



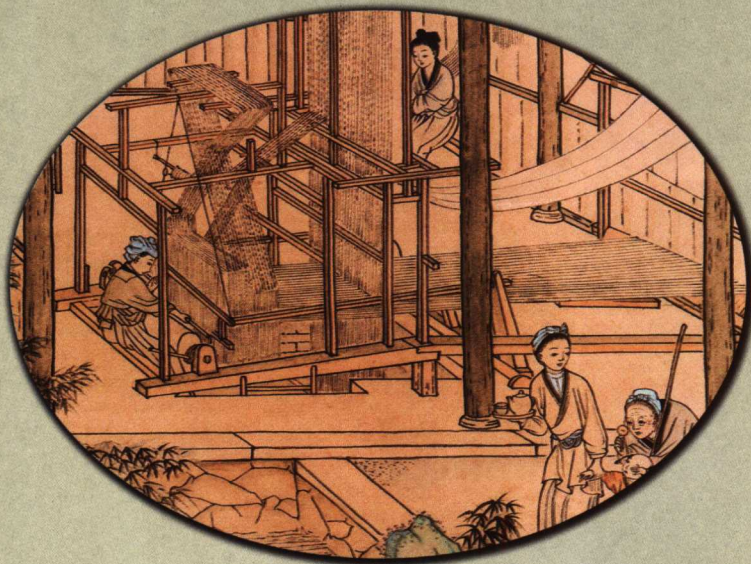
THE LAND OF SILK



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The Land of Silk

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In 1972, an ancient tomb was excavated at Mawangdui, near Changsha, capital of Hunan Province. Archaeologists identified it as that of the wife of the Marquis of Dai, who lived in the first century, during the Western Han Dynasty. Among her lavish collection of funeral objects were 46 rolls of silk fabrics, 58 tailored costumes and 27 accessories. Among them was a 128-cm-long robe with 190-cm-long sleeves. Made from silk fabric as thin as a cicada's wings, and weighing only 49 g, it has been hailed as second to none in the world in terms of antiquity, fine texture and state of preservation. Four pieces of pale red crepe were unearthed from another Han tomb nearby, which are lighter and thinner than the robe, with a thickness of 0.07-0.01 mm.

Silk originated in China, so long ago that the raising of silk worms and the invention of silk weaving is attributed to the legendary Fuxi, a ruler of remote antiquity who is also credited with the introduction of farming, fishing and animal husbandry. Another legend has it that when Leizu, a princess of the Xiling clan, became the Yellow Emperor's wife, she brought with her the skills of sericulture and silk-weaving, and passed them on to the people of the Central Plains. Fuxi, who probably belonged to the Paleolithic Age, might have been the first man to make use of wild silk cocoons, whereas the wife of the Yellow Emperor was perhaps the first woman of the Neolithic age to learn how to domesticate wild silk cocoons for domestic industry. These are by no means wild speculations, because they have the backing of historical records and archaeological finds.

Excavations in 1973 at Hemudu Village in Yuyao, Zhejiang Province, brought to light an early Neolithic culture of more than 5,000 years ago. Among the finds there, were weaving implements, and representations of a spinning wheel and wriggling silkworms engraved on bone vessels. These all indicate that sericulture was practiced at that time.

The earliest silkworm cocoon found so far was discovered in 1926 at a Neolithic site dating back to 3000-5000 BC at Xiyin Village, Xiaxian County, Shanxi Province. Half a cocoon, obviously sliced with a sharp knife, was unearthed from the site, and the Smithsonian Institution at Washington DC verified it as part of a genuine silk cocoon.

More than three decades later, silk and kemp fabrics were unearthed from a Neolithic site dating back some 2,700 years at Xianshanyang in Zhejiang Province's Wuxing County. These include a silk fabric of plain weave, ribbons woven of cocoon

silk, and twisted-spun silk yarn.

