The Golden Thread by Kassia St Clair

page 21 The First Weavers

An outside view of the Dzudzuana Cave.

These Vintage Threads Are 30,000 Years Old

In Dzudzuana cave, located in Georgia, archeologists found the oldest colorful flax fibers on earth, dating back to 36,000.

page 30 Beyond Dzudzuana

Ancient spindle whorl pictures

Spindle whorl Sumerian Early

Spinning and Weaving in Ancient Greece

Archaeologists found five human skeletons, harpoons, and nets that are some of the oldest known textiles in Devil's Gate Cave in far east Russia. The textile remains were directly dated to around 9400-8400 BP, the earliest evidence in the archaeological record for textile remains from East Asia.[1] As spindle whorls were not found in the cave, and also rarely found in contemporary East Asian sites, archaeologists postulate that the people at Chertovy Vorota either produced their textiles by hand or through the use of warp-weighted looms.[1]

In a move that would horrify most historians and the general public, Pettigrew was called to assist Belzoni in unwrapping a mummy and this he did at private events for decades afterwards. The Victorians loved the theatrics of this gruesome and destructive form of exploring the past (and according to Jay Hulme, unwrapping the mummies may have been motivated by a belief of his that they were white. Sigh.)

Examination of a Mummy by Paul Dominque Philippoteaux, 1891.

Preservation? Be damned. Back when carefully analysing the past basically resembled opening these poor dead Egyptians like a walnut at Christmas, Pettigrew himself states in his 1834 book about mummies:

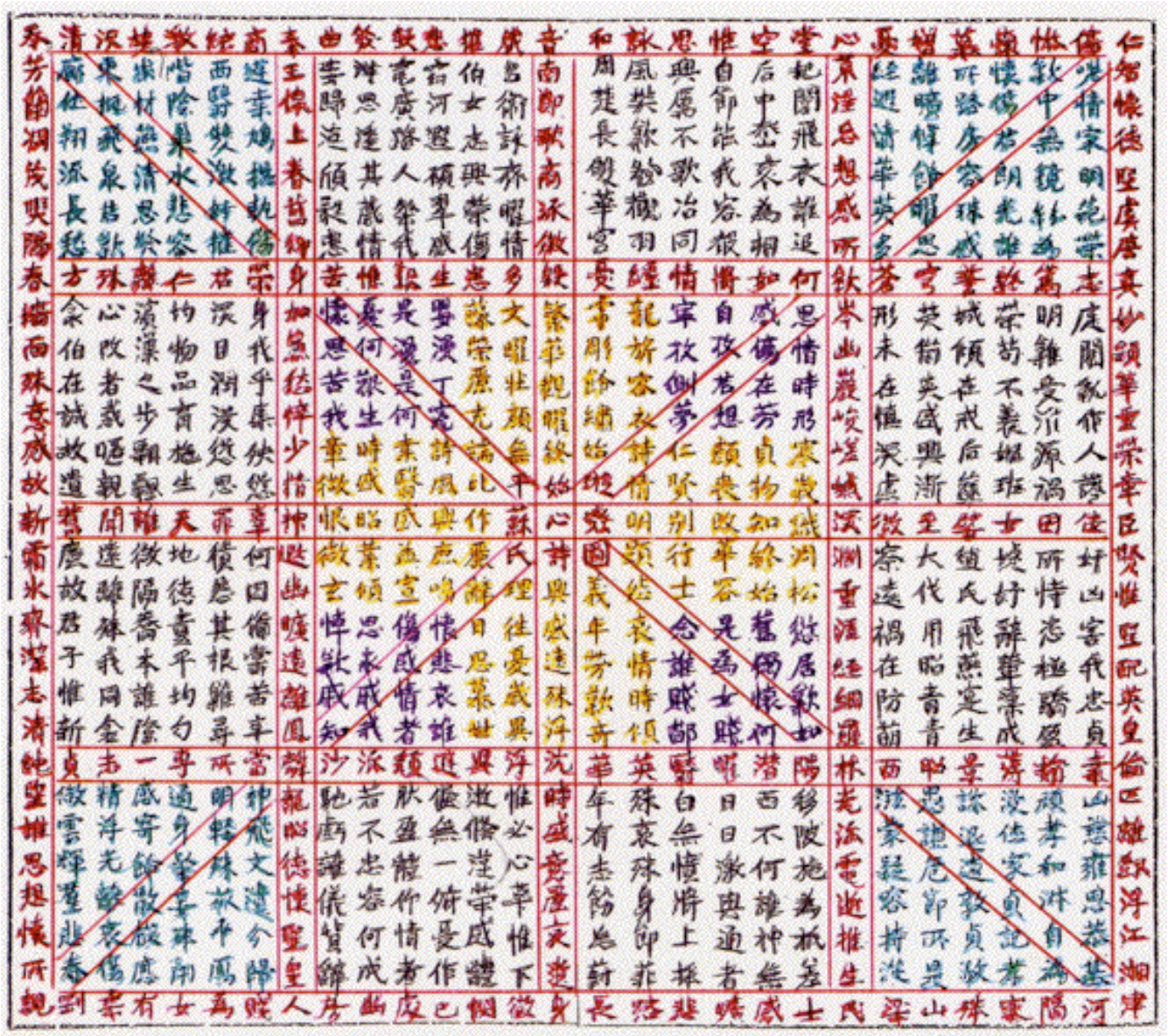
> "…(it) required considerable force to separate the layers of bandage from the body…..and levers were absolutely necessary to raise the bandages and develop the body…"

This approach, thankfully, was not seen as professional and an anonynous author in the 'Figaro in London' wrote:

> "Pettigrew positively glories in the unclean process and pulls about the encrusted carcass with a fervour of purpose which may be scientific, but is nonetheless nasty in the extreme…"

Text: Su Hui's matrix poem, Star Gauge

Poet Su Hui was alive from 365-427 C.E. Her palindrome poems could be read forward, backward, horizontally, vertically, and diagonally; the 841 characters could be read a total of 2,848 different ways.



page 60 The Sound of Rain on Leaves

Silkworms on Mulberry leaves

Silk Moth (Bombyx mori)

Frames with silk worm cocoons

Silk farmer cultivating silkworms

Chinese woman at a silk farm, using the ancient technique for unwinding and reeling silk threads by immersing silkworm cocoons in water.

Silk strands reeled from silk coocoons.

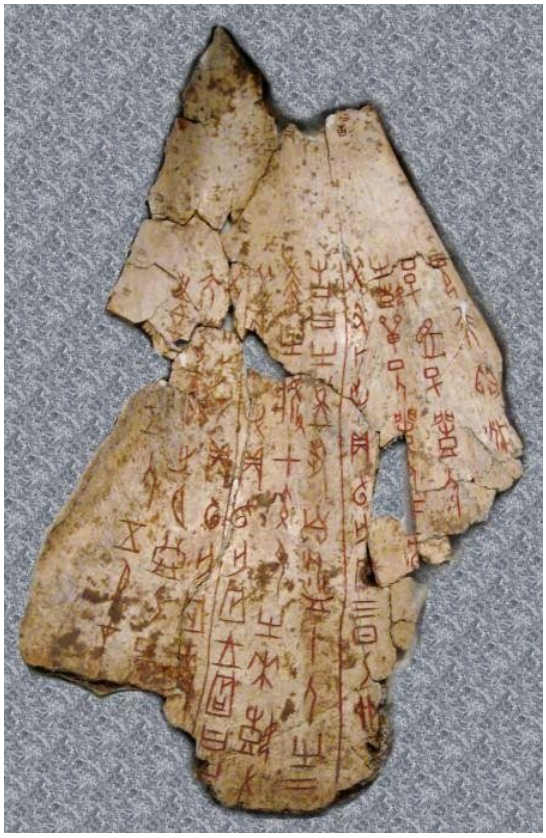
To harvest the silk, the cocoon is immersed in boiling water. This process kills the silkworm pupae, but also frees the silk filaments from the tightly wound cocoon and readies them for reeling. From here, each strand is combined with strands from other cocoons to create a single thread of silk that can be used to create textiles. One thread contains up to 48 silk filaments which is then wound onto a reel, ready to be dyed.

The painting **"Court Ladies Preparing Newly Woven Silk"** belongs to the Museum of Fine Arts Boston in the United States. It is not the original, but a copy rendered by Emperor Huizong (1082-1135). Shinu hua, or painting of women of elite society or courtesan class, prevailed in the Tang Dynasty (AD 618-907) and has remained a popular branch in traditional Chinese painting.

Page 64 Oracle Bone Script

Oracle bone script was the form of Chinese characters used on oracle bones - animal bones or turtle plastrons used in pyromantic divination - in the late 2nd millennium BC, and is the earliest known form of Chinese writing. The vast majority, amounting to over 50,000 inscribed items, were found at the Yinxu site.

