Chapter 11

Textiles, Cordage and Basketry from Çatalhöyük

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Introduction

Perishables like textiles and basketry are the most fragile objects and rather than being discarded, they make suitable kindling or fire starters. They survive only if the conditions of preservation are ideal, such as very dry or very wet environment. That is why we get only glimpses of what was used in the past. This makes them particularly valuable as they represent a significant but little-known part of the material culture of the past. This certainly applies to the textiles from Çatalhöyük that include the earliest preserved woven textiles currently known. These combine weaving with the technique of weft-twining that precedes weaving as a way to make flexible fabrics that could be used for clothing, wrapping, carrying and a multitude of other purposes. The textiles from Çatalhöyük thus reflect the emergence of weaving as a new technology to produce objects made from various fibres. Textiles made by looping, netting techniques and weft- or warp-twining are known from earlier sites and are likely to go back to the Palaeolithic and certainly to the Mesolithic (Bender Jørgensen 1992: 114-16; Bender Jørgensen 2013; Bender Jørgensen et al. forthcoming; Rast-Eicher, Dietrich 2015).

Cordage is essential for binding and tying, for netting, fishing lines etc. Such items are found in abundance in the Neolithic Alpine lake dwellings (Rast-Eicher, Dietrich 2015) and in caves, lakes and desert sites in West Asia and Egypt (Nadel et al. 1994). Cordage found at Çatalhöyük will have served for similar purposes.

Baskets served as containers, including burial receptacles, while small circular platters were used to cover or support household items or foods. Mats were used as space dividers, floor coverings and possibly sleeping surfaces (Wendrich 2005; Wendrich, Ryan 2012).

Preservation

At Çatalhöyük, tiny remains of textiles, basketry and cordage survived as charred objects due to burnt houses, as phytoliths, or in few cases through oxidation of metal beads. In cases where the building above burials had been burnt, very fragile remains were found described as ‘burnt’ or ‘charred’ in the record. Others, especially baskets and mats are preserved as phytoliths and impressions in clay. During Mellaart's excavations in the 1960’s the ground water was high and was later lowered by irrigation canals (Hodder 1996, 2); this probably influenced the preservation negatively as organics preserved in wet conditions decay when drying out, although phytolith remains of floor matting and textiles were still found. Phytolith remains are sometimes difficult to interpret, because they represent remains of the fibres, but not of the structure. Upon closer examination some of the large patches of phytoliths turned out to be from wood, even if catalogued in the Çatalhöyük database as “basket”, while the presence of layers of unworked grasses might represent bedding (Nadel et al. 2004).

Definitions (figures 11.1 and 11.2)

**Textile**. The term ‘textile’ is sometimes used of basketry and cordage as well as of woven textiles; some scholars like Seiler-Baldinger include this in their technical descriptions (Seiler-Baldinger 1994). This may easily lead others to conflate the techniques (e.g. Gilligan 2019). It is important to distinguish between these techniques as they have different histories, are used for different artefacts, and require different raw materials, tools and techniques (Wendrich 1999). In this paper, ‘textile’ is used of flexible fabrics made by weaving or twining.

**Weaving** requires a loom, i.e. a construction that allows parallel threads (warp) to be held taut and often has a mechanical system (heddles) that divides the warp in two parts. This way a shed is formed, into which weft threads can be inserted. Woven textiles can be made in different weaves, such as tabby, twill and a variety of patterned weaves. There are no preserved woven textiles dated before the Neolithic period.

**Tabby** or plain weave is the simplest form of woven textiles (Fig. 11.1e). Tabby occurs in varieties such as balanced tabby that has approximately the same number of warp and weft threads per cm2, weft- or warp-faced tabby where one system partly covers the other, or repp where one system covers the other completely. Further variations of tabby are half-basket and basket weave where threads are paired in one or both systems. Several of these varieties may appear in the same fabric as edges (transverse borders and selvedges) often are denser woven than the main web. All woven textiles from Çatalhöyük are in tabby.

**Soumak** is a technique in which the warp is wrapped with a continuous thread, with or without having weft threads in between. Soumak was found in some textiles from the Mellaart excavations at Çatalhöyük.

**Twining** (Fig. 11.1c, d) is a basketry technique but can also be used for fine, flexible fabrics that resemble woven textiles if made of finely prepared fibres. It is made of untwisted or plied yarns, with an active system ‘weft’ that binds with two threads the passive system ‘warp’. The ‘weft’ can be introduced densely or with spaces of different widths. Twining at Çatalhöyük occurs as weft-twining.

**Basketry** is defined as objects made of plant or animal materials of limited length that often retain their natural shape and are worked into a fabric or structure (Wendrich 1999). The basketry found at Çatalhöyük consists of four categories: coiled baskets and platters, as well as tabby and twill plaited matting (Wendrich 2005). Coiled basketry is constructed from a flexible strand, such as twigs, or a bundle of grasses (passive system), fastened as a coil that spirals out from the centre and is fastened by an active system that wraps around the bundle and stitches through the previous coil, often with the aid of an awl or needle. These active elements, the winders, often consist of tough grass leaves, thin strips of broader leaves, or bands of other materials. Matting is made from reeds, leave strips or grasses, using two active systems. Depending on the raw materials, the results may appear similar to the techniques of tabby and twill used in woven textiles. To distinguish between matting and weaving, matting techniques are designated ‘basketry tabby’ or ‘basketry twill’. The difference is mostly that in basketry multiple strips are inlayed to arrive at the required length and width of the mat.