Even more important finds were made in the form of fragments of silk fabrics from two coffins unearthed in 1980 from the 7th cultural stratum of a site of the Yangshao culture at Qingtai Village in Henan Province's Xingyan County. Among these are pieces of plain gauze made from silk spun from silkworm cocoons, and organza, a mesh weaving with paired warps additionally twisted in opposite directions and dyed pale red, probably with mesabite. As the 7th cultural stratum dates back about 5,500 years, these discoveries furnish new evidence that Chinese silk has a venerated history of more than 5,000 years.


As early as 10,000 years ago, the people of the valleys of the Yangtze, Yellow, Liaohe and Pearl rivers had already entered the Neolithic Age. Archaeological finds indicate that at that time people already knew how to obtain fibers from wild kudzu and hemp and to process on them in addition to simply making ropes with twisted strands from them that people had learned during the Paleolithic Age. In the Yangtze and Yellow river valleys, the climate and soil were ideal for the growth of wild mulberry trees and silk cocoons, and it is likely that the people of these early times used their knowledge of fiber processing to obtain silk from wild cocoons and weave it into fabrics. The logical next step would have been to use their knowledge of farming to domesticate wild cocoons and plant mulberry trees. The silk fiber thus obtained was fine, soft, and smooth to the touch, shiny, highly elastic and absorbent; it made excellent material for clothing.

Records concerning the cultivation of mulberry trees and silk cocoons, and the production of raw silk and silk fabrics have been found in Shang Dynasty (1600-1046 BC) oracle bone inscriptions. This indicates that silk fabrics in such forms as organza, ghatpot, gauze, crepe, damask, and embroidery were already important in the daily life and culture of the time.

Traces of silk textiles used to wrap bronze funerary objects during the mid-Shang Dynasty were found during excavations at Taixi Village in Hebei Province's Gaocheng County in 1970. They reveal the existence of fine silk fabrics of a plain weave system, organza woven with additionally twisted silk yarn and twill-woven damask.

In 1976, five types of silk fabrics were found attached to bronzewares unearthed from the tomb of Fuhao, a famed woman general and the consort of Wuding, a Shang Dynasty ruler, at Anyang, Henan Province. Among them are more than 20 pieces of gauze and fine silk fabrics.

In the 1970s, a piece of brocade was found among 20 layers of fragmented silk fabrics in a Western Zhou (1046-771 BC)



tomb at Weiyingzi in Liaoning Province's Liaoyang, which indicates that further development had been achieved in the figured weaving of silk fabrics during that dynasty. According to historical records, bartering was a major means of exchange at the time, and silks were sometimes used as equivalents. A bronze vessel inscription dating to the Western Zhou period recounts how someone obtained five slaves in exchange for horses and bolts of silk.


Major changes took place in the political and economic life of China during the Spring and Autumn and Warring States periods (770-221 BC). Records indicate that sericulture had become a major economic activity during this historical era, even leading to hostility between two dukedoms resulting from a fight for mulberry trees between children. The laws of many of the states into which China was divided then stipulated that the penalty for stealing someone else's mulberry leaves, even small amounts, would be sentenced to community labor. Because enlightened state governments encouraged the development of farming and weaving, including that of sericulture, the ancients were able to vastly improve their silk cocoon raising skills.

It was at this time that standards were first worked out for the specifications of silk fabrics. A standard piece of silk was set to be 0.51 m wide, 9.2 m long and 403 g in weight. A kind of saturant obtained by soaking the shells of certain types of shellfish in water was used to un-gum the silk fiber, and cinnabar, madder (*Radix rubiae*) and indigo were used as dyestuffs. People were already writing and painting on silk, and terms like "silk calligraphy" and "silk painting" were coined in those years.

In 221 BC, the first emperor of the Qin Dynasty unified China, and 15 years later the Han Dynasty replaced the Qin. The four centuries of the Han Dynasty were a time of unprecedented prosperity for China as a whole, and for the silk industry in particular.