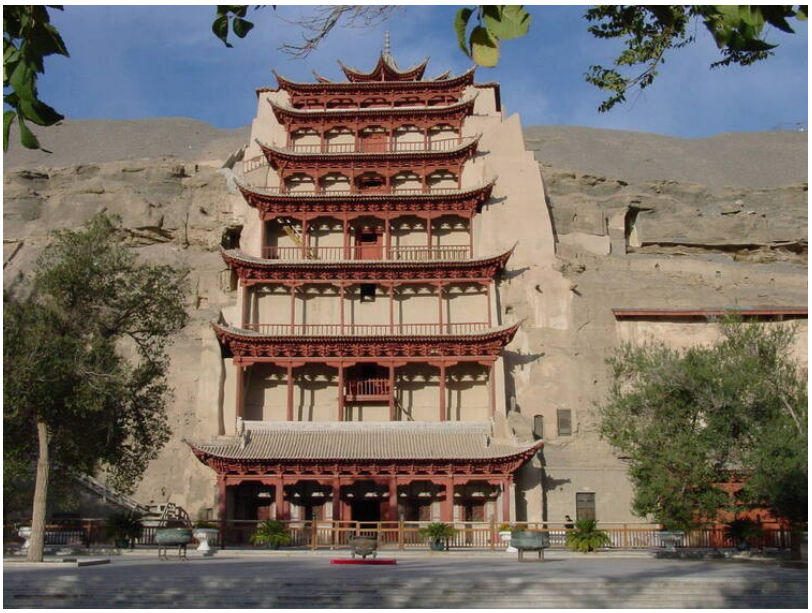
Oracle bone from the reign of King Wu Ding (late Shang dynasty). c. 1200 BCE.



page 66 - dragon robe

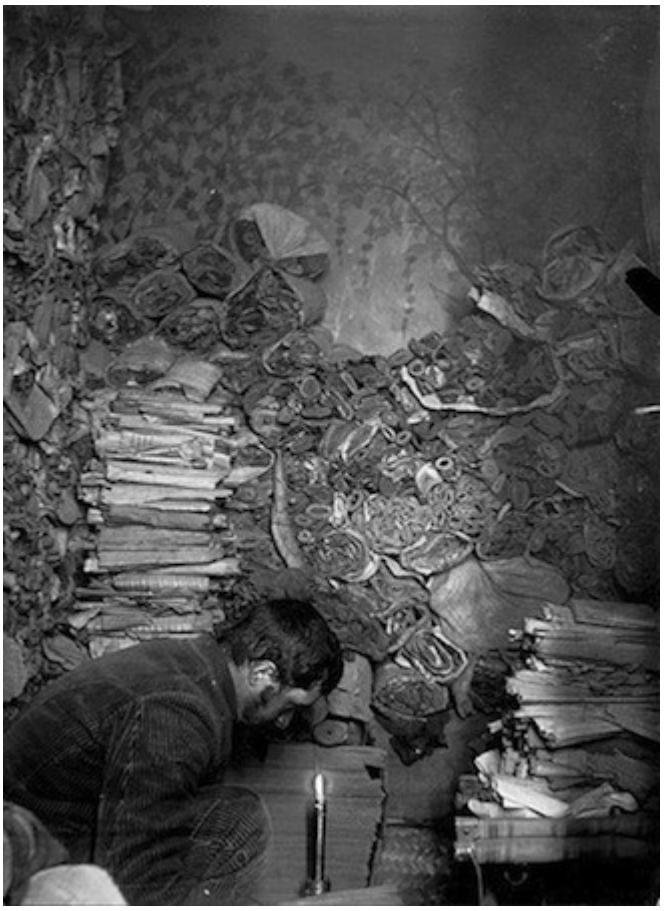
This is a man's robe. It is dated 1796–1820 This robe's brown color and two front and back slits suggest that it belonged to an official during the Jiaqing 嘉慶period (r.1796-1820) of the Qing dynasty.

page 68 - 73 depiction of Xiongnu Mongolian tribesmen



Carved into the cliffs above the Dachuan River, the Mogao Caves south-east of the Dunhuang oasis, Gansu Province, comprise the largest, most richly endowed, and longest used treasure house of Buddhist art in the world.

Paul Pelliot working in the library cave in 1908.



Mural, Cave-temple 257, Dunhuang, Gansu Province

page 80 Trade and Tribulations

Central Asia during Roman times, with the first Silk Road

page 86 The Business of Silk

Sassanid inspired two-sided silk cloth, with winged lions and tree of life, from the early Islamic period in Iran, National Museum of Iran.

page 87

Painting of Chinese monk **Xuanzang** 玄奘, also called Tang Seng 唐僧, on his quest to India to obtain Buddhist sutras. Born in 602 CE in Luoyang 落陽市, Henan Province 河南省, China, he died in 664 CE in Chang'an 長安市, now Xi'an 西安市, in Shaanxi Province 陝西省.

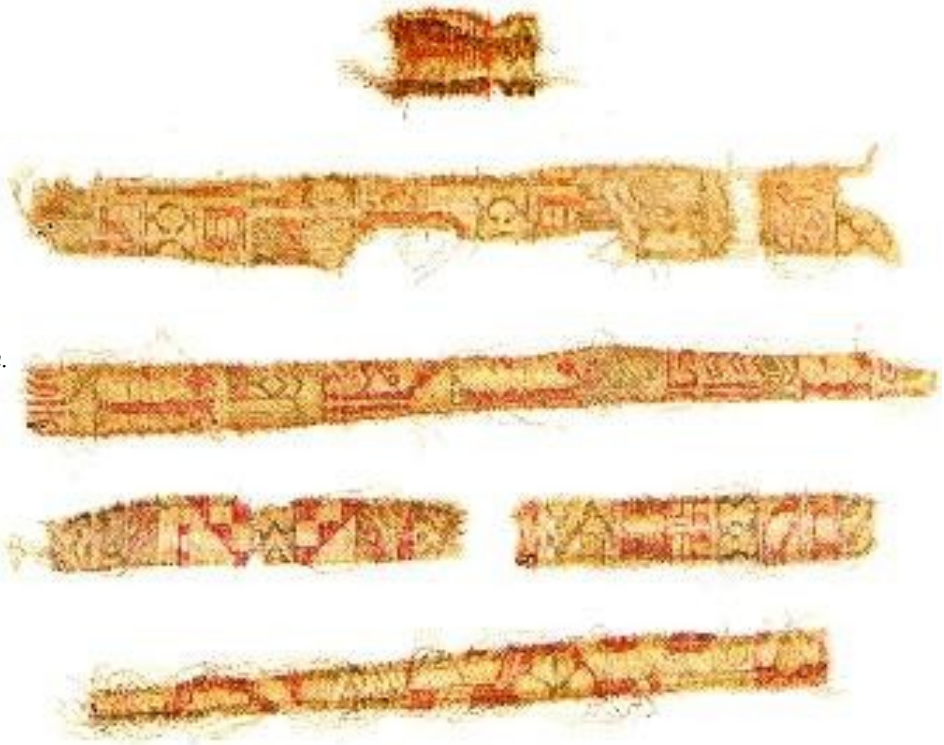
Gabriel Gustafson excavation: News photo of the Oseberg Viking Ship Burial, 1904.

The textiles found among the Oseberg finds. The two women buried in the Oseberg ship were accompanied by a lavish array of textiles designed for a range of uses. It was clear even during the excava-
tion that the large numbers of textiles constituted a

The well preserved Oseberg ship from 820 in the Viking Ship Hall in Oslo, Norway. Photo Museum of Cultural History

The Silk Fabrics

A collection of narrow silk strips exists. It is possible that they all come from the same piece of fabric. The strips have needlemarks on both lenghtwise sides and have originally been attached to another fabric, probably of wool. There is reason to believe that this was one of the fine, probably imported two-shed and red fabrics. Silk fabrics are found in no less than 50 graves at the Swedish market town Birka from the Viking age. They appear to be of the same origin as the Norwegian, and according to Agnes Geijer the majority of the Norwegian and Swedish silk fabrics appear to belong to the type known as 'samitum', which was manufactured in Byzantium and the Middle-East in that period. They were also cut up and found a similar use as decoration on plain-coloured pieces of clothing. One of the fragments from Oseberg has a pattern clear enough that it can be directly compared to a large silk fragment



[Silk strips, cut up for application. Drawing by Sofie Kraft.]

Mosaic of Triton & Amphirite in Buried city of Herculaneum Italy Wall mural

Inside the House of Actius Anicetus is a fresco showing a riot between the citizens of Pompeii, and those Nuceria, in 59 BCE. This riot took place during gladiatorial games at Pompeii's amphitheater, the oldest in ancient Rome, in a similar way to modern day riots between rival soccer fans.

Visual depictions of sailing boats have been dated as far back as 5500 BCE, discovered on painted discs from ancient Mesopotamia found in modern day Kuwait. These sailing boats, used on the Nile River, were simple, square-rigged reed ships with a single square papyrus sail attached to a mast.

Traditionally, sails were made from flax or cotton canvas.[46] Materials used in sails, as of the 21st century, include nylon for spinnakers—where light weight and elastic resistance to shock load are valued—and a range of fibers, used for triangular sails, that includes Dacron, aramid fibers—including Kevlar, and other liquid crystal polymer fibers—including Vectran.[46][37] Woven materials, like Dacron, may specified as either high or low *tenacity*, as indicated, in part by their denier count (a unit of measure for the linear mass density of fibers).[47]

Source: Sailcloth – National Maritime Museum

sheep on the Faroe Islands,
bred for viking wool

Students “roo” a sheep by gripping the wool and tugging out handfuls. Vikings would have used this method of gathering wool.

