

CHAPTER 10

PRELIMINARY REPORT ON THE TEXTILES

by

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10.1 Introduction

The excavations at the Workmen's Village have provided a unique collection of domestic textiles from the Pharaonic period. Their uniqueness lies not only in the quantity recorded, but also in their having come from well recorded provenances set within a secure dating sequence. As such they will form an invaluable basis for any history of early Egyptian textiles and the textile industry. The following report is intended to be a preliminary survey of the four thousand textiles excavated at the site between 1979 and 1984. It is planned that a more detailed study of both the textiles and related objects, such as spindles, spinning bowls and loom parts, will be published after the excavations at the Village have been completed.

As with many of the other categories of objects found at Amarna, the textiles have been recorded in a tabular form suitable for computerisation. The listed technical information has been divided into eleven variables, which, in addition to information on provenance, comprise: fibre type, spin direction, tightness or angle of spin, yarn diameter (mm.), thread count (per cm.), maximum size, general comments and whether or not a fibre sample had been taken. [1] Apart from some minor alterations to the basic form, this system will be used to record the textiles from future excavations at the site.

Most of the textiles came either from the rubbish layers associated with the quarry region, or from the rubbish pits beyond the southern enclosure wall of the Village. Due to the arid and sandy conditions at the site, the majority of the textiles are well-preserved and have not suffered any serious distortion in their original colour. Some pieces have been partially damaged by burning, but this was probably due to ash being accidentally scattered on to them, rather than to a deliberate act.

10.2. Fibres

(a) Vegetable. The majority of the textiles have been made from the bast fibre, flax (probably *Linum usitatissimum*), which ranges in colour from white, light brown to golden brown. While it is possible that this colour range reflects the use of different species of *Linum*, this seems unlikely as only *L. usitatissimum* seeds have been identified at the site (see Chapter 9). A more likely explanation

[1] Fibre samples were taken for the following purposes: fibre identification, wool fibre diameter measurements, and dye analysis.

is that the colour variations were caused by differences in the maturity of the flax plants and how they were prepared. Occasionally a deep reddish-brown colour is found, but this appears to be the result of later contamination rather than natural pigmentation. Coir type fibres have been found, usually in association with pieces of rope or basketry. However, the quantity of such pieces precludes coir from being regarded as a common or typical textile fibre from this period. Examples of raw and spun cotton (*Gossypium* specie) have been discovered in several locations, but in each case the deposits were either shallow or mixed. This fact, coupled with a possible third century B.C. date for the earliest known examples of cotton in Egypt, [2] means that these textiles can be regarded as intrusions. They were possibly of Roman date, [3] but it is more likely that they are simply modern contaminants.

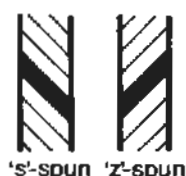


Figure 10.1. "s" and "z" spin directions.

(b) **Animal.** Of the four thousand recorded textiles from the Village, only thirty-eight fragments (many of which appear to be from the same object) were found to be spun and in some cases woven from sheep's wool, while only two were made from goat's hair. So, although present during the Amarna period, there is no evidence to suggest that either were regarded as important or even basic textile fibres. The sheep's wool is generally a natural pale yellow in colour with loose curly-tipped staples. A preliminary study of the wool fibre diameters has suggested that the wool came from a semi-breed sheep of a hairy, medium-fleece type (Ryder 1972). The fibres were heavily medullated, but with surprisingly few pigmented and kemp fibres. The goat hair textiles were spun from long, coarse dark brown fibres of a type common throughout later Egyptian textile history. However, as there appears to have been no deliberate policy of selective goat breeding in Egypt, it has not been possible even tentatively to identify the goat type which provided the hair for these textiles. Finally, no other examples of animal fibre or hair types, for example human, dog or donkey, have been used in any of the textiles from the Workmen's Village.

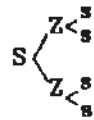
10.3 Spinning

Spinning is the twisting together of fibres in order to produce a coherent length of thread. According to the direction in which the fibres have been spun, the thread or yarn is classed either as "s-spun" (anti-clockwise) or "z-spun" (clockwise; Figure 10.1). Where two or more threads have been twisted together,

[2] Raw cotton swabs were found under the feet of PUM II, a mummified body which is believed to date from the early third century B.C. (Cockburn 1980: 54, 87).