**Splicing**. Threads and cordage are usually described as s- or z-twisted, Sz- or Zs-plied (Emery 1994: 11; Bender Jørgensen 1992: 15, fig. 2). This is not the case at Çatalhöyük. Here threads were *spliced* and then plied (fig. 11.1a). This is rendered as S2\*i, i.e. S-plied from two elements of spliced (\*) fibres, untwisted/without discernible twist (i). Splicing, i.e. adding lengths of fibres to each other by tying them at the ends is a technique first noted in Pharaonic Egyptian textiles (Barber 1991: 47-8; Granger-Taylor 1998, 2003) but has since been found in Neolithic Europe (Leuzinger, Rast-Eicher 2011; Rast-Eicher 2016; Rast-Eicher, Dietrich 2015: 34-39). The fibre strips have still connected fibres and parallel nodes. Splicing is now found in virtually all prehistoric textiles made of plant fibre in Europe, the Mediterranean and the Near East until at least 600 BC (Gleba, Harris 2018).

**Figure 11.1.** Techniques:textiles and twinings. (a) Splicing of two fibre strips; (b) plied yarn (S2\*i); (c) twining in same direction (S); (d) twining in two different directions, S and Z or herringbone; (e) tabby weave (illustrations a, b by A. Rast-Eicher; c-e by Atelier Oculus, Zürich).

**Figure 11.2.** Basketry techniques found in Çatalhöyük.

Textiles, cordage and basketry at Çatalhöyük: a short history

Textiles and basketry from Çatalhöyük were first found during the excavations by James Mellaart in the 1960s (Mellaart 1962, 1963, 1964, 1966, 1967) and were investigated by Harold B. Burnham (1965). They are now in the *Anadolu Medeniyetleri Müzesi* in Ankara. A small box of fragments is in the collections of the Textile Research Centre in Leiden.

During the excavations directed by Ian Hodder 1993-2017 further textiles and basketry have been recovered. W. Z. Wendrich’s report on the Çatalhöyük during the 2000 season has a catalogue of 31 items of basketry (Wendrich 2005; Wendrich, Ryan 2012). Textile specialists L. Bender Jørgensen and A. Rast-Eicher came to the site in the 2017 season to examine textiles and cordage, including items of basketry found since Wendrich’s visit. This resulted in the recording of 19 items designated as ‘textile’, 28 as ‘cordage’ and 30 as ‘basketry’ (Bender Jørgensen, Rast-Eicher 2017). The basketry samples examined by Bender Jørgensen and Rast-Eicher were excavated between 2006 and 2017; basketry finds discovered 2000-2006 are not catalogued. The selection of finds to investigate was carried out by searching the project database for finds labelled ‘textile’, ‘baskets’ or ‘cord’. During our work further items turned up, such as imprints of textile or basketry on clay balls or strings in beads. Some skin and hide items were also discovered by looking through the boxes with textiles. During the excavations, further finds had been observed but only a few samples were recovered. This means that the finds described below only represent a part of what was in fact found, but not recognised. Still, the recovered remains are far from reflecting the full range of items made from fibres. No remains of hunting or fishing equipment such as nets or fishing lines have been found.

Methods

The boxes with textiles and cordage were examined on the site with magnifying glasses and with a stereo microscope available from the project. Photographs were made with a Nikon added with macro objective (1:1), so that they could be taken quite close to the object.

Preservation of many items in the form of phytoliths or burnt layers precluded fibre analysis. As preserved fibres are mostly burnt or even carbonised, samples were taken for an analysis with SEM (scanning electron microscope) in Switzerland by Rast-Eicher. Samples were also taken from hides. One sample was taken for chemical analysis. We used a SEM of the Institute of Geography of the University of Bern (Oeschger center), Switzerland (Zeiss EVO 50). The samples were sputtered with gold (20nm) to be able to work with 10 to 15KV in the vacuum column. The aim of having SEM samples was to have a better picture for fibre analysis and also a picture to discuss fibre processing. The fibres have been measured with a measurement program on SEM pictures. The basketry was recorded as described in detail in (Wendrich 1991; Wendrich 2005).

Cross-disciplinary questions were discussed with other members of the team, in particular the Botany team, Human remains, Conservation, Zooarchaeology and Use-wear analysis.

Areas and dating

Cordage, textiles and basketry have mainly been found inside buildings. These were found in Buildings 49, 52 and 131. Cordage was also recovered from Building 77; any potential textile remains from this building were too badly preserved to be confidently identified as such. The four buildings are all in the North Area and are assigned to Level North G. It means they date between 6700 and 6500 cal BC. Textiles and cordage from Mellaart’s excavations derive from his Levels VI A/B. They were then C14 dated to 6200-5800 BC (Mellaart 1964: 116). They are now calibrated and assigned to the Middle period of Çatalhöyük, aligned with Level North G and thus contemporary with the textile finds from the Hodder excavations. It means that all Neolithic textiles and cordage from Çatalhöyük are dated 6700-6500 cal BC.

Basketry has been found in Buildings 4, 5, 6, 17, 18, 23, 56, 80, 89, 97, 108, 123, 132, 150, 160, 161 and 162. Further basketry was recovered from Spaces 489, 583 and 610.

Buildings 4, 6, 17, 18, 23, 160, 161, 162 and Spaces 199 and 583 belong to the Early period (7100-6700 cal BC); Buildings 5, 49, 52, 77, 80, 89, 97, 131 and 132, and Spaces 113, 489 and 610 date to the Middle period (6700-6500 cal BC), Buildings 56, 108 and 150 to the Late period (6500-6300 cal BC).

