The Textiles of the Han Dynasty & Their Relationship with Society

Heather Langford

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Declaration

NAME…….Heather Langford

PROGRAM…….Master of Arts by Research

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Summary of Thesis

The basis of this thesis is the textiles of the Han dynasty (206 BCE-220 CE). The textiles themselves deserve specific study, but this thesis takes an overarching view to discover how and why they were made so long ago, when every part of their construction and equipment was slower.

These unique textiles enlighten present day researchers in many fields. Therefore, the overall aim of this study was to find out about the textiles and the people who made and used them. To do this, the thesis investigates the technology of spinning, weaving and dyeing, including the various processes involved. However, the most important aspect of the thesis is not just a technical study, but to place the textile into asocial to understand of why they were made, who were the artisans who made them as well as the various levels of society who wore them.

A background of the Ancient China and the early Chinese people required investigation to be able to understand the importance of such highly sophisticated, technically sophisticated beautiful cloth. The social structure of the government and the beliefs of the people was needed to appreciate the textiles themselves. Textiles did not, and still do not, exist in a vacuum without giving clues of the lifestyle, structure of society, class systems as well as climate lifestyle and technology. Knowledge about these factors is diverse, so this thesis has used an inter-disciplinary approach from material culture, history, archaeology reproductions and visits to China to see the textiles and equipment still available from the past.

China was very unusual as it did not just make textiles for clothing and other artefacts, but it was an integral part of the economy textiles. Textiles were one form of tax, making their manufacture different from other countries such as Rome, where textiles were a commercial product. Though most of the cloth made was for every daywear, it is the small percentage of cloth made for the highest section of society with so many unique features worthy of study.

Therefore this thesis has been able to supply some of the answers to the questions of who were the people, what were the sources and how they actually made the cloth. The ability to dye and decorate such a utilitarian commodity two hundred years ago displays their wealth. The textiles are a mark of the society.. The importance of these textiles cannot be underestimated.

Glossary of Textile Terms

Brocade:	Brocade consists of a compound weave of polychrome threads across the ground fabric with a pattern formed by warp floats. It is used with or without a double weft to make the pattern and the binding of the threads.
Cloth, fabric,	These are interchangeable names for textile articles, usually made by weaving, knitting or felting. In ancient times, all textiles used natural fibres.
Cotton	Fibres surrounding the seeds of the cotton plant (Sp *Gossypium*). It has a short staple length up to about 7 cm. It originated in India, but was not grown in China until the Song dynasty (960 CE 1279 CE)
Damask:	Monochrome fabric with woven patterns usually performed in a twill weave. A plain (tabby), monochrome weave background with a warp float pattern where the warp threads progress over the top of several weft threads.
Embroidery:	This is a decorative method of placing a design on the finished, woven fabric. Chain stitch was the common stitch of the Han dynasty, but some knotted and satin stitches were used.
Gauze, leno	A fabric made by twisting adjacent threads together giving an open weave diamond pattern.
Heddle(s):	Are a number of parallel cords or wires usually set in a frame with eyes (holes) for the threading of the warp threads By raising or lowering the set of threads attached to the heddle, a shed is formed for the shuttle to pass though
Hemp:	*Cannabis* Is a bast fibre (from the stem of the plant) It as been treated and spun into various grades of cloth since ancient times,
Jin silk:	Brocade silk fabric
Linen:	A bast fibre from the flax plant, Linum usitatissimum
Loom	The mechanism used to make cloth. Here it refers to the hand operated looms
Plain (tabby) weave	Each weft thread crosses over one warp and under the next warp. In the following row, the threads are alternated.
Ramie:	*Boehmeria nivea* is a flowering plant in the nettle family *Urticaceae*. It is native to eastern Asia.
Reeling wheel:	A mechanical device to simultaneously wind the continuous filaments from several cocoons at the one time.
Selvedge:	The edge formed when weaving by the warp thread as it returns across the loom