[3] Roman or Romano-Christian occupation is known from the area of the North Suburb, Kom el-Nana and el-Hawata. A very small number of Roman sherds have been found in surface deposits at the Workmen's Village.

the resulting yarn is classed as a plied thread (capital S or Z). Normally z-spun threads are S-plied and vice versa. For example, S-plied yarn is usually represented as $S<_Z^Z$ (two ply) while Z-plied yarn is shown as $Z<_S^S$ (again two ply). Where several plied threads have been twisted together a cord is produced; for example



represents a cord which has been made from four s-spun threads which have been Z-plied and then spun into an S-cord (Figure 10.2).

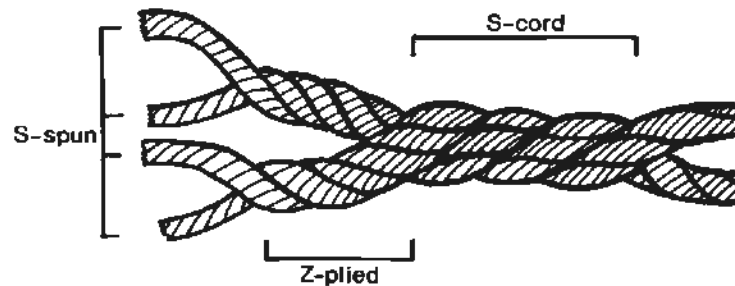


Figure 10.2. Elements of an S-spun cord.

Out of the thirty different spin combinations recorded from the Amarna textiles, only seven were associated with woven textiles, the rest were of various types of cords (Table 10.1).

In all of the flax examples the plied yarns were $S<_S^S$ forms, a feature unique to flax threads and a characteristic of Pharaonic Egyptian flax textiles. The most common spin combinations were: (a) warp: s, $S<_S^S$ weft: s, $S<_S^S$; (b) warp: s, $S<_S^S$ weft: $S<_S^S$, s; (c) warp: s weft: s.

The only variation found in the plying of flax threads is where the yarn was used for sewing purposes. In these cases it is usual to find a Z-plied yarn (with two or three s-spun threads). It is interesting to note that the spinners in the Village not only knew how to spin flax threads in a z-spun form, but that they also had a tradition of producing a special thread for sewing purposes. The cotton textiles were all woven with z-spun yarns in both the warp and the weft systems. When taking into consideration the s-spun nature of the flax threads, the z-spin of the cotton textiles can be taken as a further indication that these pieces were not of Pharaonic origin.

All the woollen textiles were s-spun (s/s), while the goat fibres were used in a $Z<_S^S/Z<_S^S$ combination, a feature of goat-hair cloth which continued well into the Roman period in Egypt (Eastwood 1982: e.g. no. 14).

A further method of distinguishing the quality of spun threads is to describe the angle or tightness of the spin. The angle of spin relates to the lie of the spun threads. The term tight (t) has been used to describe an angle of 45° or above; medium (m) 25° to 45° and loose (l) for an angle below 25° . Although these have only been used as general classifications, with the addition of the average yarn diameter measurement (.mm), it is possible to define both the quality of the yarn, and any variations which may exist between the threads used in the warps and the wefts. In general, the flax thread form most commonly used in this collection of textiles is an s-spun yarn with medium

(a) Threads	(b) Strings	(c) Cords
s/s	$S<_s^s$	$S<_S^S$ -(multi)
$s, S<_s^s/s$	$S<_s^s$	$S<_S^S$ -(multi)
$s, S<_s^s/s, S<_s^s$	$S<_s^s$	$S<_Z^Z$ -(multi)
$S<_s^s/S<_s^s$	$S-s$ (multi)	$S<_{Z-s}^{Z-s}(5)$
$S<_{s,s}^s/S<_{s,s}^s$	$S<_z^z$	$S<_{Z-s}^{Z-s}(6)$
$S<_{s,s}^s/s, S<_s^s$	$S-z(6)$	$S<_{Z-s}^{Z-s}$
z/z	z	
$Z<_s^s/Z<_s^s$	$Z<_s^s$	$S<_{Z-s}^{Z-s}(6)$
	$Z<_s^s$	$S-Z(6)<_s^s$
	$Z-s(5)$	$Z<_S^S$ -(multi)
	$Z-s$ (multi)	$Z<_S^S$

Table 10.1. Spin combinations associated with threads, strings and cords. Key: s="s"-spun; z="z"-spun; S="S"-plied; Z="Z"-plied.

angled twist and an average diameter of between .2/.3mm., the warp and the weft threads being of an equal quality.