Trondenes Church is the northernmost and one of the most important stone churches from medieval times.

The church is located at Trondenes, ca. 10 min from the center of Harstad in an area which has traces back to the Viking era. After several years of restoration the doors were again opened in 1950. Your first impression as you enter the church is the beauty of the religious artwork and the vast, high-ceilinged room that is quite unique. At the head of the church there are three triptych which represents an important part of the church's 700-800 years history. In the roof structures were also found some remains of what is the oldest preserved sails.

A fragment of the woolen sail found in the roof of Trondenes church.

Nålebound socks from Egypt (300–500 AD)

Mittens done in "nålebinding"

Nålebinding (Danish: literally "binding with a needle" or "needle-binding", also **naalbinding**, **nålbinding**, **nål-bindning** or **naalebinding**) is a fabric creation technique predating both knitting and crochet.

Top view of the mitten

The extant nålbound mitten - an example from Iceland held at the National Museum of Iceland.

Bone nalebinding needles

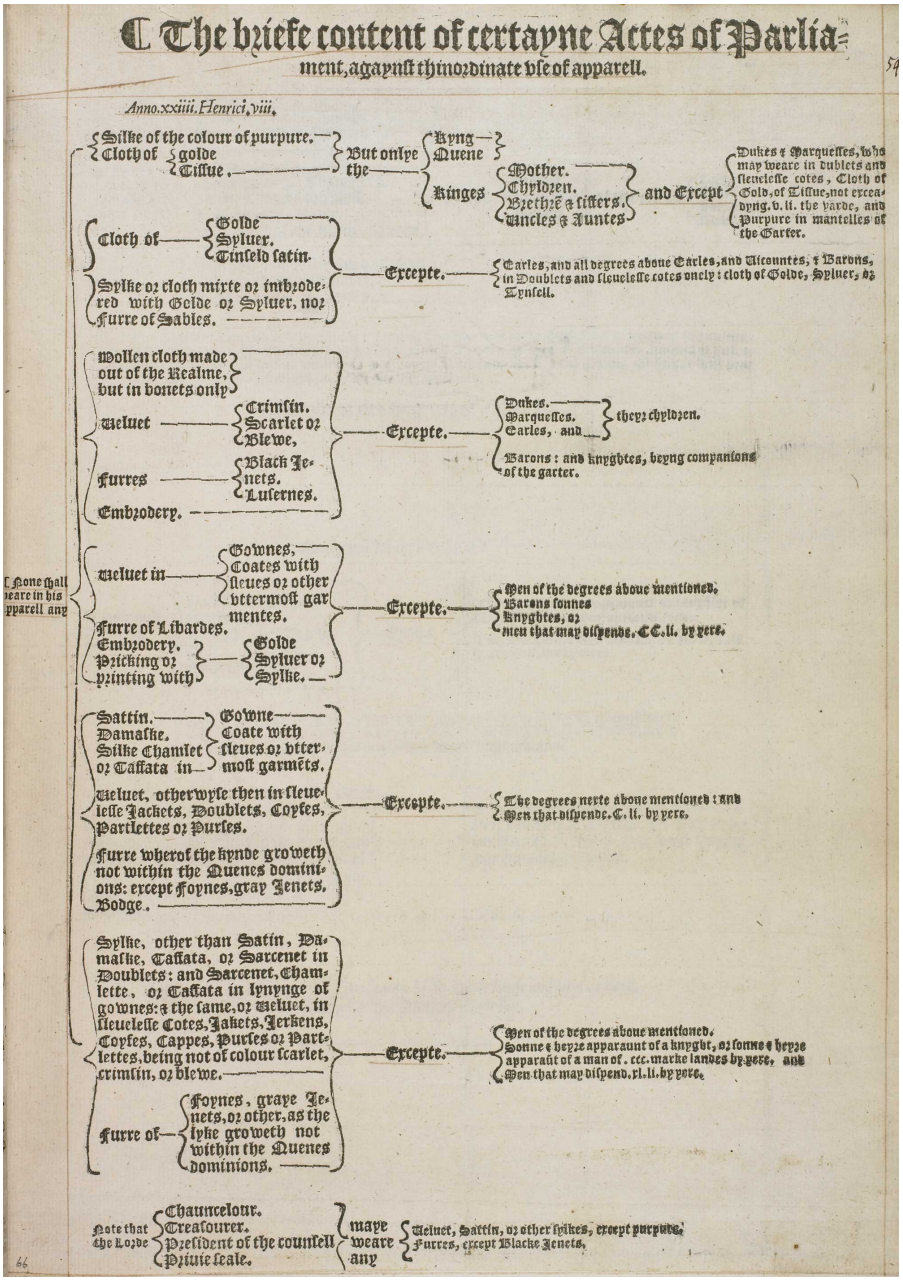
Page 117 Clothed in Lincolne Green

Robin Hood in Lincoln Red and Lincoln Green.

There is debate as to whether Lincoln green referred to the color green (in the late 1300's when Robin Hood was supposedly alive) or the quality of the cloth.

Lincoln Green was green by Elizabethan times and the 18th century. But up to and including the early sixteenth century some historians believe a red colur was the primary cloth produced in Lincolnshire. Lincoln grayne was a superior broadcloth mainly due to the knap of the cloth and the kermes (the grayne) used to dye it red.

page 118



¶ The brieke content of certayne Actes of Parliament, agaynst thinordinate vse of apparell.

Anno.xxiiii. Henrici, viii.

¶ Silke of the colour of purpure. Cloth of golde Tissue. — But onlye the — Kyng Quene; Kinges Mother. Chyldren. Brethren & sisters. Uncles & Auntes — and Except — Dukes & Marquesses, who may weare in dublets and sleuelesse cotes, Cloth of Gold, of Tissue, not exceadyng. v. li. the yarde, and Purpure in mantelles of the Garter.

Cloth of — Golde Sylver. Tinseld satin. Sylke or cloth mixte or imbrodered with Golde or Sylver, nor Furre of Sables. — Excepte. — Earles, and all degrees above Earles, and Viscountes, & Barons, in Doublets and sleuelesse cotes onely: cloth of Golde, Sylver, or Tynsell.

Wollen cloth made out of the Realme, but in bonets only. Velvet — Crimsin. Scarlet or Blewe. Furres — Black Jenets. Luserne. Embrodery. — Excepte. — Dukes. Marquesses. Earles, and — their chyldren. Barons: and knyghtes, beyng companions of the garter.

¶ None shall weare in his apparell any: Velvet in — Gownes, Coates with sleues or other vttermost garmentes. Furre of Libardes. Embrodery. Pricking or printing with — Golde Sylver or Sylke. — Excepte. — Men of the degrees above mentioned. Barons sonnes. Knyghtes, or men that may dispende. CC. li. by yere.

Sattin. Damaske. Silke Chamlet or Taffata in — Gowne Coate with sleues or vttermost garmets. Velvet, otherwyse then in sleuelesse Jackets, Doublets, Coyfes, Partlettes or Purles. Furre wherof the kynde groweth not within the Quenes dominions: except Foynes, gray Jenets, Bodge. — Excepte. — The degrees nerte above mentioned: and Men that dispende. C. li. by yere.

Sylke, other than Satin, Damaske, Taffata, or Sarcenet in Doublets: and Sarcenet, Chamlette, or Taffata in lynynge of gownes: & the same, or Velvet, in sleuelesse Cotes, Jakets, Jerkens, Coyfes, Cappes, Purles or Partlettes, being not of colour scarlet, crimsin, or blewe. Furre of — Foynes, graye Jenets, or other, as the kynde groweth not within the Quenes dominions. — Excepte. — Men of the degrees above mentioned. Sonne & heyre apparaunt of a knyght, or sonne & heyre apparaunt of a man of. CCC. marke landes by yere, and Men that may dispend. xl. li. by yere.

Note that the Lorde Chauncelour. Treasourer. President of the counsell. Priuie seale. — maye weare any — Velvet, Sattin, or other sylkes, except purpure. Furres, except Blacke Jenets.

King Edward III passed these Sumptuary Laws to regulate the dress of various classes of the English people, promote English garments and to preserve class distinctions by means of costume, clothes and dress.
The document is an indenture of enfeoffment from the 14th century.

During the late 1500s, Queen Elizabeth I passed a series of strict laws relating to dress codes. The laws ensured that people across the social spectrum dressed according to their rank and class.

Medieval wool trade artifacts from Coppergate dig in 1976 - 81

Fig. 800 Iron spikes from the wool-comb, (far left) 2273 compared with other probable wool-comb spikes: (left to right) two spikes from 2273, 2342, 2358, 2281, 2343, 2299 and 6601. Length of 2281, 111mm

This photograph of the investigations, taken towards the end of the dig in 1981, shows the considerable depth at which the Coppergate archaeologists worked.