Shed:	The opening formed by the set of threads threaded in the heddle so that a shed (tunnel is produced so the weft threads on a shuttle can be passed through to the other side.
Spindle:	A rod attached to the whorl to turn and twist the fibres into a yarn. A drop spindle is the apparatus combining the rod and the whorl (weight) used for hand spinning
Spinning:	Spinning is the twisting together of two or more threads to join if the fibres are short, and to strengthen the yarn. The thread is then double and twisted to produce even stronger threads for weaving
Treadle:	A foot lever (s) of the loom, set to operate the raising and lowering of the heddles. There is usually more than two in a hand loom
Twill weave	The character of the weave has diagonal ridges on the front of the fabric caused by advancing the pattern one thread each row.
Warp faced	The warp threads made the patterns in brocade weaves. The pattern is vertical.
Warp thread:	The strong threads set onto the loom in ready for weaving. The warp runs down the length of the cloth
Weft faced:	The pattern is made using the weft threads horizontally across the weave
Weft:	The thread which traverses over a set of warp threads and under another set to form the cloth. It passes from one side of the loom to the other.
Whorl:	A weight attached to the rod to form a drop spindle for spinning by hand. The whorls were different sizes and shapes depending on the fibres and fineness or coarseness required.

Chinese Dynasties

Taken from University of Maryland History Department site
http://www.chaos.umd.edu/history/time_line.html

1. Introduction

In 2004 I read that ancient corpses had been discovered from long disappeared towns in what is now China's Xinjiang Uighur Autonomous Region. These mummified corpses were not decomposed and still wore clothes of bright colours. These remains, plus the fact they were associated with the famous Silk Road, led me to embark on a discovery tour of China and its known ancient textiles. Could these textiles really be as marvellous as the writings about them? Then I found that the textiles had been discovered in tombs from over two thousand years ago, fabrics which looked as if they had been made by modern machinery!

To be able to study any two millennia year old textile is a unique experience. The ability to study, not just an isolated textile, but a selection in various museums in China is a privilege which very few people have the opportunity to experience. However, seeing the amazing colours and patterns, or even just dyed and un-dyed cloth made me inquisitive about the people who made them and to ask how they could produce such beautiful textiles so long ago? How did they spin such fine thread and weave such even cloth? Why were the textiles so well preserved and why didn't they fade, as usually happens when vegetable dyes are used? How were they able to make such quantities of textiles to be able to spare so many to be buried with the dead? Were all the threads made by spinning on a drop spindle and primitive looms, or had the Chinese spinners and weavers invented something which helped speed up the processes? Finally, who were the people who made and used the textiles? How did they live and what did they wear? What was life like at the time of the Han dynasty?

As a textile person who had studied English costume and textile history for decades, the many examples of magnificent, and even the ordinary pieces of cloth, left me with many questions; these are questions which compelled me to research these two millennia old textiles and the society of the people of the Han dynasty who created them.

Hitherto, Chinese textiles have almost always been studied from a technical point of view of weave and fibre content. More rarely, they have been studied as part of the costume of different people and periods, or for their weaving and embroidery designs and production technique. The study of these facets of textiles is interesting, but does not embrace the people who made them, let alone their lives. Consequently, this study will not just be a description of technicalities, notwithstanding the fact that the textiles of the Han dynasty (206 BCE to 220CE) appear particularly advanced in comparison to other textiles from a similar period. The fine threads were evenly spun, the structure of the cloth was regular and woven and a multitude of colours and intricate designs were used.

More generally, when talking of ancient China, many claims are made about the "thousands of years of Chinese culture." Confucius, Daoism, the Imperial system, bronzes, art and lacquer work spring readily to mind. In contrast, the roles of textiles and their crucial values are almost entirely overlooked. There is a clear lack of academic contextual study where the textiles, their creators and society are integrated.

This thesis is then, an attempt to fulfil, at least in part, a major gap in our knowledge of Chinese textiles: particularly those of the Han dynasty. To fulfil this objective there is the need to integrate widely disparate sources of knowledge so as to place the textiles in their social context and examine some of their roles in Han society. A select few such as Bray, Hinsch and Sheng, have investigated later periods and written on women and their

occupations as weavers and their place in society.[1] This interconnection of different aspects of the Han dynasty and their crucial relationship with textiles is rarely considered. Barbieri-Low has recently achieved a similar overview with the integration of various artisans, history and society in early imperial China. However little is included on the textile artisans.[2] Therefore, these studies aim at a comprehensive collection of knowledge about the Han Dynasty showing its textiles in an important social, religious and economic context and, where appropriate, how different factors influenced their textile development. These factors range from ancient cosmological beliefs and calling on gods and ancestors to protect and increase the wealth of the living, to the imperial system under which the people lived.