10.4 Coloured Fibres and Textiles

Although some of the flax textiles have the appearance of being bleached white, the majority of the pieces have been left a natural colour. Nevertheless, the techniques of dyeing must have been known within the locality as a number of dyed flax threads and flax textiles have been found at the site. In each case the fibres were spun and then dyed. Curiously most of the threads were dyed a pale blue, while all of the dyed textiles were a dull brickish red. Other thread colours include a pale pink and a purplish blue. The colours have been

analysed [4] and the following dye sources identified:

Blue: indigotin - there are two main plant sources of indigotin associated with Egypt, first Woad (*Isatis tinctoria*) and Indigo (*Indigofera argentea* or *tinctoria*). Unfortunately it is chemically impossible to differentiate between a dye produced from either woad or indigo (Hofenk de Graaff 1974: 55). However, as there is no evidence to suggest that indigo was a commercially available dye in Egypt during this period, it seems likely that woad had been used to produce the blue colour.

Red: the red dyes proved to be more complex. Most of the samples were identified as Madder (*Rubia tinctorium*), which was particularly rich in alizarin. However, several of the samples proved to be inorganic and it has been suggested that they are from a red ochreous earth.

Purple : the purple thread proved to have been double dyed with both indigotin and madder. Although it became a common method in later Egyptian periods for producing a cheap but effective purple colour, this appears to be one of the earliest recorded examples.

The mordants have not yet been identified.

10.5 Weaves

The simplest form of weaving is where one weft thread (pick) passes over and under the warp threads (ends). In the next row (throw) the pick passes under one end and over the next, so forming an interlocking structure (Figure 10.3).

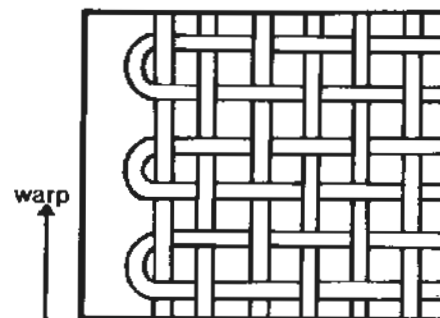


Figure 10.3. Tabby weave with plain selvedge.

All other weaves are simply variations upon this theme, although it must be admitted that some of the possible variations can be extremely complex. However, in the case of the textiles from the Workmen's Village, there are only two basic categories of weaves, [5] namely tabby weave (described above; Figure 10.3) and basket weave (Figure 10.4). Basket weaves are where the ends and/or the picks have been used in pairs rather than as single threads in both systems. Nevertheless within these two categories of weave types, there is a wide range of variations:

Tabby: tabby, warp-faced tabby, weft-faced tabby, tabby plus weft-faced band;
Basket: half-basket (paired wefts), basket, weft-faced half basket (paired warps), warp-faced half-basket (paired warps), warp-faced half basket (paired wefts)

[4] The analysis of the dyes has been carried out by Dr. George Taylor at the Y.A.T. Conservation Laboratory, York.

[5] There are no examples of any form of twill weave.

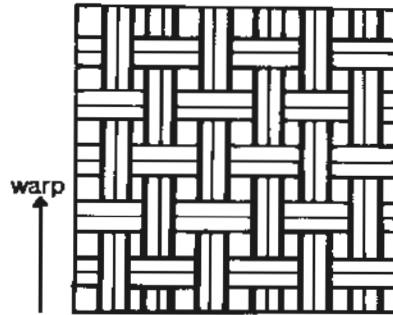


Figure 10.4. Basket weave.

and warp-faced basket.