Brown.(1990) has dubbed these tools 'picker-cum-beaters' and similar tools, called 'pick-ups', are still used today on two-beam looms for tapestry weaving. Their function is to pick out groups of warp threads and to give the weft a preliminary downwards beating, before using a toothed weft beater.

ig. 815 Pin-beaters in bone and antler; above, double-ended cigar-shaped pin-beater 6669, and rough-out 6670; middle, a selection of single-ended pin-beaters or 'picker-cum-beaters', 6671-2, 6694 (antler), 6673-4; below, a selection of longer single-ended pin-beaters, 6695 (antler), 6677-8, and rough-out 6676. Length of 6670, 142mm

Fig. 838 Textile equipment and textiles from Period 3 (AD 850–900). Teasels and madder root have been replaced by modern representatives

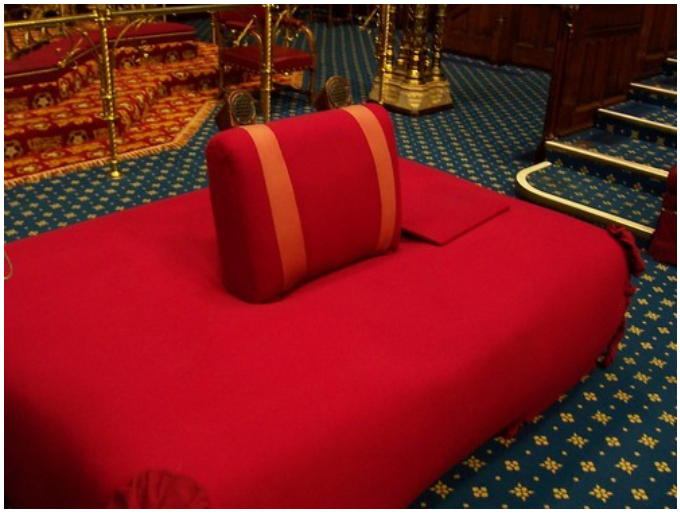
page 128 Monks Habits

Cistercians at work in a detail from the *Life of St. Bernard of Clairvaux*, illustrated by Jörg Breu the Elder (1500)

page 130 A Lionheart for Sheep's Wool

King Richard I

page 133
King Edward III



The Woolsack, British House of Lords, (2016).

The Woolsack is the seat of the Lord Speaker in the House of Lords Chamber. The Woolsack is a large, wool-stuffed cushion or seat covered with red cloth. It was introduced by King Edward III (1327-77) and originally stuffed with English wool as a reminder of England's traditional source of wealth - the wool trade - and as a sign of prosperity.

page 137 The Lacemaker

The Lacemaker is a painting by the Dutch artist Johannes Vermeer, completed around 1669–1670 and held in the Louvre, Paris. The work shows a young woman dressed in a yellow shawl, holding up a pair of bobbins in her left hand as she carefully places a pin in the pillow on which she is making her bobbin lace.

The Lace Maker (1662) by Caspar Netscher. Although this work shares with Vermeer a sense of quiet solitude, it hints at sexual overtones unvisited by the later artist[1]

Lacings

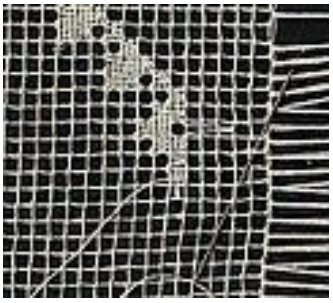
In medieval clothing terms, the word *lace* refers to lacing, like our modern shoe-lacing, not of fancy, frilly lace. Lace was used extensively to close gown fronts, in some cases, sides and only in two cases that I know of on sleeves.. Lacings were also used by men to attach hose and for arming, which we won't look at here.

Until the 15th century, lacings were coloured to match the gown or kirtle it was worn on, thus making the closure fairly invisible. 15th century Italy led the way in leaving gowns unlaced widely across the bust, and at this time, lacing cords were often an entirely different colour to the dress as it was now a feature of the dress, not merely a way to fasten it closed.

Cord produced on a *lucet* produced a square braid or lace. This lace was strong, durable and didn't easily slip when used for garment fastenings. Many other braids and laces are made using the fingerlooping method- that is a method of looping the thread around the fingers to form a kind of knotted braid. Plaiting or braiding is also another method of making laces for clothing or shoes.

page 139 Stitches in the Air

Page 140 Filet lace, embroidered on an existing net



Portrait of Anna Boudaen Courten by Saloman Mesdach

Diego Velázquez (Spanish, 1599-1660). *Lady with a Fan*, 1640. Oil on wood. London: Wallace Collection. Source:

black lace

white lace

Portrait of Laurens Reael, governor-general of the Dutch East Indies.
by Cornelis van der Voort 1620

Early bobbin lace in gold and silver

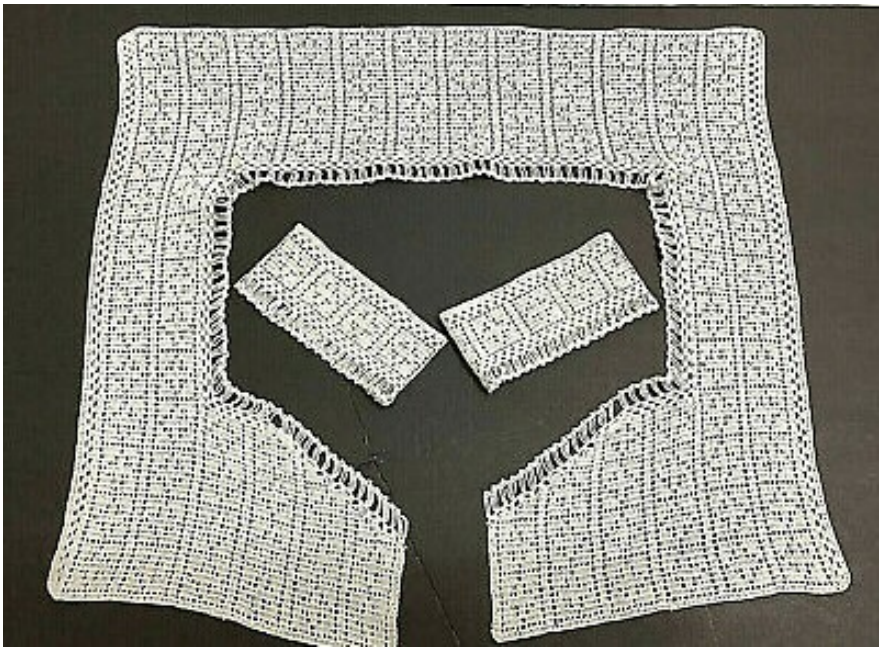
antique silver and gold metallic French lace

Louis XIV

CLAUDE LEFÈBVRE / ISAAC DELGADO MUSEUM OF ART

Examples of col a rabat (lace collars)

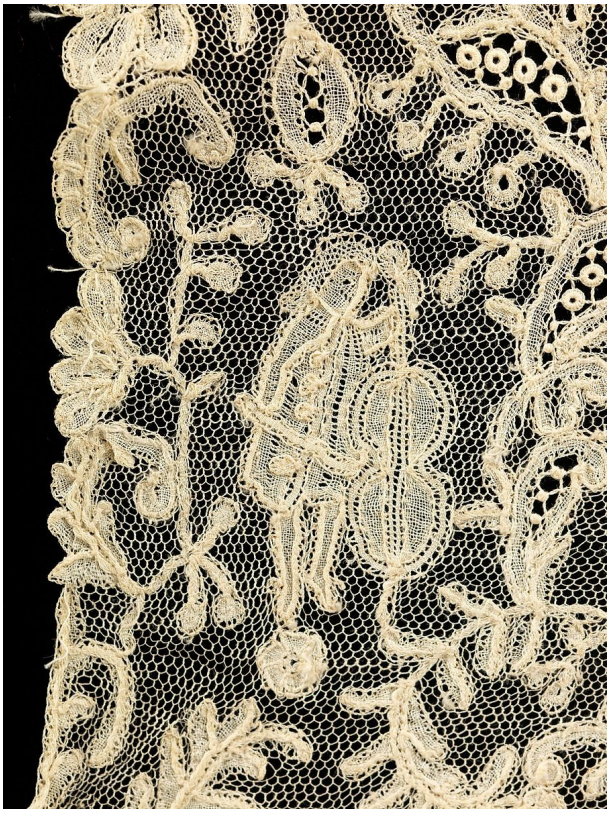
ca. 1675 - ca. 1700



Antique Lace Collar & Cuffs for Nightdress Handmade Victorian

Rhinegraves (breeches)

Canions (knee lace), 1661 or 1662



page 147

Flanders lace (point de Flandres) was made in Flanders, which was particularly well known for its bobbin lace. The supreme epoch of Flemish lace lasted from about 1550-1750.

page 147

Venetian lace

A piece of *point de France* lace produced between 1700 and 1725

page 149

Habit de Lingere 1695 engraving Nicholas de l'Armessin

page 150 Wearing It All

Queen Elizabeth I

Catherine of Aragon

Mary Tudor

page 152

The Laughing Cavalier (1624) is a portrait by the Dutch Golden Age *painter* Frans Hals

Mary Queen of Scots

page 153

Karl X Gustav
Lace collar and cuffs
over armour

King James I

20 Dollars Reward.

RANAWAY from the subscriber on TUESDAY the 30th inst. a bright colored Negro Man named

ABNER,

bought by me of Wm. S. Brown of this city: te said negro is about 21 years old, 5 feet 7 inches high, or thereabout. Very slim and straight, speaks English only, no scars about him perceptible; had on when he went away a blue surtout Coat, a fur Hat, a pair of Bennets Cord yellow Pantaloons, a pair of brokans, and coarse shirt. The above reward and all reasonable charges will paid, for apprehending and lodging said negro in jail, or returning him to the subscriber in Fouché st. one house from Julie-st. No. 43.