To achieve this goal of understanding the people and their association with textiles, this work uses a cross-disciplinary approach with information obtained from a very wide and diverse variety of sources. Many such sources have been obtained from texts in English not usually associated with textile history. However, where possible I have used visits to China to speak to its textile experts where possible and to find various textile examples both in little remote museums to larger state-run modern museums whose where labelling of exhibits is often in English.[3] By placing textiles into a social context it is also possible to investigate the motivations as to why people of the Han dynasty produced textiles in such large quantities, with such variety in designs, types of weaves with such varying weights to such high standards. Therefore a key question addressed in this work is why the textiles of the Han dynasty obtained such a high level of sophistication some 2000 years ago, while western textiles did not reach the same levels of technical achievement

1 Francesca Bray, "Textile Production and Gender Roles in China 1000-1700" C*hinese Science*, 1995.p.116.

Bret Hinsch, "Textiles and Female Virtue, Nan Nu Men, Women and Gender in Early China," *Chinese Science*, Vol 5, No2, 2003.

2 Anthony J Barbieri-Low, Artisans in Early Imperial China, Seattle: University of Washington Press.

3 As a result of this work I have found some recurrent inconsistencies in the English labelling of textiles due to the common western misunderstanding of the difference in the fine hemp or ramie textiles being mistaken for linen. Linen was not grown in China during the Han dynasty and then not used for cloth until the Qing dynasty.

until industrialization in the late 18th and early 19th Century, even though parallels could be drawn with one another. Both of these periods were times of momentous change.

The four hundred years of China's Han dynasty, between 206BCE and 220CE, rivalled that of the Roman Empire in many aspects, but surpassed it in others; not the least in textile production. Rome had a population estimated as varying from a half to one million.[4] Chang'an, (present day Xi'an), the capital of Han China, according to the latest estimation from the size of the city ruins, had a population of 1.2 million.[5] In Chang'an, the capital city during the Han dynasty, many palaces were built within the city walls where around 240,000 people lived.[6] Each of these palaces needed clothing and decorations, household articles and textiles available for gifts and guests.

Textiles were needed in China to clothe a much larger population and the need for taxes was considerable. Textiles were a primary tax in Han China. To obtain the quantities of cloth needed, the Han dynasty and its reign needed great technical advances.

As the Han dynasty was marked by a sophisticated, orderly government which produced a life of luxury for the rich, different types of textiles were needed. Salaries and numbers of officials and retainers as set out in the contemporary *Standard History of the Han Dynasty* reflects the considerable numbers and wealth of the recipients; classes which demanded large quantities and varieties of textiles. The increase in the officials and their retainers due to the Han's new hierarchical structure of imperial rule, generated amongst other things, an increased demand for textile production. These influences were interdependent: society depended on the textiles for basic clothing, variety and beauty;

4 Gregory S, Aldrete, The Daily life of the Roman City: Rome, Pompeii and Ostia, viewed 12/03/2009 <http://books.google.com.au/books?id=40AjSfdJXaAC&pg=PA21&dq=Population+of+Ancient+Rome#PPP1,M1>

5China.org.cn, Han Dynasty's Chang'an Ruins Revealed, 2008, China.org.cn, viewed 17/11/08 <http://www.china.org.cn/english/culture/188791.htm>.

6 Chang'an is believed to be largest and most populated city in the world at this time. The capital moved to Loulan during the second period of the Han dynasty, but the population of Chang'an continued to increase due to the trade and workshops situated there. By 637 775 CE, the population had increased to 600,000 people.

the textiles then depended on the technology which also depended on social demand to foster innovation. Increases in well-paid government appointments resulted in demands for a greater variety of cloth, design and colours.[7] Paying officials was in turn, partly achieved by levying taxes which included textiles. The resultant new technologies made the Chinese the world leader in textile production, technology, volume and variety. My diagram, Figure 1.1, Interdependence of Textiles and Society, reflects this independence in a schematic way.

