



# Threads Crossing the Warp

## MODULE 5

### The Technique of Weaving and The Oldest Known Woven Textiles

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HAROKOPIO UNIVERSITY



## B. The Oldest Woven Textiles



### Brief History

Clothing is a basic human need for survival, following food and shelter. That is why textile manufacturing has been one of people's oldest activities.

First evidence of textile processing is dated back to Paleolithic Era. Later on, Neolithic cultures, realizing the advantages of woven fibers compared to animal skin, had started making cloth, gradually developing the manufacturing process.

Even till present, the creation of textile is based on the conversion of fiber into yarn and yarn to fabric, following the same principles as in old times:

- ▶ Cultivation of plants and harvesting / Raising of cattle and collection of wool
- ▶ Cleaning and alignment of fiber or wool
- ▶ Spinning into thread and yarn
- ▶ Weaving into cloth
- ▶ Sewing of clothes.

What is new today is the introduction of complex synthetic fibers, while weaving process remains as performed on cotton and flax thousands of years ago.

## Brief History (2)

Textiles may be any objects created out of organic fibers.

Archaeologists examine woven cloth, bags and sandals, strings and cords, nets and basketry.

Yet, organic materials rarely survive. Textiles are perishable and may only be preserved in extreme conditions of cold, wet or dry environment or when fibers come into contact with copper and other metals (i.e. textile remnants have been discovered next to weapons).

Apart from such traces, information is also derived from clay items or tools related to weaving.

Dating is estimated following radiocarbon testing.



# The Oldest known Sewing Device

## Sewing Needles

The oldest part of sewing needle identified is a needle point, without the stem and the eye. It was discovered in **Sibudu Cave, South Africa** and estimated to have been used *60,000 years ago*.

Other sewing needles discovered in **Denisova Cave, Siberia**, are dated back at least *50,000 years ago*. Other early examples of *needles* have been discovered in *Slovenia, Russia, China, Spain and France*. These samples date back *41,000 to 15,000 years*.



Views of a single flat bone sewing needle from “Elephant Cave”, Gourdan-Palignan, Haute Garonne classified as Magdalenian Upper Paleolithic, between 17,000 and 10,000 BCE).

Size: 59x3x2 mm, Musée de Toulouse.

## Evidence through pieces of Art: Figurines

*Figurines* have provided evidence of clothing and accessories in ancient times. Indicative is the “*Venus of Lespugue*”, discovered in *Pyrenees*, **southern France** and dating back 25,000 years. It depicts a cloth or twisted fiber skirt.

Other figurines from Europe showed the body wrapped with cloth covering the breast, string skirts, basket hats and belts.

Figurines have also been discovered in Near East and India.



Venus of Lespugue, Musée de l' Homme, Paris.

Upper Paleolithic. Discovered in Rideaux Cave (Haute- Garonne), France. 150 mm tall, carved from tusk ivory.

Displays the earliest representation found of spun thread, as the carving shows a skirt hanging from below the hips, made of twisted fibers, frayed at the end.

## Evidence through pieces of Art: Pottery

Pottery and other pieces of art have also provided evidence of weaving, by showing cords and people dressed. Indicative samples will presented below.