The tabby weaves were expected and well-known flax weaving forms and account for nearly all of the existing examples of Pharaonic textiles. However, the range of basket weaves was very surprising, especially as this type of weave is generally considered to be typically Roman and has not been associated with New Kingdom textiles. Very few of the textiles have any form of weaving faults and where these do occur they are either ends/picks which float over three threads (Figure 10.5a), or where paired threads have been treated as one (Figure 10.5b).

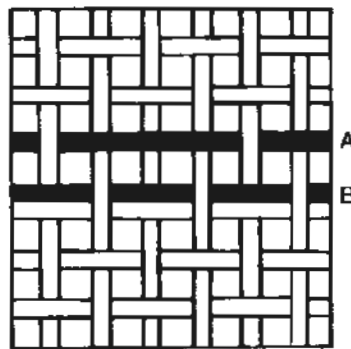


Figure 10.5a. Floating thread fault. Figure 10.5b. Paired thread fault.

10.6 Selvedges and Edges

Selvedges are where the weft picks turn back on themselves and return into the cloth, so forming a solid structure at the sides of the cloth (Figure 10.3). Edges are the "top" and "bottom" of the cloth. Sometimes these are left raw, but most Pharaonic textiles have been neatened in some form. The selvedges associated with this group of textiles fall into two types: simple selvedges (Figure 10.3) where the weft returns into the cloth and no extra threads or any form of reinforcements are used to strengthen this region, and warp-faced selvedges which are again simple forms, but there is a higher density of warps per centimetre than in the main body of the cloth (Figure 10.6). In general, the tabby weave textiles have either a simple or warp-faced selvedge, while the warp-faced textiles only have warp-faced selvedges. There is a similar division of selvedge types amongst the basket weave textiles. A number of the textiles

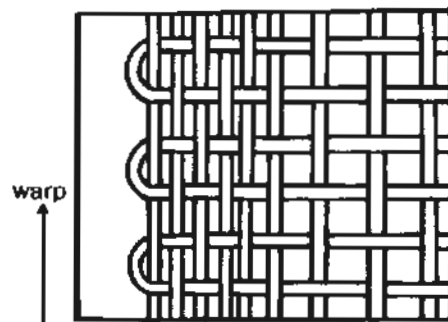


Figure 10.6. Tabby weave with warp-faced selvedge.

also include a fringe woven into the selvedge (warp-faced). These were produced by the addition of a thicker "gimp" thread, usually multi-stranded, which was worked into the selvedge while the cloth was being woven.

There is a surprising variety in the number of ways in which these fringes were produced and in the complexity of their basic construction. However, most of the fringes would originally have been short uncut loops which were twisted upon themselves, but due to wear and deterioration these loops have become damaged and untwisted. This type of fringe was probably one of the main decorative elements of the textiles and could have been used in a similar manner to those depicted in the Twelfth Dynasty tomb of Khnemhotep III at Beni Hasan. [6] Occasionally the fringe has been cut off the cloth, but no explanation has been found for this action in connection with the Amarna textiles. Only a few of the textiles still show any evidence of the starting edge, but in each case this was made up of three rows of multi-stranded throws, (usually three or five stranded, Figure 10.7).

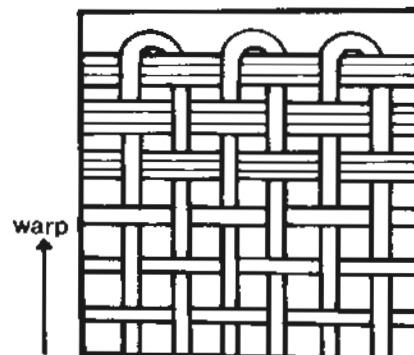


Figure 10.7. Starting edge with three multi-stranded throws.

The finishing edges, like the weft fringes, tend to be a decorative feature of the cloth and were usually made up of three rows of multi-stranded throws and then a fringe formed out of the cut ends. The warp fringes can be divided into three different types: (a) where the warp ends have been left hanging free; (b) those where the weft ends are simply twisted together; (c) where they have been plaited together. Of these (c) is the most common and widely varying form, with

[6] Newberry 1893, tomb 3. Unfortunately, in Newberry's illustrations the fringe details have been omitted from many of the figures. Crude renderings can be seen in Plate XXX, the main figure, and plate XXIX, the woman standing to the left of the weaver.

fourteen methods of producing the plait having been recorded so far.