WHO HAS FOR SALE,

Two first rate HORSES, a DRAY, and a Negro WOMAN, cook, washer, &c.

D. L. PEIRCE.

TWENTY DOLLARS REWARD.

RAN AWAY from the plantation of the subscriber, lying in Warren County, ten miles from Vicksburg, some time in February last, a Negro Boy, named

PETER,

about 18 or 20 years of age, five feet seven or eight inches high, well proportioned in make, very active and sprightly; has a pleasing countenance, smiles when spoken to, and is very intelligent; slightly inclined to the mulatto in color, and has a scar on his face, but not recollected where. He took with him several articles of clothing, amongst which was a coat of Kentucky jeans that reached to his feet, or nearly so. Said boy was taken up in March last by Charles Cox, near the mouth of Cole's creek, from whom he made his escape, and has not been heard of from that time to the present.

100 DOLLARS REWARD!

Ranaway from the subscriber on the 27th of July, my Black Woman, named

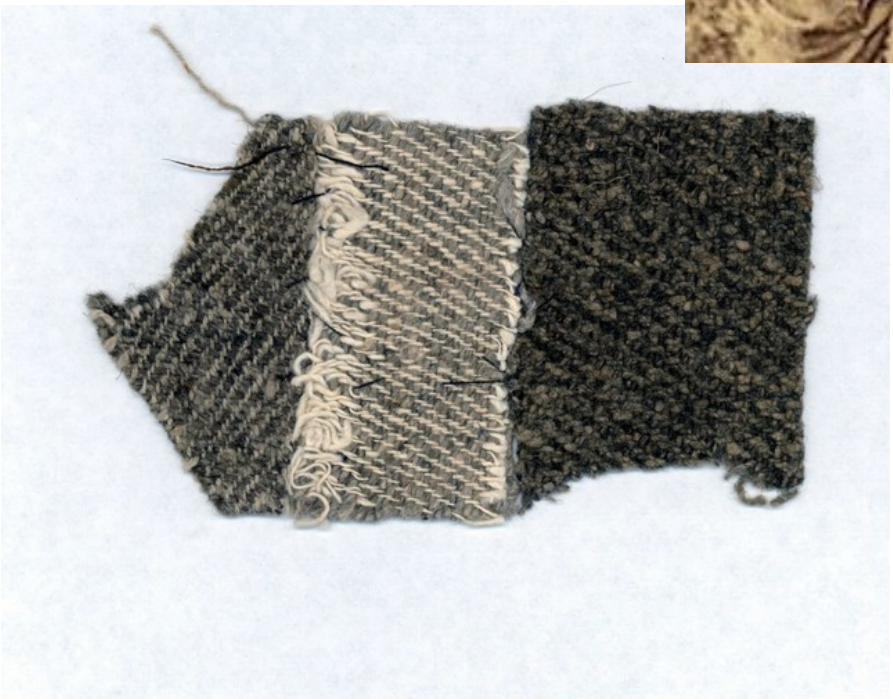
EMILY,

Seventeen years of age, well grown, black color, has a whining voice. She took with her one dark calico and one blue and white dress, a red corded gingham bonnet; a white striped shawl and slippers. I will pay the above reward if taken near the Ohio river on the Kentucky side, or THREE HUNDRED DOLLARS, if taken in the State of Ohio, and delivered to me near Lewisburg, Mason County, Ky.

THO'S. H. WILLIAMS.

August 4, 1853.

page 163
Slave children dressed in “negro cloth”



bric samples for “Negro Cloth” included in an 1835 letter from Rowland G. Hazard to Isaac P. Hazard of the Peace Dale
n of the Rhode Island Historical Society. Print

Fabric samples for “Negro Cloth” included in an 1835 letter from Rowland G. Hazard to Isaac P. Hazard.

Plantation made Osnaburg by unnamed slaves of Mr. Mitchell King, Sth Carolina, c. 1860. Cotton hand spun and woven.

Fig. 7: Plantation-made Osnaburg by unnamed slaves of Mr. Mitchell King, South Carolina, c.1860. Cotton, hand spun and woven. Collection of the Museum of the Confederacy, acc. 0985.10.85. Print

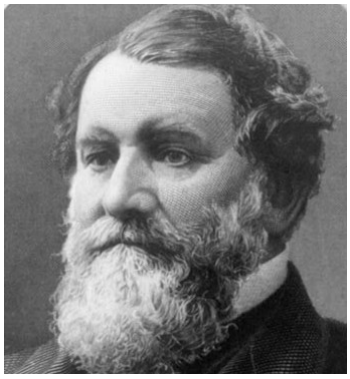
page 167 Vegetable Wool

Cotton cloth fragment from Huaca Prieta, Peru 2500 BC - American Museum of Natural History, New York

page 169

John Kay
inventor of flying shuttle
1733

flying shuttle



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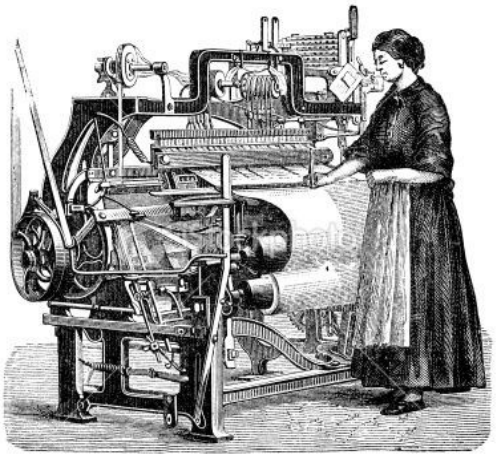
James Hargreaves
Inventor of spinning jenny
1764