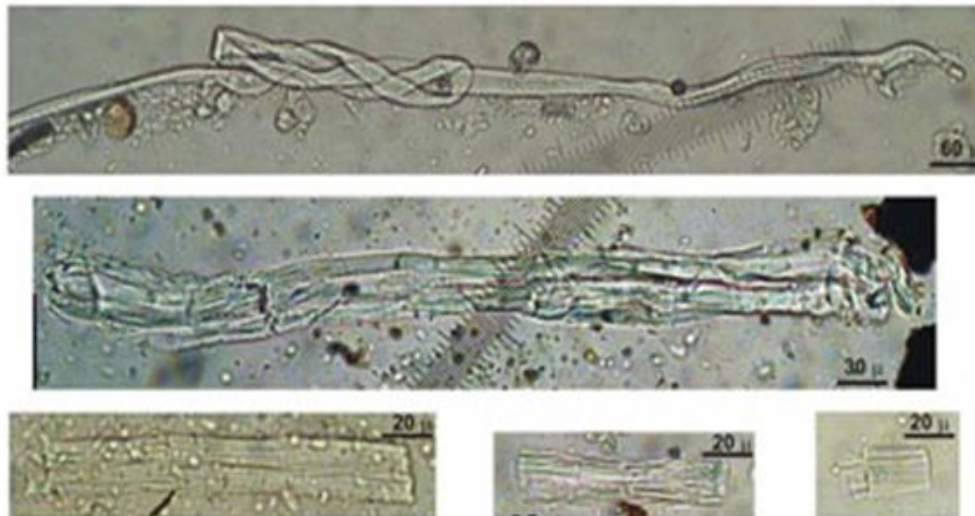


## The Oldest known Woven Textiles:

### Woven Flax Threads, Georgia

Certain archaeologists and palaeobiologists insist that the oldest fiber, dating back to 34,000 years, has been discovered at **Dzudzuana Cave** in former Soviet state of **Georgia**. Fiber consists of short length woven flax threads, *twisted, deliberately cut and dyed in various colors* (turquoise, pink and black to gray), possibly with locally available natural plant pigments.

Fiber is believed to have been used for domestic activities: clothing, ropes or baskets.



## The Tarkhan Dress, Egypt

V-neck linen shirt has been confirmed as world's oldest woven garment. Its flax fibers date back to *the late 4<sup>th</sup> millennium BC, between 3482-3102 BC*. The dress was discovered in a First Dynasty tomb at Tarkhan, near Cairo.

Dress consists of 3 pieces, bodice and pleated sleeves and is made of sturdy hand-woven linen. It is believed to have covered the knees and have belonged to a thin woman or young teenager of a noble family. The dress has been beautifully stitched and pleated, revealing wealth.

Currently on display in the UCL Petrie Museum of Egyptian Archaeology.





## Imprints in clay and burned remnants of cloth, Czechia

Artifacts discovered at Dolní Věstonice site in Czechia, include imprints in clay and burned remnants of cloth. These create the impression that **cordage, plaited basketry, sophisticated threads and plain woven cloth** were manufactured.

## Plant fibers, Israel

String making was a first stage towards the use of cloth. Earliest samples of string-making have been **three fragments of twisted and plied plant fibers**, dated back *19,000 years*.

Plant fibers were discovered at Ohalo II site, a submerged late Upper Paleolithic site, located on the southwest shore of the Sea of Galilee.

Remains (polished bone points, enigmatic bone tools, seeds and fruits) are of a hunter-gatherer-fisher camp. Since the area submerged, organic materials have been perfectly preserved.

## Agave fibers and textile fragments, Peru

Oldest evidence of textile use in America comes from agave fibers and textile fragments, dated back *12,000 years*, discovered in the *Andes Mountains*, Peru.

Furthermore, in Peru, a *6,200 year-old* fabric, dyed *indigo-blue*, has also been found. Discovery has taken place in Huaca, a desert area believed to have served as a temple, in which textiles and other offerings were laid, in the context of rituals.

The fabric has been identified as one of the oldest *cotton* textiles and *the oldest decorated with indigo blue*.



## Cordage, Florida, North America

Cordage was discovered at Windover Bog, Florida, dating back 8,000 years, preserved by chemistry special circumstances.

Ancient inhabitants used to hunt and gather vegetable. The area was a pond cemetery and all remnants that were buried in the soft mud of the pond, which developed into a peat bog, have been astonishingly well preserved.

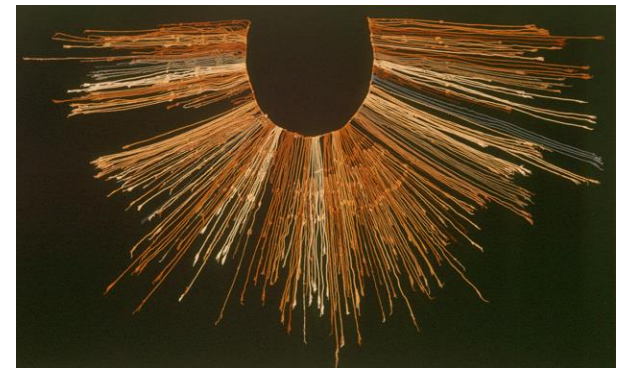
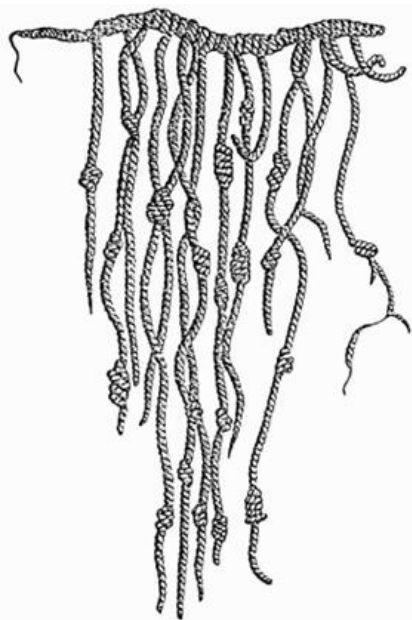
Further to human DNA collected, archaeologists have discovered 87 samples of weaving, basketry and woodworking, using 5 different kinds of twining. Clothing was identified too, including hoods, fitted clothing and burial shrouds.