Post-Chalcolithic and later textiles and basketry: textile fragment (8770.s3) is Iron Age or later; the basket from (12634.s20) and textile from (19586.s3) are Post-Chalcolithic.

Textiles from the Mellaart excavations

The textiles from the Mellaart excavations were examined by Harold B. Burnham (1965). Previously they were briefly described by botanist H. Helbæk (1963) who had excavated most of them himself. The textiles are now in the collections of the *Anadolu Medeniyetleri Müzesi* in Ankara, except for a small sample. We did not have occasion to study the textiles in Ankara, and our catalogue of these pieces below has been put together based on Burnham's. As Burnham was a textile specialist, we assume his technical descriptions are accurate, although his descriptions of fibres and yarns should be revised according to our findings. We did however examine a sample of one of the textiles now in the Textile Research Centre in Leiden.

Leiden sample: 29 small fragments in box labelled ‘Textile from skull, lower layer VI’ (table 11.1 and fig. 11.3). As the sample is dated ‘Summer 1963’ it may derive from a textile that had been used to replace the extracted brain of a skull found under Room E.VI.1 (Burnham 1965: 172; Mellaart 1964: 93, pl. XXIV a, b; Mellaart 1967: pl. 94).

Table 11.1. Textile fragments in the Leiden collection.

**Figure 11.3.** Textile fragments in the Leiden collection (Mellaart excavation).

Textiles and basketry from the Hodder excavations

Raw materials (table 11.2)

Cordage and basketry

According to the phytolith identifications, Çatalhöyük basketry is made from wild grasses, sedges and cereal straw, matting from sedges and reed (Ryan 2011; Wendrich, Ryan 2012). One piece of cordage which has been analysed appears to be made of tree bast (oak bast, see fig. 11.7; Rast-Eicher et al. forthcoming).

Twining and woven textiles

Generally, the fibres used for twining and woven textiles are bast fibres, which includes tree basts and flax. Animal fibres would melt with heat and could not be charred or burnt. Fibres for the Çatalhöyük textiles have previously been identified as flax (Ryder 1965; Vogelsang-Eastwood 1988; Fuller et al. 2014). The question of the first domesticated flax has been very much discussed (latest articles: Bar Yosef 2020; Shamir, Rast-Eicher 2020). Fibre analysis of a few samples has shown that it was not very easy to differentiate the basts, but that tree bast has been used for woven textiles as well (Rast-Eicher et al. forthcoming). In two cases, flax could not be excluded, but flax fibres can be obtained from several species of wild and domesticated flax. The very low number of flax seeds in the settlement - according to their size wild flax - lead to the assumption that wild flax was more important than domesticated flax for fibre use. The presence of domesticated flax would have required enough seeds for sowing out. The use of tree basts even for woven textiles is well known in the Neolithic lake dwellings of Switzerland (Rast-Eicher, Dietrich 2015; Rast-Eicher 2016).

Animal fibres

Hides found in Çatalhöyük clearly show animal fibres, but the preservation is so bad that the species could not be identified. Fibre diameters and pores with large fibres of about 100μ and fine undercoat (wool) of about 15-20μ might however fit with ancient sheep types (fig. 11.4).

Table 11.2. Çatalhöyük. Samples analysed from the Hodder excavation.

**Figure 11.4.** Surface of hide with pores.

Presentation of the material

Threads and cordage (table 11.3)

Twenty-eight fine threads and cordage were catalogued. The diameter varies between 0.5 and 10mm. Several items - especially when preserved as phytolith cord - were so deteriorated that the diameter could not be measured. Three items were found inside beads. One is a plied thread (7580) from unstratified burial F.1202 in Sp. 1003. The others are fine strings composed of a multiple-2-ply thread (17457), from infant burial F.4023 in B.49, and (21682), from burial F.8060, B.77) The diameter of these plant fibre strings indicates that they were used for stringing the beads rather than for sewing them on to a textile or hide (figs 11.5 and 11.6).

Table 11.3. Strings and cords with visible twist.

**Figure 11.5.** Fine string found in bead (7580.x1-4).

**Figure 11.6.** Multi-ply string in bronze bead (17457.x3-5).

Building 52, multiple burial F.7127: A thread with a diameter of 2mm (30510.x1) was found around the mandible of a child. Medium strings of 5-7mm were used to tie the deceased in a foetal position. Cordage (30511.s4) was found wrapped around the legs of infant skeleton (30511), also holding the body in flexed position.

Building 77, burial F.7611, skeleton (21606): (21605.s5) was wrapped around the skeleton with orange-brown material. In the same building, cordage preserved as white phytoliths (30154) connected to burial F.7309. Cord remains from skeleton (21606) (an infant, 2-4 years old) are thicker, with diameters up to 10mm. They are preserved as phytoliths. One piece (21606.s1) was found wrapped several times around the head. One cord went over the brow ridge and into the eye socket, showing that when the wrapping had taken place the body must have been decomposed (fig. 11.7).

**Figure 11.7.** Multi-ply string. Cordage over the eyelid in burial F.7611.

Building 131, skeleton (22661): Three thread samples (22661.s17-19) were found in connection with the skeleton. They are burnt and very brittle and probably made of bast fibres.