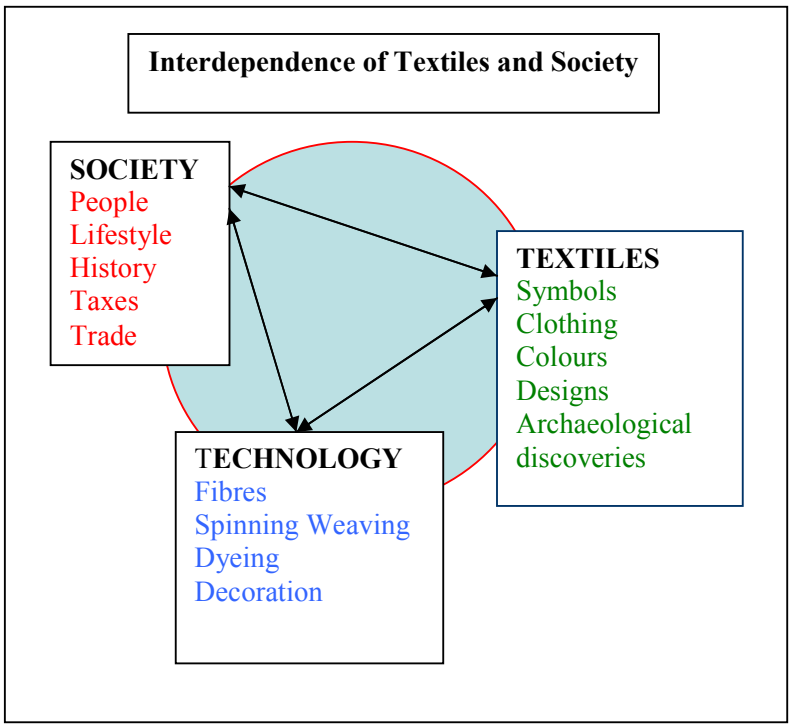

Fig 1-1–1 Interdependence of Textiles and Society[8]

Through examining the integration of textiles and society, this thesis moves from merely identifying, cataloguing and technically analysing the fabrics and clothes, to showing how they were an integral part of life. It does this by contextualizing historical sources and relevant aspects of society. As a result, this work will propose corrections of some erroneous assumptions, for example on dates and origins on the invention of the spinning

7 These colours were still based on the five auspicious colours, black, white, yellow, blue-green and red.

8 Diagram by author.

wheel and looms, as well and their uses for utilizing silk and other fibres. The evidence will show that a spinning wheel was used to unwind and spin silk from several cocoons simultaneously and was used for the spinning of hemp in the Han dynasty; and possibly earlier. This was almost a millennium before it was known to have been used in Europe around the 12th century CE. The intricacies of some of the fibres and their technology will be examined to establish the high levels of technical development achieved. This examination of the fibres and their sources as well as the dyes used will show how the numbers of dyes increased from less than twenty to twenty-seven during the four hundred years of Han reign. These dyes also demonstrate the knowledge of the Han dyers who were not only able to obtain specific colours, but were also able to make these colourfast, hence solving one of my original questions about the basis of the longevity of the Han textile colours. Other civilizations used dyes, but not in such variety as to achieve textiles which could be considered works of art. These natural dyes and techniques were not improved until analine (synthetic) dyes were invented in 1856.

The dyes were more than decorative as they reflected often-crucial association of colours and symbolism. During this period people of the Han dynasty used colours and meanings which had ancient origins. These were associated with the interrelationship of the cosmos, earth and the animals that protected the realm. Each direction of the earth had a colour and an animal which protected that direction. The centre of the earth reflected the centre of the empire and consequently represented the emperor. The five colours were considered auspicious and were often used in conjunction with zoomorphic animal symbols such as tigers, dragons, deer, phoenix and Chinese characters as these also had meanings. These included ones for protection, wealth and longevity.[9] These symbols of animals and colours can be seen in many textiles as well as other examples of material

9 The profound and auspicious colours, white, black, blue, red and yellow as used in Han textiles, were associated with the directions of the earth and universe as well as the animals which protected them.

culture. By using these specific colours and animals there must have been a close correlation with the symbols and the beliefs of the people.