10.7 Looped Textiles

A small number of the basket weave textiles also had rows of looped threads woven into them. These rows are usually widely spaced apart and worked in coarse, bast fibre strands. In most cases these strands have become badly deteriorated. Nevertheless, it has been possible to identify the loop constructions illustrated in Figures 10.8, 10.9 and 10.10.

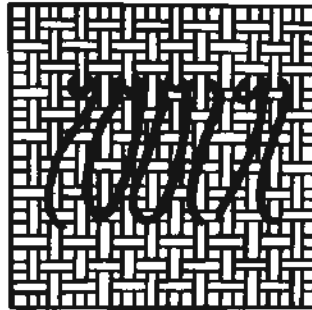


Figure 10.8. Sehna knots.

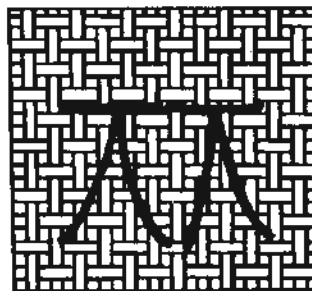


Figure 10.9. Ghiordes knots.



Figure 10.10. Wrapped knots.

10.8 Applied decoration

Apart from the dyed textiles and the various forms of fringes, there is only a single example of a textile which has been decorated. This particular piece has a red dyed ground with a row of short cut lengths of thread laid on top, these lengths secured in place by a couched thread being sewn down the middle of the row. When the threads are folded upon themselves it gives the impression of a

row of cut loops.

10.9 Cloth quality

Comments about the range of cloth qualities must remain subjective, especially as it has not been possible to compare the textiles from the Main City with those from the Workmen's Village. Nevertheless certain categories of cloth can be highlighted. For example, the finest type of cloth has evenly s-spun warps and wefts with an average thread diameter of 0.2 mm. The warp threads tend to be slightly more tightly spun than the weft threads. Most of these pieces are warp-faced with a thread count of up to forty in the warp, and between ten and fifteen in the weft (a thread ratio of 3:1 being very common). As the textiles become coarser so the thread counts become less and the ratio of warp threads to weft threads becomes more even. The presence of plied and unplied threads also appears to be related to the quality of the cloth, and in general the coarser the thread, the higher the percentage of plied threads. It is possible that the presence of plied and unplied threads in the same area was intended to produce a stronger thread, or that it was the result of deliberate "splicing" in order to produce long even threads. However, considering the quantity of these textiles, it does seem more likely that this feature was simply a method of using up spare threads and being economical.

In general the tabby weave textiles tend to be fairly coarse to medium forms, with thread counts in the fifteen to twenty region. Very few of these textiles included plied and unplied threads in the same cloth or system. The basket weave textiles are usually much coarser than either the warp-faced tabbies or the tabby weave textiles. Many of the pieces have thread counts as low as three to five in both systems. There is one major exception to this (no. 1453) which has a thread count of 58x19. In this particular example the fineness is due to the cloth being a warp-faced form. Again, few if any plied threads were found in the basket weave textiles.

Only generalised comments can be made with regard to the question of quality and where and by whom the textiles were made, but it is worthwhile noting that one of the textiles included a weaver's mark set into the fringed selvedge. Such marks had the same function as potters' marks for identifying the work of a particular craftsman, but so far few weavers' marks have been recorded, [7] and none is identical to this particular example (Figure 10.11). As only one mark has been found within a group of four thousand textiles, and as this piece of cloth was of a good to fine quality, it can be tentatively suggested that it was the work of a professional weaver and had been brought into the Village. If this was the case, then it might be possible to use the different methods of fringe construction to identify cloth being produced by a particular weaver and/or workshop. For example, out of the fourteen different methods of producing a weft fringe found within the Amarna textiles, several were duplicated because they were associated with pieces of the same cloth. However, one technique was found on two very different textiles (nos. 208 and 773), the implication being that these were separately woven pieces, made at different times, but within the same workshop tradition.