During the Qin and Han dynasties, silk weaving workshops were controlled by both the central and local governments. During the Western Han period (206 BC-24 AD), the imperial palace in the capital city of Chang'an operated the Eastern and Western Silk-weaving Chambers, and in the prefecture of Qi, in present-day Shandong Province, there was a government department the task of which was to prepare spring, summer and winter clothing for officials. During the reign of Emperor Wu of Han, the official responsible for preparing seasonal official robes had several thousand workers under his charge and a sizeable budget. During the Eastern Han period (25-220), a special institution was set up and officials were appointed to it to manage government-run workshops which produced a wide range of silk products.

Meanwhile, Chinese peasants developed techniques of textile weaving to meet their own needs for clothing. According to



the Book of Han, the wife of a nobleman, by the name of Zhang Shi'an, was able to grow wealthier than a senior army commander by running a silk weaving workshop employing 700 child laborers. Another book written during the Han Dynasty has details of manors in which large numbers of women raised silk cocoons, reeled silk, and wove and dyed silk fabrics.


In the imperial palace, maids were employed as silk weavers, and, according to a tradition handed down from antiquity, even the empress herself was obliged to operate a loom from time to time. The silk weaving workshops run by the government were manned by workers who handed down their skills from generation to generation through a master-apprentice system. Because of this, silk weaving skills were able to survive and improve continuously, enabling the production of a wide variety of fabrics, exquisite brocade included. A contemporary poem mentions 54 kinds of silk products.

During the Wei, Jin and Southern and Northern Dynasties period (220-589), raising silk cocoons, planting mulberry trees, and weaving silk fabrics became common family sideline occupations. At this time, a number of textile industrial centers emerged in north China. In the south, the settlement of 700,000 migrants from the north, among whom there was no lack of skilled craftsmen, gave a big impetus to the silk weaving industry in the Yangtze River valley and the regions farther south. A document shows that a local official once asked for a government reward of more than 10,000 bolts of brocade. On another occasion, the central government paid more than 100 million strings of copper cash for supplies of grain and silk.

During this period, people of the Sichuan Basin in southwest China developed the Shu style of brocade, and this earned Chengdu, the region's leading city, the nickname "City of Brocade." Popular for its beautiful colors and resplendent patterns, the Shu-style brocade was in so much demand at one time that the local authorities had to put sales under a quota system.

During the Southern and Northern Dynasties (420-589), people inhabiting the oases around the Tarim Basin in what is now the Xinjiang Uygur Autonomous Region developed their own cocoon raising and silk weaving businesses. According to an ancient book discovered in the area of Astana in Turpan, sericulture was most developed in the Qoco area, where the local government exercised a monopoly over silkworm cocoons and other materials and tools needed for the industry. In addition, all silk fabrics had to be sold to the local government. A document titled *Inventory of a Qoco Family's Assets Lost in a Fire* shows that among the property the family in question had lost during the fire were large amounts of silkworm eggs, raw silk, gauzy silk, cloth and looms, indicating that household-run silk workshops had already attained a sizeable scale at that time.

The Tang Dynasty (618-907) was another prosperous era in Chinese history. Well-developed production, transportation



and commerce set the stage for an upsurge in silk production. There is no lack of statistics to verify the fact that the Tang was another peak period in Chinese sericulture and silk weaving.

The foremost indicator of this upsurge is silk output. In his *Comprehensive Documents*, compiled in this dynasty, Du You says that during the Tianbao reign period (742-755) alone the government income from silk fabrics amounted to more than 7.4 million bolts, which did not include revenues from brocade, gauzy silk or silk fabrics delivered as tribute to the imperial family.