## Quipu, South America

In South America, a unique use of string was discovered. Over 5,000 years ago, civilizations around the central Andes, had developed quipu, a system of communication, with the use of knotted and dyed string from cotton and lama wool.

Later on, and particularly during the *Incas* period, these devices were used for recording statistical and narrative information. The cords stored numeric and other values encoded as knots. A *quipu* could have few or thousands of color-coded cords, which were attached on a base of carved wood.



Left: Representation of a quipu.

Middle: Quipu (of a later period) in the Museo Machu Picchu.

Right: Quipu (of a later period) from the Inca Empire, currently in the Larco Museum Collection, Peru.

So far, the oldest known woven textiles have been presented.

Yet, it is considered useful to also incorporate the following items, which been discovered in *individual ancient civilizations*.

## Flax fabrics in Near East

Flax fabrics used to wrap the dead, have been discovered at a Neolithic site at Çatalhöyük, Anatolia. These were the earliest known woven textiles of the Near East, dating back to around 6000 BC and were preserved, as they were carbonized and protected by layers of clay or plaster, in an anaerobic environment. There is evidence that flax was cultivated as of 8000 BC, while sheep breeding for woolen fleece must have started around 3000 BC.



In Mesopotamia, at the end of the 3<sup>rd</sup> millennium BC, men used to wear a tunic with short sleeves, tied around the body with a belt, while wealthy people also added a woolen cloak on top of it. Women used to wear long, loose dresses, with or without sleeves.



Left: Sumerian Statues of worshippers, male and female; 2800-2400 BC (Early Dynastic period).

Right: God and female statuette; 2800-2400 BC (Early Dynastic period), Iraq.

Skirt is a piece of cloth, with twisted tufts shrunk to a fringe.

Both are in National Museum of Iraq, in Bagdad.



Sources mention a *cocoon of domesticated silkworm*, dating back to 5000 - 3000 BC, as the earliest evidence of silk production.

Furthermore, *fragments of primitive looms*, dating back to around 4000 BC and *scraps of silk*, from 2700 BC, have been discovered. Fragments have also been recovered from royal tombs in the Shang Dynasty, 1600 – c. 1046 BC. During that period, Han Chinese clothing consisted of a narrow-cuffed, knee-length tunic, tied with a narrow, ankle-length skirt. Noble men used to wear clothes made of silk in vivid primary colours.

Around 114 BC, the Han Dynasty inaugurated Silk Road, a Trade Route of over 8,000 km, connecting China with Asia Minor and the Mediterranean.



Left: Emperor Wu of Jin dynasty, 7th-century painting. Center: Yellow Emperor.

Right: Silk fabric manufacturing, 12<sup>th</sup>-century. Painting by Emperor Huizong of Song.

A few *twisted cotton threads*, which possibly connected a bead necklace, were discovered at Civilization sites at *Indus Valley*.

Terracotta figurines also depict a male figure wearing a turban, another male figure with the label "Priest King" wearing a shawl with floral patterns and sculptures of Dancing Girls wearing jewelry.

India was famous for its cotton fabrics. According to scripts, even when Alexander the Great invaded India in 327 BC, his soldiers replaced their woolen clothes with comfortable and "vivid" cotton ones.



*Left:* Painting on wooden panel, depicting legend of princess who hid silk worm eggs in her headdress

to smuggle them out of China to the Kingdom of Khotan; 7th - 8th c.; British Museum, London

*Center:* The Didarganji Yakshi with wrap; 300 BC; Bihar Museum, India.



*Right:* Statue of "Priest King" with wrap, 2400–1900 BC; National Museum of Pakistan, Karachi.

## Cords printed on ceramic vessels, Japan

**Pottery decorated with cord patterns**, discovered at *Fukui Cave* and dating back around 13,000 years, provides evidence on **cord making** in the **Jōmon period**. Patterns also illustrate *fine mat designs* and **clothing**: upper garments with sleeves, trousers and belts like ropes. Male and female garments looked alike, as they were probably meant to decorate rather than differentiate.

**Cloth fragments** of that period were also discovered, made of bark and hemp. **Bone needles** were found too, indicating that pieces of fabric were sewn together.

