CROSS WARP

Threads Crossing the Warp

MODULE 2

History and evolution of weaving

ΙΔΡΥΜΑ ΚΡΑΤΙΚΩΝ ΥΠΟΤΡΟΦΙΩΝ IKY

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HISTORY AND EVOLUTION OF WEAVING - REVIEW

As we have already seen…

- Weaving is acknowledged as one of the oldest surviving crafts in the world.
- The art of weaving traces back to the Paleolithic era, about 30.000 to 20.000 years ago.
- Some theories state that the observation of bird nests suggested the idea of interlacing and, consequently, the invention of weaving.
- Early man developed the first string by twisting together plant fibers. Preparing thin bundles of plant material and stretching them out while twisting them together produced a fine string or thread.
- Even before the actual process of weaving was discovered, the basic principle of weaving was applied to interlace branches and twigs to create fences and shelters, and baskets for collecting goods and storing products.

https://www.arch.cam.ac.uk/research/projects/archived-projects/origins-weaving-project

HISTORY AND EVOLUTION OF WEAVING - REVIEW

As we have already seen…

- Initially, because of the difficult weather conditions, humans used animal skins and furs for their clothing and in their everyday lives' needs (tends, covers, etc.), which provided the best protection against the cold.
- The first evidence of a textile product is the carved bone figure of Venus wearing cloth in the form of a fringe of twisted strings of fibre, dating from about 20.000 B.C. *(Soffer, Adovasio, & Hyland, 2000)*.
- The first proof of weaving is dated to around 7000 B.C. It comes from impressions of textiles stamped on two little clay balls found in Iraq.
- However, some theorists claim that it is impossible to tell with certainty the exact time that weaving started, mostly because of the fragile nature of the tools used and the easy deterioration of the products.

https://www.arch.cam.ac.uk/research/projects/archived-projects/origins-weaving-project

HISTORY AND EVOLUTION OF WEAVING

- Research has identified the use of particular plants (sedges, nettles, birch and lime bast) in weaving, and the production of basketry, cords and nets. Gradually, the use of plant fibres within the native environment and the animals provided the main source of clothing.
- Moreover, archaeological evidence points to a general diffusion of weaving and spinning that suggests a knowledge of natural and vegetable fibers.
- Stone Age man's early experiments with string and thread led to the first woven textiles. Eventually, people developed great skill in weaving cloth.
- Every household produced cloth for their own needs. Weaving cloth remained an activity associated with the family unit for thousands of years.
- Textile making involved:

a) the selection of an appropriate natural fibre (e.g., from pants or animals),

b) the harvesting and spinning of fibres into thread or yarn,

c) the weaving (or knitting) of clothes.

http://www.smithsonianeducation.org/educators/lesson_plans/spinning_yarns/ATZ_SpinningYarns_Sep1980.pdf

HISTORY AND EVOLUTION OF WEAVING - REVIEW

- Stone Age people wove nets, baskets, mats, and belts out of reeds, grasses, and strips of animal skins. This led to the creation of textiles that served as clothing.
- Textiles were also used as rugs and blankets to line drafty dwellings and to cover dirt and stone floors.
- Later, textiles were also used in the form of flags, banners, and nonutilitarian items of clothing (e.g., ceremonial robes), bearing symbols of state or leadership.
- Ancient textiles were made mostly of linen, cotton, wool, and silk.
- As civilizations developed, the fibres and the different methods and patterns invented for weaving traveled to different parts of the world, resulting in various ideas and knowledge being exchanged among people and cultures.

Gleba, 2014

THE HISTORY OF WEAVING

- In Jarmo, in northeast Iraq, there is evidence of woven cloth circa 7000 B.C., while in Nahal Hemar, in the Judean desert, there is proof of woven cloth circa 6500 B.C.
- Fragments of simple linen burial cloths prove that weaving with flax existed circa 6000 B.C. in Çatal Hüyük, a site of a Neolithic city in the Konya region of Anatolia. In the same ancient city, loom weights have been found, dated even earlier, around 7000 B.C.
- Other evidence from Mesolithic and Paleolithic eras are impressions recovered in sites in Eastern Europe. Sometimes microscopic amounts of fibre remains were found in the material containing the impressions.

Good, 2001

THE HISTORY OF WEAVING

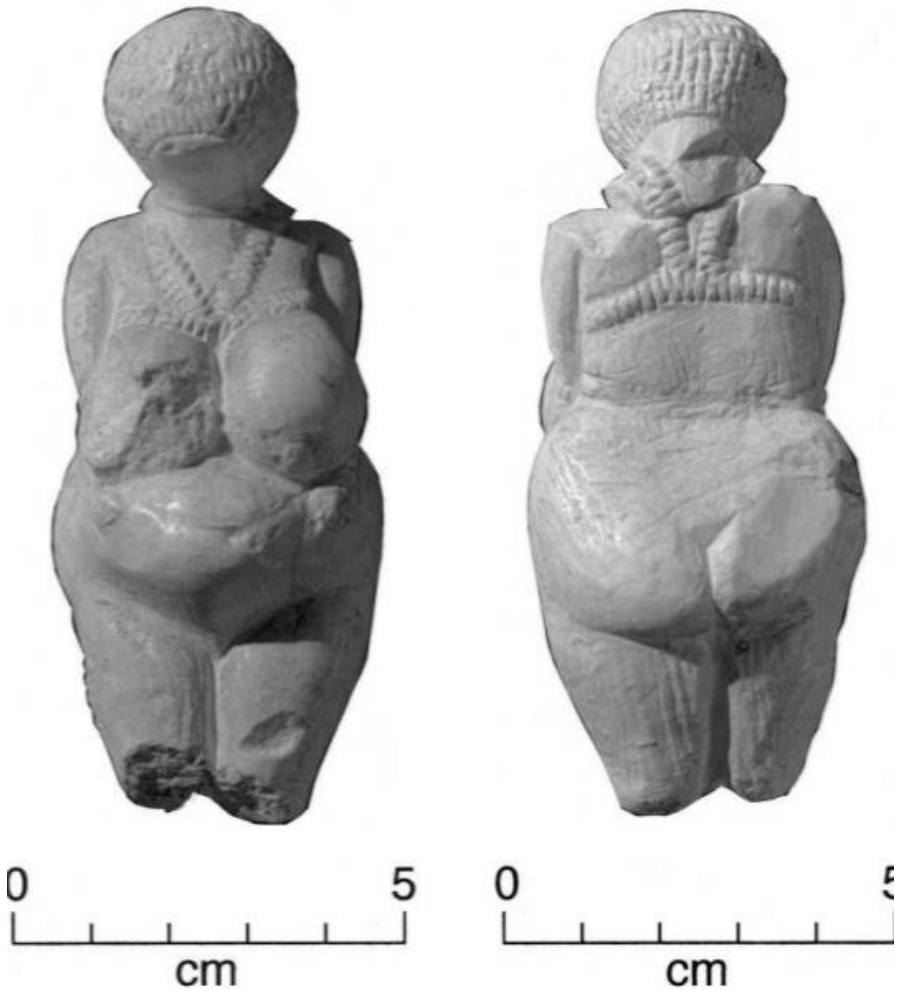
- The development of weaving forms constitutes the *'human revolution*' in the Palaeolithic era.
- Clothing depicted on the so-called 'Venus' figurines found across Palaeolithic Eurasia, as well as clay fragments with the imprints of textiles, demonstrated the use of plant material in the production of items such as skirts, belts, hats, bandeau, bands, and necklaces.
- The presence of weaving tools used in textile production at particular locations in Palaeolithic sites on the Russian Plain indicated specific activity areas related to weaving.
- Imprints on clay, carvings on figurines and these tools constitute the first physical evidence of weaving.

(Demeshenko, 2006; Soffer et al., 2000)

THE HISTORY OF WEAVING

Venus Figurine

Soffer et al., 2000



THE HISTORY OF WEAVING

- In ancient Mesopotamia, in Asia, women were very skilled spinners and weavers. Women weaved rectangle of clothes, large enough to cover the body.
- Men also participated in the weaving process, as they dyed the fibres and did the finishing of the fabrics.
- Wool was the most common fabric found in Mesopotamia.
- The woven clothes are depicted in statues of people found from that era.

THE HISTORY OF WEAVING

Standing female worshiper

Sumerian, Early Dynastic IIIa (ca. 2600–2500 B.C.)

Limestone, inlaid with shell and lapis lazuli

The Metropolitan Museum of Art, New York
Rogers Fund, 1962 (62.70.2)

https://www.metmuseum.org/blogs/collection-insights/2020/art-for-resilience

THE HISTORY OF WEAVING

Standing male worshiper

Sumerian (ca. 2900–2600 B.C.)

Standing figure, with clasped hands and a wide-eyed gaze

The Metropolitan Museum of Art, New York

https://www.metmuseum.org/art/collection/search/323735

THE HISTORY OF WEAVING

- Some of the oldest textile finds are fragments found in the tombs of ancient Egypt. These textiles have been preserved thanks to the dry climate and the sand of the Sahara Desert.
- Textile production formed an important function in ancient Egypt, in both religion and commerce. Developments in agriculture contributed to the advancement of the textile production.
- The importance of the textile tradition in ancient Egypt is also confirmed by the discovery of the representation of a loom on a terracotta plate, dating back to 4400 B.C., and by a horizontal loom on the ground that first appeared around 3000 B.C.

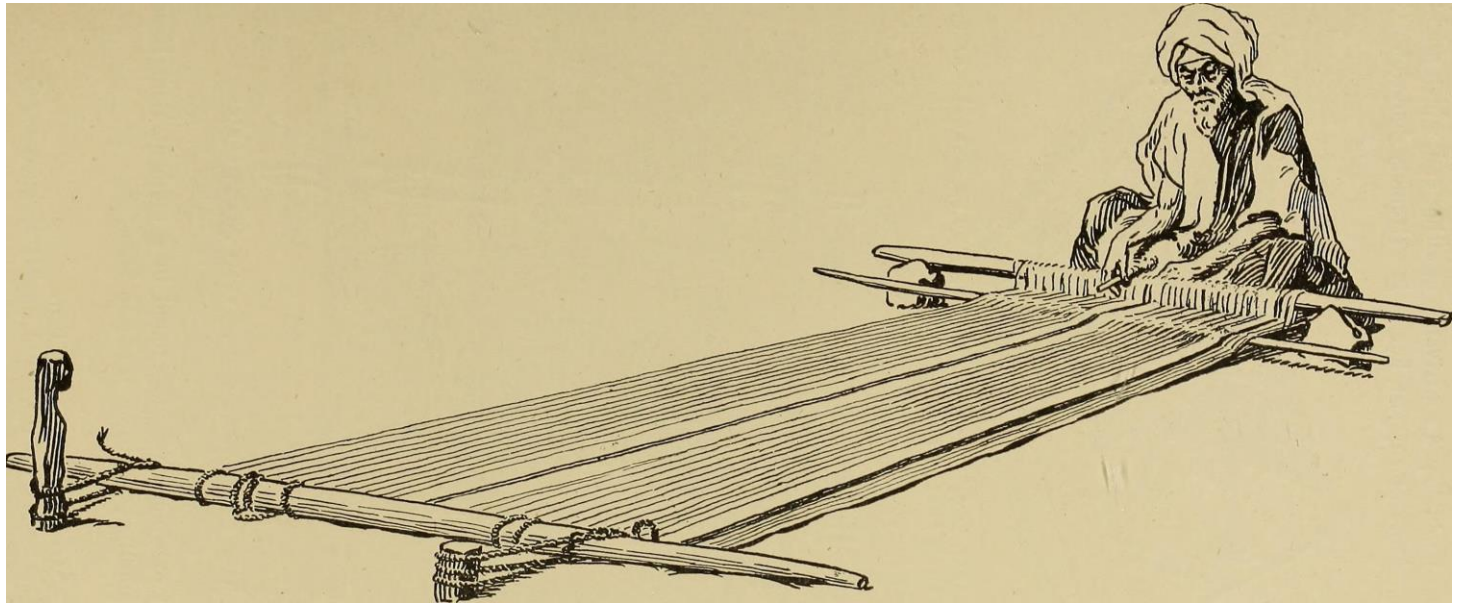
https://www.arch.cam.ac.uk/research/projects/archived-projects/origins-weaving-project

THE HISTORY OF WEAVING

The horizontal loom, known as early as the Neolithic period, is the oldest type of loom used in Egypt.

In this loom, the warp is mounted horizontally between two beams and is held in tension by pegs in the ground.

The weaver kneels and has to move forward as the fabric progresses, either sitting beside the tissue, or perhaps on it *(Mossakowska-Gaubert, 2020)*.



https://www.artemorbida.com/brief-history-of-weaving/?lang=en

THE HISTORY OF WEAVING

Prehistoric Horizontal Loom

https://www.youtube.com/watch?v=ZqffpRu3K-g

THE HISTORY OF WEAVING

- The Egyptians were distinguished by their ability to spin and then weave linen.
- Flax weavings are found in Fayum, Egypt, dating from around 5000 B.C. First popular fiber in ancient Egypt was flax, which was replaced by wool around 2000 B.C.
- Dyeing techniques also improved.
- Batik, a wax-resistant dye on fabrics was used in Egypt in the 4th century B.C.
- Egyptians used the batik technique on textiles created to wrap mummies.
- Batik is a technique that uses hot dye-resistant wax to “draw” patterns and designs on cloth. When the wax cools, the cloth is immersed in the dye. Afterwards, the dyed piece of cloth is placed in boiling water to remove the wax. Irregular patterns of crackles are formed when the wax is cooling off, and these appear as part of the design. These irregular crackles are unique in design.

https://www.arch.cam.ac.uk/research/projects/archived-projects/origins-weaving-project

THE HISTORY OF WEAVING

The story of Batik

https://www.facebook.com/magicalartbyhumanhand/videos/3799488931511 69/

ANCIENT WEAVING TOOLS

- Excavations discovered burned wooden frames of looms and rows of clay loom weights in many houses in Egypt.
- These looms were also "warp-weighted“, where the threads on the long axis of the weave (the warp) were suspended vertically with weights. The passing of thread (the weft) horizontally in and out of the warp created the weave.
- At that time, the principal fibers used was for weaving were sheep wool, goat hair, and flax, a fibrous plant used to make linen.
- Before it could be formed into a thread, wool had to be washed, picked clean and combed straight. Then the fibers were spun to entwine them and draw them into a long, even strand. Usually a spindle, a weighted stick suspended in the air and spun on the thigh, was used. The spun fibers were then stretched upon the loom to weave into garments.

