

## Linen in Ancient Egypt

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### Summary

Egypt was famous through the Ancient Near East for both weaving linen cloth and the produced quantities. Cloth was sent as expensive gifts from one king to another and given to a laborer as wages in return for his work. Cloth was regarded as an essential element in everyday life as it could be used for everything: clothing, bedding, trappings for animals, or sails of a ship. It was in fact one of the most widely used item throughout Ancient Egypt.

Although other textile fibers were used in Pharaonic Egypt, namely, sheep's wool, goat hair and a form of coir, the majority of textiles were made from the plant *Linum usitatissimum*, flax. Cloth made from this fiber is defined as linen.

The research starts with a brief definition of the flax, and then reviews the scenes representing the sowing and the harvesting of its seeds. It also focuses on the way of removing the seeds heads, the preparing of the flax for spinning: retting, beating and scutching. After that, it deals with transforming flax into orderly lengths, and rolling it into balls or coils.

The researcher as well studies the Ancient Egyptian spinning techniques: grasped spindle, support spindle and drop spinning; the different types of weaving: tabby weaves, basket weaves, tapestry weaves and warps-patterned weave and the types of looms that were in use in Egypt, namely, the horizontal and vertical looms.

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The research notes the dyeing techniques in Ancient Egypt such as: smearing, vat dyes, adjective dyes, double dyeing and the source of dyestuffs like the ochreous earths and the plant dyes. Finally, the researcher deals with the different methods of laundering and storing of clothes and their representations.

## Introduction

Egypt was famous through the ancient Near East for both weaving linen cloth and the produced quantities. Cloth was sent as expensive gifts from one king to another and given to a laborer as wages in return for his work. Cloth was regarded as an essential element in everyday life as it could be used for everything: clothing, bedding, trappings for animals, or sails of a ship. It was in fact one of the most widely used item throughout Ancient Egypt.

Although other textile fibers were used in Pharaonic Egypt, namely, sheep's wool, goat hair and a form of coir, the majority of textiles were made from the plant *Linum usitatissimum*, flax. Cloth made from this fiber is defined as linen. Turning the flax plant into a piece of cloth is an elaborate process, which must have taken a long time to mature. The production of linen involves several essential stages, including sowing and harvesting of the flax seeds, spinning and finally the weaving of the cloth itself.

Although there is no single representation of the whole process, the story of how cloth was produced can be deduced from a series of tomb paintings and models.

### - The Flax:

Flax is a member of the Linaceae family of which there are twelve genera. Although the genus *Linum* has 230 species, only few can be used in the production of textiles<sup>1</sup>. *Linum* is an annual herb with alternating lanceolate leaves along the entire length of the stem. The flowers have five petals which may be white, blue or purple. The fruit consists of a capsule that encloses ten seeds. Flax, however, is not native to Egypt, although its use dates back to the Prehistoric Period. Maybe it was imported to Egypt from the Levant<sup>2</sup>.

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<sup>1</sup> D. Catling and J.J. Grayson, *Identification of Vegetable Fibers*, Chapman and Hall, London-New York, 1982, p. 13.

<sup>2</sup> R. Germer, *Flora des Pharaonischen Ägypten*, Mainz am Rhein: P.Von Zabern, Germany, 1985, p. 101.

### - Sowing the Flax Seeds:

The sowing of the flax seeds fell in mid-November after the annual inundation of the Nile. There are a number of representations of sowing scenes in the Old and Middle Kingdom tombs. Usually, the sowing of grain and flax are shown together. For example, in the Middle Kingdom tomb of Urarna, at Sheikh Saïd (tomb 25), a man was shown collecting seeds from the storerooms. The distribution was watched by two officials who note the amount on a writing board; the grain and flax seeds were then taken to the fields. In both cases, the ground was prepared by a team of oxen pulling a plough. However, the man sowing grain used an overarm action, while the man scattering the flax seeds used an underarm movement. The latter action is typical for the sowing of flax. Finally, flocks of sheep trample the seeds into the ground (fig. 1)<sup>3</sup>.

### - Harvesting the Flax Seed:

Flax plants take about three months to mature. The exact time of the flax plants pulling is of great importance, since the plant's age affects the uses of the fibers. For example, if the flax plants are pulled while still young and green then a fine textile can be produced; if it is pulled when slightly older then the fibers are suitable for a good quality cloth and if they are pulled when the plants are old then the resulting flax is usable for coarse cloth and ropes<sup>4</sup>.