At the **Yayoi period**, when rice cultivation was developed, people wrapped their body with unsewn fabric, which had a hole for the head, like a poncho. Later on, the Chinese taught them to dress differently according to sex and age. During the **Yamato period**, 300-500 A.D., statues revealed that men wore an upper piece with front opening and loose trousers, while women wore a pleated skirt. Silk had been introduced by the Chinese, but was costly and only used by upper classes.



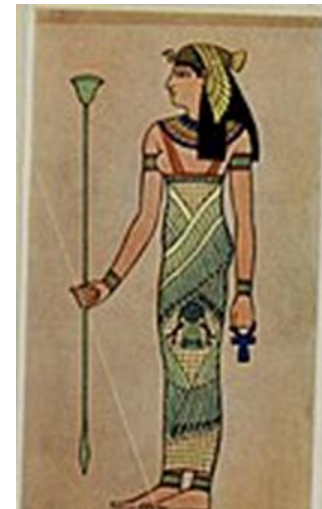
Left: Ceramic vessel with cord patterns.

Right: The Buddha; ca. 200 BC. Tokyo National Museum, Japan.

There is evidence that linen cloth was manufactured in Ancient Egypt in the **Neolithic** period. Flax was cultivated from around 6000 BC and combined with other fibers, such as rush, reed, palm and papyrus, to make rope and other textiles.

Men wore linen kilts, while women's clothes consisted of narrow dresses, shirts and jackets, often pleated. Linen bandages were also used upon mummification process.

Most textiles for the masses were produced by home looms; there must also have been workshops run by the state, the temples or the wealthy. Initially, a horizontal ground loom was used, but upon New Kingdom, a vertical two-beam loom was introduced, probably from Asia.



Center left: Statue of Sobekhotep VI, with male skirt. Neues Museum, Berlin.

Center right and right: Illustrations of Goddess and woman respectively.



Quality of the fabric was excellent. Scientists, who examined a fragment of the -almost transparent- cloth of Thutmose III, concluded that modern commercial production techniques struggle to make something similar.



*Left:* Child's dyed wool tunic, 700-800 AD, with intricate woven details and the popular colourful style of Coptic Period. Discovered in a cemetery at Matmar. © Bolton Museum and Art Gallery.

*Center:* Pair of sandals; 1390–1352 BC; grass, reed and papyrus. Metropolitan Museum of Art, New York.

*Right:* Tunic fragment, reconstructed. It dates from New Kingdom and is around 3200 years old. © Bolton Museum and Art Gallery.

Textiles were expensive, thus, reused, even cut into strips to wrap the mummies.



*Left:* Sleeve, part of a tunic, from the Coptic Period, ca. 1500 years ago.

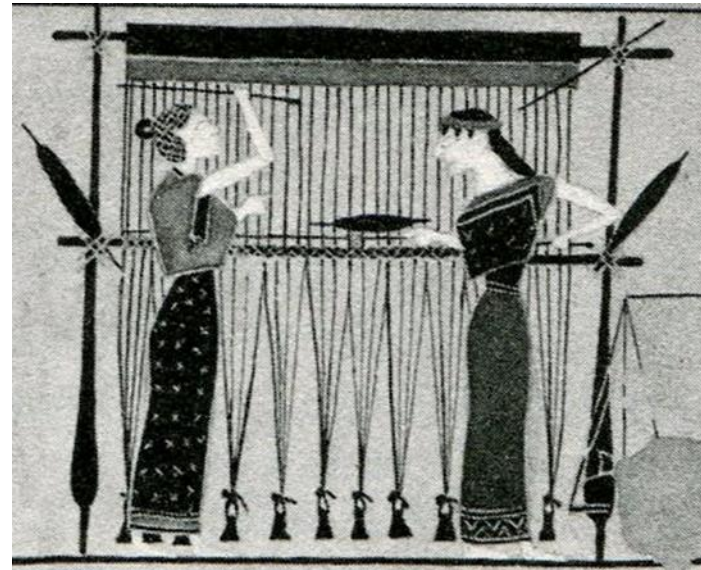
*Center above:* Linen bandage, like the one used at mummification process. Often found in tombs.

*Right above:* Mummy cloth made of linen, dating from Middle Kingdom, ca. 3800 years ago.

*Right below:* Part of material that covered a mummy; it must have shown the image of Osiris, hoping to be reborn and look like him. All available at © Bolton Museum and Art Gallery.