THE HISTORY OF WEAVING

https://www.egypttoday.com/Article/4/89664/What-you-may-not-know-about-types-of-Linen-Fabrics

THE HISTORY OF WEAVING

Demonstration of the Ancient Weaving Loom

https://www.youtube.com/watch?v=KPqnA-bxk2I

THE HISTORY OF WEAVING

- Early looms need one or two persons to work on them.
- By 700 A.D., horizontal and vertical looms could be found in Asia, Africa and Europe.
- At that time also appeared pit-treadle loom with pedals for operating heddles. That kind of loom first appeared in Syria, Iran and Islamic parts of East Africa.
- Many religions acknowledge the importance of weaving.
- Bible refers to loom and weaving in many places.
- Faithful were required by Islam to be covered from neck to ankle which increased the demand for cloth.
- Finally, in Africa, the rich wore cotton clothing while the poorer had to wear wool.

THE HISTORY OF WEAVING - ICONOGRAPHY

- The term *iconography* includes all archaeological finds with iconographic representations, such as wall paintings, sculpture, vase painting, mosaics, figurative or other representations on coins, etc.
- Iconography is one of the basic sources of information on ancient textiles and their production, the techniques used, as well as the social aspect of weaving.
- Iconography is also a source of knowledge on ancient fashion and garments. For instance, the garments worn by Minoan women are very different than those worn by Athenian women of the 5th century B.C.

https://artextiles.org/en/content/iconography

THE HISTORY OF WEAVING - ICONOGRAPHY

- Usually, we combine evidence from iconography with that from written sources to extract details for ancient textiles, such as the types of fabrics, their quantity and the tailoring necessary for the manufacture of each type of garment.
- We can also find information regarding the colours (e.g., from ancient wall paintings depicting dressed individuals) and the techniques of embellishment of the fabrics. For example, in the Classical period along with the selvedges decorated with geometric patterns, there were other decorative elements such as fringes, permanent pleats and applied metal decorations.
- In addition, we can discern between thick and heavy textiles and fine and transparent ones, which allow the human body to be seen. Such transparent garments are depicted in the wall paintings of Akrotiri, Thera, as well as on several vase paintings of the Classical period.

https://artextiles.org/en/content/iconography

THE HISTORY OF WEAVING - ICONOGRAPHY

The “campstool fresco”
Partially restored fresco from Knossos

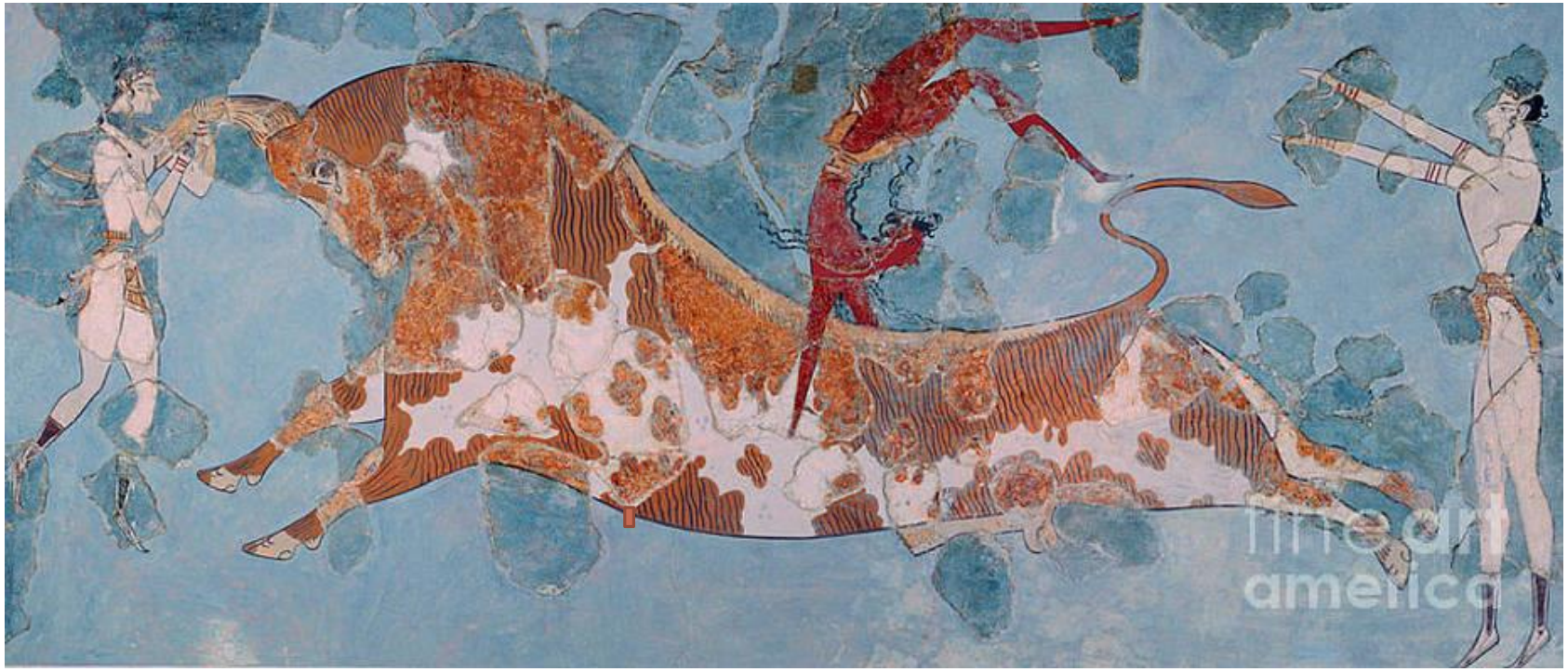
https://giacobbegiusti9.wordpress.com/category/national-archaeological-museum-athens/

THE HISTORY OF WEAVING - ICONOGRAPHY

The “Prince of Lilies”, fresco, Minoan civilisation, Knossos (1550-1450 B.C.) Reconstruction with the original pieces – Heraklion Archaeological Museum

https://giacobbegiusti9.wordpress.com/category/national-archaeological-museum-athens/

THE HISTORY OF WEAVING - ICONOGRAPHY



Bull-leaping or Toreador Fresco, east wing of Knossos Palace
Minoan Civilisation
Knossos (circa 1400 B.C.)
Heraklion Archaeological Museum

https://smarthistory.org/bull-leaping-fresco/

THE HISTORY OF WEAVING - ICONOGRAPHY

Boxing Boys (possibly girls) and Gazelles Frescos from Akrotiri, Thera Island (Santorini)

National Archaeological Museum of Athens

https://en.wikipedia.org/wiki/Wall_Paintings_of_Thera

THE HISTORY OF WEAVING - ICONOGRAPHY

Shaffron gatherer
Fresco from Akrotiri, Thera Island
(Santorini)

https://en.wikipedia.org/wiki/Wall_Paintings_of_Thera

THE HISTORY OF WEAVING - ICONOGRAPHY

House of Ladies
Fresco from Akrotiri, Thera Island (Santorini)
Circa 1700 B.C.
Museum of Prehistoric Thera, Santorini
http://www.fira-santorini.com/prehistoric-thera-museum-photos.html

THE HISTORY OF WEAVING - ICONOGRAPHY

Cycladic Town
Fresco from Akrotiri, Thera Island (Santorini)

https://en.wikipedia.org/wiki/Wall_Paintings_of_Thera

THE HISTORY OF WEAVING

Marble funerary statues of a maiden and a little girl (Athens) (ca. 320 B.C.)

The Metropolitan Museum of Art
New York

https://www.metmuseum.org/art/collection/search/254508

THE HISTORY OF WEAVING

Statue of Peplos Kore
Athens (circa 530 B.C.)
Acropolis Museum

https://theacropolismuseum.gr/en/statue-kore-peplos-kore

THE HISTORY OF WEAVING

Terracotta bell-krater
(bowl for mixing wine and water)
Athens, ca. 440 B.C.

The Metropolitan Museum of Art
New York

https://www.metmuseum.org/art/collection/search/252973

THE HISTORY OF WEAVING

Left: One of the six original Caryatids, stolen by Lord Elgin (early 19th century) from the Erechteion Athens, displayed at the British Museum

Right: Copies of Caryatids displayed at the Acropolis Museum, Athens and at the Erechteion, Athens

https://en.wikipedia.org/wiki/Caryatid

THE HISTORY OF WEAVING - ICONOGRAPHY

- Moreover, iconography provides information about other uses of textiles, beyond clothing. Textiles were manufactured in different forms to serve various needs, such as containers, beddings, carpets, tents, sails, etc.
- Iconography informs us about technical issues of the textile production. For example, the activity of spinning was a favourite theme to vase painters of the 1st millennium B.C., and even more for those of the Classical period. Weaving on the warp-weighted loom or on a small portable loom were less often depicted in ancient art. However, there are representations of scenes of textile production with women engaging in different stages of cloth manufacture.

https://artextiles.org/en/content/iconography

THE HISTORY OF WEAVING - ICONOGRAPHY

- The study and interpretation of iconography is not always straight-forward. There are occasions where iconographic elements cannot be readily recognized, as they depend on artistic conventions of the particular period under study.
- For example, certain motifs on the surface of garments might be hard to understand, or we might not be able to recognize a specific technique of weaving in a depicted textile, as is the case with grids of diagonal lines. Such patterns could indicate either twill or check weaves.

THE HISTORY OF TEXTILES

Side A: scene at center
Museum of Art, RISD, Providence

RISD 25.087
Perseus Digital Library Image

http://www.perseus.tufts.edu/hopper/image?img=1990.03.0191

THE HISTORY OF TEXTILES

- *Written sources* offer broad information about ancient Greek textiles.
- Depending on their nature, texts and inscriptions describe the use and, rarely, the processing of raw textile materials, the function of textile tools, the colours and patterns of fabrics, as well as certain textile characteristics, such as decorative patterns, techniques, and embellishment treatments.
- Classical written sources can be divided into literary texts, specific technical handbooks and administrative documents.
- Plato uses extensively weaving and spinning scenes as metaphors to explain vivdly his topic. Historians, such as Herodotus and Xenophon, provide information about garment types and decorations. The philosopher Theophrastus offers valuable insights to the textile dyes. In the plays of Aristophanes, we find information about textile production and commerce. Further information can be found in several other written sources about theatre, political or judicial speeches, poetry, philosophy, and history.

https://artextiles.org/en/content/written-sources

THE HISTORY OF TEXTILES

- Inscriptions constitute another corpus of information about textile production and technology. They are particularly important for the study of social organisation, providing numerous terms of textile-related occupations, but also information about the exchange and trade of raw materials and finished products. For example, the 4th c. BC votive inscription of textiles and garments to Artemis Brauronia in particular offers information about raw materials, types of garments, colours and various decorative techniques.
- However, to avoid misunderstandings due to the polysemy of Greek language technical terminology and the evolution of meanings through time, the modern reader must be cautious when interpreting several terms.

https://artextiles.org/en/content/written-sources

THE HISTORY OF TEXTILES

"Come and weave"
An educational programme from the Museum of Silk in Soufli, Thrace, Greece

Piraeus Group Cultural Foundation
Year: 2010

Flax	Wool	Sheep	Textile

Σύμβολα της Γραμμικής Β.

Symbols in Linear B (language)

THE HISTORY OF TEXTILES

- Textile remains are exceedingly rare in archaeological sites, when compared with artefacts of a more durable nature, such as ceramic or metal.
- Textiles are very impermanent, and because of their fragility they can survive in good shape only in very good conditions.
- Unfortunately, they are most often discovered in crypts or ground graves where they have stayed for sometimes thousands of years exposed to humidity, extreme temperatures, fungi and microbes.
- Especially in Europe, preserved textiles are quite rare.