According to various Egyptian depictions of flax harvesting scenes, both men and women were involved in the process. In each case, a bundle of flax stems is grabbed in both hands and then pulled out of the ground, rather than cutting it with a sickle as in the case of wheat. Flax is pulled rather than cut in order to get as long and straight a length of fiber as possible. The flax plants are then tied into bundles

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<sup>3</sup> N.G. Davies, *The Rock Tombs of Sheikh Saïd*, Egypt Exploration Society, London, 1901, pl. XVI.

<sup>4</sup> A. Lucas and J.R. Harris, *Ancient Egyptian Materials and Industries*, Dover Publication, London, 1964, p. 143.

and left to dry in the sun. This process can be seen in the tomb of Urarna mentioned above, which shows men pulling the flax and bundles of flax drying in the sun, and in the near contemporary New Kingdom tomb of Paheri at el-Kab where the flax is being pulled by both men and women while another man is tying the flax into bundles (fig. 2)<sup>5</sup>.

#### - Removing the Seed Heads:

After the flax plants are carefully dried, the seed heads have to be removed. There are several ways to strip the heads. One way, they can be removed by hand; another, which is shown in the tomb of Paheri mentioned above, is that the flax stems are pulled between the teeth of a long board<sup>6</sup>. The seeds fall into a pile around the base of the board. A similar board, but this time shown with a stand, is represented in the New Kingdom tomb of Menna at Thebes (TT 69)<sup>7</sup>.

#### - Preparing the Flax for Spinning:

The process of preparing flax for spinning can be divided into two separate activities. Firstly, the removal of any impurities on the flax stems (retting or cleaning and scutching) and secondly, the twisting of the bundles of flax filaments into preliminary roves. Both steps are vaguely depicted in tomb models and representations. However, the following processes appear to be taking place:

##### ▪ Retting:

After the seed heads have been removed, it is necessary to ret the flax stems in order to remove the hard outer bark or cortical tissue of the plant. Generally, flax is placed into slowly running water to complete this process. The length of time the stems remain in the water is dependent on the type of flax and the temperature of

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<sup>5</sup> N.G. Davies, *op. cit.*, pl. XVI; J.J. Tylor and F.L.I. Griffith, *The Tomb of Paheri at El-Kab*, University of Oxford, London, 1894, pl. IV.

<sup>6</sup> *Ibid.*, pl. IV.

<sup>7</sup> W.M.F. Petrie, "The Tomb of Menna", *Ancient Egypt*, British School of Archeology in Egypt and Egyptian Research Account, London, 1914, vol. 1, p. 49.

the water, but between ten and fourteen days would seem acceptable<sup>8</sup>. After the outer bark of the flax plants have rotten away, the flax is removed from the water and allowed to dry in the sun.

▪ **Beating:**

The next stage involves beating the flax stems in order to separate the fibers from the wooden parts of the stem. This step is not shown in the Egyptian representations, but wooden mallets have been found which would serve this task<sup>9</sup>.

▪ **Scutching:**

In order to remove any hard bits leftover after retting, the lengths of flax fibers are either beaten with a large wooden fan or bat to shake out all loose pieces, or passed between two sticks held in the hand. This latter technique can be seen in the Middle Kingdom tomb of Daga at Thebes (TT 103), and the New Kingdom tomb of Thutnefer at Thebes (TT 104) (fig. 3)<sup>10</sup>. In the first example the sticks are small, whereas in the second they appear to be quite large, but the process remains the same.

- **Spinning:**

▪ **Preliminary twisting:**

Once the fibers have been scutched, they are ready for the next stage. The fibers are given to a person, normally a woman, who transforms them into rough but orderly lengths. These lengths are produced either by rolling the flax threads on the thigh or by rolling the fibers on a semicircular form directly in front of the women. These forms can be seen in various Middle and New

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<sup>8</sup> G.M. Crowfoot, *Methods of Hand Spinning in Egypt and Sudan*, F. King & Sons LTD, Halifax, 1931, p. 32.

<sup>9</sup> T.E. Peet and C.L. Woolley, *City of Akhenaton*, Egypt Exploration Society, London, 1923, pt. I, pl. XIX.

<sup>10</sup> N.G. Davies, *Five Theban Tombs*, W Clowes and Son, London, 1913, pl. XXXVII; *Id.*, "The Town House in Ancient Egypt", *Metropolitan Museum Studies*, University of Chicago Press, New York, 1929, vol. I, p. 239.

Kingdoms tombs, for example, tombs of Tehutihetep at Deir el-Bersha and Thutnefer at Thebes (TT 104)<sup>11</sup>.