[7] Amarna textile no. 876; Barber 1982: 443; Hayers 1953: 260.



Figure 10.11. Textile no. 876 with weaver's mark set into the selvedge.

10.10 Uses

Until comparatively recently the role of cloth in the Near East has been constant. The basic uses can be divided into four general categories, namely (a) housing/linting, (b) animal equipment, (c) clothing, and (d) soft-furnishings. While there is no direct evidence that the two former categories of textiles were in use within the Village (although it would seem unlikely that they were not), there are numerous indications that the latter two formed an important part in the general life of the Village.

Clothing. Although no complete garments have been found it has been possible to make a tentative identification of the main types of garments in use during the Amarna Period. These identifications have been based upon a detailed examination of all the fragments which show evidence of seams, hems and shaping in general. So far two main garments have been identified:

(a) **Loin-cloths:** these are the most common form of clothing and appear to be a triangular form similar to those recorded from the tomb of Tutankhamun (Murray and Nuttall 1963: e.g. nos. 46e, f, g) and Kha (Schiaparelli 1927: 91, Figure 62), and at the Village at Deir el-Medina (Bruyère 1939: 60-1, Figure 31 (3)). In most cases a close warp-faced cloth was used to make up the loin-cloths. They were probably worn in a manner similar to that displayed by the soldiers in the tomb of Meryra at Amarna (Figure 10.12; Davies 1903: Plate XVI).

(b) **Short-sleeved tunics:** the evidence for this type of garment is based upon surviving seams, sleeves and necklines. Five sleeves were found, two complete (Figure 10.13) and from the right side of the garment (seam evidence), and three from the hem section of the sleeve. In most cases a tabby cloth was used.



Figure 10.12. Depiction of soldier wearing kilt, Tomb of Meryra, Amarna.

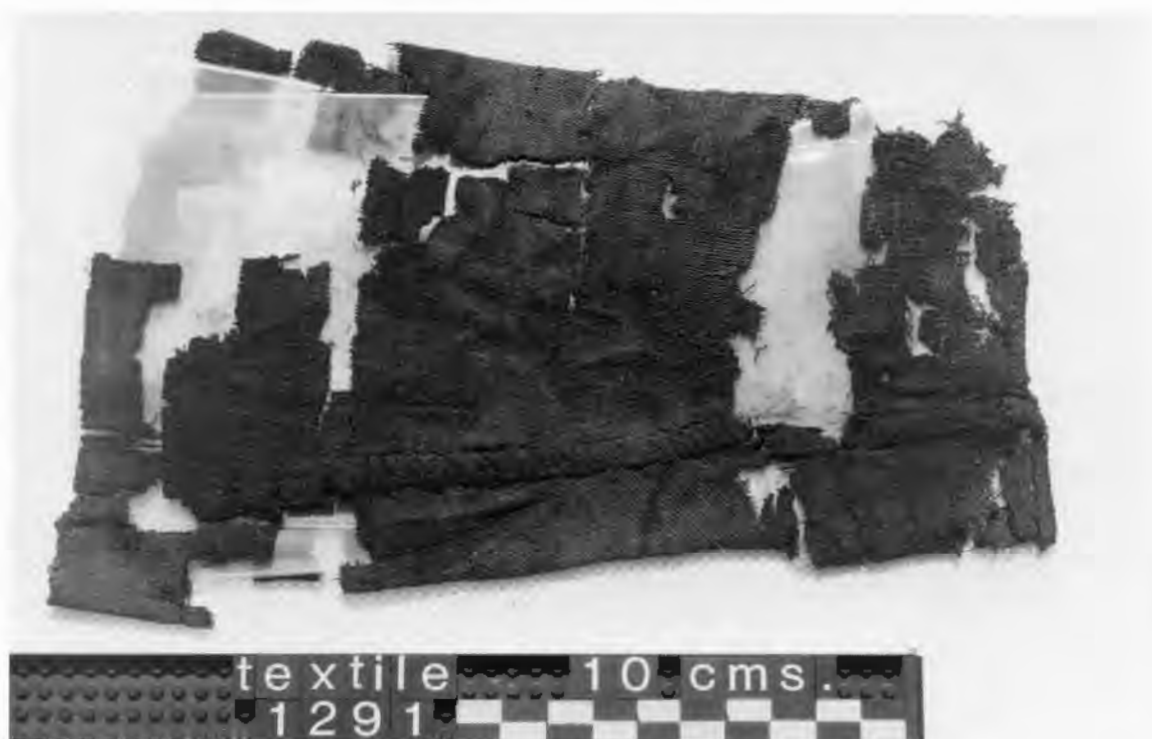


Figure 10.13. Reverse side of a short sleeve showing the main seam.