This figure is the highest in the whole of Chinese history for the amount of silk collected by the government as tax in kind, and testimony to the flourishing state of the silk industry under the Tang. The only written record available prior to Tang records five million bolts of silk collected in 110 AD, the first year of the Yuanfeng reign of Emperor Wu of the Han. In the Northern Song Dynasty (960-1127), the government took compulsory measures to collect gauzy silk and silk fabrics as tax in kind, with the peak being 6.83 million bolts. During the Yuan Dynasty (1271-1367) the top record was a mere 400,000 bolts. During the Ming Dynasty (1368-1644), the highest amount of silk the government could collect in a year was only 280,000 bolts.

It is calculated that the amount of silk fabrics the peasants of the Tang Dynasty delivered to the government accounted for 40 percent of the total silk output of the time. That is to say, if 7.4 million bolts of silk were collected in a given year, then the annual silk output should have exceeded 18.5 million bolts. A total of 8,500 tons of silk was needed to produce that amount of fabrics, and this called for the raising of 1.32 million tons of cocoons. Thus the nation should have had nearly 2.5 million hectares of land planted with 370 million mulberry trees. These figures are based on taxpayers' contributions rather than the total output during the Tang, but even so they remain unsurpassed in the history of the silk industry in ancient China. This record was not broken until the 1930s, when new developments in science and technology made this possible.

During the Tang Dynasty, all grown women were engaged in weaving. If the number of men who paid silk as tax in kind was 3.7 million, then at least the same number of women must have been engaged in silk production across the land. Moreover, this did not include those employed in government-run workshops.

The Yellow River valley was a traditional silk-producing region as early as in the Han Dynasty, and continued to lead the nation in silk output throughout Tang times with more than a dozen varieties of silk fabrics.

By the mid-Tang, silk production quickly rose in importance in the regions south of the Yangtze River, where the climate

was ideal for the growing of mulberry trees and the raising of silk cocoons. The settlement there of skilled workers from north China boosted silk productivity in southeast China. A story goes that around the year 760, a local official in Zhejiang Province encouraged his subordinates to marry skilled women weavers from north China so as to improve local silk production techniques and develop more silk products. As a result, the variety of silk products in Zhejiang rose remarkably during the late Tang.

Even in remote regions, silk production made much headway. When the Tang princess Wencheng went to marry Songtsan Gambo, the king of Tubo (in present-day Tibet), her entourage included a large team of artisans skilled in brewing, papermaking, and silk production. Impressive progress in silk production was also made in Xinjiang in northwest China at that time.

During the period from the 10th to the 13th centuries, which encompassed the Five Dynasties (907-960), Ten Kingdoms (907-979) and the Song Dynasty (960-1279), silk production gradually found its way to minority-inhabited regions in north and northwest China, thanks to the rise of the northern nomadic tribes on the borders.

In the Northern Song Dynasty, the Chinese were producing large quantities of silk and silk fabrics, and many of the products were sold north of the Great Wall. At this time, most silk fabrics were produced in areas ruled by the Liao Dynasty (907-1125), with what is today's eastern Inner Mongolia as the center.

The techniques of making the silk products in the Liao-ruled areas undoubtedly originated in the Central Plains. Some silk items were probably obtained through barter trade. Despite a style that is unmistakably pastoral, Liao silks show a close connection with the Northern Song tradition. Silks attributed to this period have also been discovered in Buddhist pagodas of the Kingdom of Western Xia (1038-1227), the Scripture Cave at Dunhuang, and Alagol in Xinjiang. Though these sites are far away from the Central Plains, many silk products found there are attributed to the Northern Song, and only a small quantity was produced locally.

Jin Dynasty (1115-1234) silk products have been found in considerable quantities at two sites. One is the tomb of Yan Deyuan, a Taoist priest of the Han nationality, in Datong, Shanxi Province, where 24 silk robes were found in 1190; and the other is a tomb at Juyuan in Heilongjiang's Acheng County, which belonged to Wanyan Yan, king of Qi, who died in 1162. The 100 or so silk-woven products and accessories found at the latter site are in a wide variety and bear distinct northern ethnic traits. According to historical records, weavers of Western Xia, in the present-day Ningxia Hui Autonomous Region produced *kesi* (a kind of tapestry woven using fine silk and gold thread).