▪ **Rolling into Balls or Coils:**

The final step of the pre-spinning process is still uncertain. The roughly spun fibers are either wrapped into balls, as represented in the Middle Kingdom tomb of Khety at Beni Hasan (tomb 17)<sup>12</sup>, or they are coiled as depicted in the tomb of Daga at Thebes (TT 103)<sup>13</sup>.

▪ **Pharaonic Egyptian Spinning Techniques:**

Unfortunately, there are no representations of people spinning thread for cloth until the Middle Kingdom<sup>14</sup>. Three methods of spinning are shown in various Middle and New Kingdom tombs:

- a- **Grasped Spindle:** a prepared rove is passed through a ring or over a support such as a forked stick and then spun on a large spindle grasped in both hands. This technique is depicted in the Middle Kingdom tombs of Baqt and Khety at Beni Hasan (forked stick) (fig. 4)<sup>15</sup> and the New Kingdom tomb of Thutnefer at Thebes (ring)<sup>16</sup>.
- b- **Support Spindle:** the technique involves supporting the spindle while it moves. This process is shown in the Middle Kingdom tombs of Khety and Baqt at Beni Hasan. In the tomb of Khety, for example, a man is shown sitting back on one heel while drawing a rove from a pot through his left hand and spinning with a spindle held in his right hand (fig. 5)<sup>17</sup>.

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<sup>11</sup> N.G. Davies, *op. cit.*, pl. XXXVIII; P.E. Newberry, *El-Bersheh*, Egypt Exploration Fund, London, 1894, pt. I, pl. XXVI; N.G. Davies, *Town House*, p. 239.

<sup>12</sup> P.E. Newberry, *Beni Hassan*, Egypt Exploration Society, London, 1894, pl. XIII

<sup>13</sup> N.G. Davies, *Theban Tombs*, pl. XXXVII.

<sup>14</sup> C.M. Firth and B.G. Gunn, *Teti Pyramid Cemeteries*, Le Caire Imprimerie, London, 1926, p. 36.

<sup>15</sup> P.E. Newberry, *op. cit.*, pl. IV

<sup>16</sup> N.G. Davies, *The Town House*, p. 234, fig. 1a.

<sup>17</sup> P.E. Newberry, *op. cit.*, pl. XIII.

c- **Drop Spinning:** the spindle is rolled on the thigh and then allowed to drop. Scenes depicting this technique are shown in a number of tombs, notably those of Khety and Baqt at Beni Hassan<sup>18</sup>. In some cases the spinners are standing on blocks in order to achieve a greater height. In other examples, they are depicted standing on the floor. Sometimes the spindle was rotated by the spinner rolling the spindle on her thigh as can be seen in the tomb of Daga at Thebes (fig. 6)<sup>19</sup>.

- **Weaving:**

Weaving is the process of interlacing two or more sets of threads according to a pre-defined system to produce all or part of a textile. In Pharaonic Egypt, the range of weave forms seems to be limited to the following types:

- **Tabby Weaves:** the simplest form of weaving is the tabby weave where one weft thread passes over and under the warp threads. In the next row the pick passes under one end and over the next, so forming an interlocking structure<sup>20</sup>. All other weaves are variations upon this idea. The oldest known example of Egyptian cloth from the Fayum-A culture is woven in this weave pattern (Petrie Museum, London, UC 2943).
- **Basket Weaves:** is a tabby weave in which the warp ends or weft picks move in groups of two or more. Most of these basket weaves have been recorded from the Workmen's Village, Amarna<sup>21</sup>.
- **Tapestry Weave:** comprises of a warp and a weft. The latter is composed of threads of different colors which do not pass from selvage to selvedge but are carried back and forth, interweaving only with the part of the warp that is required for a particular

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<sup>18</sup> *Ibid.*, pl. XIII.

<sup>19</sup> N.G. Davies, *Theban Tombs*, pl. XXXVII.

<sup>20</sup> D. Burnham, *Warp and Weft*, Royal Ontario Museum, Toronto, 1980, p. 139.

<sup>21</sup> G.M. Vogelsang-Eastwood, *The Production of Linen in Pharaonic Egypt*, National Museum of Ethnology, Leiden, 1992, p. 26.

pattern area<sup>22</sup>. Most of the examples of the tapestry weave are found in royal tombs. For example, several pieces were in the tombs of Kings Thutmosis IV<sup>23</sup>, Amenophis II and Tutankhamun<sup>24</sup>.

- **Warp-Patterned Weave:** this type of cloth has been described as being woven in a double weave; compound weave; tablet weave or a warp-pattern weave<sup>25</sup>. It is one of the most complex weaves used in Egypt during the Pharaonic period. Little work has been done on this type of cloth and its exact nature is still uncertain. One of the largest examples of this type of work is the so-called girdle of Ramesses II, now in the Liverpool Museum (M 11156).