The examination of colours, symbols and meanings all leads back to who made the textiles in the first instance. Who wore the extravagant and beautiful textiles? Did all classes of society have the same cloth and clothing or were there different levels? What did these people believe and were these beliefs in any way associated with textiles? What uses did the textiles have apart from general clothing and artefacts? Did trade affect them? Did the type of clothing, and the embroidery and other features of manufacture have any significance? Who made it? What were the social circumstances behind the different textiles and their production?

Hitherto, the social aspects of textiles during the Han dynasty have not been dealt with adequately in any serious study. This work uses archaeological findings from Xinjiang Uighur Autonomous Region, Masham and Mawangdui tombs in Hunan and Hubei province and those from Noin-Ula in the Republic of Mongolia studied as photographic reproductions. These textiles and related cultural displays were the object of two specific trips to China. Related areas of pottery, lacquer ware and bronzes were also investigated to understand design and culture. These sources were all invaluable to help provide material on how people utilized textiles within Han society and understand more fully their value to the global history of textiles.

China has a long history of thousands of years as an identifiable entity. Since silk cloth has been known for at least six thousand years, there must have been some other forms of cloth before this. Barber, using Kuhn's identification says that hemp, being an Asian fibre, was probably the source of cloth impressions found on Neolithic pots from the fifth and early fourth millennia BCE. Actual cloth has been found from the third millennium

BCE.[10] A spindle for hand spinning and even a primitive loom was found from Neolithic sites at Humudo and dated to circa 5000BCE.[11] Silk cloth is known to have been produced in the Neolithic and subsequent eras alongside other cloth fibres. Another fibre was a leguminous vine called co-hemp by Cheng. It is referred to in Shi Chun Qiu (Master Lui's *Spring and Autumn Annals* from the Warring States period 480BCE-222 BCE) where the king wears a "dress of fine co-hemp in summer".[12] Another reference is from *The Book of Master Han* Fei, written in the Han dynasty and quoted by Cheng. The writer described Yao, a leader of several tribes as "wearing fur in winter and co-hemp in summer".[13] The description suggests these fabrics were known and used as early as the Neolithic period.

Other fibres were also used during this early period as the use of vines and hemp would have predated the silk even though silk was used for royalty from Neolithic times.[14] Yet, because silk is such a phenomenal fibre, most writers on China write about it. This concentration is understandable when examining the map "Location of Silk sites in Pre-Han China" in Figure 3.1, showing the places where evidence of pre Han silk has been found. However, to be able to understand the context of these finds, an historical background of the Chinese people is necessary.

Fortunately, the Han dynasty has provided researchers with extensive and reliable information on its society, laws and history. Just as importantly, a substantial number of textiles have been preserved to allow us to elicit valuable information about the people and their lives. Aspects of these finds have been investigated by authors such as Michael

10 Elizabeth Wayland Barber, *Women's Work: The First 20,000 Years, Women Cloth and Society in Early Times*, New York: W.W. Norton & Company, Inc., 1994. p.177.

11 Vainker, *Chinese Silk: A Cultural History*, New Brunswick, New Jersey: The British Museum in association with Rutgers University Press p.22.

12 Cheng, ed., *History of Textile Technology of Ancient China*. p.57.

13Cheng, ed., *History of Textile Technology of Ancient China*: p.11.

