Archivio di Ateneo, è l'unica alla quale farà riferimento l'Università per rilasciare, a richiesta, la dichiarazione di conformità di eventuali copie;

Data 12/12/2018 **Firma** Chiara Spinazzi Lucchesi

NON AUTORIZZO

l'Università a riprodurre ai fini dell'immissione in rete e a comunicare al pubblico tramite servizio on line entro l'Archivio Istituzionale ad Accesso Aperto la tesi depositata per un periodo di 12 (dodici) mesi a partire dalla data di conseguimento del titolo di dottore di ricerca.

DICHIARO

1) che la tesi, in quanto caratterizzata da vincoli di segretezza, non dovrà essere consultabile on line da terzi per un periodo di 12 (dodici) mesi a partire dalla data di conseguimento del titolo di dottore di ricerca;
2) di essere a conoscenza del fatto che la versione elettronica della tesi dovrà altresì essere depositata a cura dell'Ateneo presso le Biblioteche Nazionali Centrali di Roma e Firenze dove sarà comunque consultabile su PC privi di periferiche; la tesi sarà inoltre consultabile in formato cartaceo presso l'Archivio Tesi di Ateneo;
3) di essere a conoscenza che allo scadere del dodicesimo mese a partire dalla data di conseguimento del titolo di dottore di ricerca la tesi sarà immessa in rete e comunicata al pubblico tramite servizio on line entro l'Archivio Istituzionale ad Accesso Aperto.

Specificare la motivazione:
□ motivi di segretezza e/o di proprietà dei risultati e/o informazioni sensibili dell'Università Ca' Foscari di Venezia.
☒ motivi di segretezza e/o di proprietà dei risultati e informazioni di enti esterni o aziende private che hanno partecipato alla realizzazione del lavoro di ricerca relativo alla tesi di dottorato.
□ dichiaro che la tesi di dottorato presenta elementi di innovazione per i quali è già stata attivata / si intende attivare la seguente procedura di tutela:

.....;

□ Altro (specificare):

.....

.....

.....

A tal fine:
- dichiaro di aver consegnato la copia integrale della tesi in formato elettronico tramite auto-archiviazione (upload) nel sito dell'Università; la tesi in formato elettronico sarà caricata automaticamente nell'Archivio Istituzionale ad Accesso Aperto dell'Università Ca' Foscari, dove rimarrà non accessibile fino allo scadere dell'embargo, e verrà consegnata mediante procedura telematica per il deposito legale presso la Biblioteca Nazionale Centrale di Firenze;
- consegno la copia integrale della tesi in formato cartaceo presso la segreteria didattica del dipartimento di riferimento del corso di dottorato ai fini del deposito presso l'Archivio di Ateneo.

Data 12/12/2018 **Firma** Chiara Spinazzi Lucchesi

La presente dichiarazione è sottoscritta dall'interessato in presenza del dipendente addetto, ovvero sottoscritta e inviata, unitamente a copia fotostatica non autenticata di un documento di identità del dichiarante, all'ufficio competente via fax, ovvero tramite un incaricato, oppure a mezzo posta.

Firma del dipendente addetto .....

Ai sensi dell'art. 13 del D.Lgs. n. 196/03 si informa che il titolare del trattamento dei dati forniti è l'Università Ca' Foscari - Venezia.
I dati sono acquisiti e trattati esclusivamente per l'espletamento delle finalità istituzionali d'Ateneo; l'eventuale rifiuto di fornire i propri dati personali potrebbe comportare il mancato espletamento degli adempimenti necessari e delle procedure amministrative di gestione delle carriere studenti. Sono comunque riconosciuti i diritti di cui all'art. 7 D. Lgs. n. 196/03.