(Cybulska & Maik, 2007)

THE HISTORY OF TEXTILES

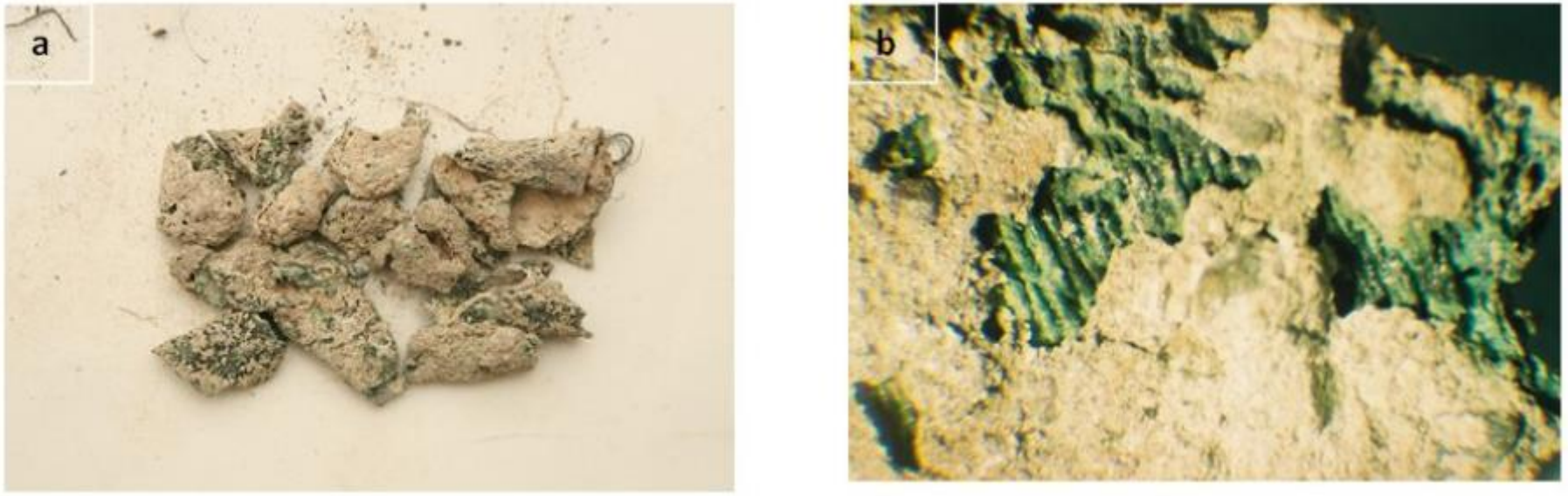
- Central and Eastern Mediterranean Europe between 1000 and 400 B.C. was an area of dynamic change, characterised by the movement of people and goods, the production of wealth, the rise of urbanism, mobility and craft specialisation.
- Susanna Harris (2012) proposed the concept of '*cloth culture*' based on the idea that all societies use cloth-type materials, but the way they do so is culture-specific.
- Although archaeological textiles are relatively rare finds in Mediterranean Europe, those fragments survived are mostly in a mineralised form.

Gleba, 2017

THE HISTORY OF TEXTILES

- Although the environmental conditions in Greece were not generally in favour to the preservation of organic materials, there are circumstances which can considerably decelerate deterioration.
- For example, the presence of another material (such as metal) may aid the preservation of textiles (mineralization), as may the partial burning of textiles, resulting in their carbonization.
- The process of textile preservation in association with a metal object (less often with a ceramic one) is known as **mineralization**. Such fabrics have been found in Kalyvia (5th century B.C.), and in Glyphada (3rd to 4th century A.D.)*(Spantidaki & Moulhérat, 2004; Moulhérat & Spantidaki, 2007)*.
- Similarly, in the process of **carbonization**, the textile fibres change to carbon; it is an irreversible chemical reaction of incomplete burning, similar to the process of wood becoming charcoal. The carbonized textiles are black and very brittle, but short lengths of fibre may remain virtually intact *(Ryder, 2000)*.

THE HISTORY OF TEXTILES



Fragments of textiles: a. the whole picture, b. details
The investigation under the stereomicroscope outlined the structural elements of the textile material

https://textilerestorationconservation.com/2016/09/08/mineralization-textiles-archaeological-context-case-study/

THE HISTORY OF TEXTILES

McDonald Institute for Archaeological Research, University of Cambridge

Gleba, 2017

Figure 2. An iron dress pin with several different mineralised textiles preserved in layers (image: Margarita Gleba).

THE HISTORY OF TEXTILES

The Society for the Promotion of Hellenic Studies and the British School at Athens

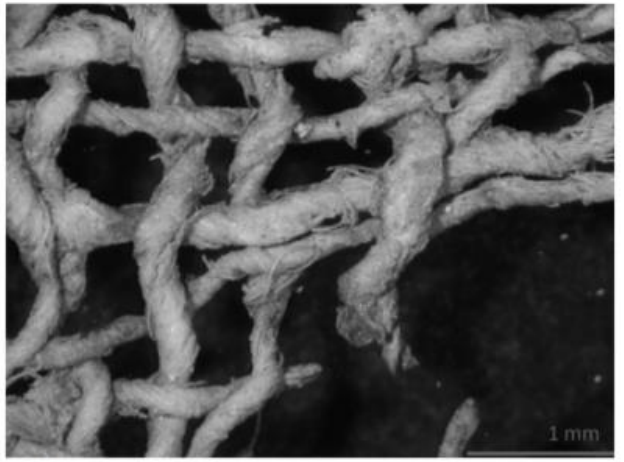
Spantidaki & Margariti, 2017

58. Amorgos: rope fragment from a fourth-century AD carbonized find. © Christina Margariti.

ANCIENT WEAVING TOOLS

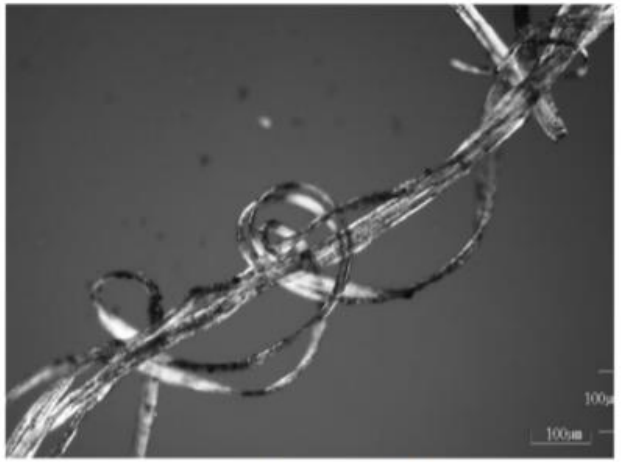
The Society for the Promotion of Hellenic Studies and the British School at Athens

Spantidaki & Margariti, 2017

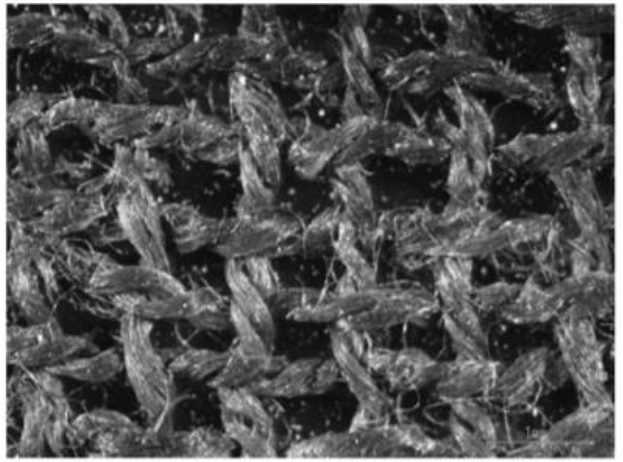


62. Marathon: example of very tightly spun threads from a fifth-century BC fabric. © ARTEX.

63. Mycenae: detail of fabric (inv. no. 15863) showing a splicing joint. © ARTEX.



64. Kerameikos: spliced threads found on one of the fifth-century BC textiles, viewed through an optical microscope. © ARTEX.



65. Thebes: stereoscope image of the S-twisted threads of a 13th-century BC fabric. © ARTEX.

THE HISTORY OF TEXTILES

- Mineralized formations are usually found on iron and bronze grave goods that were deposited in close proximity to textiles.
- They are particularly common on personal ornaments such as pins and belts.
- These traces can provide a considerable amount of information concerning ancient textile structure, including their various technical parameters.
- Using advanced methods, such as scanning electron microscopy, it is often possible to identify the nature of the fibre.

(Gleba 2008, 2014)

THE HISTORY OF TEXTILES

McDonald Institute for Archaeological Research, University of Cambridge

Gleba, 2017

Figure 9. Selection of tabbies from Greece: top left and right) Knossos, eighth century BC; bottom left) Eretria, seventh century BC; bottom right) Athens, Koropi, fifth century BC (images: top left and right and bottom left) Margarita Gleba with permission of the British School at Athens; bottom right) Margarita Gleba with permission of the V&A).

THE HISTORY OF TEXTILES

McDonald Institute for Archaeological Research, University of Cambridge

Gleba, 2017

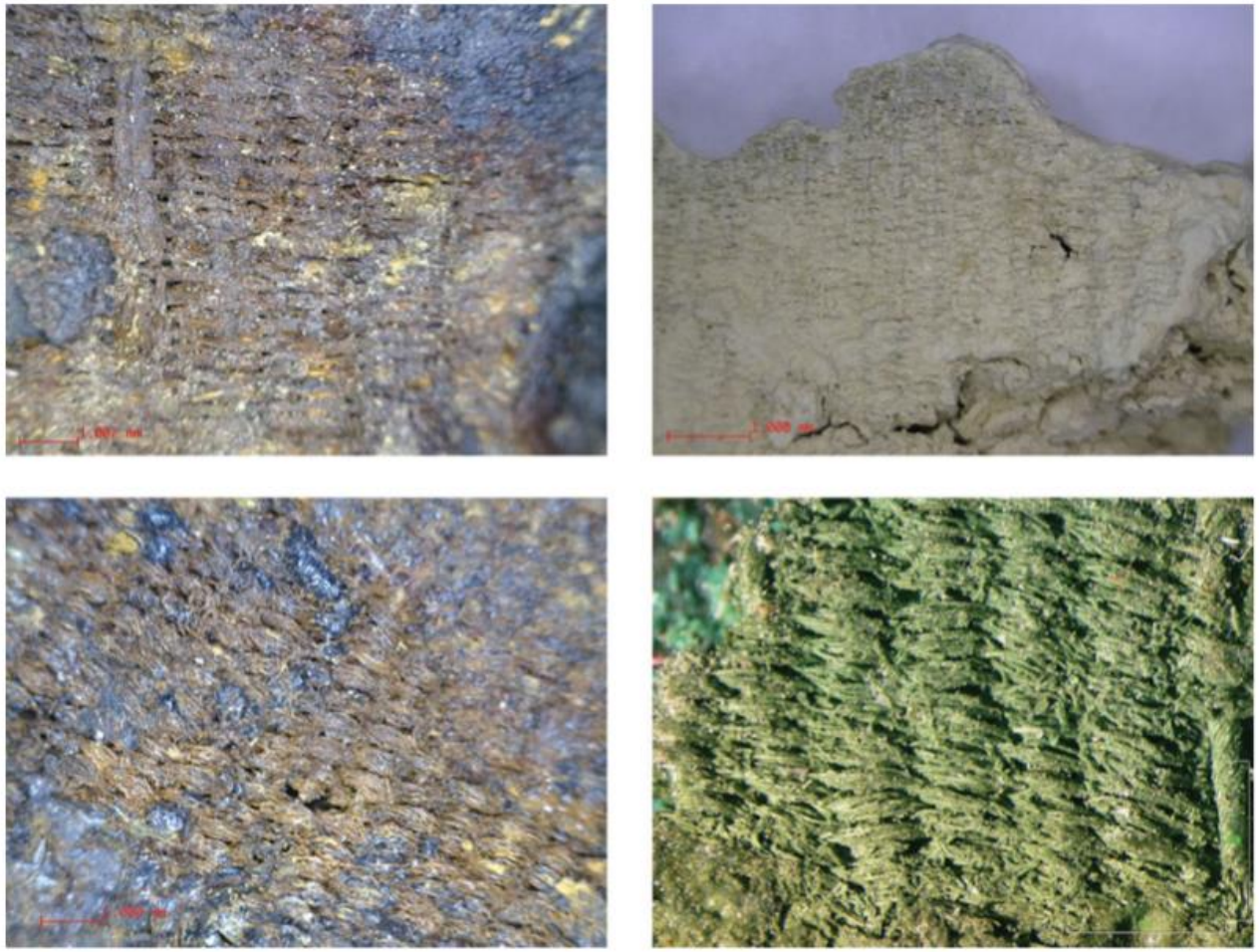


Figure 10. Selection of weft-faced tabbies from Greece: top left) Knossos, eighth century BC; top right) Eretria, seventh century BC; bottom left) Karabournaki, sixth century BC; bottom right) Corfu, sixth century BC (images: top left and right) Margarita Gleba with permission of the British School at Athens; bottom left) Joanne Cutler and Margarita Gleba; taken courtesy of the Trustees of the British Museum; bottom right) Artex).

THE HISTORY OF TEXTILES

- In Greece, for several years, the prevailing view was that there would not be significant discoveries of archaeological textiles, due to the climate which did not favour the conservation of fabrics. Confirming this view, few discoveries of ancient textiles were accomplished until the middle of the 20th century (e.g., fabric in Eleusis).
- However, this picture has changed dramatically since the excavations for the construction of the Athens Metro, where archaeological fabrics have been discovered. These textiles were usually in very small fragments, mostly preserved in a mineralised state, due to their contact with metal objects. Scientific analysis of these mineralised textiles (which combined the optical together with the scanning of electron microscope) allows us today to identify even the fabrics' fibres.
- Thus, nowadays, there is a corpus of over 100 fabrics from Greece dating from the Neolithic to the Byzantine era.

https://artextiles.org/en/content/conditions-preservation

THE HISTORY OF TEXTILES

The construction of Athens Metro led to a large-scale archaeological excavation work in Athens, spanning over an area of 79.000 m2, and revealing more than 50.000 ancient articles.