Basketry

In his report of the 1963 season, Mellaart showed different forms of baskets found in his Level VI (Mellaart 1964: pls XXIIb-XXIIIa). The baskets and mats recorded in 2017 are listed in table 11.4. There are two main techniques, coiled baskets and matting (see fig. 11.2). The coiled baskets are made of a coil of grasses, sewn with grass leaves or bast. The sewing is always stitched - there are no examples with wrapping around the bundle without stitching through the bundle of the previous coil. The stiches are irregular and dense, or V-shaped. In some cases, they run into the last stitch or in the stich of the lower row (no 32673; 32803). The mats are all made in basketry tabby.

Table 11.4. Basketry found in Hodder's excavation, recorded 2017.

Coiled baskets

Most of the coiled baskets seen in 2017 by Lise Bender Jørgensen and Antoinette Rast-Eicher are preserved as phytoliths; two are imprints on clay balls. They are quite variable in form, coil diameter and stitching (see table 11.4). One of the new finds, (32610.x1), found in Building 160 as an infill in a burial was preserved in several big fragments that will allow the calculation of its diameter. One of the fragments, where both bottom and remains of the lid were preserved, had a height of 13.5cm. Over this lid a fragment of a cover could be observed; this fragment had larger coils (fig. 11.8).

**Figure 11.8.** Coiled basket with cover (32610.x1).

Mats

In Mellaart’s reports impressions of mats are often mentioned. One is particularly interesting, as it was found on pottery from Shrine E, level IX. This was the earliest pottery found (Mellaart 1964: 82). He further observed matting on the floor in several rooms, ‘carpeted with fine reed matting’ (Mellaart 1964: 55). Mats were also found in burial contexts; the skeletons were laid on mats or placed in baskets (Mellaart 1964: 94).

We found eight mats, one of them as imprint on a clay ball. All these are in basketry tabby (see table 11.4); in most cases the fibre strips of both systems have approximately the same width. Strip widths vary between 3 and 11mm. Some look like grasses, other like bast. The imprint on clay ball (22351.m113) is particularly interesting as the imprint on the mat changes its direction and partly superposing itself (fig. 11.9). This means that the ball has been rolled on the mat in order to obtain its round shape.

**Figure 11.9.** Mat impression on clay ball (22351.m113).

Textiles

Neolithic textiles were found in Buildings 49, 52 and 131, all of which had burnt, causing textiles in recent burials to be charred. One item, (19586.s3) proved to be post-Chalcolithic while (8770.s3) dates to the Iron Age or later.

As mentioned above, ‘textiles’ is used of flexible fabrics made in two different techniques, weft-twining and tabby weaving (see figs 11.11 and 11.12). The two techniques appear linked, directly or because they are made from the same yarns within the same unit. This corresponds with Burnham’s records of the textiles from the Mellaart excavations (Burnham 1965). One of the pieces recorded by Harold Burnham (1965: 172) had a twined heading cord with 13 warp threads and 16 weft threads per cm; another fragment, probably of the same piece, had a plain rolled hem sewn in coarse running stitch. He also described two types of narrow tapes (1965: 171-2); one is 7-8mm wide, strongly warp-faced and composed of 20 threads with about 6 wefts/cm. The other is wider, ca 1.5cm, and has on average 9 warp and 8 weft threads/cm. Textiles from the current project are similar, with between 8 and 14 threads/cm.

Textiles from Building 49, Feature 4023

The textiles from Building 49 were found in 2008. They are labelled (17457.x3 and x10) and derive from F.4023, an infant burial wrapped in matting. Grave goods included a copper bead and twine necklace and textiles. The burial was the earliest in Building 49. The copper beads were on a string described above (17457.x3 s10, fig. 11.6). One textile fragment was found on a copper bead (17457.x3, x10); three further fragments, (17457.x10), were also found with copper bead(s) (fig. 11.10). All are mineralised and preserved by oxidation of the copper.

**Figure 11.10.** Textile found with beads (17457.x10).

Textiles from Building 52

The textiles from Building 52 were found in 2013 and were first examined in 2014 by D. Fuller (Fuller et al. 2014). They derive from Space 94, F.7127, a multiple burial that contained an adult skeleton (30514) and four infants/children, (30510), (30511), (30513) and (30524). The textile remains were found between (30511) and (30513) and on cranium of (30510). They are labelled (30503.x9), (30503.s5-9, s10) box 1 and 2. Two samples labelled (30510.x1) were described as burial bandage from skull, and cord sample; both were found to be cordage. Another sample labelled (30511.s4) described as ‘textile from legs (cords)’ was also found to be cordage. Textile samples (30503.s2) and (30503.s10) subsample were exported by D. Fuller in 2013. They, as well as (30503.s5), stored in the Konya museum, were not examined by the present authors. Textiles (30503.s6-9) were found with infant (30511.s6) in the thorax region, (30511.s7) in the neck region, (30511.s8-9) in the abdominal region. Textile (30503.s10) box 1 was found in the head region of infant (30513), that of box 2 above (30513). The textile fragments from (30503) are small; the largest piece is 7 x 4cm (figs 11.11, 11.12).

**Figure 11.11.** Textile in tabby (30503.s9).

**Figure 11.12.** Weft twining (30503.s10).

Textile remains from Building 77, Feature 7611

Possible textile remains, and cordage were found in 2014. They are labelled (21605.s3 fill, 5 and 8, and 21606 s1, s2, s3, 4, 5, 6, 8, 9 (associated with s5), 10 and 11 (continuation of s1, s10). They derive from Space 336, F.7611, skeleton (21606). This was a juvenile primary burial, flexed and bound. As fibres were badly preserved, none of the samples could be identified unequivocally as textile but may be remains of them. Several were strings and cordage. Some of the cordage (21606.s1) was found attached to the skull (fig. 11.13). Hide remains (non-human) were found underneath the cordage (see fig. 11.14)

**Figure 11.13.** Hide on a fragment of skull (21606.s3).

**Figure 11.14.** SEM-photo of the hide (see fig. 11.15) (21606.s3).

Textiles from Building 131

The textiles from Building 131 were found in 2015, 2016 and 2017. They derive from Space 500, Features 7956, 7977, 7997 and 7961.