#### - Looms:

It is known from a variety of written and representative sources. By the 18th Dynasty, two basic types of looms were in use in Egypt, namely, the horizontal and the vertical looms.

- **The Horizontal Loom:**

This type of loom has a simple construction and simply consists of a horizontal warp which has been stretched in its length between two beams (fig. 7)<sup>26</sup>. The beams are generally kept in place by a pair of pegs driven into the ground. The warp threads are divided into two sets: 1 3 5 7 9 etc, and 2 4 6 8 etc. By lifting up one set of threads, a shed is created; the countershed is obtained by lifting the second set of threads. The countershed is normally created by pulling up a simple heddle or heddle rod. The weaver starts at one end of the warp and works until the other end is

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<sup>22</sup> D. Burnham, *op. cit.*, p. 144.

<sup>23</sup> W.G. Thompson, "Textiles", in: H. Carter and P.E. Newberry, *The Tomb of Thoutmosis IV*, Egypt Exploration Society, Cairo, 1904, pp. 143-144.

<sup>24</sup> G.M. Crowfoot and N.G. Davies, "The Tunic of Toutankhamon", *Journal of Egyptian Archeology*, Egypt Exploration Society, London, 1941, vol. 27, pp. 113-130.

<sup>25</sup> H.L. Roth, *Ancient Egyptian and Greek Looms*, Public Domain, Halifax, 1951, pp. 27-28; E. Riefstahl, *Patterned Textiles in Pharaonic Egypt*, Brooklyn Institute of Arts and Sciences, Brooklyn, 1940, p. 22; R. Hall, *Egyptian Textiles*, Ospery Publication, Aylesburg, 1986, p. 46.

<sup>26</sup> H.L. Roth, *op. cit.*, pp. 3-15.

reached, moving the position of the heddle as needed.

One of the oldest representations of this loom is on a Predynastic bowl (Badarian period) which was found in a woman's tomb (3802) at Badari in Lower Egypt<sup>27</sup>. More detailed depictions of the horizontal loom can be found in three 11<sup>th</sup> and 12<sup>th</sup> Dynasty tombs at Beni Hasan in Middle Egypt (nos. 3, 15 and 17)<sup>28</sup>. In addition to these painted representations of the ground loom, a number of similarly dated tomb models have survived which include women working on this form of loom, for instance, an 11<sup>th</sup> Dynasty weaving workshop from the Middle Kingdom tomb of Meket-Rê at Thebes (TT 280)<sup>29</sup>.

● **The Vertical Loom:**

The second form of loom depicted in various tombs is the vertical loom (fig. 8). As the name suggests, instead of the warp being stretched horizontally as with the loom described previously, they are tensioned vertically. The warp ends are wrapped around two beams (the top and lower beams). The loom is placed either vertically or lent against a firm object such as a wall. The lower beam can be fixed into positions; for example, by placing it in a slight shallow in the ground; resting it in grooves cut out of heavy blocks, or perhaps by fixing it to the ceiling of a room. The weavers stood or sat at the base of the loom and worked upwards. The warp was released during the process of weaving by either turning or lowering the top beam. The vertical loom has been depicted in several 18th Dynasty tombs, most notably the tomb of Thutnefer at Thebes (TT 104)<sup>30</sup>.

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<sup>27</sup> G. Brunton and G. Caton-Thompson, *The Badarian Civilisation and Predynastic Remains Near Badari*, British School of Archeology in Egypt, London, 1928, p. 54, no. 70k, pl. XLVII.

<sup>28</sup> P.E. Newberry, *Beni Hassan, I*, pl. XXIX, *II*, pls. IV, XIII.

<sup>29</sup> H.E. Winlock, *Models of Daily Life in Ancient Egypt*, MMA, Cambridge, 1955, pls. 25-27.

<sup>30</sup> H.L. Roth, *op. cit.*, fig. 9.

### - Dyeing in Pharaonic Egypt:

Although the Egyptians are known for their love of colors but unfortunately the surviving textiles were undyed. This is possibly because the colored textiles were carefully cared for and were not normally placed within tombs. Or maybe, the flax is difficult to be dyed because it is made from cellulose. But this does not mean that Egyptian clothes were left undecorated. A study of the textiles and clothing from the New Kingdom tombs of Tutankhamun has shown that sequins, beads, embroidery, applique, as well as colored yarns were used to decorate clothing<sup>31</sup>.

The main possibilities of using color can be divided into two groups. Firstly, the cloth was colored in its entirety. Secondly, colored threads were used as stripes or bands either in the main body of the cloth or they were used in the selvedge stripes and transverse end bands<sup>32</sup>.