The Greek Ministry of Culture warned the designers of the Athens Metro construction about the massive presence of antiquities laying within the subsoil of Athens and dictated them the obligation to preserve these antiquities.

Today, the ancient articles are in public display in six Metro Stations, inviting thus every rushing passenger to examine and admire them.

https://www.ametro.gr/?page_id=4229&lang=en.

THE HISTORY OF TEXTILES

- Although the number of finds has increased, the corpus is not representative of the variety of textile production in ancient Greece, nor of everyday textiles, since almost every textile find in Greece derives from a funerary context. Therefore, we have access on a very specific subgroup of the ancient Greek textile production.
- The fabrics discovered represent a specific type of textiles (funerary), used to accompany the dead to the underworld. Their characteristics reveal the specifications of the burial cloths at that time, which sometimes was defined by the law. Thus, we observe certain uniformity, as for example, in the use of raw materials, and in spinning and weaving techniques.

https://artextiles.org/en/content/conditions-preservation

THE HISTORY OF TEXTILES

- The oldest textile discovered in Greece was identified amongst other finds dating to around 6000 B.C. from the ongoing excavation at the Drakaina Cave on Kephallonia, conducted by the Hellenic Ministry of Culture, Ephorate of Palaeoanthropology and Spelaeology, under the direction of Georgia Stratouli *(Inkefalonia 2012; Drakaina Cave 2013)*.
- In addition, textile fragments have been preserved on stone weapons and tools from the Neolithic period in Thessaly *(Apostolaki 1999)*.
- Similarly, a fourth-millennium B.C. needle found at Methoni, southern Greece, still contained a plant fibre thread *(Myrtsioti, 2015)*.
- Fabrics were also discovered in the Prehistoric settlement of Akrotiri (ca. 2.500–1.650 B.C.) *Spantidaki & Moulhérat, 2012*), the Mycenaean textile fragments recovered from a 13th-century B.C. context in Thebes *(Margariti et al., 2010)*, and the recent find of 8th century A.D. textile and rope fragments at Katapola on Amorgos Island *(Alexiou et al. 2017)*.

THE HISTORY OF TEXTILES

McDonald Institute for Archaeological Research, University of Cambridge

Gleba, 2017

Table 2. Iron Age textiles of Greece: weft-faced tabbies (x indicates presence; – indicates absence. N.B.: more than one textile with these features has been found at many of the sites listed).

Site	Cultural region	Date	Weft-faced tabby	Weft thread count over 50 threads/ centimetre	Weft shows weak or no twist	Source
Lefkandi	Euboea	tenth–ninth centuries BC	x	x	x	Spantidaki & Moulhérat 2012: 191
Stamna	Aitolia	tenth century BC	x	x	x	Kolonas *et al.* in press
Athens	Attica	ninth century BC	x	x	x	Spantidaki & Moulhérat 2012: 194
Knossos	Crete	tenth–seventh centuries BC	x	x	x	Cocking 1996; Gleba—unpublished data
Kerkyra/Corfu	Corfu	seventh century BC	x	x	x	Spantidaki & Moulhérat 2012: 191
Argos	Argolid	seventh century BC	x	–	x	Margariti & Papadimitriou 2014
Vergina	Macedonia	sixth century BC	x	–	x	Spantidaki & Moulhérat 2012: 195
Karabournaki	Macedonia	sixth century BC	x	x	x	Cutler & Gleba 2014
Kamatero	Attica	fifth century BC	x	x	x	Spantidaki & Moulhérat 2012: 198
Kalyvia	Attica	fifth century BC	x	x	x	Spantidaki & Moulhérat 2012: 198

Margarita Gleba

THE HISTORY OF TEXTILES

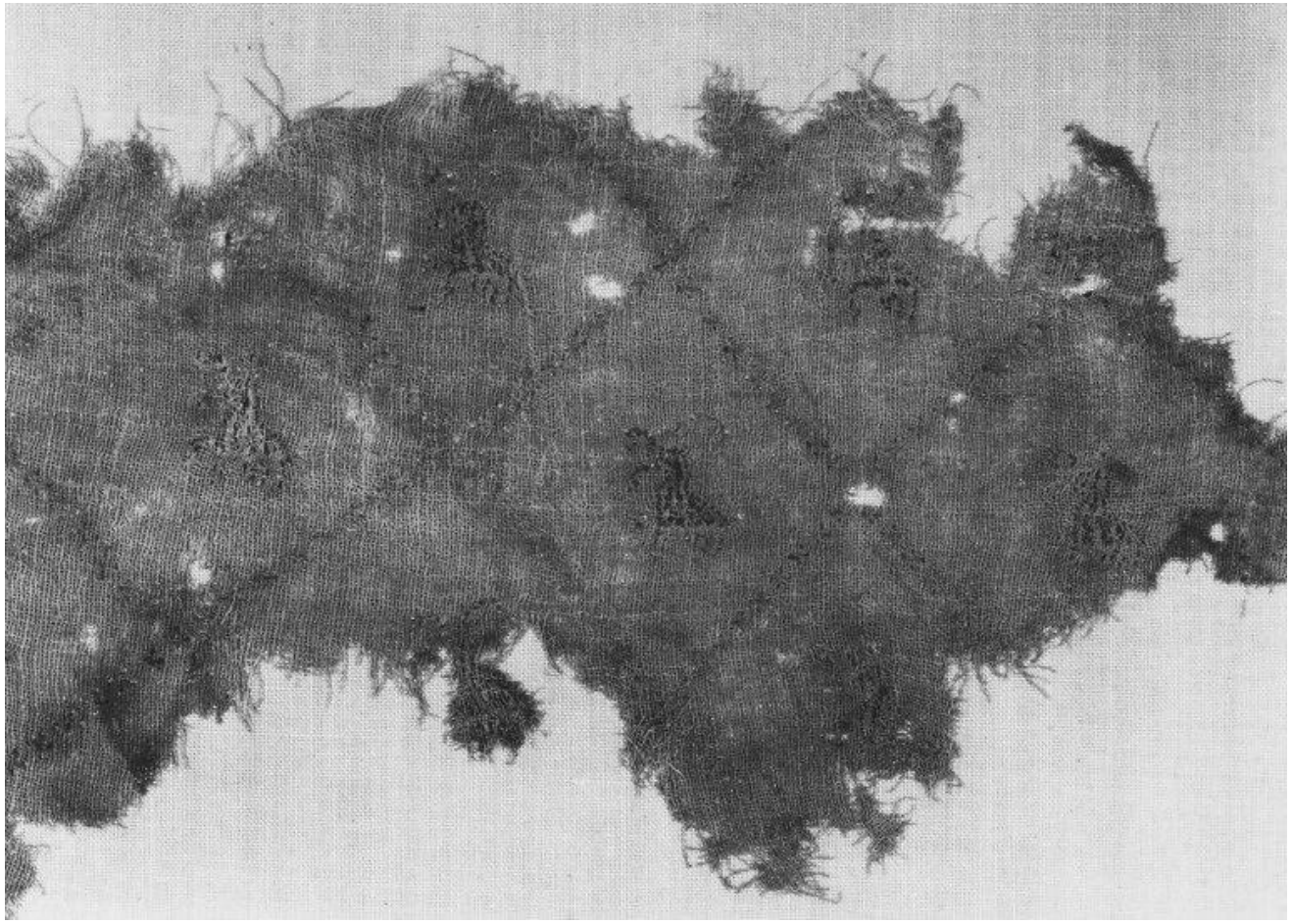
- Each textile discovery adds to our knowledge about the materials and techniques used.
- The discovery of the Koropi, near Athens, fragments showed that the ancient Greeks did employ embroidery techniques, something many scholars had doubted. The fabric design was a diaper pattern with small lions in the centre of each lozenge. The threads were all Z-spun and the gold and silver embroidery threads had been wrapped around a fibre core (perhaps silk or linen). The fragments were dyed green, with a tapestry or plain weave. They have been dated to 500-440 B.C. These fragments are now at the Victoria and Albert Museum in London.
- Wool and linen are the most common (but not the only) materials found. At Kastelli Khania, in Crete, a small carbonized ribbon was found made of linen, goat hair and (perhaps) nettle fibres. The site was dated to the Late Bronze Age *(Moulherat, C. & Spantidaki, 2009)*.

https://trc-leiden.nl/trc-digital-exhibition/index.php/ancient-greek-loom-weights/item/134-6-ancient-greek-textiles

THE HISTORY OF TEXTILES

Early 5th century B.C. textile fragments, from Koropi, near Athens, Greece.

Courtesy Victoria & Albert Museum, London, acc. nT.220 to B-1953o.



https://trc-leiden.nl/trc-digital-exhibition/index.php/ancient-greek-loom-weights/item/134-6-ancient-greek-textiles

THE HISTORY OF TEXTILES

- Other textiles come from a 1936 excavation of a grave (number 35 HTR 73) at the Kerameikos cemetery in Athens. A copper vessel was discovered wrapped in straw and wide purple ribbons, inside a sarcophagus. Inside the vessel were fragments of a textile decorated with stripes of purple on its corners. Some fragments were a plain weave, others weft-faced. Some fragments had selvedges and a starting edge, which indicates it was woven on an upright loom, perhaps the warp-weighted loom. Earlier analysis indicated the material was silk, but the latest analysis shows bast and possibly cotton fibres. The fragments are dated to between 430-400 B.C.

https://trc-leiden.nl/trc-digital-exhibition/index.php/ancient-greek-loom-weights/item/134-6-ancient-greek-textiles

THE HISTORY OF TEXTILES

- The most famous recent find is perhaps the 4th century BC funerary pyre textile from the Royal Tomb II in Vergina. This tomb is associated with King Philip II of Macedonia, the father of Alexander the Great. Fragments of a wollen woven tapestry, were discovered in the tomb's antechamber. In the centre of the textile is a floral design with two birds; the border has a meander motif. The textile was woven with gold and mollusk purple thread. The gold appeared to be "cut strips with no indication that they were spun around a core" *(Andrianou, 2012)*.

https://trc-leiden.nl/trc-digital-exhibition/index.php/ancient-greek-loom-weights/item/134-6-ancient-greek-textiles

THE HISTORY OF TEXTILES

Gold-decorated purple cloth from Meda's larnax (ash-chest)

http://aigai.gr/www.aigai.gr/en/explore/museum/royal/grave/of/philip/aiges/vergina.html

THE HISTORY OF TEXTILES

- In 1875, textiles were found in burial mounds, called the Seven Brothers, near Kertch in the Crimea. These mounds are associated with the Greek Black Sea colony of Panticapaeum (also known as Pantikapaion).
- Fifty fragments of a large wollen textile were discovered. They were made from at least eleven long bands stitched together, painted in red, black and fawn colours, with scenes of running women, warriors, and at least two chariots drawn by horses.
- Some of the human figures are identified on the textile in Greek letters. The names Athena, Nike, Iocasta, Phaidra and Mopsos can be made out. It has been speculated that this textile may have been a wall hanging, perhaps in imitation of a more expensive woven tapestry, before it was used as a pall *(von Hofsten, 2011)*. The textile had been carefully mended at some point.

https://trc-leiden.nl/trc-digital-exhibition/index.php/ancient-greek-loom-weights/item/134-6-ancient-greek-textiles

THE HISTORY OF TEXTILES

- Moreover, inside a sarcophagus, over the legs of a body, more textile fragments were found. These fragments belonged to a woollen tapestry with a design of polychrome ducks on a red background. Stags' heads decorate the border. Based on other artefacts in the tomb, all the textiles were dated to the early 4th century B.C.

https://trc-leiden.nl/trc-digital-exhibition/index.php/ancient-greek-loom-weights/item/134-6-ancient-greek-textiles

THE HISTORY OF TEXTILES

- Recent analysis of Iron Age textiles from Italy and Greece indicates that, despite the use of similar textile technologies at this time, Italy shared the textile culture of Central Europe, while Greece largely followed the Near Eastern traditions of textile production.

- Among the best-known examples are the almost completely preserved semi-circular mantles and tunic-like garments from Verucchio, on the Adriatic side of northern Italy *(Stauffer, 2012)*. While such organic preservation is relatively rare, mineralized textile traces on metal objects in burials are more common than previously recognised.

THE HISTORY OF TEXTILES

- However, as we have previously mentioned, information on the variety of fabrics and garments used in everyday life is available via sources other than extant textiles, such as ancient texts and iconography.

THE HISTORY OF TEXTILES

Short introduction to the preservation of textile works of art

video

https://www.youtube.com/watch?v=wyS-azf6BEA&feature=youtu.be

WEAVING TOOLS

- At first, people wove narrow bands with their fingers, tying one end to their belt. That kind of weaving remained common for a long time in Central Asia, where people were nomadic and couldn’t carry big heavy looms with them.

- Throughout time, some basic tools used in creating complex textiles have remained constant, such as the ones used for spinning thread: wooden spindles (smooth wooden sticks) and ceramic spindle whorls (disks threaded on the spindle).

https://artextiles.org/en/node/189

WEAVING TOOLS

- Early humans made ropes and wove nets to survive. Thus, the earliest weaving tool, the spindle, emerged and weaving was created.
- Gradually, skills included cultivating and processing fiber plants, spinning, weaving, and dyeing.
- The main tools used in the ancient period were:
  - ✓ Spindles
  - ✓ Needles made of different materials, such as bone, ivory, and metal
  - ✓ Horizontal and vertical looms
  - ✓ Shuttles
  - ✓ Spinning combs
  - ✓ Vessels
  - ✓ Bobbins

WEAVING TOOLS

Ancient Greek loom weight

Ancient Greek loom weight

Ancient Greek disc-shaped loom weight

Ancient Greek bobbin

Ancient Greek conical spinning whorl

https://trc-leiden.nl/trc-digital-exhibition/index.php/ancient-greek-loom-weights/item/140-digital-catalogue

The Textile Research Centre in Leiden houses eleven ancient Greek loom weights, and a small number of ancient Greek bobbins and spinning whorls.