14 Vainker, *Chinese Silk: A Cultural History*.p23.

Loewe in his many works such as the *Government of the Qin and Han Empires*, *Everyday life in Early Imperial China*, and Cook and Major in *Defining Chu*.[15] The book by T'ung-tsu, *Han Social Structure,* is an enlightening commentary of people and life of the Han dynasty.[16] Han history, economic and social structures, beliefs, economic importance discussed by these writers, reflects and provides background for the story of textiles. Textiles also indicate wealth, class, prosperity, education and religion, material advancement and the technology required for their construction.[17]

These textiles, particularly silk, were also popular outside China as an expansion of Chinese territory began. Trade in textiles and other commodities such as salt and jade, many of which were taken as far as Rome. In Rome, China even became known as Serica, Latin for silk due to the country's association with silk. Once trading with westerners began, silk became the most highly traded commodity greeted with wonder for its fineness, sheen and ability to drape easily. It was said in the *History of the later Han*, *(*Hou Hanshu), to have been worth the equivalent of gold.[18]

This brief background gives some idea of the people of various classes and the textiles they used, their lives, beliefs and the motivators for their actions. Most of the elite used fine hemp for most of their clothing as sumptuary laws which controlled the wearing of certain textiles such as silk and the use of colours to distinguish occupations were still supposedly in force. However, Lady Dai, of the Mawangdui tombs, had copious amounts of silk in her tomb.[19]By the end of the Han dynasty many more were using silk than those

15 Cook, Constance A., Major S. John, *Defining Chu: Image and Reality in Ancient China*. USA University of Hawai'i Press, 1999,
Michael Loewe, Crisis and Conflict in Han China: 104BC-AD9 London: George Allen & Unwin Ltd, 1974.

16 Ch'u, ed., Han Social Structure: Han Dynasty China Volume 1. Seattle, London: University of Washington, 1972.

17 Maryta M. S.SP.S. Laumann, *The Secret of Excellence in Ancient Chinese Silks: Factors Contributing to the Extraordinary Development, of Textile Design and Technology Achieved in Ancient China*.p.14.

18Vainker, *Chinese Silk: A Cultural History*. p.55.

19 Lady Dai, the wife of a Marquis, is described further in chapters 10 and 11.

allowed by law.[20] Other levels of society wore different grades of hemp or ramie which looked similar to linen. Wool was used in areas with sheep grazing. Cotton production was introduced into Western China by the Han dynasty, but does not appear to have been popular for general use. The weaves of the greater percentage of the cloth made for everyday use was plain, or tabby, weave. As this weave was a simple construction, the loom only needed to be basic. Here again, most of the cloth for everyday use was left undyed, or dyed black. From the author's observation, the more sophisticated weaves, such as damask, appear to have been woven in silk during the Han era, the finer silk fabrics were only used by royalty. These sectors of society used beautifully coloured fabrics, particularly silk, which varied from transparent ones to the heavy brocades. It was elite who wanted variety in their textiles.

However, the elite may have been the arbiters of style, colours and design but they did not make the textiles they desired. Any textile more complicated than the monochrome weaves was made in special workshops. These workshops were run by the Imperial Government directly or they were in private workshops on large estates. To create these new textiles of complicated weaves and brilliant colours, workers laboured many hours: even longer when working with silk. These workers never had the opportunity of using, or wearing the fabulous fabrics they made. Their own cloth for clothing was made at home after their tax contribution at the workshop.

The use of particular colours, high-grade weavings and embroideries were keys for determining value.[21] Textiles for clothing, functioning as mundane daily protection, also provide information on the climate, as well as status of the wearer. They can even be an indication of moral codes. Much of this information can be inferred from the abundance

20 Angela Sheng, "The Disappearance of Silk Weaves with Weft Effects in Early China," *Chinese Science* 12 (1995).pp.52-53.

21 Judith Rutherford, Menzies, Jackie, *Celestial Silks: Chinese Religious & Court Textiles* Sydney: Art Gallery NSW, 2004.p.5.

of textiles found in Han tombs. These finds can be identified by the particular status of the tomb dweller. The colours and designs displayed in these textiles and other artefacts are indicative of the social identity as well as the type of clothing worn.[22] Groups of people attached different customs to their burial ceremonies but the basic needs of both the living and the dead can be deduced through an analysis of textile finds.

From the remnant textiles available to us in the twenty first century, an understanding can be developed about the textile technology used and the inventions necessary to produce the cloth. New inventions helped provide cloth for the particular uses of each level of society. The inventions meant workers met their tax quotas faster and reduced their workload, but they did not benefit financially. Nor did the majority of people ever handle the new equipment made to produce the elaborate textiles with the complicated designs. This was due to the fact that these textiles had to be made on large looms which would not fit into the average home. Many of these types of textiles were made in specific workshops for royalty, the elite, and for gifts trade.