Finally, so far no actual dye workshops, or their representations, have been found in Egypt. Nor does the act of dyeing seem to feature in the repertoire of the tomb painters<sup>33</sup>.

### - Pharaonic Egyptian Techniques of Dyeing:

From textile discoveries, four different techniques of coloring clothes were used in Ancient Egypt:

- **Smearing:** the color was factually spread on the cloth. Such textiles have been found at the Workmen's Village at Amarna<sup>34</sup>.
- **Vat Dyes:** one of the most common dyestuffs is indigotin, which must be first reduced in oxygen. The solution is called the vat and is colorless. The fibers are dipped into the vat and then hung up in the air; the oxygen in the air oxidizes the dyestuff and the

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<sup>31</sup> W.W. Midgley, "Reports on Early Linen", in: W.M.f. Petrie and E. Mackay, *Heliopolis, Kafr Ammar, and Shurafa*, School of Archeology in Egypt, University College, London, 1915, p. 50.

<sup>32</sup> G.M. Vogelsang-Eastwood, *op. cit.*, p. 37.

<sup>33</sup> F. Brunello, *The Art of Dyeing in the History of Mankind*, AATCC, Vicenza, 1973, p. 41; M. Lichtheim, *Ancient Egyptian Literature, A Book of Readings, The Old and Middle Kingdom*, University of California Press, Berkley, 1973, vol. 1, p. 188.

<sup>34</sup> G.M. Vogelsang-Eastwood, *op. cit.*, pp. 37.-38.

fibers turn blue, while the dyestuff is fixed to the fiber. Most blues found in Ancient Egyptian contexts have been produced in this manner.

- **Adjective Dyes:** an adjective dye is one where a mordant salt is added to the dyebath in order to fix the dyestuff to the fiber, thread or cloth.
- **Double dyeing:** this is a manner whereby fibers, threads or clothes are dyed one color and then again with a different dyestuff in order to obtain another color, for example, a purple (red and blue) or green (yellow and blue)<sup>35</sup>. Rare examples of double dyeing have been found at various sites in Egypt, including the Workmen's Village at Amarna<sup>36</sup>.

- **The Dyes:**

The sources of dyestuffs can be divided into two different types; the ochreous earths and the plant dyes:

- **Ochreous Earths:**

Ochre is an earth consisting of an hydrated oxide of iron mixed with clay. This matter varies in color from light yellow to deep orange or brown. Most natural ochres are colored yellow because of the hydrate oxide. In addition, yellow iron oxide can be transformed into red iron oxide by heating it<sup>37</sup>.

Dyeing linen with iron oxide has been a long tradition in Egypt, which may date back to the Old Kingdom. Linen that was colored red using iron oxide has been found at various sites including the Workmen's Village at Amarna<sup>38</sup>.

- **Plant Dyes:**

A wide range of plants produce a color of some kind:

- **Blues:** research has shown that one of the most common sources of the blue color of Egyptian textiles is indigotin. This element is found in plants of both the Indigofera (e.g., indigo) and Isatis

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<sup>35</sup> *Ibid.*, p. 37.

<sup>36</sup> *Ibid.*, p. 38.

<sup>37</sup> Brunello, *op. cit.*, p. 42.

<sup>38</sup> G.M. Vogelsang-Eastwood, *op. cit.*, p. 38.

species (e.g., woad; *isatis tinctorum*)<sup>39</sup>. It is clear from New Kingdom finds, from the tomb of Tutankhamun and the contemporary Workmen's Village at Amarna, that both dark and light blue yarns were available.

- **Reds:** besides coloring with iron oxide, there is a second technique of red dyeing includes the use of madder. The main coloring ingredients are the anthraquinones, most notably alizarin, which are plentiful in the root of some *Rubia* species (for example, *Rubia tinctorum*). This dye plant was introduced into Egypt, possibly from the Levant, during the 18th Dynasty<sup>40</sup>.
- **Yellows:** the main sources of yellow dyes in Pharaonic Egypt are safflower (*Carthamus tinctorius*) and pomegranate (*Punica granatum*).

As noted above, the most two common dyestuffs associated with Egyptian textiles are indigotin and alizarin. Both of these elements are obtained from plants, namely woad and madder, which are not native to Egypt. They were both maybe imported from Palestine sometime during the 18th Dynasty but it is not known whether they were imported in the form of dyestuff or whether the cultivation of these plants was brought to Egypt<sup>41</sup>.