WEAVING TOOLS

- The main textile tools used in antiquity continued to be used through time, with varieties in the basic technological conceptions: the thread was spun with the *spindle* and the fabric was woven on the *loom*.
- Textile production in antiquity was a complex and very time-consuming craft that required specific know-how and a variety of tools.
- Ancient textile tools, made of clay, stone or bone, are possibly the most important archaeological source regarding ancient textile production.
- They are found in archaeological excavations and studied by specialists using specific analytical methods.
- This information is complementary to that of other sources, such as written sources, iconography, ethnological data, and the finds of ancient textiles, which are quite rate, due to their organic nature.

https://artextiles.org/en/node/189

WEAVING TOOLS

Tools could be distinguished according to the stage of the textile production.

1. Processing of raw material:

- Tools, such as the *scissors* to shear sheep (*kouris*), *sticks* to beat the material and separate the fibres, and *combs* for combing wool and linen could be listed in this category.

https://artextiles.org/en/node/189

WEAVING TOOLS

2. Thread production:

- Spinning is the operation during which the fibres are twisted in order to produce a continuous and solid thread that can be used on the loom.
- At earlier times, spinning would have probably been carried out by hand, without instruments. However, the use of tools allows the production of more thread in less time.
- The most common tools of thread production in ancient Greece were:
  - ✓ the spindle (*atraktos*),
  - ✓ the distaff (*hēlakatē*) and
  - ✓ the spindle-whorl (*sphondylos*).

https://artextiles.org/en/node/189

WEAVING TOOLS-THE SPINDLE

- The ***spindle*** is a simple, wooden rod at the bottom of which was inserted the spindle-whorl, a perforated circular weight of clay, stone, bone or wood.
- In Greece, spinning was carried out approximately in the same way, from prehistory to modern times. It consists in taking some fibres from the distaff, stretching them with the fingers and simultaneously twisting the spindle. With the double movement of the spindle and the fingers, the fibres are being stretched and twisted, thus forming a solid thread, which is wrapped around the spindle.

https://artextiles.org/en/node/189

Spindle whorls & bone batten

http://threads-of-time.carlos.emory.edu/spinning

WEAVING TOOLS-THE SPINDLE

- There are variations of this instrument in every period and culture. We find the spindle-whorl sometimes at the bottom, sometimes at the top, and other times at the middle of the spindle. In addition, the spindle-whorl was made of various materials, such as clay, stone, bone or wood and had different shapes: conical, biconical, cylindrical, spherical or, often in the shape of a fine, circular disk.
- Moreover, ethnological studies have shown that spinning was performed using different gestures in each society: the spindle, for example, instead of floating in the air, can also rest on the ground, inside a bowl or on the spinner's thigh and rotate in a supported position.

https://artextiles.org/en/node/189

WEAVING TOOLS-THE SPINDLE & BONE BATTEN

- Spindle whorls are small round or disk-like ceramic pieces, used for spinning loose fiber into thread. The spinner gradually fed loose cotton fiber onto the spindle and spun it like a top.
- Whorls could be decorated with various motifs, natural elements (the sun, flowers, etc.), or geometrical shapes.
- The bone batten (carved or simple) is another elaborate weaving tool. Its pointed ends used for picking up certain warps to create patterns and its wide blade for packing down wefts.

WEAVING TOOLS

- From prehistoric times, spindle-whorls from Troy and the Acropolis of Athens were famous for their quantity and decoration. The weight and diameter of spindle-whorls depended on the desired thickness of the threads.
- Spindles are rare finds in Greece because they were made of wood which is rarely preserved.
- However, two bone spindles from the 4th century B.C. have been discovered in Kerameikos.
- The spindle and spindle-whorl could be of precious materials, such as ivory and silver, like the famous “silver *hēlakatē*” of the Homeric Helen.

https://artextiles.org/en/node/189

WEAVING TOOLS

- The *distaff* is the wooden, forked rod that accommodates the raw material for spinning. It changes size depending on the raw material. In general, the distaff for wool is shorter than the one for flax and plant fibres.
- Raw materials, threads and tools were transported and stored in baskets (*kalathos*, *talaros*). As they were made of organic materials, they are rarely found in excavations. However, models of the 9th century B.C. ceramic baskets are exhibited in the Museum of the Agora.
- Another textile instrument depicted in ancient iconography is the *epinētron*, a clay knee protection of semi-cylindrical shape and coarse surface. It is positioned on the spinner's thigh and used for twisting fibres on its surface in order to make a first, coarse thread that would be later spun with the spindle.

https://artextiles.org/en/node/189

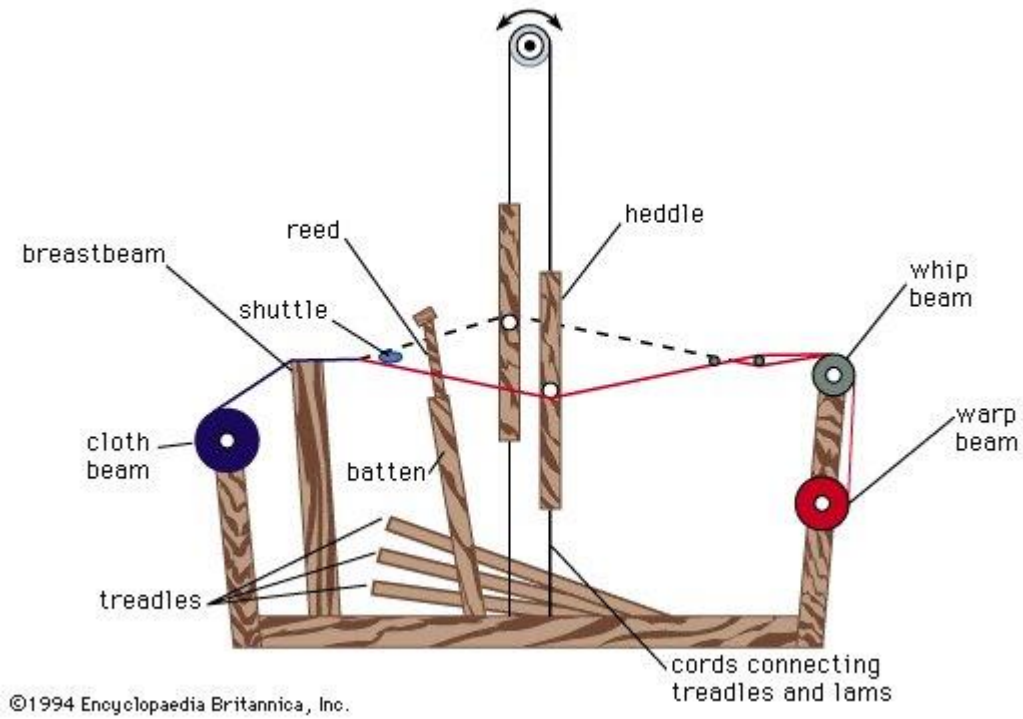
WEAVING TOOLS

3. Textile Production:

- The loom is a technological invention that facilitates the interweave of the warp and the weft in order to produce a cloth. The conception is that one thread system, the warp threads, have to be well taut, in order that the other system, the weft threads can be inserted quickly between the warps.
- In the eastern Mediterranean, there is archaeological evidence for two types of loom, depending on the period and the culture: the horizontal and the vertical loom.

https://artextiles.org/en/node/189

THE PARTS OF THE LOOM

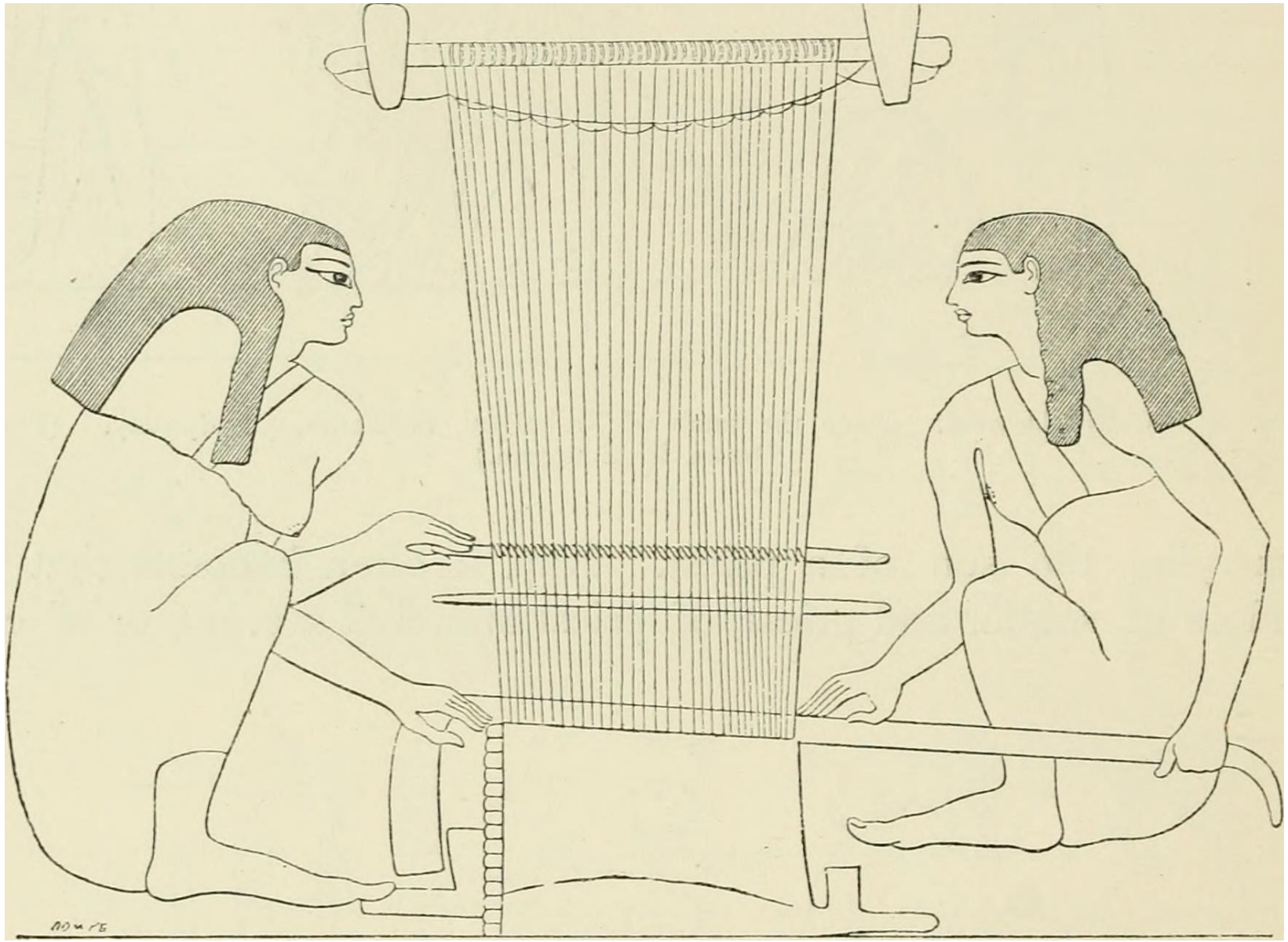


https://www.britannica.com/technology/loom

WEAVING TOOLS

- Around the 16th century B.C., a vertical loom with two rollers supported by a rectangular wooden frame appeared in Egypt.
- The weaver sat in front and worked in the lower part of the frame. The loom with the warp held in tension by stone and terracotta weights dates to the 12th century B.C.
- The looms could also be upright with a frame attached to a wall and the weaver standing in front. As the work progressed, the fabric produced was wound up in a roll at the top. Small clay weights were used to weigh down the ends of the warp. The fabric manufactured by this loom was of high quality.
- The raw material was held in a spinning basket. A rough, semi-cylindric clay, called an epinetron, was used to prepare the wool.