After the Mongols put the whole of China under their rule, they devoted major efforts to promoting sericulture and silk weaving. As a result, silk production was able to regain the scale it had enjoyed under the Song Dynasty, and even surpassed that in some regions. Historical records, such as Marco Polo's travelogue and the *History of the Yuan Dynasty*, shed precious light on what was going on in the silk-producing regions during this time. The government-run silk weaving workshops during the Yuan Dynasty were large businesses employing hundreds and even thousands of artisans.

The hinterland of China, encompassing the present-day Shandong, Hebei, Shanxi, Liaoning and Henan provinces, and the Inner Mongolia Autonomous Region, was a major silk-producing region by tradition, but local silk production suffered major destruction during the invasions which set up the Liao and Jin dynasties. As soon as the Yuan Dynasty reunified China, the central government issued a series of edicts urging the people to plant more mulberry trees and raise more silk cocoons. Owing to the ensuing favorable political and economic situations, silk production quickly returned to normal. Residents in more than half of the areas in this region grew mulberry trees and delivered raw silk as tax, and around 80 percent of the nation's government-run silk weaving workshops were situated in this region.

Silk production gravitated toward the lower reaches of the Yangtze River during the Southern Song Dynasty (1127-1279). Destruction in this region was relatively small during the southern expedition of the Yuan troops. According to Marco Polo's travelogue, he saw silk workshops in all the cities he visited, such as Nanjing, Zhenjiang, Suzhou, Wujiang, Jianing, Wugan, Citong (present-day Quanzhou). These were major silk producing and trading centers, but nowhere was the production, exchange and consumption of silk products more thriving than in Jingshi (present-day Hangzhou), the capital city of Southern Song.

During the 276-year Ming Dynasty, founded in 1368, productivity and traditional science and technology reached a peak in feudal China, which already led the world in quite a few fields. During the Ming, silk production inherited a rich tradition, and on this basis developed to an advanced level. From the mid-Ming onward, a commodity economy flourished, and trading ports and towns centered on silk production and trade mushroomed on the lower reaches of the Yangtze River and around Taihu Lake.

The Ming administration contained two central departments in charge of textile production. The one in Beijing, known as the Outer Weaving and Dyeing Bureau, provided silk fabrics for officials and the government, and the one in Nanjing, called the Inner Weaving and Dyeing Bureau, was in charge of dyeing and producing gauzy silk, and fabrics for the use of the

emperor and the imperial family as well as imperial mandates and edicts. The Inner Weaving and Dyeing Bureau had 300 looms operated by 3,000 workers, who produced 5,000 bolts of fabrics on an annual basis. Nanjing was also the site of a workshop equipped with 40 looms and producing 1,369 lengths of silk fabrics for ritual and ceremonial purposes every year. Apart from Beijing and Nanjing, dyeing and weaving bureaus were also established in major silk-producing areas, those in Suzhou and Hangzhou being the largest.

In north China, there were two major official silk weaving centers. One was in southeast Shanxi Province, with more than 13,000 looms in operation; the other was in Shaanxi Province, where, according to an official report, thousands of skilled workers could produce 5,450 bolts of silk fabrics with dragon and phoenix patterns a year.

During the Qing (1644-1911), the last Chinese feudal dynasty, founded by the nomadic Nüzhen (Manchu) people from northeast China, the silk industry grew unabated. Weaving bureaus were set up in Beijing as well as Jiangning, Hangzhou and Suzhou to meet the demand of the imperial family for luxury apparel and accessories. In the meantime, silk weaving achieved unprecedented development among the common people. By the late 17th century, big workshops with 1,000 looms and 3,000-4,000 weavers had appeared south of the Yangtze.