Feature 7956, skeleton (22661)

Skeleton (22661) is a female, 20-30 years old, tightly flexed and wrapped in cords and textile. The textile remains from F.7956 are labelled (22661.s2, s3, and s5); cordage from the same feature are labelled (22661.s4, s17, s18, s19 and s20). Samples labelled (22661.s11-s13) were exported by Fuller in 2015 and not seen by the current authors.

Feature 7977, skeleton (30040/30045)

Skeleton (30040/30045) is a young adult possible female from F.7977. The textiles are labelled (22676.s4 and s12) (subsample of s5). A basketry impression, (22676.s15) was initially described as a textile impression.

Feature 7997

Feature 7997 is designated as a pit that contained the remnants of a carbonised basket (32373). Textile fragment (32373.s1) derives from this basket.

Feature 7961, Skeleton 23126

Feature 7961 is a multiple burial. The primary inhumation is skeleton (23126), an adolescent female found with objects such an obsidian mirror with ochre, beads, pigment, a wooden bowl and a large pottery fragment placed underneath the cranium. A tiny, possible textile fragment labelled (30039.s10) was found among other organic material on the leg of skeleton (23126).

Table 11.5. Neolithic textiles of the Hodder excavations.

Summing up

The textiles from Çatalhöyük are very homogeneous. They are all made from spliced threads. Yarn diameters vary slightly between find spots: in Building 49 and Building 131, F.7956 they are 0.5-0.7mm, in Building 131 F.7961 and F.7963 they are 0.8mm and in Building 52 they are 1.0mm. Most are woven in tabby, in Building 49 possibly with an edge in basket weave. One of the fragments from Building 52 has remains of what may be a transverse (starting) border, others appear to end in fringes, and two appear to end with one or two rows of weft-twining. This also applies to one of the fragments from Building 131, F.7961 and F.7963 (22661.s2 and s3, 30503.s10). The twining in (30503.s10) consists of both a single and double row of weft-twining, the latter creating a herringbone effect (see fig. 11.12). Organic remains from Building 77 were too badly preserved to identify as textiles.

Some pieces (22661.s2 and s5) from Building 131, F.7956 had fine knots or loop ends, and could derive from a net or a tassel. They may represent a form of decoration at the end of fringes or, perhaps, detached from the textiles (fig. 11.15). The woven fabrics have thread counts between 8 and 14 threads/cm but appear almost balanced in each individual piece. As regards the weft-twining, distances between ‘weft-rows’ are 7 to 10mm.

**Figure 11.15.** Fragment of (22661.s2) with loop ends.

This corresponds well with the findings of Harold Burnham (1965). He documented twining and soumak along with the tabby-woven textiles. The woven tabbies of Burnham had thread counts of 10-16 threads/cm. Like those from the current project they are nearly balanced. Burnham also found narrow tapes in warp-faced tabby with simple selvedges that were used to tie the deceased into a foetal position. Burnham describes the weft yarns of these as z-twisted, but photos (Burnham 1965: pl. XXXIIb) shows that like all other fine threads they were spliced. Burnham also found various edges. One textile, from EVI,1 has reportedly a heading or starting cord, made by inserting what is to become warp threads into each turn of a plied cord. Three to four threads follow in the same shed to strengthening the starting border before the regular tabby weave begins (fig. 11.16). The same textile is also reported to have a rolled hem, sewn with a quite coarse thread. Burnham mentions another rolled hem but does not supply details on which textile. Another tabby (without specified technical details) is described as having been mended; it was sewn with overcast stitches onto a different fabric.

**Figure 11.16.** Technical drawing of starting border (illustration by Atelier Oculus, Zürich).

Non-Neolithic textiles

One textile, (19587.s3) proved to be post-Chalcolithic. It is a very fine textile imprint on clay, tabby or possibly twining. Another, (8770.s3), is a fine tabby with fine z-twisted threads that proved to be cotton. The single yarns and cotton fibres indicate that the textile is not Neolithic, corroborating the fact that it derives from a burial in one of the top layers of the site.

Table 11.6. Non-Neolithic textiles.

Hides

A number of hides were recognized while looking through boxes with organic remains from burials. Samples for the SEM were taken to try to find out more: if it was hide, and which kind of hide (table 11.7). These remains are especially interesting as they reflect inhumation practices. Exposure to high temperatures in a burning building will cause animal fibre to melt; hide will be charred and obtain a glassy surface.

Samples were taken and examined by SEM. Results demonstrated that some samples were indeed remains of hide; others were botanical ((20413) grass, (32330) wood). The burial of child skeleton (21606) F.7611 in Building 77 was especially interesting as remains of hide (21606.s3) were visible on parts of the cranium (figs 11.13 and 11.14). If the pores are of different size, it cannot be human skin. Such differences are especially well-visible in the hide remains in the burial F.7056 in Building 131 (22661). The SEM photo shows some well-visible pores, large ones of nearly 100μ, and next to it fine ones of 15-20μ (see fig. 11.4). The "wall" on the right of the large hole (pore) has a glassy shape from the heat. In the same grave, a hide could be documented on a textile. The results show that the dead in some instances must have been wrapped in hide(s).