VERTICAL LOOM



https://www.artemorbida.com/brief-history-of-weaving/?lang=en

WEAVING TOOLS

- In Greece, the commonest textile production technique was weaving on the warp-weighted loom (*histos orthios*). At the same time, however, there were other textile production techniques in use, and each required specific tools.
- The warp weighted looms used by the ancient Greeks were of the oldest types. The first looms in Greece were probably developed during the Minoan period. The Minoans who lived in the Greek island of Crete between 3.000 and 1.600 B.C. had developed a complex culture, more advanced than other contemporary societies.
- In the vertical loom, used in Greece, the fabric was formed in the upper part and, with the help of rods, useful for lifting and lowering different warp threads, it greatly increased the possibilities of creating different decorative motifs.

https://artextiles.org/en/node/189

WEAVING TOOLS

- The warp-weighted loom is a simple construction made of two vertical wooden beams (*istopodes* or *keleontes*) stuck in the ground and connected by two other, finer beams. The first one is the modern anti (*antion*), positioned at the upper side of the loom and holding the cloth. The second one (*kairos*) is at the centre and divides the warp threads into groups depending on the weave in order to create the shed to insert the weft threads.
- The ends of the vertical warp threads were attached to small weights, the loom-weights (*laiai*) that kept the threads taut so that the wefts could pass between them. The loom-weights were usually made of clay or stone and had several sizes and shapes, imposed by functional or cultural factors, or both.
- The most common shapes of loom-weights in ancient Greece were the pyramidal, the conical, the trapezoid and the discoid. Loom-weights are a common archaeological find in Greece. As they were always used and stored in sets, they are usually discovered in smaller or larger groups.

https://artextiles.org/en/node/189

WEAVING TOOLS

- The weight of the loom-weights depends on the diameter of the warp threads. The finer the thread, the lighter the loom-weights.
- The width of the loom-weights (namely the distance between on two loom-weights) depends on the desired density of the cloth. The wider the loom-weights, the more open the cloth.
- The different shapes of loom-weights served different types and qualities of fabrics. In order to produce a very fine and dense fabric, weavers had to use a light and fine loom-weight, for example a discoid one. Thus, when a large quantity of very light loom-weights is discovered, we can be sure that they were used to produce very fine fabrics.

https://artextiles.org/en/node/189

ANCIENT WEAVING TOOLS

- The looms were upright with a frame attached to a wall and the weaver standing in front. As the work progressed the work was wound up in a roll at the top. Small clay weights were used to weigh down the ends of the warp. The results of this loom were of high quality
- There were no spinning wheels, but use was made of the distaff and spindle and whorl.
- The raw material was held in a spinning basket. A rough clay semicylinder called an epinetron was used to prepare the wool.
- The ancient Greeks used a vertical loom with the warp strings stretched with weights. The fabric was formed in the upper part and, with the help of rods, useful for lifting and lowering different warp threads, it greatly increased the possibilities of creating different decorative motifs.

WEAVING TOOLS

- It should be noted that both the vertical and the horizontal looms had more parts and tools usually made of wood that are not preserved.
- Iconography enriches our understanding of these instruments via depictions of looms in Archaic and Classical art.
- The detailed form and function of the prehistoric looms in Greece and their tools is less clear, since textile tools and production scenes were not depicted in iconography of the Neolithic and Bronze Age.

https://artextiles.org/en/node/189

ANCIENT WEAVING TOOLS

Side A: loom
University Museums,
University of Mississippi

Mississippi 1977.3.116

Perseus:image:1991.01.0286 (tufts.edu)

http://www.perseus.tufts.edu/hopper/image?img=1991.01.0286

WEAVING TOOLS

- Although there is no indication of evolution or change concerning the main style of loom used in ancient Greece, recent research indicates that the same tools and techniques were not used everywhere, nor across all periods.
- Spinning with a draft spindle in ancient Greece is attested through iconographic, written and archaeological evidence *(Tzachili-Douskou, 1997)*. This technique produces threads that vary from lightly to very tightly spun.
- Recovered spindle-whorls date back to the Early Neolithic period. At that time, the principal fibres used for weaving were sheep wool, goat hair, and flax (i.e., a fibrous plant used to make linen) *(Perlès, 2001)*.

WEAVING TOOLS - CLOTHING

- Initially, cloth was scarce and very valuable.
- Pictures which show ancient Minoan women wearing flounced skirts are deceptive. Because of the difficulty of weaving without a loom these skirts were probably not made of cloth. They were probably made just of string. The material used in clothing should have been a minimum. The loom probably increased the quality and decreased the cost of the cloth made.
- After the loom was invented clothing covered more of the body, but since the loom produced cloth that was rectangular the clothing also had that shape. Since weaving was always the work of women it seems likely that a woman invented the loom.

WEAVING TOOLS - CLOTHING

- Minoans' garments were more elaborate in very much the same way that modern garments are made. Unlike the classical Greeks who followed them hundreds of years later, the Minoans wore skirts and blouses that were shaped to the body of the wearer.
- Men's and women's clothing from Minoan era are depicted in fresco art paintings within various aspects of society, such as child rearing, ritual or religious participation and worshiping, and social activities.

WEAVING TOOLS

Hagia Triada sarcophagus (and detail - right), circa 1400 B.C.
Limestone and fresco

Archaeological Museum of Heraklion

https://brewminate.com/ancient-minoan-burial-rituals-reading-the-hagia-triada-sarcophagus/

WEAVING TOOLS - CLOTHING

https://brewminate.com/ancient-minoan-burial-rituals-reading-the-hagia-triada-sarcophagus/

- The Hagia Triada sarcophagus is the only Minoan sarcophagus known to be entirely painted.
- One of the long sides is the most complete and shows a funeral procession of offering bearers and a libation ceremony that features seven figures—two women and five men.
- From the far left, we see a female in profile facing left, dressed in an elaborate hide skirt and open short-sleeved shirt, holding a vessel in both hands while pouring the contents into a larger vessel which is resting on a stone platform between two poles. The poles are set on richly-veined stone bases and are topped with double axes surmounted by birds.
- Behind the woman pouring is another woman, and behind her, a man. The second woman, who is also elaborately robed and wears a crown of lilies, carries on her shoulders a pole that supports two vessels identical to the one being used for pouring by the first female. The man behind her plays a lyre and is also elaborately robed.

WEAVING TOOLS

4. Finishing:

- This is the last stage of preparation of the cloth before its use.
- In this stage, the fullers (*knapheis*) had the first role and carried out a series of activities in specific workshops and using a variety of tools. After fabrics were washed and fulled with the feet to soften and felt the fibres, they were left to dry. Fullers were also responsible for pleating fabrics using a special press (*ipos*) and create the permanent pleats depicted in ancient iconography.
- Finally, the decorative techniques used after weaving, such as embroidery, also required a set of tools, like varieties of needles of different sizes (*belonis*, *rhaphis*), also necessary for sewing.

https://artextiles.org/en/node/189

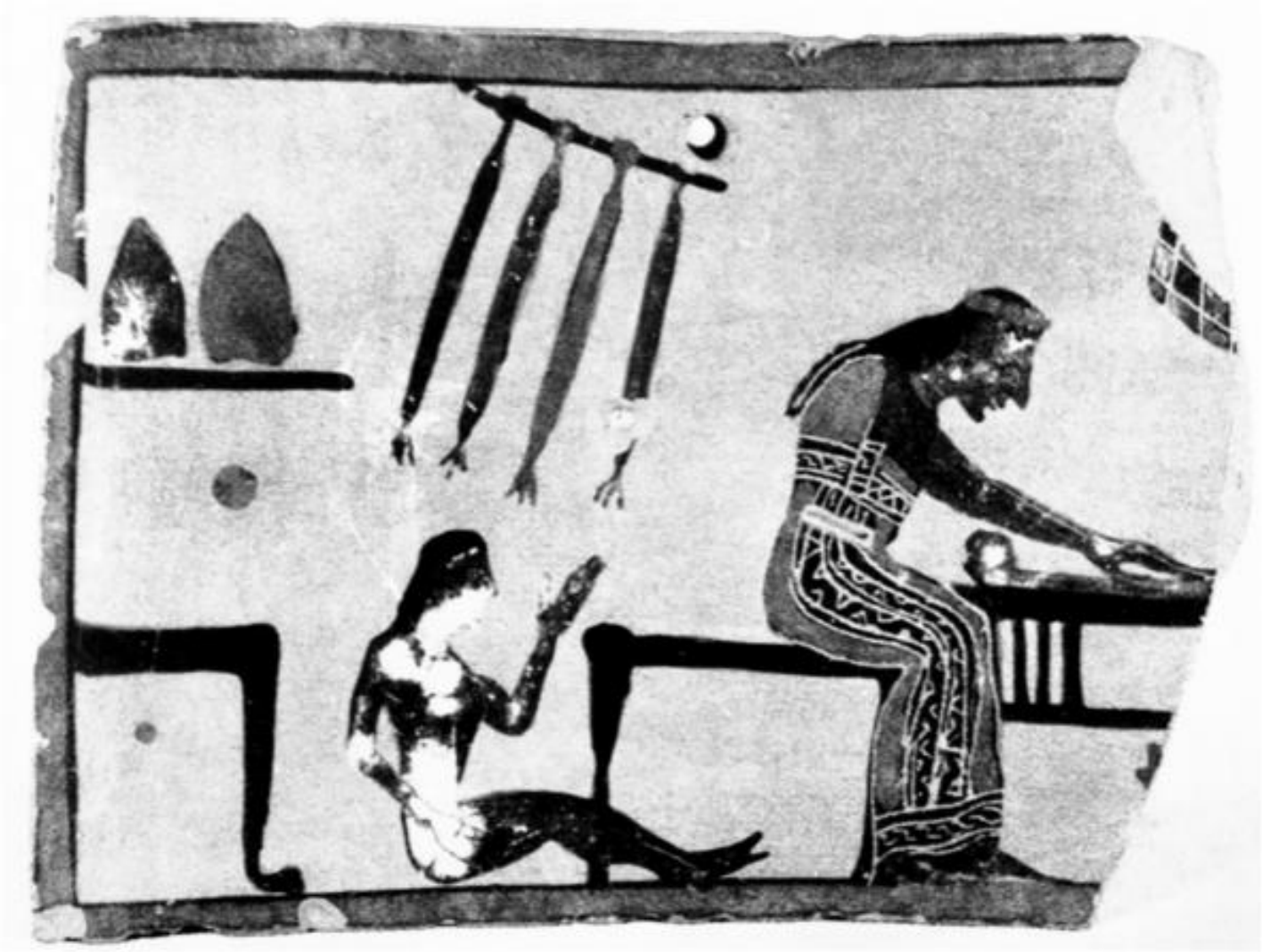
THE EVOLUTION OF WEAVING

- Weaving was an important tradition for women in every part and civilisation of Ancient Greece. Textiles were extremely valuable and spinning and weaving of wool and flax were not only necessary skills for a woman to possess, but also highly respected skills.
- In the Mycenean Culture weaving produced one of the major exports and women who could weave were in high demand. Weaving was also an occupation of the ladies of the highest status.
- Generally, in Ancient Greece, the art of weaving and the creation of textiles related to women and their home, called '*oikos*', as it is often presented in iconography. Thus, there are several scenes depicting women spinning and weaving on the loom.
- In his book *Oeconomicus*, the historian Xenophon has his character, Isomakhos, explain the running of the ideal household to his young wife. The ideal wife is likened to a queen bee. She is to teach slave women how to spin and how to weave by standing in front of the loom herself.

THE EVOLUTION OF WEAVING

A blackfigure Attic plaque dated to the 6th century BC depicts a woman weaving at a horizontal loom while a girl sits and plays behind her

National Archaeological Museum, Athens



THE EVOLUTION OF WEAVING

- For an Athenian citizen woman, weaving was simultaneously the mark of a good wife, a religious duty, a domestic responsibility, her traditional role, and, of course, a contribution to the oikos.
- However, relatively recent studies suggest that professional men in commerce also participated in the manufacture of textiles.
- Based on written sources from the 5th and 4th centuries B.C., it could be suggested that there were two different “spheres” of activity: at home and in the workshops.
- At home, only women, both free and slaves, were involved in every stage of textile production, from the preparation of the raw materials to the tailoring of garments, while in the workshops, men were responsible for the textile production.

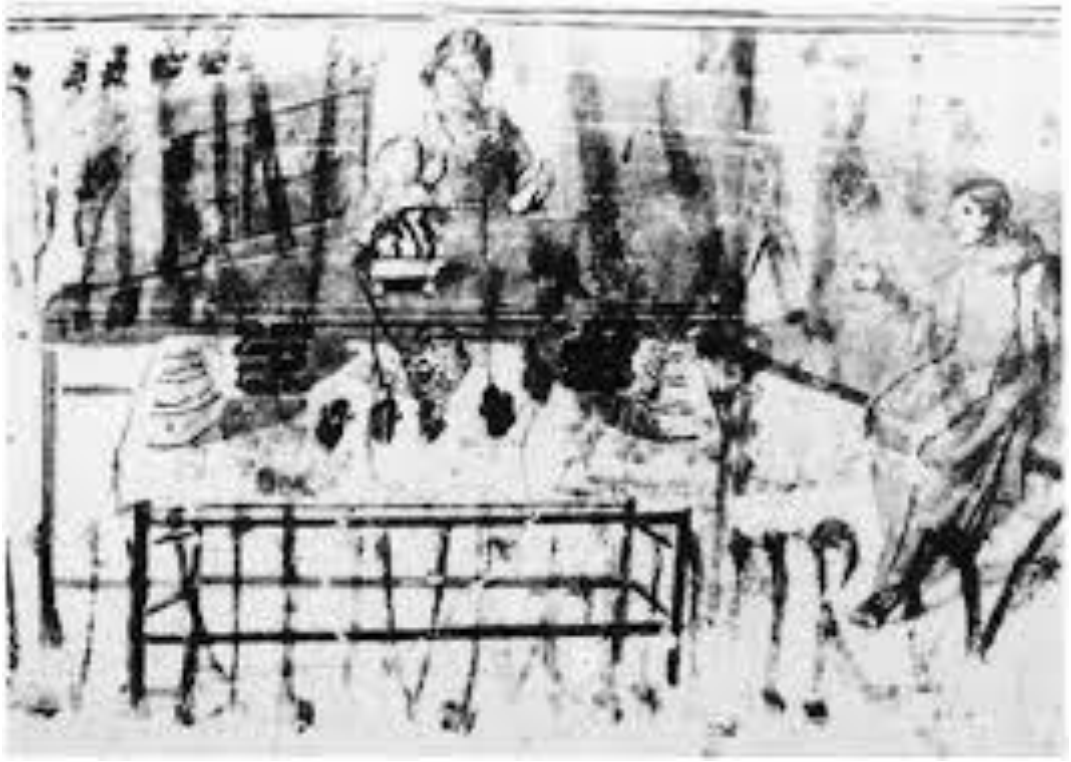
Spantidaki, 2016

THE EVOLUTION OF WEAVING

- Textile production was a vital part of the Roman economy. Textiles were professionally manufactured and exported throughout the Mediterranean world.
- Women in Rome were involved in the last phases of the textile process, while the men were responsible for the more physically demanding jobs.
- The carding, combing, spinning and weaving of wool were part of daily housekeeping for most women.
- Women of middle or low income could supplement their personal or family income by spinning and selling yarn, or by weaving fabric for sale.
- Iconographic and epigraphic inscriptions mention that spinners were mainly women. They could also be involved in the sales of the textiles.
- Men were usually the wool-weighers in charge of weighing the daily amount of wool given out.
- This is demonstrated on a wall painting at the entrance of a shop in Pompeii. The wall painting depicts a woman selling textiles to a customer and managing the shop on the left side of the entrance, and men working with textiles on the right side

Wilson & Flohr, 2016

THE EVOLUTION OF WEAVING



Pompeii, workshop IX 7, 7, painting on left side of the entrance showing women selling textiles (Soprintendenza Archeologica di Pompei,

Pompeii workshop IX 7, 7, painting on right side of the showing men in the production of textiles (Soprintendenza Archeologica di Pompei,

THE EVOLUTION OF WEAVING

- Clothing in ancient Rome generally comprised a short-sleeved or sleeveless, knee-length tunic for men and boys, and a longer, usually sleeved tunic for women and girls.
- Most clothing was simple in form and its production required minimal cutting and tailoring, but all was produced by hand and every process required skill, knowledge and time.
- Spinning and weaving were thought virtuous occupations for Roman women of all classes. Wealthy matrons, including Augustus' wife Livia, might show their traditionalist values by producing home-spun clothing, but most men and women who could afford to buy their clothing from specialist artisans.
- High-caste brides were expected to make their own wedding garments, using a traditional vertical loom.