During the 1662-1795 period, the Qing imperial court gradually established a hierarchical system of officials, with their own distinctive hats and robes, and inherited the Yuan and Ming techniques of using gold thread and dyed silk yarn to design and make luxury apparel for palace use, thereby bringing Chinese hand-made color-weaving, jacquard and embroidering skills to new heights. However, in the years that ensued, high-grade silk fabrics suffered a decline in both technique and artistic style.

China sank to the status of a semi-colonial country toward the end of the Qing Dynasty. Reformists began to advocate Westernization, and, as a result, steam-powered silk reeling machines and jacquard looms found their way into this country. The impact of Western culture, that emphasized the practicality of garments, was gradually felt among fashion-conscious Chinese urbanites. Non-government silk mills, which by then made up the lion's share of the Chinese silk industry, brought marked changes to the variety, patterns, designs and production process of silk fabrics. The victorious Revolution of 1911 put an end to a thousand years of Chinese feudalism, and shifted silk production to the market and made it available to people in everyday life. Modernization became the order of the day in both the mode of production and the designing of products.

In the years from the Opium War of 1840 to the eve of Liberation in 1949, however, silk production was bogged down in a

prolonged slump. During the Japanese invasion of China (1937-1945) alone, more than 130,000 ha of mulberry fields were destroyed, and half of the silk mills were razed to the ground; the Chinese silk industry was on the verge of extinction. In Shanghai, there was 160 reeling mills in 1929 when the silk industry was booming, but by 1949, only two had survived. In Shanghai and Hangzhou, only 37 percent of the machines in small silk mills were still running on the eve of Liberation in 1949.

However, the silk industry quickly revived after the founding of the People's Republic in 1949. In 1980, the nation recorded a 7.9-fold increase over 1950 in the amount of silk cocoons purchased, a 10.4-fold rise in raw silk output, a 14-fold growth in the output of silks and satins, a 5-fold increase in the export of raw silk, and an 11-fold increase in the export of silks and satins. Meanwhile, domestic sales of silk fabrics multiplied by 100 times, with steady improvement in the quality of raw silk and sustained growth in the varieties and designs of silks and satins. Some silk mills were already using automatic reeling machines and looms and computerized techniques in the early 1980s. By 2000, China had 70 percent of the world's silk production capacity, occupied 80 percent of the world's silk cocoon and raw silk market, and exported an average of US \$ 3 billion worth of silks every year.

The raising and utilization of tussah silk cocoons was yet another major contribution the Chinese people made to world civilization in ancient times. As early as the Western Han Dynasty, the Chinese were already reeling silk from wild cocoons and weaving silk fabrics. After 1949, the output of tussah silk cocoons increased steadily; in 1980, it was 7.3 times more than what it had been in 1950, and made up over 80 percent of the world output.

The invention of the loom was an outstanding contribution our ancestors made to silk weaving technology. From the Warring States Period through the Han Dynasty, the Chinese invented the pedal-controlled jacquard loom, and the number of pedals increased steadily as the patterns in the fabrics became increasingly more complicated. In fact, the pedaled jacquard loom was already in wide use before the Han Dynasty. When the patterns on the silk fabrics grew in size and were embossed in multiple layers, an even more complicated loom was invented, which called for two weavers working together to conjure up patterns of flying birds and prancing beasts of prey. An image of the world's earliest manual jacquard loom is found in the *Pictures of Tilling and Weaving* of the Southern Song Dynasty. In the late 18th century, Europeans turned it into a steam-powered machine, and it reappeared in China in the early 20th century. The technique of mechanical reeling from cocoons developed after 1949 was further improved with the invention of the hydraulic reeling machine.

Figures and embroidery first appeared on silk fabrics during the Shang Dynasty, indicating the real beginning of silk weaving as an art.