#### - **The laundry of Cloth:**

The washing of cloth is depicted in several Middle and New Kingdom tombs from Beni Hasan and Deir el-Medineh. The basic process appears to be the same; it starts by damping the cloth and then rubbing it, probably with natural detergents which were available in Pharaonic Egypt, for example, natron, potash and the plant soapwort. Afterwards, the wet cloth was rubbed with sticks on a stone or a wooden base; then it was rinsed in water. Next, as depicted at Beni Hasan (tombs 2 and 3), one end of the cloth was wrapped around a post, while the other was firmly twisted (fig. 9). Finally, the damp cloth was left to dry in the sun.

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<sup>39</sup> R. Germer, *op. cit.*, pp. 47-49.

<sup>40</sup> *Ibid.*, p. 48.

<sup>41</sup> G.M. Vogelsang-Eastwood, *op. cit.*, p. 39.

There is a slight difference in the laundry process between the Middle and the New Kingdom tombs; in the Middle Kingdom tombs (tomb of Khnumhotep, Beni Hassan, tomb 3) a group of men are shown washing cloth while standing in water<sup>42</sup>, whereas in the 19th Dynasty tomb of Ipuuy at Thebes (TT 217), a group of men are shown washing cloth in large pots<sup>43</sup>. These differences may be due to the availability of water, the type of water or simply regional variations in how cloth was washed.

### - The Storage of Cloth:

There are different approaches to store cloth in Ancient Egypt. Sometimes, it was placed into baskets with lids, as was the case with some of the textiles found in the New Kingdom tomb of Merit, the wife of Kha at Thebes (TT 8)<sup>44</sup>.

Alternatively, linen was stored in chests, where several of them were found in the tomb of Tutankhamun, (e.g., chest no. 101, Egyptian Museum, Cairo, 61468), which was described as linen chest, not only from the large number of textiles it included, but also because of the inscription on the inside of the chest's lid which described its original contents.

Similarly, three chests containing linen were found in the New Kingdom tomb of Ramose at Thebes (TT 55) (fig.10). Two of them were in the form of plain rectangular boxes with flat lids and the third has a gabled lid and four small legs<sup>45</sup>. Finally, in the mastaba of Mereruka at Saqqara, there are several scenes showing servants carrying lengths of cloth and chests containing clothes (fig. 11)<sup>46</sup>.

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<sup>42</sup> P.E. Newberry, *Beni Hassan*, pl. XXIX.

<sup>43</sup> N.G. Davies, *Two Ramesside Tombs at Thebes*, The Metropolitan Museum, London, 1927, pl. XXVIII.

<sup>44</sup> E. Schiaparelli, *La Tombaintatta dell'arcitetto Cha nella Necropolis di Tebi*, AdArte, Turin, 1927, fig. 80.

<sup>45</sup> A. Langsing and H.C. Hayes, "The Egyptian Expedition 1935-1936: The Museum's Excavation 1935-1936", *Bulletin of the Metropolitan Museum of Art*, New York, 1937, vol. 32, pt. 2, pp. 24-26, fig. 37.

<sup>46</sup> P. Duell, *The Mastaba of Mereruka*, The University of Chicago Press, Chicago, 1938, pl. 72.

**- Conclusion:**

- Flax is not native to Egypt, although its use dates back to the Prehistoric Period. Maybe it was imported to Egypt from the Levant.
- The flax plant's age affects the uses of the fibers. If the flax plants are pulled while still young and green then a fine textile can be produced; if it is pulled when slightly older then the fibers are suitable for a good quality cloth and if they are pulled when the plants are old then the resulting flax is usable for coarse cloth and ropes.
- Separation of the flax fibers from the wooden parts of the stem is not shown in the Egyptian representations, but wooden mallets have been found which would serve this task.
- There are no representations of people spinning thread for cloth until the Middle Kingdom.
- The tabby weaves are the basic of the rest of the weaves.
- Oldest known example of Egyptian cloth from the Fayum-A culture is woven in the tabby weave pattern (Petrie Museum, London, UC 2943).
- Most of the tapestry weaves are associated with royal tombs.
- Oldest example for horizontal looms is represented on Predynastic bowl (badarian period) from a woman tomb (3802) at Badari in Lower Egypt.
- Although the Egyptians are known for their love of color but most of the surviving textiles were undyed.
- No actual dye workshops or their representations have been found in Egypt.
- Most blue textiles found in Pharaonic Egypt contexts were produced from the vat dyes.
- Rare examples of double dyeing were found at various sites in Egypt.
- There is a slight difference in the laundry process between the Middle and the New Kingdom tombs; in the Middle Kingdom tombs men are shown washing cloth while standing in water,

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whereas in the New Kingdom men are shown washing cloth in large pots.