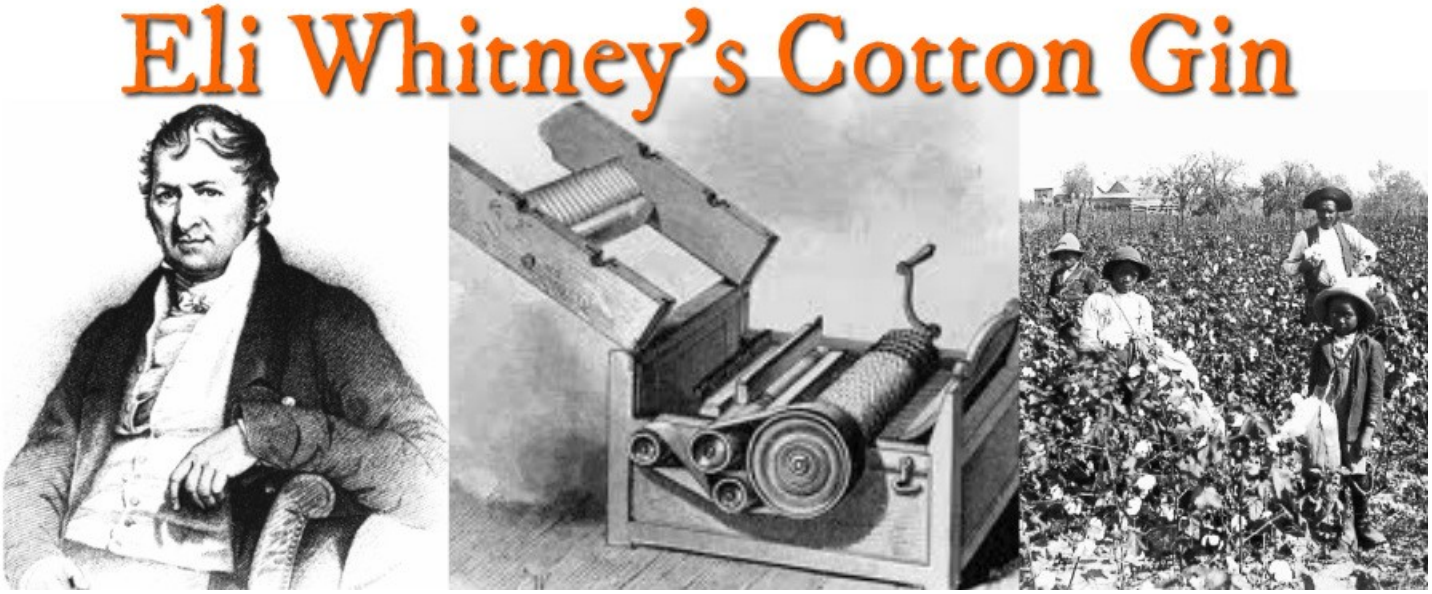
spinning jenny

Edmund Cartwright Inventor of the power loom that was powered by steam 1785



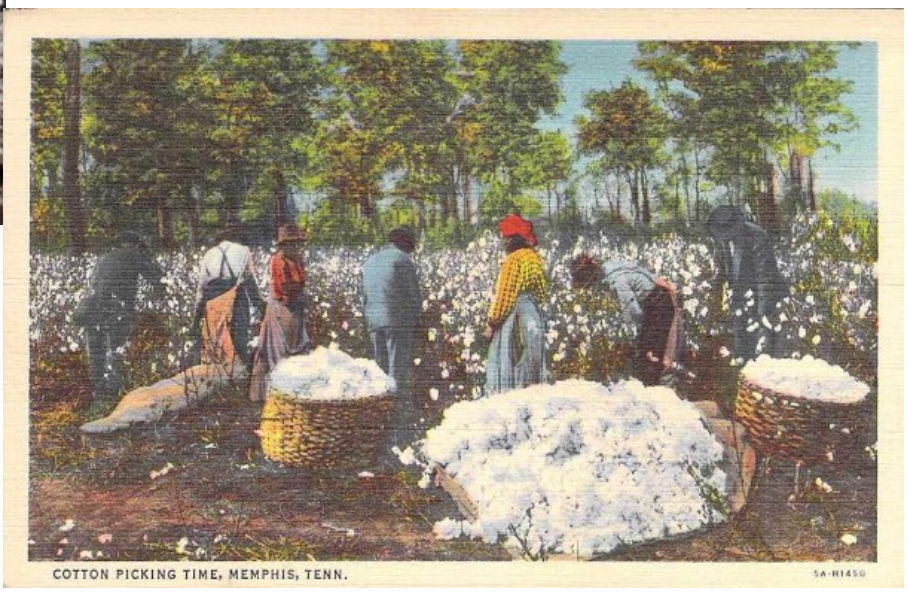
page 171 Winners and Pickers

page 173



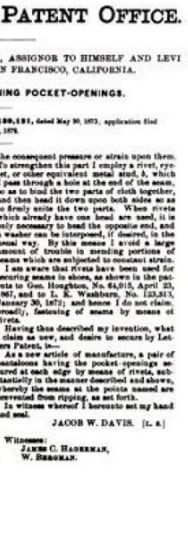
page 175

cotton picking baskets



page 175 The Canadian Tuxedo

page 176 Bing Crosby in Elko, Nev. wearing the “Canadain Tuxedo” - 1951



UNITED STATES PATENT OFFICE.

JACOB W. DAVIS, OF RENO, NEVADA, ASSIGNOR TO HIMSELF AND LEVI STRAUSS & COMPANY, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN FASTENING POCKET-OPENINGS.

Specification forming part of Letters Patent No. 139,121, dated May 20, 1873, application filed August 2, 1872.

To all whom it may concern:

Be it known that I, JACOB W. DAVIS, of Reno, county of Washoe and State of Nevada, have invented an Improvement in Fastening Seams; and I do hereby declare the following description and accompanying drawing are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvement without further invention or experiment.

My invention relates to a fastening for pocket-openings, whereby the sewed seams are prevented from ripping or starting from frequent pressure or strain thereon; and it consists in the employment of a metal rivet or eyelet at each edge of the pocket-opening, to prevent the ripping of the seam at those points. The rivet or eyelet is so fastened in the seam as to bind the two parts of cloth which the seam unites together, so that it shall prevent the strain or pressure from coming upon the thread with which the seam is sewed.

In order to more fully illustrate and explain my invention, reference is had to the accompanying drawing, in which my invention is represented as applied to the pockets of a pair of pants.

Figure 1 is a view of my invention as applied to pants.

A is the side seam in a pair of pants, drawers, or other article of wearing apparel, which terminates at the pockets; and B B represent the rivets at each edge of the pocket-opening. The seams are usually ripped or started by the placing of the hands in the pockets and the consequent pressure or strain upon them. To strengthen this part I employ a rivet, eyelet, or other equivalent metal stud, b, which I pass through a hole at the end of the seam, so as to bind the two parts of cloth together, and then bend it down upon both sides so as to firmly unite the two parts. When rivets which already have one head are used, it is only necessary to bend the opposite end, and a washer can be interposed, if desired, in the usual way. By this means I avoid a large amount of trouble in mending portions of seams which are subjected to constant strain.

I am aware that rivets have been used for securing seams in shoes, as shown in the patents to Geo. Houghton, No. 64,015, April 23, 1867, and to L. R. Washburn, No. 123,313, January 30, 1872; and hence I do not claim, broadly, fastening of seams by means of rivets.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

As a new article of manufacture, a pair of pantaloons having the pocket-openings secured at each edge by means of rivets, substantially in the manner described and shown, whereby the seams at the points named are prevented from ripping, as set forth.

In witness whereof I hereunto set my hand and seal.

JACOB W. DAVIS. [L. S.]

Witnesses:
JAMES C. HAGERMAN,
W. BERGMAN.

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A field lieutenant with prisoners picking cotton at Cummins Prison Farm in 1975.

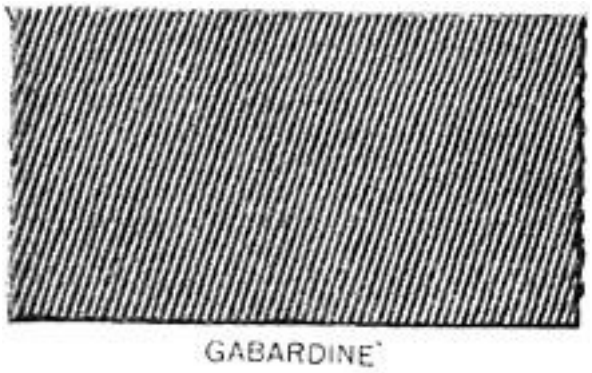
page 183 - 185 Of Fur and Burberry

Balaclava used by the polar expedition on display at the Natural History Museum, London

7th Feb 1911, Scott's expedition members wearing Wolsey (brand) knitted woolen underwear, reindeer skin sleeping bags on the ground.

page 183 - 185

Wolsey ad



Gabardine is a tough, tightly woven fabric used to make suits, overcoats, trousers, uniforms, windbreakers and other garments.

Photograph from Roald Amundsen's account of his expedition which became the first to reach the South Pole on 14 December 1911.

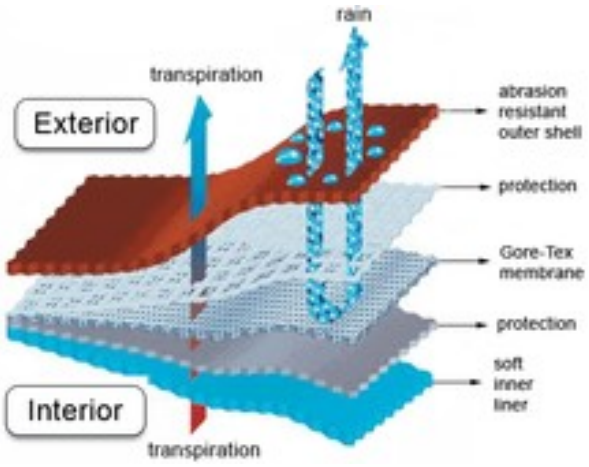
page 187 Plus Fours at 28,000

Mountaineers Andrew Irvine (L) and George Mallory (R) who died on Mt. Everest in an attempt to reach its summit in 1924. Their bodies were finally found in 1999.

page 195

George Finch wearing the world's first puffer jacket at Everest base camp, 1922.