Gleba & Pásztókai-Szeőke, 2013; Sebesta & Bonfante, 1994

THE EVOLUTION OF WEAVING

- The manufacture and trade of clothing and the supply of its raw materials made an important contribution to Rome's economy.
- Relative to the overall basic cost of living, even simple clothing was expensive, and was recycled many times down the social scale.
- Quite often, laws were passed designed to limit public displays of personal wealth. However, they were not particularly successful, as the wealthy elite loved luxurious and fashionable clothing.
- Exotic fabrics were available, at a price; silk damasks, translucent gauzes, cloth of gold, and intricate embroideries. Vivid, expensive dyes, such as saffron yellow or Tyrian purple were used.
- Not all dyes were costly, and most Romans wore colourful clothing. Clean, bright clothing was a mark of respectability and status among all social classes.
- The fastenings and brooches used to secure garments, such as cloaks, provided further opportunities for personal embellishment and display.

Gleba & Pásztókai-Szeőke, 2013; Sebesta & Bonfante, 1994

THE EVOLUTION OF WEAVING

A maenad wearing a silk gown. A Roman fresco from the Casa del Naviglio in Pompeii, 1st century AD

Sebesta & Bonfante, 1994

THE EVOLUTION OF WEAVING

- As the Roman empire dissolved around the 4th century A.D., emperor Constantine the Great consolidated power in Byzantium, creating the Byzantine Empire, with Constantinople as its capital. For centuries, Constantinople was famous for its power, its wealth, and especially its clothing.
- Constantinople was located on the eastern edge of the Mediterranean region, situated at the crossroads of Europe, Asia, and the Middle East. As a result, it controlled some of the most important trade networks in the world and became extraordinarily wealthy.
- Visitors to Constantinople often remarked on the finery of everyone's clothes that were made from the finest silks and coloured with purples and golds, colors traditionally reserved for royalty.

https://study.com/academy/lesson/byzantine-textiles-characteristics-history.html

THE EVOLUTION OF WEAVING

- Textiles were highly deemed by the Byzantines. Thus, large amounts of money waw invested in the textile industry.
- Byzantines considered textiles to be a form of high art, such as painting, architecture, and sculpture.
- Textiles were used by the wealthy to display their status. Many textiles followed the conventions of Byzantine paintings and mosaics as well, characterized by flat gold backgrounds and bold lines.
- Amongst the greatest patrons of textiles was the Church. The Byzantine Church, later called the Greek Orthodox Church, was incredibly rich and powerful. Priests and churches were often decorated by elaborate textiles with religious images. Most of the Byzantine textiles that have survived to the present are liturgical garments used in Church rituals.

https://study.com/academy/lesson/byzantine-textiles-characteristics-history.html

THE EVOLUTION OF WEAVING

- Byzantine textiles were woven, created on specialized looms that were adopted from Asia.
- The most luxurious textiles, and those that really defined Byzantine wealth, were woven with silk.
- For a long time, the Chinese controlled the secrets to silk production, and the Byzantines had to purchase the raw silk from China. Around the 6th century, Byzantine monks sent by the emperor Justinian managed to smuggle silk-worm eggs out of China.
- By the 7th century, the Byzantines could produce their own silk and refined the technique to match their own needs.
- From the paintings, we can see that Byzantine textiles had vibrant colours, such as red, blue, orange and purple. This shows a highly developed control of the dye processes and procedures, that used only plant dyes.

https://nazmiyalantiquerugs.com/blog/antique-byzantine-art-textiles/#:~:text=Antique%20Artistic%20Byzantine%20Textiles%20It%20is%20easy%20to,developed%20control%20of%20the%20dye%20processes%20and%20procedures.

THE EVOLUTION OF WEAVING

- Currently, one of the largest collections of Byzantine art textiles in the world is housed in the Byzantine and Christian Museum in Athens, Greece.
- This museum hosts about 1,000 antique textile pieces dating from the 5th to the 12th centuries.
- One of the things that stands out the most about this collection is the level of fine detail and advanced textile weaving techniques that were used, particularly in objects intended to be used for religious purposes.

THE EVOLUTION OF WEAVING

The mosaic of Emperor Justinian and his retinue. 526-547.
Mosaic, Ravenna, Italy: San Vitale Basilica.

https://fashionhistory.fitnyc.edu/tablion/

THE EVOLUTION OF WEAVING

A 14th-century icon. The martyr wears four layers, all patterned and richly trimmed: a cloak with tablion over a short dalmatic, another layer, and a tunic

https://en.wikipedia.org/wiki/Byzantine_dress

THE EVOLUTION OF WEAVING

Archibishop's Garment
Red silk (exterior surface) and linen (interior surface) - Embroidered figures of saints, prophets, Virgin Mary, and Christ

Byzantine and Christian National Museum, Athens

https://www.ebyzantinemuseum.gr/?i=bxm.el.exhibit&id=201

THE EVOLUTION OF WEAVING

- In the early Middle Ages, most weaving was done at home for the family's own use.
- In the late Middle Ages, most weaving was commercial, carried out as a full-time craft by professionals.
- The loom, mostly used across Europe, until the 12th century, was the vertical frame loom. It could weave a piece of cloth as large as the frame.
- Textiles for clothing and other necessities, as well as cultural tradition, varied across the centuries of the Middle Ages and the countries of Europe.
- Various fabrics, such as taffeta, velvet, and damask were made from textiles like silk, cotton, and linen using specific weaving techniques.
- There are exceedingly few garments surviving from the Middle Ages. Statues, paintings, manuscripts, tomb effigies, and tapestries depict the medieval clothing.
- Clothing was the easiest way to identify someone's status and station in life. Throughout the medieval era, but especially in the later Middle Ages, laws were passed to regulate what could and could not be worn by members of different social classes.

https://www.thoughtco.com/medieval-clothing-and-fabrics-1788613

THE EVOLUTION OF WEAVING

A loom with four pedals, from the 15th century

Mendel Foundation Housebook, Nuremberg

https://medievalshroud.com/the-medieval-weave/

THE EVOLUTION OF WEAVING

- Dyes came from a lot of different natural sources, such as plants, roots, lichen, tree bark, nuts, mollusks, iron oxide, etc. Some of them were very expensive, raising the price of the textiles. Thus, clothing made from an undyed fabric in various shades of beige and off-white was not uncommon among the poorest folk.
- A dyed fabric would fade fairly quickly if it wasn't mixed with a mordant, and bolder shades required either longer dyeing times or more expensive dyes. Thus, the fabrics with the brightest and richest colors cost more and were, therefore, most often found on the nobility and the very rich.
- One natural dye that did not require a mordant was *woad*, a flowering plant that yielded a dark blue dye. Woad was used so extensively in both professional and home dyeing that it became known as "Dyer's Woad," and garments of a variety of blue shades could be found on people of virtually every level of society.

https://www.thoughtco.com/medieval-clothing-and-fabrics-1788613

THE EVOLUTION OF WEAVING

- In the Middle Ages, the thriving textile and weaving trade resulted in the creation of more jobs and the development of corresponding guilds.
- Workers in the cloth trade were:
  - ✓ Dyers – who dyed threads and textiles
  - ✓ Spinners – who spun (e.g., the woolen fleece into yarn)
  - ✓ Weavers – who wove the threads into lengths of cloth
  - ✓ Fullers – who washed and stretched the finished fabric
  - ✓ Drapers – who sold woven fabrics
  - ✓ Tailors – who made the fabric into clothes
- Workers would take the name of their trade. Thus, in the United Kingdom, Weaver, Fuller, Taylor, and Draper are typical surnames that have survived into modern times, even though people no longer work in the old trades.

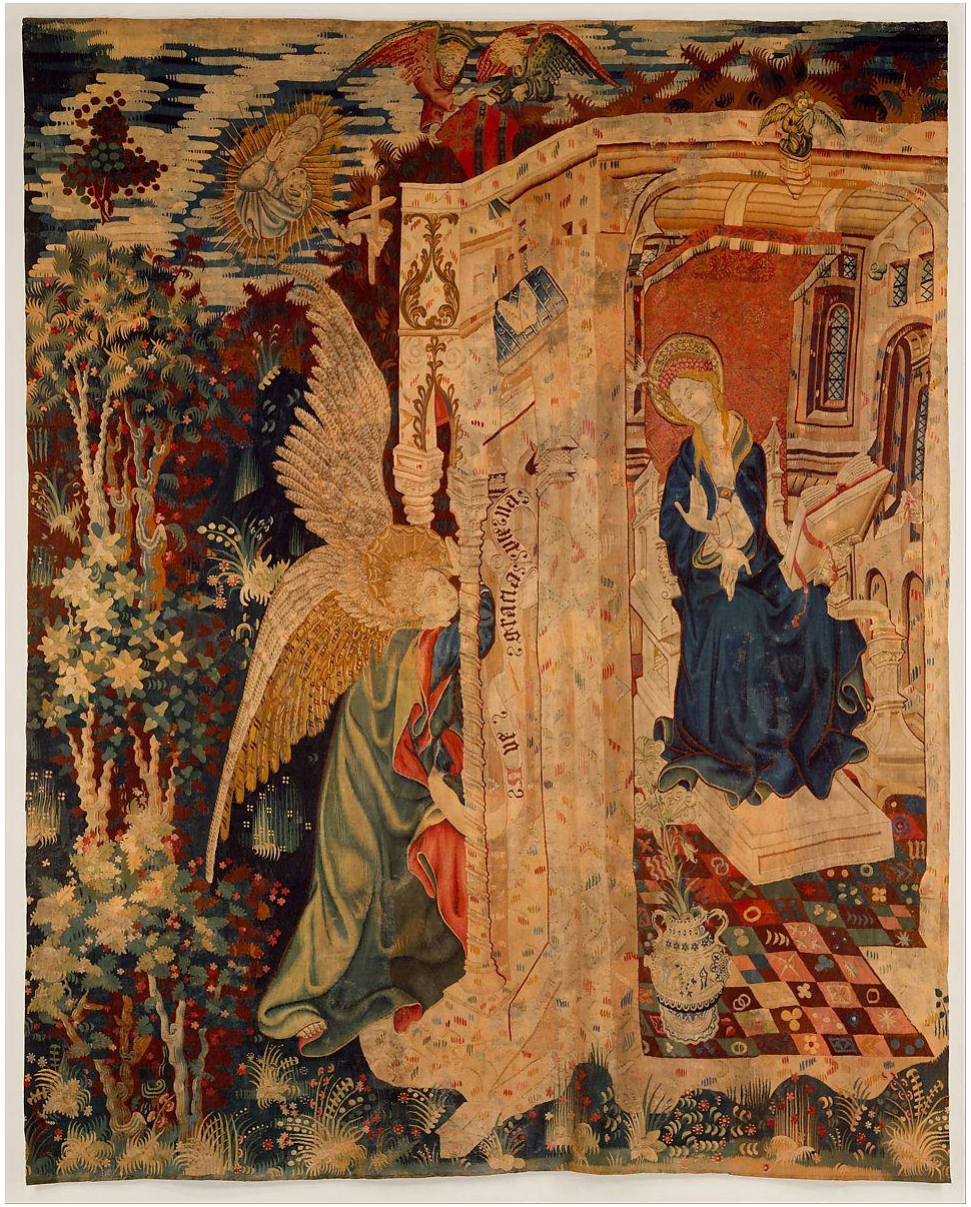
THE EVOLUTION OF WEAVING

- **Tapestries** were always present in the castles and churches of the late medieval and Renaissance eras. They provided a form of insulation and decoration that could be easily transported.
- The process of tapestry weaving enabled the creation of complex figurative images. While much production was relatively coarse, intended for decorative purposes, wealthy patrons could commission specific designs, enriched with silk and gilt metallic threads.
- From the early fourteenth century, workshops producing simple, small-scale figurative tapestries flourished.
- However, in the towns of northern France and in the Low Countries, bigger workshops, with skilled weavers and dyers, produced large amounts of high-quality tapestries and exported them throughout Europe.