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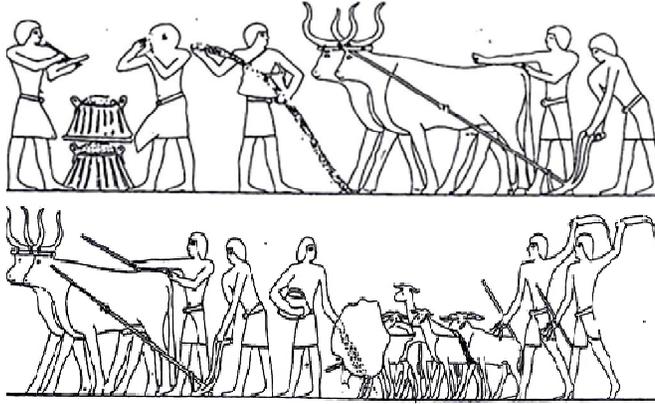
### ملخص

كانت مصر عبر تاريخ الشرق الأدنى القديم شهيرة على حد سواء بنسج الكتان والكميات المنتجة منه. أرسل الكتان كهدايا باهظة الثمن من ملك إلى آخر كما كان يعطى للعمال كأجور في مقابل عملهم. اعتبرت الأقمشة عنصر أساسي في الحياة اليومية في مصر القديمة فكانت تستخدم في صناعة الملابس، أغطية الأسرة، زخارف للحيوانات، أو أشعة للسفن. على الرغم من استخدام الألياف النسيجية الأخرى كالصوف وشعر الماعز والأغنام إلا أن الكتان كان العنصر الأكثر استخداما في جميع أنحاء مصر القديمة.

يبدأ البحث بتعريف عام للكتان، ثم يستعرض المناظر التي تمثل بذر بذور الكتان وحصاها. ويركز أيضا على طريقة إزالة رؤوس البذور وإعداد الكتان للغزل: التنظيف والحلج.

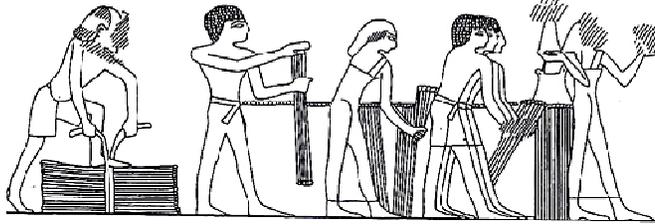
كما يتطرق الباحث إلى الطريقة التي يتم بها تنسيق عيدان نبات الكتان باطوال متقاربة منظمة، ثم لفها على هيئة كرات أو لفائف، ثم الي التقنيات المصرية القديمة للغزل والى الأشكال المختلفة من غرز النسيج، وأشكال الأنوال المستخدمة في عملية النسيج.

يتناول هذا البحث أيضا تقنيات الصباغة في مصر القديمة ومصدرها مثل الأتربة والأصبغ النباتية. وأخيرا ينتهى البحث بشرح الأساليب المختلفة لغسل وتخزين الملابس مع استعراض بعض من هذه المناظر.



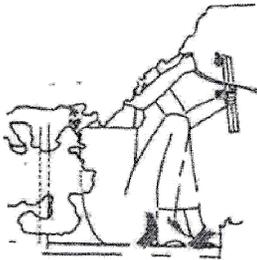
**Fig. (1)**

Collecting grain seeds and the scattering of grain and flax seeds (from the tomb of Urarna, Sheikh Saïd). After N.G. Davies, *The Rock Tombs of Sheikh Saïd*, Egypt Exploration Society, London-Boston, 1901, pl. XVI.



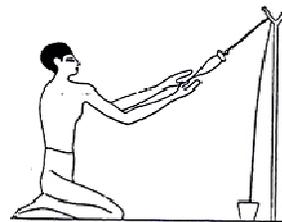
**Fig. (2)**

Harvesting the flax (from the tomb of Paberi, el-Kab). After J.J. Tylor and F.L. Griffith., *The Tomb of Paberi at El-Kab*, University of Oxford, London, 1894, pl. IV.



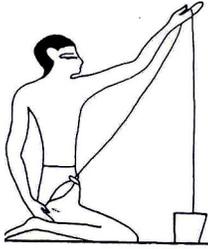
**Fig. (3)**

Scutching scene (from the tomb of Daga, Thebes (TT 103)). After N.G. Davies, *Five Theban Tombs*, W. Clowes and Son, London, 1913, pl. XXXVII.