page 197

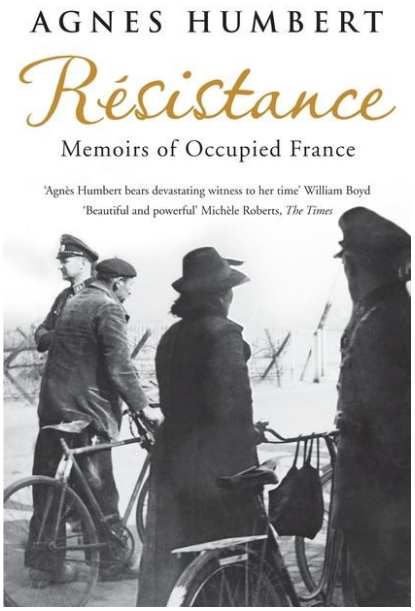


Schematic of a composite Gore-Tex

Effect of water repellent on a shell layer Gore-Tex jacket (Haglöfs Heli II

Current (2018) Kit List for Mt. Everest climb (clothing only!!)
[ ] 45-55 Litre rucksack will suffice for the trek in
[ ] Approach shoes
[ ] Lightweight trekking boots (*in addition* to approach shoes just in case it snows during the trek and we can therefore avoid getting cold wet feet). Something that is reasonably substantial like the Trango Evo, Scarpa Rebel or a suitable alternative.
[ ] Gaiters (again just in the event that there is any snowfall during the trekking phase)
[ ] Lightweight spikes (again this is *just in case* we have conditions underfoot that may compromise safety). Available in KTM
[ ] Tevas / sandals (optional)
[ ] Base Camp booties (with some sort of rugged sole) (optional – available in KTM)
[ ] Waterproof jacket
[ ] Waterproof overtrousers (must go over your plastic boots for use up to Camp 2)
[ ] Duvet jacket
[ ] Lined windproof (highly recommended and much more versatile than a windproof top *and a* fleece
[ ] Thermal / wicky tops x 4 or 5 min (mix of short and long sleeve).
[ ] Also thermal / wicky long sleeve tops x 1 or 2 in light colours (white or light grey) for when we are on glaciers or in The Western Cwm.
[ ] Thermal leggings. Yet again check out out Icebreaker, Smartwool, Montane and Macpac
[ ] Trekking trousers / softshell pants x 2 or 3 prs (NO Tracksters by Ron Hill please!)
[ ] Underwear x 5 (absolute minimum).
[ ] Good quality trekking socks x 3 or 4 prs. You can't beat Smartwool
[ ] Light gloves (depends on circulation as to how thick they should be) – Powerstretch suggested
[ ] Sunhat (baseball style hats not so good as they offer no ear protection from the sun).
[ ] 3 x 1L Water bottles
[ ] Water bottle insulation covers (available in KTM)
[ ] 4 season sleeping bag.
[ ] Sleeping bag compression sack – with your name on it
[ ] Sleeping bag liner – optional but stops your bag getting too soiled and adds extra warmth depending upon type
[ ] Karrimat / Thermarest / Ridgerest (repair kit required if using Thermarest) – with your name on it
[ ] Beanie style hat or silk balaclava (must be comfortable to wear when sleeping i.e. no big seams and poppers to jab you in the head)
[ ] A buff (great multifunctional piece of clothing)
[ ] LED headtorch for knocking around Base Camp (Check out the range by Petzl and Black Diamond)
[ ] Sunglasses
[ ] Nose guard (optional)
[ ] 2 / 3 Kitbags for portering gear and storing it in your tent
[ ] A few heavy duty plastic bags to keep your packed items waterproofed in to your kitbag. Or, better, a selection of coloured drybags so you know what is packed where – all marked with your name on
[ ] **Personal Mountain Equipment** *(this is **IN ADDITION** to the above equipment already listed)*
[ ] 55-65 Litre rucksack. This needs to be comfortable when loaded and should have side compression straps rather than side pockets.
[ ] Down suit.
[ ] OR a High Altitude Down Jacket and a pair of Down Salopettes or trousers.
[ ] 5 season sleeping bag. [ ] Sleeping bag compression bag (with your name on it!)
[ ] Sleeping bag liner – optional but stops your bag getting too soiled and adds extra warmth depending upon type (available in KTM)
[ ] 5 season foam sleeping mat
[ ] Double layer mountaineering boots.
[ ] Gaiters (wide enough to fit over the ankle of your plastics when going up and down to C2
[[ ] Foot warm up pads (air activated heat pads) – *highly recommended*. Better to be slightly too warm than slightly too cold
[ ] Crampons – Heel clip and 'French' straps or thermoplastic 'Y' toe piece preferred.
[ ] Softshell pants
[ ] Warm good quality mountaineering socks x 4 prs.
[ ] Liner gloves
[ ] Mountain gloves
[ ] Down mitts.
[ ] Mountain hat that covers the ears or a headband and beanie, or a beanie and a buff
[ ] Balaclava
[ ] Face mask
[ ] Category 4 Goggles.
Extra Equipment you might want to also consider *(this is **IN ADDITION** to the above equipment already listed)*
[ ] Overboots (must fit over plastics – optional. Depends on circulation). BUT I have to ask … if you are bringing overboots does that mean that your boots just aren't warm enough?
[ ] A pillow! Yes you can make something with a down jacket popped in to a stuff sac (and indeed that is what I do on the hill) but at Base Camp … a pillow is the business. Thermarest do the compressible pillow or you could get one on the international flight (but don't tell them I told you).
[ ] Down booties. You can get these in the UK or at a fraction of the price they are available in KTM. Great for knocking around in at Camp 1 and Camp 2.
[ ] A hat that will keep the sun off your neck no matter where you are.

page 203 Resistance



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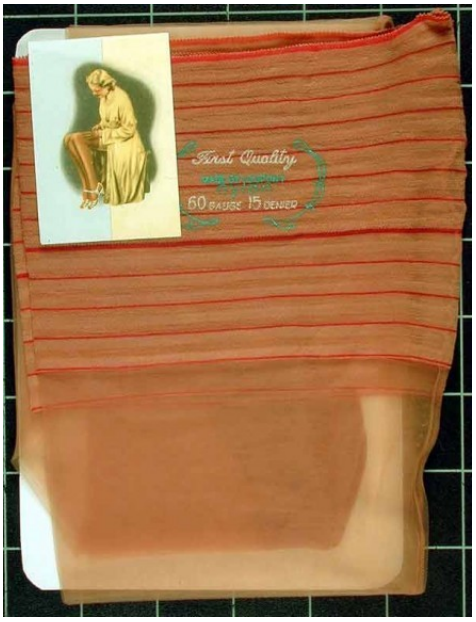
This is the first pair of experimental nylon stockings made by Union Hosiery Company for DuPont in 1937. The leg of the stocking is nylon, the upper welt, toe and heel are silk, and cotton is used in the seam. The nylon section of the stocking would not take the silk dye, and dyed to black instead of brown. (National Museum of American History)

page 207



Stockings made from DuPont nylon, 1945. (German Hosiery Museum)

page 208

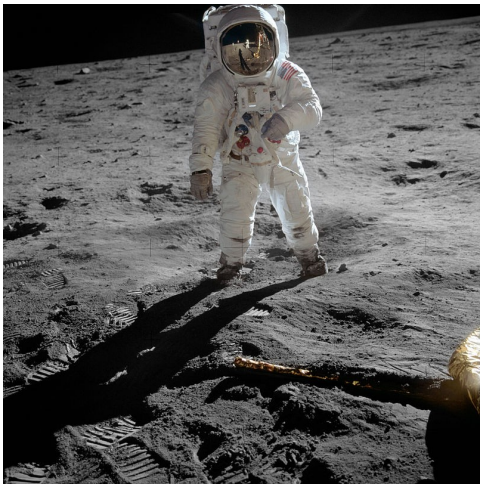
Lines formed when nylons were finally available again in autumn 1945 after the end of

page 217 - 218
Fast Fashion; Old Problems

A report blamed the mayor for wrongly granting construction approvals and recommended charges for the Rana Plaza building's owner.

page 225- 28 Suited to the Moon

Buzz Aldrin on the Moon as photographed by Neil Armstrong (Armstrong seen in the visor reflection)



Neil Armstrong described his Apollo 11 A7L suit as "tough, reliable and almost cuddly.

The Integrated Thermal Micrometeoroid Garment (ITMG). The ITMG is the suit that included the pressure layer, the restraint layer, and the white thermal micrometeoroid layer along with the integrated boot. Getting into the ITMG was no easy task. The astronaut would have to climb through a back zipper. The opening was a tight fit, and he would need to maneuver his shoulders and hips through the opening simultaneously in order to get his legs, arms, and head into the suit properly. Success was signaled by the feet being in place in the boots and the astronaut’s head popping through the neck ring.

page 129

Hawthorne Gray
"His courage was greater than his oxygen supply."

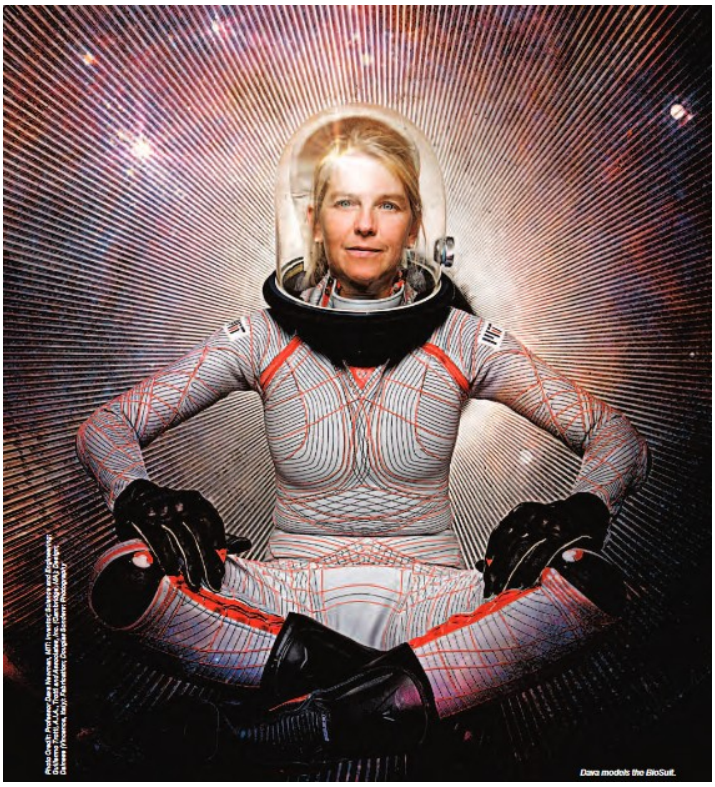
page 129

Famed aviator Wiley Post made many record flights in his Lockheed Vega *Winnie Mae*, including a high-altitude flight through the stratosphere from California to Cleveland in 1935. The airplane's cabin could not be pressurized, so Post wore this pressure suit, created for him by the B.F. Goodrich Company.