Table 11.7. Hides.

Production processes

The *chaîne opératoire* of textile production consists basically of the procurement and processing of raw materials (fibres), the transformation of these fibres to threads, and then the creation of flexible, flat materials by weaving or twining. This is followed by finishing processes such as wetting, and perhaps further shaping and/or decoration. Cord-making also consists of the harvesting and processing of fibres and turning them into threads that are then plied and re-plied until the desired type of string or cord has been obtained.

Most time and effort for basketry production is spent on the collection and selection of grasses, leaves, culms and other raw materials. Most materials would have been found in the swampy environs surrounding the settlement. The best period for harvesting was the late summer. Typically, basketry materials are cut and then left to dry, a procedure needed both to avoid shrinkage of the elements in the fabric and to allow storage for later use in periods when time or season sensitive tasks are done. Depending on the basketry technique the dried plant parts are briefly soaked or only wetted before final use, to restore flexibility, and then intertwined in different ways as outlined below.

Threads and cords

Tree bast is harvested in springtime. Strips of bast are either worked immediately or stored and soaked before use. The strips are (then?) twisted; as they are long but not discontinuous, new strips need to be added by knotting. For finer, continuous threads fine strips of tree bast or flax are spliced together in order to obtain continuous thread (see "splicing", above). Flax can be used either as green stems or by soaking dry stems. Spliced threads are frequently plied to obtain a stronger thread. This is usually carried out with a spindle, a tapered wooden stick often supplied with a spindle whorl that may be made of a variety of material but mostly stone or fired clay (Crowfoot 1931; Barber 1991: 42-44). No spindle whorls were however found in Neolithic layers at Çatalhöyük (Rast-Eicher, Bender Jørgensen 2018); any spindles were therefore presumably whorlless. Cords are made by twisting fibres into long strands, followed by plying and cabling several strands together (Wendrich 1991: 30-32).

Coiled basketry: grasses, bone awls and rings

The grasses used in the coiled bundle could have been harvested in different seasons, but the best result is obtained when cutting and drying the grass in late summer. The material has to be wetted, or briefly soaked to be used while moist and flexible. The same is true for the wrapping strands that are stitched around the bundle. A bone ring can be used to maintain a regular diameter of the coil throughout the basket. Such a ring keeps together the bundle of grass and allows easy insertion of new material into the coil. The stitch of the wrapping strand through the previous bundle is most often done with the aid of an awl. Bone awls are frequent at Çatalhöyük (see Volume 9 Chapter 18).

Matting

The creation of plaited mats does not require any tools, although hammer stones in combination with awls can be used to tighten the fabric. Rushes, reeds and sedges are prepared the same way as grasses: cutting, drying and briefly soaking before use. Employing fresh material results in a loose fabric, because the strips will shrink when drying. The culms of rushes, reeds and sedges may have to be split to create thin strips of uniform thickness and width. From the appearance of the mats it seems more likely that rushes or sedges were used, rather than reeds, because the latter often are plaited as several parallel strips (the flattened circumference of the culm), with recognizable knots. They also create a harder, less flexible surface than sedge matting does.

Twining

Twining can be made on a frame that is closely related to the loom used for woven textiles (Rast-Eicher, Dietrich 2015), or on a loom as decoration or closing border of woven textiles. In many regions of the world twined basketry and matting are among the earliest forms known, but this technique does not seem to occur for basketry in Çatalhöyük (e.g. Berger et al. 1998).

Textiles

Woven textiles are produced on a loom. This can be a simple backstrap system or a loom built as a frame. Both require heddles. Most loom types are made entirely of materials that are easily perishable such as wood and string; the main exception is the warp-weighted loom where loom weights made of baked or unbaked clay or stones are used to keep warp threads taut (Hoffmann 1964). Loom weights are known from Neolithic sites in Anatolia (Çilingiroğlu 2009; Gleser 2016) but none have been recovered from Neolithic layers at Çatalhöyük (Rast-Eicher, Bender Jørgensen 2018).

The lack of spindle whorls and loom weights from the Neolithic layers a Çatalhöyük does not indicate that no production of textile did take place at the site. It merely suggests the use of whorl-less spindles and other loom types than the warp-weighted loom (see Crowfoot 1931 for spindle types, Ciszuk, Hammarlund 2008 for loom types). Along with a form of backstrap loom the ground loom is a likely possibility. It was used in Mesopotamia and Egypt throughout Prehistory (Barber 1991; Breniquet 2008) and is indeed still used in parts of the Middle East and North Africa (Bender Jørgensen 2018 with further references).

Textiles and basketry from Çatalhöyük in Chronological and Geographical context

Coiling, twining and early woven textiles

The well-developed coiled basketry found in Çatalhöyük, is part of a long tradition. String and cord production have been attested for the Palaeolithic (Glory 1958). Coiled matting and basketry have been found at Jericho and Nahal Hemar, both in Israel and dated to the 10th and 9th Millennia calBC respectively (Kenyon 1957: Pl. 12B; Schick 1988:Pl. XV, 4).