**Fig. (4)**

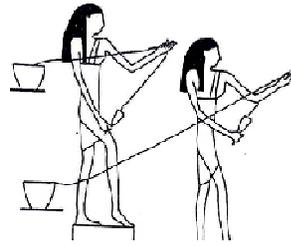
Grasped spindle, plus forked stick (from the tomb of Baqt, Beni Hasan). After P.E. Newberry, *Beni Hassan*, Egypt Exploration Society, London, 1894, pl. IV.



**Fig. (5)**

Support spinning (from the tomb of Khety at Beni Hassan).

After *Ibid.*, pl. XIII.

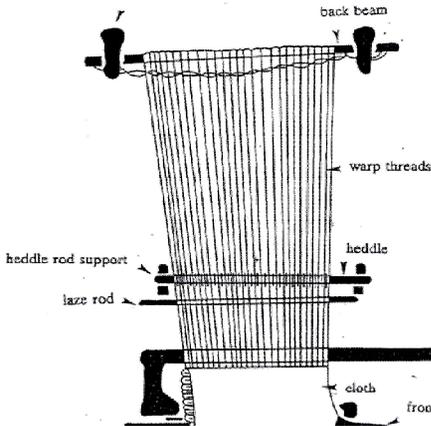


**Fig. (6)**

Drop spinning: one of the spinners is standing on a block while rolling the spindle on her thigh (from the tomb of Daga at Thebes).

After N.G. Davies, *op. cit.*, pl. XXXVII.

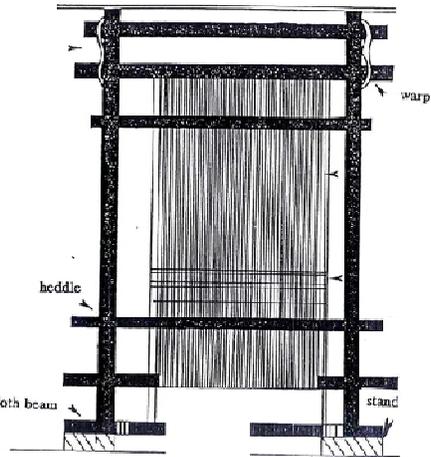
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**Fig. (7)**

Elements of a ground loom.

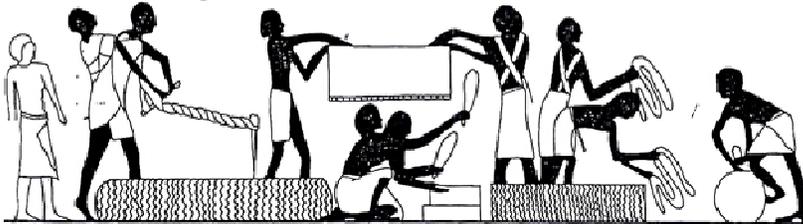
After H.L. Roth, *Ancient Egyptian and Greek Looms*, Public Domain, Halifax, 1951, fig. 6.



**Fig. (8)**

Elements of a vertical loom.

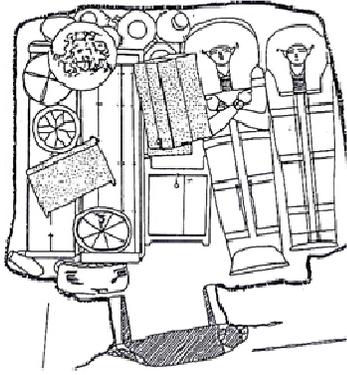
After *Ibid.*, fig. 9.



**Fig. (9)**

Washing scene (from the tomb of Amenemhat at Beni Hassan, tomb 2).

After P.E. Newberry, *op. cit.*, pl. XXIX.



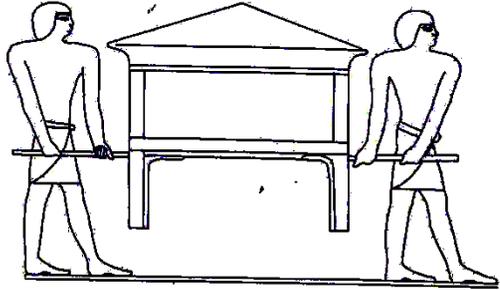
**Fig. (10)**

Chest containing linen (from the tomb of Ramose at Thebes).

After A. Langsing and H.C. Hayes, "The Egyptian Expedition 1935-1936:

The Museum's Excavation 1935-1936", *BMMA*, New York, 1937, vol.

32, pt. 2, fig. 37.



**Fig. (11)**

Linen chests from the Mastaba of Mereruka

After P. Duell, *The Mastaba of Mereruka*,

The University of Chicago Press, Chicago,

1938, Pl.72.