page 231
Alan Shepard's Mercury & space suit

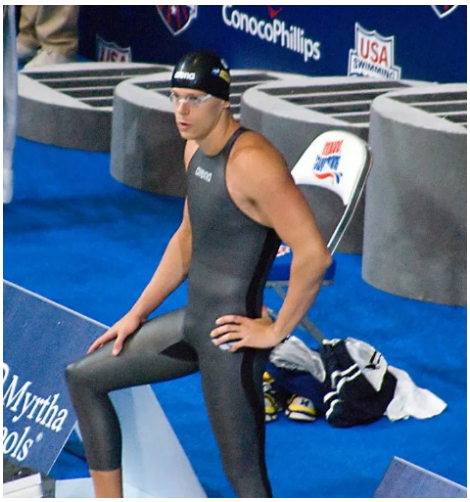
page 234 - 235
The seamstresses who fashioned Apollo's spacesuits for ILC.

page 242
Elon Musk unveiled vision of spacesuit in 2017.



page 244
Dava Newman modeling the skin tight Bio Suit for space travel in 2014.

page 251 Floaters



page 253
The Arena X—Glide swimsuit in 2009.

page 251 - 253

The LZR Racer Suit unveiling at a press conference in New York City in February 2008.

page 255 Sports Coverage

page 257
British 4 × 100 m freestyle team at the 1912 Olympics, wearing silk suits and bikinis, with a chaperone in the middle.

page 257
At the 1912 Olympics - The men wore shorts with a tight fitting full body mesh.

page 258

The first sports bra was two jockstraps sewn together.

Lisa Lindahl, left, and her manufacturing partner, Hinda Miller.

Jogbra, back view with packaging, "The Professional Athletic Support Bra That Keeps Breasts from Bouncing"

Nikes began selling made-for-athletes hijab in 2017.

page 260

As swimsuits changed, controversy followed, at both the pool and the beach. Clare Dennis [standing second from the right] won gold at the 1932 Olympics but was nearly booted from the competition for showing too much shoulder. (Claire was wearing a Racerback swimsuit.)

page 261

The actual track shoes used by Britain's Sir Roger Bannister when he ran the first sub-four-minute mile in 1954.

page 262

Nike Air Zoom Miler (2004) – The Air Zoom Millers featured a perforated upper and a timeless colorway.

Nike Flyknit Spike (2012) – The Flyknit spike marked the start of Nike's move into knit fabric uppers

Nike Zoom Superfly Elite (2016) – The latest iteration of the Nike track spike. The sole is modeled after ocean organisms' geometric structures.

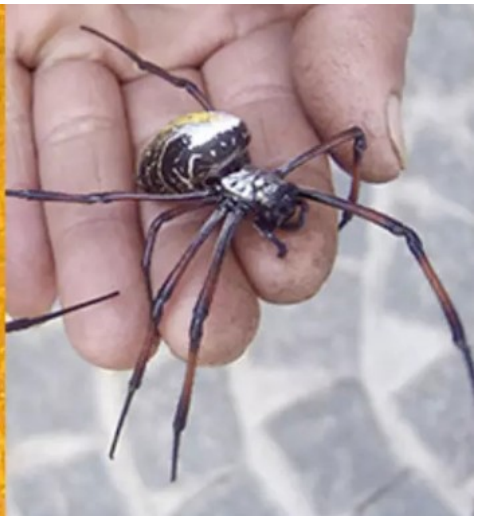
page 264 End of the Lane

Fastskin LZR

page 269 The Golden Cape

page 271

Tapestry made from the silk of about 1.2 million spiders, goloden orb weavers

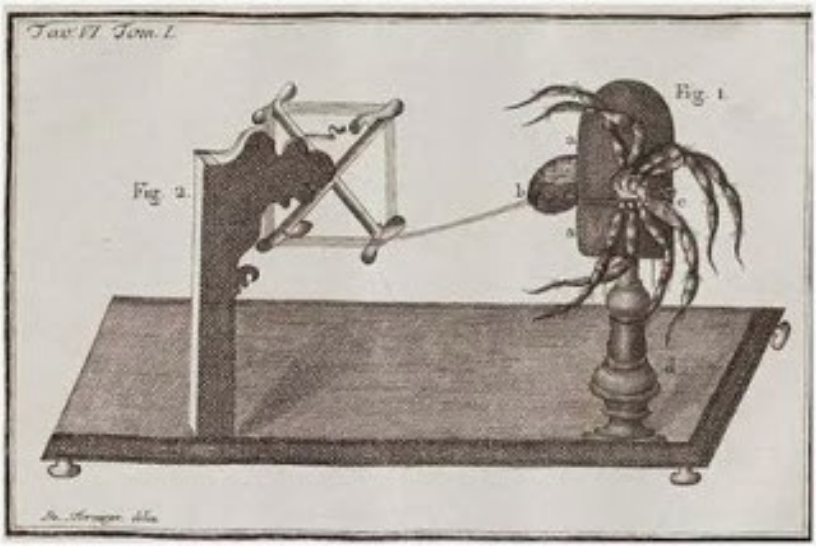


page 272
A golden cape woven from the silk of over a million wild spiders is on show at the V&A museum in London.

close up of spider silk cape
Its thread are the product of more than one million female Golden Orb weaver spiders of Madagascar.
The color belongs to nature; no dying was necessary.
You can see more detailed images of the process at the following website:
https://www.dezeen.com/2012/01/26/spider-silk-cape-by-simon-peers-and-nicholas-godley/

page 279 - 80

machine that ‘silks’ spiders



page 281 Emperor’s New Threads

These reels contain "synthetic" spider silk fibers spun from the spider silk proteins produced by Saanen goats.

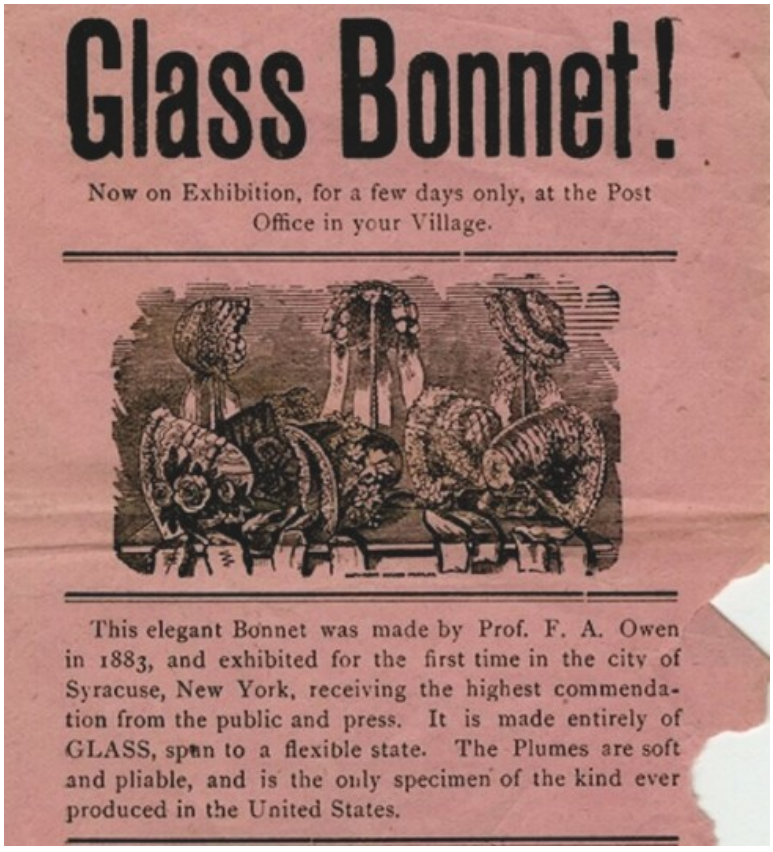
page 284 - 286 Spin Doctors

Bolt Threads launched first commercially available product, a microsilk tie, made of spider silk.

page 286
Bolt Threads and Stella McCartney collaboration - gold dress and biofabric (microsilk and cellulose blend) tennis dress which is fully biodegradable.

Libbey's World's Fair souvenirs included shimmering ties made from braided glass filaments. COURTESY CORNING MUSEUM OF GLASS

A mannequin models a dress made from spun-glass cloth. COURTESY RAKOW LIBRARY, CORNING MUSEUM OF GLASS



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Silk is usually made from the cocoons spun by silkworms - but there is another, much rarer, cloth known as sea silk or byssus, which comes from a clam.
Chiara Vigo is thought to be the only person left who can harvest it, spin it and make it shine like gold.

more images and information on Chiara Vigo can be found at:
https://www.bbc.com/news/magazine-33691781