As shown in table 11.8, twining as ‘textile’, i.e. as fabrics rather than netting or basketry, has been found at Nahal Hemar in Israel dated 8200-7300 cal BC (Schick 1988; Solazzo et al. 2016), at Tell Halula in the Euphrates Valley, Syria, dated 7600-7300 BC (Alfaro 2012) and at Çayönü, southeast Turkey (Vogelsang-Eastwood 1993). The Çayönü fabric is dated ca 7,500 cal BC. It was found wrapped around a bone handle of a sickle in the burned fill of Cell Building DS, phase c3 (Gleser 2016: 83; Özdoğan 1999: 32, fig. 54). Such fabrics also appear in Neolithic sites in Europe, especially the Alpine lake dwellings dated from about 4300-2600 cal BC (Cardon 1998; Grömer 2006; Médard 2000, 2006, 2010; Rast-Eicher, Dietrich 2015). The Similaun man (‘Ötzi’) also wore a mantle made by twining (Winiger 1995). Soffer et al (2000) have suggested that coiled basketry existed as early as the Upper Palaeolithic, Similarly, impressions of twining are claimed from the Palaeolithic site of Pavlov VI in the Czech Republic (Adovasio et al. 1996). Both claims are based on impressions; these are however not easy to read, and tree basts were not available in this period (discussion in Rast-Eicher, Dietrich 2015: 10-11).

Table 11.8. Date ranges of early textiles, etc.

Twining may feature as an element in borders, e.g. in the Chalcolithic burial in the ‘Cave of the Warrior’ in Israel. Here, two rows of weft-twining create decorative bands shortly before another pair of twinings form the transition between web and end fringes (Schick 1998: fig. 3.9). Two similar rows of weft-twining form an important element in the closing border of a large, early wool textile found in a burial at Pustopolje, Bosnia and Herzegovina dated to the 15th century BC (Grömer et al. 2018). Later, rows of twining became a regular way of decorating and reinforcing exposed parts of woollen items of clothing in the Roman World (Granger-Taylor 1982: 16-18).

Harold B. Burnham (1965) presented an item from Çatalhöyük Level VI made in fine twining combined with a woven textile. The twining has small spaces between the rows and is made in S-direction. In the material from the 1993-2017 project some examples of twining were found; they are all very fine and partly visibly linked to woven textiles. Therefore, we may assume that they were produced on a loom, as part of the web.

The woven textiles from Çatalhöyük are among the earliest known. Imprints of woven textiles have been claimed from earlier Neolithic sites, e.g. Jerf el-Ahmar (Stordeur 2015: 282-83) and Tell Aswad (Stordeur et al. 2010: 46, fig. 6), but closer examination of these have showed them to derive from basketry. The dating ranges of the imprints of woven textiles from Jarmo and El Kown overlap with the Çatalhöyük textiles and all three groups may thus be considered largely contemporary. The Çatalhöyük textiles are however currently the earliest woven textiles where fabric and fibres are preserved.

The closest current parallel to the Çatalhöyük textiles is a tabby-woven fragment on an idol in Building 33, dated to level Vb (6400/6300 cal BC) at Ulucak, Izmir, Turkey (Çilingiroğlu 2009; Gleser 2016: 83). Pieces of woven fabrics have also been recovered from phase X at Ilıpınar in the eastern Marmara region of Turkey. They date to 6000 cal BC (Roodenberg 2011).

In figure 11.17, the appearance of the various types of cordage, basketry, twining and weaving at 23 early sites is shown (for numbers see table 11.8). First are preserved strings/cordage that have been documented at Palaeolithic sites, in the Levant at Ohalo II (Nadel et al. 1994). To be able to bind or sew things together was important in early human history. Cordage must therefore have preceded harpoons and other weapons or tools that need binding. The early containers made of threads and asphalt are a particularly interesting phenomenon; basketry may have started in the Palaeolithic as well. Coiled baskets or mats are not very difficult to make and could have been made from grasses. The coiling technique is extremely versatile and may be used to create all kinds of shapes. A Mesolithic coiled mat found in Holland proves that non-sedentary people wanted to sit on mats when they prepared their arrowheads (Rast-Eicher, Dietrich 2015: fig. 283). Nets have been recorded during the Palaeolithic period on depictions. It is a textile technique which needs a continuous thread and therefore a certain fibre processing if the threads had to be fine. The fibres used were bast fibres as soon as climatic conditions allowed larger trees to grow. The earliest nets have been found in Mesolithic layers such as at Antrea i Karelia (Bender Jørgensen 1992: 93), Friesack in Germany (Rast-Eicher, Dietrich 2015: 107) and in early Neolithic Layers of the PPNB layers of the Levant such as Nahal Hemar, Israel (Schick 1988a, b). Among the finds from Çatalhöyük some tiny, badly preserved fragments may derive from nets.

**Figure 11.17.** Development of techniques.

Twining is a technique for various purposes; it can be made by hand for three-dimensional objects like containers or hats, or on a frame for large two-dimensional objects which can resemble in fineness woven textile. The first twined textiles have been found in the Levant (Nahal Hemar) and consist of two- and three-dimensional objects (Schick 1988a, b). The starting borders of the large flat twining must have been fixed on a frame and precede technically the woven textiles with a warp fixed on a frame, too. The same development from large sheets of twining to weaving could be reconstructed with the finds of the lake dwellings in Central Europe (Rast-Eicher, Dietrich 2015: 112–18). First woven textiles appear during the first half of the 7th millennium BC as imprints in clay - still in Pre-pottery layers. Within a series of finds from Mesopotamia, Syria and Anatolia, the woven textiles of Çatalhöyük are the oldest preserved textiles and not only imprints of textiles. As there are many finds in Nahal Hemar, woven textiles would probably have been preserved, if there were any. We may thus suppose that the development from twining to weaving took place between Nahal Hemar (the last quarter of the 8th Millennium BC) and Jarmo, El Kown and Çatalhöyük (the first half of the 7th millennium BC).