Some unearthed Shang bronze vessels bear traces of silk fabrics in which they had apparently been wrapped before being placed in tombs. As archaeological studies of the Shang Dynasty progress, more and more attention is being paid to the study of fabrics on bronze vessels. From the 1970s through the 1990s, archaeologists unearthed large amounts of silk fabrics attached to bronze vessels along with a considerable amount of silk fabrics and silk garments dating back to the Shang and Zhou dynasties.

These wide varieties of fabrics include gauzy silk, gauze, organza and brocade, and are more complex in texture than their predecessors.

Gauzy silk is a kind of light and sheer fabric of plain weave formed by passing paired warp yarns over paired weft yarns in the scheme of over-one and under-one. As the technique was simple, gauzy silk became a common fabric, a texture consisting of 50 warp yarns and 30 weft yarns, as was found mostly in the tomb of Fuhao, but some pieces are woven with 72 warp yarns and 26 weft yarns. The silk yarn used is not twisted, the weft being twice as thick as the warp, yielding a surface evocative of a chessboard.

The gauze of the Shang and Zhou dynasties is also of a plain weave texture, but it is meshed with square holes and looks loose, thin and light. The organza produced in this period is another product of mesh weave, with additionally twisted warp yarns intertwined in a series of figure-eights with filling yarn. It comes in two categories: patterned organza and plain woven organza. Both gauze and organza are found among the relics unearthed from the tomb of Fuhao.

The damask produced during the Shang and Zhou dynasties is mostly decorated with chevrons and zigzags. The chevron patterns were first discovered by the same Swedish scholar who discovered traces of silk fabrics on bronzewares of the period.

The zigzags pattern is a mixture of S-shaped lines and oblique straight lines and woven with an average of 20 warp yarns and 16 weft yarns per square cm. The clearest example of this pattern extant is found on a small patch of white silk fabric attached to a Shang jade *ge* (dagger-axe) in the collection of Beijing's Palace Museum.

The most important of all silk fabric patterns are those of colored embroidery. According to ancient authorities, no silk fabric could be counted as brocade if it was not embroidered with at least five colors of silk yarn. But because the colors have basically faded from the fragments of brocade unearthed from ancient tombs, it is hard to determine their patterns clearly. However, the patterns on some pieces can be made out, thanks to the use of mineral dyestuffs or because the thread is thick enough to leave discernable traces. Judging from the traces of embroidery on Shang bronzewares, cinnabar and another mineral dye were the most common dyestuffs used in those days, and the lock-stitch technique was used. From the animal patterns carved on a Shang jade figurine we can conclude that similar animal patterns were used in embroidery at the time.

Due to technical limitations, the patterns on silk fabrics made during this period are mostly simple chevrons, zigzags, S's and other geometrical shapes, which were also commonly used on bronze vessels. Experts believe that some of the tiny geometrical shapes are actually symbols of cloud patterns. They conclude that setting the likeness of animals against a background of cloud patterns conveys the ancients' conviction that heaven and earth were in communion, and that nature and man were one.

In the Spring and Autumn and Warring States periods, more gauzy silk was produced than any other silk fabrics. It was produced by using single warps and wefts, and as a result the texture was fine and tight. Some pieces were specially processed to become softer to the touch or made to shine. Aside from its use as a clothes fabric, gauzy silk was also an important material for writing and painting on. The silk calligraphic work unearthed from a tomb of the State of Chu at Zidanku, Changsha, and the silk painting of the State of Chu unearthed at Chenjiadashan in the same city are all done on gauzy silk.

Gauze is mostly a kind of sheer fabric, but there are also varieties that are coarse in texture. A pale pinkish-purple gauze handkerchief found in a Chu tomb at Zuojiatang, Changsha, is probably made of silk reeled from ten cocoons, because, observed through an overhead projector, the thickness of both the warps and wefts is about 80 microns. Most gauze is pure silk, but the five pieces found in the tomb of Marquis of Zeng at Suixian County, Hubei Province, perhaps the earliest of the kind, are a silk-linen weave, with the wefts consisting entirely of silk yarn.