A terracotta lekythos, ca. 550-530 B.C., provides the first illustration of weaving in the western world. It illustrates two women weaving at a warp-weighted, upright loom. The warp threads run vertically and are tied together tightly with weights at the bottom. The weaver on the right runs the shuttle with the weaving thread across the warp. The weaver on the left uses a beater to keep the woven threads in place.



*Left: The terracotta lekythos (oil flask). Metropolitan Museum, New York.*

*Right:* Detail of central scene.

Garments in ancient Greece constituted of loose, unsewn rectangular pieces of fabric, pinned with ornamented pins and draped. Men used to wear a cloak, called chlamys, while women wore a loose dress, called peplos. Both also used to wear a tunic, called chiton, reaching the knees when designed for a man or the ankles, when designed for a woman, as well as a long cloak on top of the peplos or the chlamys, called himation.

The fabric used was linen or wool. The former was rare, as flax was very expensive, but the latter was widely used. The wool they bought was washed, then, dried in the sun and dyed with mineral and plant substances. Then, it was collected in balls and left in vessels, in order to be turned into thread for the loom.



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Slide 4: "From Sibudu Cave, Probably the Earliest Sewing Needle, Made of Bone". *Jeremy Norman's HistoryofInformation.com*. Available at: <https://historyofinformation.com/detail.php?id=3608>

Slide 5: "The Lespugue Venus is a 25 000 years old ivory figurine of a nude female figure". *Don's Maps*. Available at: <https://donsmaps.com/lespuguevenus.html>

Slide 7: "World's Oldest Cloth". January 6, 2010. *World Archaeology*. Available at: <https://www.world-archaeology.com/world/europe/georgia/worlds-oldest-cloth>

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Slide 10: Barlow, N. September 15, 2016. "One of the world's oldest cotton textiles discovered". *About Manchester*. Available at: <https://aboutmanchester.co.uk/one-of-the-worlds-oldest-cotton-textiles-discovered/>

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Slide 12: photos available at: <https://en.wikipedia.org/wiki/Quipu>

Slides 14, 15 and 16: photos available at: [https://en.wikipedia.org/wiki/History\\_of\\_clothing\\_and\\_textiles](https://en.wikipedia.org/wiki/History_of_clothing_and_textiles)



## Sources of Photos (part B) (2)



Slide 17: Left: photo available at:

<https://www.bing.com/images/search?q=jomon+ceramic+vessels&qpv=Jomon+ceramic+vessels&qpv=Jomon+ceramic+vessels&form=IGRE&first=1&tsc=ImageBasicHover>

Right: photo available at: [https://en.wikipedia.org/wiki/History\\_of\\_clothing\\_and\\_textiles](https://en.wikipedia.org/wiki/History_of_clothing_and_textiles)

Slide 18: Left: photo available at: <https://en.wikipedia.org/wiki/Weaving>

Center and right: photos available at: [https://en.wikipedia.org/wiki/History\\_of\\_clothing\\_and\\_textiles](https://en.wikipedia.org/wiki/History_of_clothing_and_textiles)

Slide 19: Left and right: Trumble, I. 24-01-19. "The world's oldest textiles: Bolton's Ancient Egyptian collection". *Museum Crash*. Available at: <https://museumcrush.org/some-of-the-worlds-oldest-textiles-bolton-museums-ancient-egyptian-textiles-collection/>

Center: photo available at: [https://en.wikipedia.org/wiki/History\\_of\\_clothing\\_and\\_textiles](https://en.wikipedia.org/wiki/History_of_clothing_and_textiles)

Slide 20: Trumble, I. 24-01-19. "The world's oldest textiles: Bolton's Ancient Egyptian collection". *Museum Crash*. Available at: <https://museumcrush.org/some-of-the-worlds-oldest-textiles-bolton-museums-ancient-egyptian-textiles-collection/>

Slide 21: Left: photo available at: <https://www.artsy.net/artwork/attributed-to-the-amasis-painter-terracotta-lekythos-oil-flask-1>

Right: Vasiliou, Ch. July 2, 2020. "Garment in Ancient Greece". *Max Mag*. Available at: <https://www.maxmag.gr/politismos/istoria/endyma/> (in Greek).

Slide 22: Left and middle: Vasiliou, Ch. July 2, 2020. "Garment in Ancient Greece". *Max Mag*. Available at: <https://www.maxmag.gr/politismos/istoria/endyma/> (in Greek).

Right: "Ancient Greek Costumes". *Greek History Topics*. June 13, 2011. Available at: [https://www.istorikathemata.com/2011/06/blog-post\\_13.html](https://www.istorikathemata.com/2011/06/blog-post_13.html)