Textile tools are as yet missing in sites dated before the middle of the 7th Millennium BC. Spindle whorls appear only to turn up in the Near East during the third quarter of the 7th Millennium BC (Roijaakkers 2012:101-03), and loom weights seem to begin about the same time. The loom-weights found in levels dated 6200-5800 cal BC at Ulucak Höyük in West Anatolia (Çilingiroğlu 2009; Gleser 2016) are currently the oldest from this area but it is uncertain whether they were used for weaving. It is well possible that they have been weights for large items of twining as it has been the case in Europe. Another argument is the lack of starting borders which are typical for a warp-weighted loom.

The woven textiles from Çatalhöyük were used as cloth to wrap bodies. Before, in everyday life, these textiles were probably used as clothing as suggested by the early figurines found at Jarmo wearing long tunics with fringes (Braidwood et al. 1983: fig 161). The early depictions in Çatalhöyük such as the figurine published by Mellaart (phase II; Mellaart 1962, pl. 23b) suggest that skirts with fringes were worn, but otherwise most garments were supposedly made of hides.

Hide

The fragments of hides found in Çatalhöyük are all found in connection with inhumations. The dead were obviously wrapped in or covered with hide. The preservation of hide is difficult and finding and recording them even more difficult. Hide fragments were for a very long time not really a research subject but is now beginning to emerge (Van Driel-Murray 2000; Hatziminaoğlou, Boyazoğlu 2004; Rast-Eicher 2010; Spangenberg et al. 2010; Ruß-Pupa 2018).

As wall paintings show (e.g. Mellaart 1967, fig. 61), hides were a main component of clothing at Çatalhöyük, but hides would also have been used for bags or other items. The hides depicted seem to be from leopard, as they are dotted. But hides from other animals such as sheep, goat or ox are very well possible, too. Throughout history, hides have been important, from the Palaeolithic period to modern times – as protection against a cold climate as well as to display affluence and social prestige. Hides were certainly the first materials used for garments.

Evidence from Palaeolithic graves show beads in very structured compositions, indicating that they were sewn on hide. In Sunghir (Russia), two individuals from the Gravettien Period (29,000-26,000 bp) have been buried in clothing decorated with thousands of mammoth ivory beads (Trinkaus, Buzhilova 2012). Two children in the ’Grotta dei Franciulli‘ (prov. Imperia/Italy) dated to the late Upper Palaeolithic (13,000 BC) also had thousands of beads (Mussi 2002); the grave of a child in the cave of ’Arne Candide‘ (prov. Savona/Italy) contained about 80 squirrel tails, very probably remains of a fur mantle with tail decoration (Mussi 2001). In Scandinavia, late Mesolithic burials excavated at Vedbæk (Denmark) also display groups of beads indicating decorated skin garments (Albrethsen, Brinch Petersen 1976).

In the Neolithic lake dwellings of Central Europe, the soil is alkaline, preventing the preservation of hides or animal fibres. Due to climate change and melting glaciers, finds of Neolithic skins that had been enclosed in the ice for thousands of years have appeared. The most famous of them is the "Iceman" found in the glacier of the Tisenjoch in Northern Italy and dated 3300 BC (Egg, Spindler 2008). He was wearing arctic clothing, a combination of hide garments and a grass mantle to prevent the hides to become wet. The trousers and the upper garment, a sort of long jacket, were made of red deer and goat hide (very solid and smooth), the girdle is from cow hide, the head covering from bear fur. Similar objects of the same period were found on the Schnidejoch, a passage at 2700m altitude in the Swiss Alps (Hafner 2015). One item was a large piece of trousers of goat hide - interestingly according to DNA analysis an Asian type (Schlumbaum 2010), and a cape of willow bast with a fine leather strap to close the cape under the chin (Rast-Eicher 2015). As soon as metals appear, hides can be documented on metal objects added in graves, often pointing to capes or wrappings. In Northern Europe, many hides have been found in bog burials or oak coffins dated to the Bronze or Iron Age (Hald 1980). At Çatalhöyük, beads (no 17457, see fig. 11.6) found with hide may well represent similar clothing (see Chapter 10).

Due to difficult preservation of the organic material in Çatalhöyük - textiles and hides - and the lack of specialist analyses during the excavations, the interpretation is difficult. As the textiles appear to have been made from wild plants we find a large-scale textile production for clothing unlikely. It follows that hides remained an important part of clothing.

Conclusion

The body at Çatalhöyük was covered in life and death, but most of the evidence we have speaks to the latter. The small textile fragments, mostly preserved in contact with metals or as charred remains, are the only evidence for what probably was clothing. The dead, buried under the feet of the living, were separated from the earth either by wrapping in hides or putting the body in a contracted position in a coiled basket. Matting does not seem to have been used to wrap the dead, but only as floor covering, which speaks to the stiffness of the matting materials, but perhaps also to an understanding of the need to separate the living from the earthen floor. No continuous matting was found on the platforms in which the dead were resting, but it is on these platforms that plate-sized coiled mats were found. These similarly form a separation of objects, or maybe foodstuffs from the ground surfaces. From the little evidence that was found, we can conclude that there is consistency in techniques, which points to a local craft production. Detailed study of these coherent technical traditions show, however, quite some variation in those aspects that are indicative of several non-specialized households involved in the production.

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