It is now impossible to estimate the length of the original tunics, but in the tomb scenes for Huya at Amarna (Davies 1905: Plate IX), most of the short-sleeved tunics come to a level just above the knees (Figure 10.14). Although it would be reasonable to expect that sleeveless tunics were also in use at the Village, no evidence has yet been found to prove this.

A number of small ovals were found which correspond in shape to neck-openings of tunics. The size of the Amarna examples suggests that they came from children's tunics rather than from adults'. An interesting feature of all the pieces of cloth found at the site is the absence of any form of patching, darning or mending. This places the textiles in the same category as the pottery: too readily available to merit attention once damage had occurred.

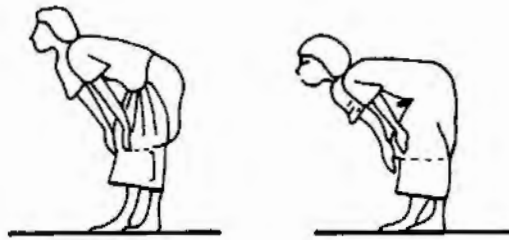


Figure 10.14. Depiction of two men wearing short-sleeved tunics.

Soft-furnishing. The description "soft-furnishing" covers items ranging from lamp-wicks, cushions, bed covers and curtains to carpets. The lamp-wicks were made by twisting lengths of cloth together and then allowing them to fold back upon themselves (Figure 10.15). In their shape they resemble the hieroglyph 𓏏 , which is usually described as depicting a wick of twisted flax.



Figure 10.15. Selection of Amarna lamp-wicks.

The Amarna examples are identical to wicks, which are still in their lamps, now on display at the Egyptian Museum, Cairo. [8] Other objects of household use cannot be identified so easily, especially as the majority of the textiles are less than fifteen centimetres in size. It has been suggested that the looped textiles were once part of a tunic, the loops being added for extra warmth. However, the pile on later tunics (no looped tunics having survived from this period) tends to be made from soft flax strands woven in close rows in a dense warp-faced

[8] The Egyptian Museum, Cairo, Case B, Room 34.

cloth. [9] The Amarna examples are hard-bast fibres on a basket weave ground with widely spaced rows. It would seem more likely that these looped textiles were once part of a cushion cover or bed cover, perhaps similar to those found in the tomb of Kha (Schiaparelli 1927: Figure 105, 113), where the loops have been arranged in an apparently identical manner to the Amarna textiles. One curious woollen textile (no. 3938) has the remains of a selvedge (3 x 5 strands), which is very similar to those found on closely woven blankets and "kalims". The main weave appears to be a weft-faced tabby, but unfortunately the size of the piece prevents any further identification. An exception to the different categories of cloth listed previously is a small twist of cloth (no. 3565) which contains a brown substance. This "lump" was placed on a small ledge of cloth in the centre, and completely enfolded by the material. The bag was then sealed with a length of spun thread (Figure 10.16). It was probably used in some kind of domestic magic.



Figure 10.16. Cloth bag used in domestic magic (?).

10.11 Storage of the Textiles

A minimum number of the textiles were washed using local water and no detergents. This was done in order to facilitate the recording of their structure and/or because they were part of an identifiable object. Wherever possible, these textiles have been stored in acid-free tissue paper. Some of the textiles proved to be so brittle they had to be kept in unsealed plastic bags, and left with no further treatment. All the textiles are now housed in the site magazine, a dry dark mud brick structure. At present there are no plans to seek to bring

[9] For example the tunic now in the Egyptian Museum, Cairo, no. 57174.

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any of the pieces to England.

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