THE EVOLUTION OF WEAVING

Tapestry with the Annunciation
ca. 1410–20

South Netherlandish
Wool warp, wool with a few metallic wefts



https://www.metmuseum.org/art/collection/search/468106

THE EVOLUTION OF WEAVING

Fragment of a Tapestry or Wall Hanging
ca. 1420–1430
The Cloisters Collection, 1990

Made in Basel, Switzerland
Tapestry weave: wool on linen

https://www.metmuseum.org/art/collection/search/466178

THE EVOLUTION OF WEAVING

- During the 17th century, the trade increased between different countries, resulting in the exchange of different textiles and patterns between cultures.
- For example, the textile industry in the United Kingdom, was influenced by the Asian traditions (e.g., the coloured patterns from India).
- In France, woven silk and velvet textiles were in high demand by the nobility. Lyon in France became the centre of luxurious silk textile production.
- In 1685, after the religious truce, called *the Edict of Nantes*, many French Protestants left France for England, Germany, and the Netherlands, taking the knowledge of weaving silk textiles with them.
- Along with the weaving tradition, European textiles were recognised for their lace and embroidery. Slippers, purses, handkerchiefs, and chemises were a few of the embroidered goods made popular throughout Europe. Sometimes, weavers cut slashes in cloth and sewed in buttons as decoration.

THE EVOLUTION OF WEAVING

- Before the Industrial Revolution, textile merchants contracted out work to local workshops or women who weaved at home. Textiles and clothing were produced on a relatively small-scale and then sold to the public through merchants. As a result, every piece of clothing was different and unique.
- As the industrial revolution approached, the production and use of manufactured goods changed. Weaving was forced to respond to large-scale production demands. Thus, there was a need for a speeding-up of weaving process by trying to mechanize the action of the loom.

THE EVOLUTION OF WEAVING

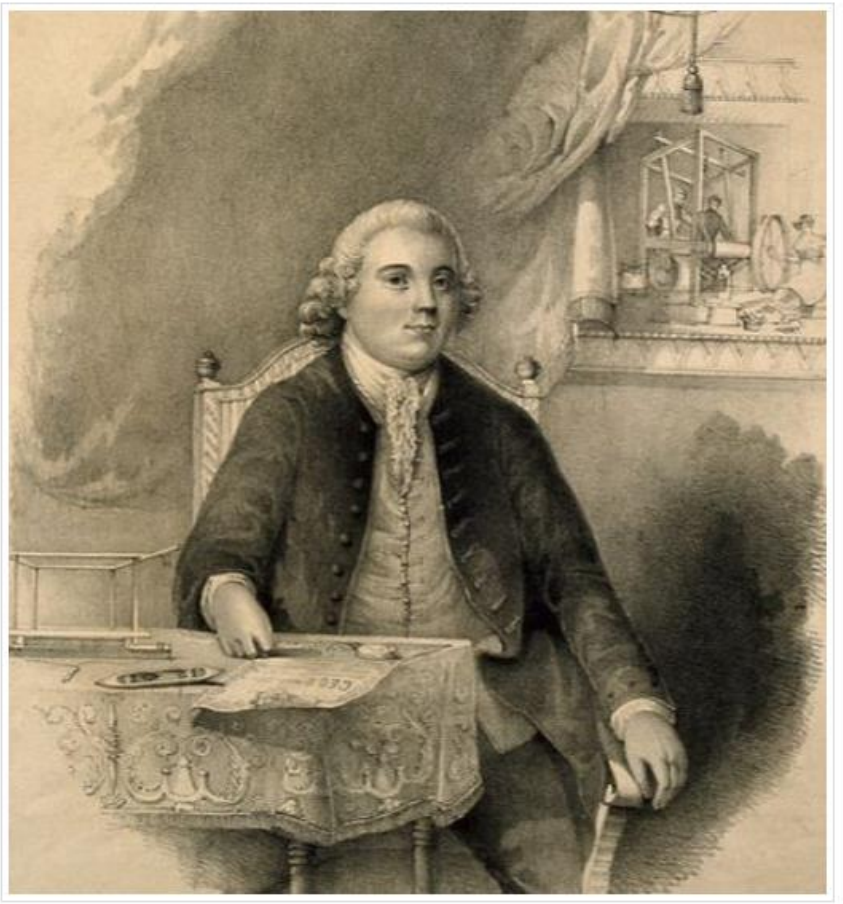
- Throughout the 18th century, certain inventions made textile production more efficient.
- In 1733, an Englishman from Bury, John Kay, patented the *Flying Shuttle*, a device used for weaving yarn together to make wider fabric. A fly shuttle is a long, narrow canoe-shaped instrument, usually made of wood, which holds the bobbin. Its invention significantly increased the output of textiles from yarn, especially once it was converted into an automatic, mechanized loom.
- In 1764 James Hargreaves invented the *Spinning Jenny*, a machine used to produce yarn from fibers. The Spinning Jenny was the first practical spinning device containing multiple spindles.
- By the 1780s, power looms were remarkably advanced. They could produce more fabric than a single individual could just a few decades before. At that time, looms were powered by water and steam. High quality, durable clothing could be mass produced, and was made increasingly affordable to the middle class.

THE EVOLUTION OF WEAVING

John Kay and his invention, the Flying Shuttle.

A fly shuttle is a long, narrow canoe-shaped instrument, usually made of wood, which holds the bobbin.

https://www.historycrunch.com/flying-shuttle-invention-in-the-industrial-revolution.html#/



John Kay

Flying Shuttle

THE EVOLUTION OF WEAVING

James Hargreaves invented the Spinning Jenny.

The Spinning Jenny was a spinning device containing multiple spindles.

https://www.gettyimages.it/immagine/james-hargreaves-spinning-jenny

THE EVOLUTION OF WEAVING

- The first factories for weaving were built in 1785. **Industrial revolution switched weaving from hand to machine.**
- Jacquard loom was invented in about 1803. It could be programmed with punch cards which enabled faster weaving of complicated patterns. Jacquard built a weaving machine to be applied to the loom, which allowed the automatic movement of the single warp threads by means of a perforated card.
- The Jacquard loom is the most important invention in the textile sector, because it allows the production of very complex fabrics; it reduces the need for manpower because it replaces the heddles, originally the weaver had to be assisted by a helper, who had to manually move the heddles.

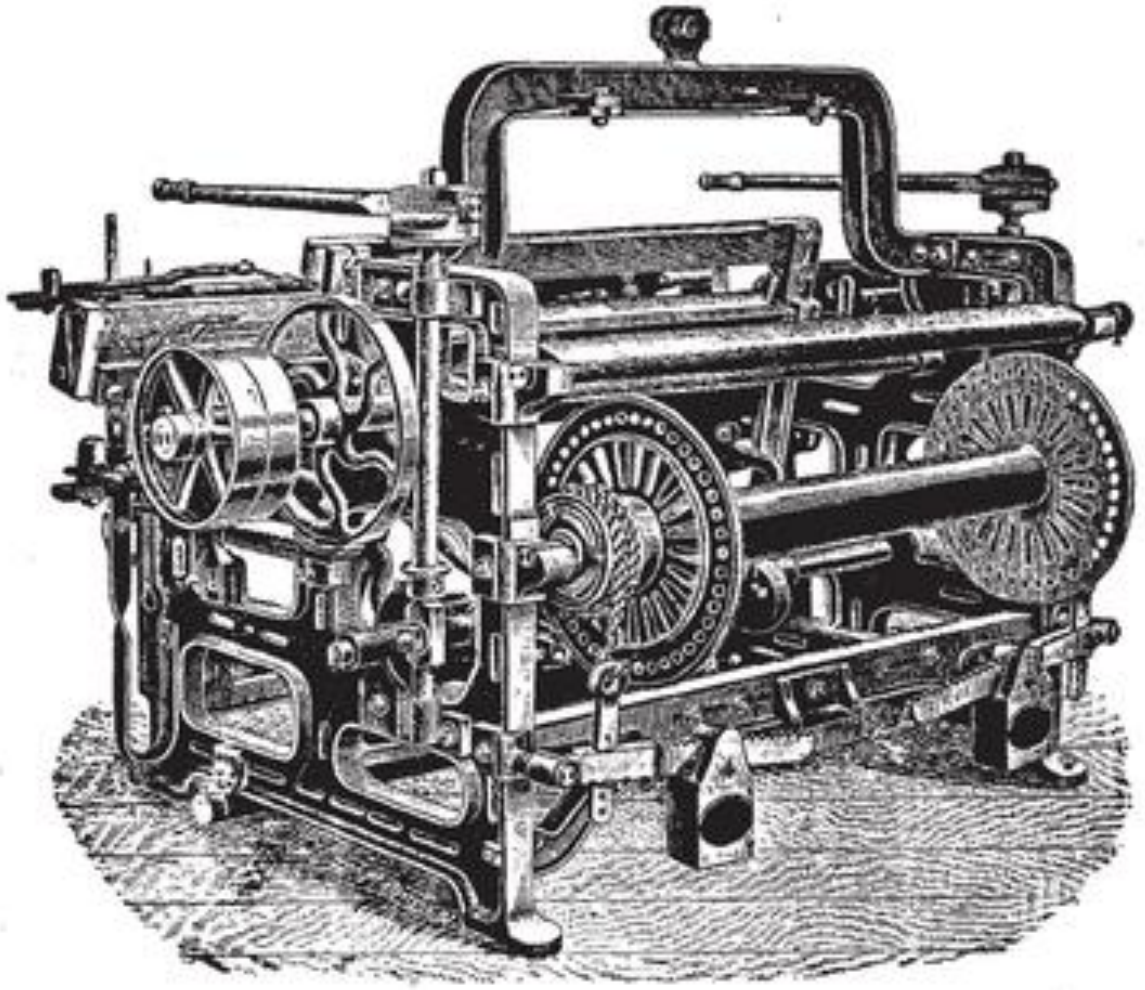
THE EVOLUTION OF WEAVING

- Despite being innovative, the new Jacquard loom was not well received. Its spread was long opposed by the weavers themselves for fear of losing their jobs, and even the Council of the City of Lyon ordered its destruction.
- However, by 1812 there were already 11,000 Jacquard looms in operation in France; ten years later, it was widespread in most of the world: England, Italy, Germany, America, and even China.
- White fabrics were printed mechanically with natural dyes at first with synthetic dyes coming in the second half of the 19th century.

THE EVOLUTION OF WEAVING

Power Loom – Industrial Revolution

https://industrialrevolutioninventions7.weebly.com/power-loom.html



THE EVOLUTION OF WEAVING

https://www.artemorbida.com/brief-history-of-weaving/?lang=en

THE EVOLUTION OF WEAVING

- Early textile innovations quickly spread to North America. The man that played a particularly significant role in this transmission was Samuel Slater (1768-1835), known as the 'Father of the American Industrial Revolution', because he brought British textile technology to the United States. As there were laws forbidding the exportation of British textile machines, British-born Slater memorized the designs and workings of textile machines and immigrated to the United States where he replicated these technologies. Because of this, he was regarded by the British as 'Slater the Traitor.'
- Slater set up a mill in Rhode Island in the 1790s, creating what has come to be known as the 'Rhode Island System.' This system was modeled on traditional New England family life, and whole families worked together at the mill.
- In the early 1800s, New England was the center of American textile manufacturing. Many mills were located along waterways. In many cases, textile mills developed into full-fledged towns as schools and other social institutions were built nearby.

THE EVOLUTION OF WEAVING

https://searchinginhistory.blogspot.com/2015/01/samuel-slater-father-of-american.html

THE EVOLUTION OF WEAVING

- The technological innovations in cloth production made during the Industrial Revolution dramatically changed the role of the weaver. Large volumes of inexpensive cloth were now readily available. Weaving had been changed to a manufacturing industry. Textile workers were among the founders of the modern labour movements.
- Today most of our textile needs are supplied by commercially woven cloth. A large and complex cloth making industry uses automated machines to produce our textiles.
- Although nowadays weaving has become a mechanized process, there are still people who practice hand weaving.There are artisans making cloth on hand looms, in home studios or small weaving businesses, who keep alive the skills and traditions of the early weavers.
- Textile weaving is almost as old as civilization itself, and it is still practiced around the globe.

THE EVOLUTION OF WEAVING

From wool to woven textile - video
http://eprl.korinthos.uop.gr/openwebquest/view/resources.php?wq=1295

THE EVOLUTION OF WEAVING

Loom tradition in Crete – video
https://www.youtube.com/watch?v=3KgTh8Vs6IA

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Time for questions…

http://clipart-library.com/clipart/kcMKrBg5i.htm

https://www.dreamstime.com/stock-illustration-stickman-question-bulb-answer-white-background-image51960894

QUESTIONS

- Why are there few archaeological finds regarding textiles and weaving tools?
- Which are the two most common forms of archaeological textile preservation?
- As there are few finds in the archaeological excavations, where do we get the information regarding the textiles and the clothes used in past eras?
- Could you name some weaving tools?

QUESTIONS

- Could you name the stages of the textile production? Can you name some tools according to each stage?
- Could you describe the woven textiles and the clothing in the Roman and the Byzantine Empire?
- What do you remember about the tapestry?
- Can you name some European countries that are known for their textile production?
- Can you name some of the inventions that made textile manufacturing more efficient?