The textiles may have been made and designed for internal trade or consumption, but it is not known whether differently designed brocades were altered for the outside market once this area of commerce began. Designs of the Han dynasty were taken from many aspects of life and beliefs which may not have been relevant outside the empire. The Han designs including those of birds, fish, deer, tigers, dragons, plant motifs such as dogwood, other flowers, as well as rural motifs such as ploughing the fields, gave a beauty and fluidity. The beauty of curvilinear patterns was characteristic of many of the textile designs from the Han period. Designs displayed animals and plants and other symbols

22 Maryta M. Laumann, S.SP.S. *The Secret of Excellence in Ancient Chinese Silks: Factors Contributing to the Extraordinary Development of Textile Design and Technology Achieved in Ancient China,* Taipei: Southern Materials Centre.p.90.

intertwined with clouds and other patterns with designs whose origins the author thinks can be traced to ancient bronzes and contemporaneous lacquer ware.[23]

By using designs and colours from everyday life, the textiles would have been a constant reminder to the people of the Han dynasty of the symbolic meanings, the balance needed between heaven and earth, and the continuous state of life and death. These beliefs were reflected in textiles as well as other aspects of life and culture and in return showed a sophisticated, intellectual and orderly society. They helped cater to a populace which knew and accepted its place in life as well as the social structure. The elite men and women, who were privileged to use the textiles, possibly encouraged further production and new designs on the fabric. It was the need to satisfy demand for new and different textiles which also helped in the development of new technologies and inventions while many others would have still produced the older styles.

Although other textile fibres were used beside silk, it is this commodity which exemplifies Chinese textiles. The proof that silk played an important role in Chinese life for many millennia is shown by artefacts discovered over the last hundred years. One find from the Shang Dynasty (3500BCE-3000BCE) was a jade silkworm talisman that suggests that silk was revered thousands of years ago.[24] This reverence continued to be reflected in the many carvings and pictures showing various stages of the textile manufacture. By the Han dynasty, silk and other textiles were found in burial sites, reflecting the value placed on them.

By the Han, the beauty and evenness of silk and hemp fabrics explains why these high quality textiles were so coveted as far away as Rome. Silk was the textile desired by the rich, but their use was regulated by sumptuary laws. Despite the laws, silk was coveted

23 Personal observation of the designs on various artefacts in Museums in China. September 2007.

24 Vainker, *Chinese Silk: A Cultural History*.p20.

by both those who could buy it legally, or illegally. This demand drove the industry to make newer and more interesting designs. Royal patronage may have resulted in new inventions and techniques used in their state-run workshops, but these were soon copied by private workshops.

Much of our information on the Han and their textiles can be inferred from the treasury of textiles found in Han tombs. The colours and designs displayed in these textiles and other artefacts are indicative of the social identity of people much as the style and quality of the clothes they wore.[25] The clothes used for such identification were not only found on the living, but also on the dead. Groups of people attach different customs to their burial ceremonies but the basic needs of both the living and the dead can be deduced through an analysis of the textiles in graves. Much of the Han burial custom can be inferred from the textiles and other artefacts found in tombs.

1.1. Literature Review

This thesis is limited by the available relevant knowledge written in English. Nevertheless because it is a composite study, the necessary resources can be drawn from many diverse areas including history, religion, archaeology and literature, as well as interpretation from artefacts and paintings in museums and books.

Writings on the social aspects of the pre-Han and Han dynasty are dealt with extensively by specialists such as Michael Loewe whose works on the social history, religion and government are invaluable. Derk Bodde's work on language and its association with government, social classes is useful.[26] The varied topics which Csikszentmihalyi approaches from law and punishment to death and transcendence, all contribute to an

25 Laumann, *The Secret of Excellence in Ancient Chinese Silks*.p.90.

26 Derk Bodde, *Chinese Thought, Society and Science: The Intellectual and Social Background of Science and Technology in Pre-Modern China,* Honolulu: University of Hawaii Press, 1991.

overall understanding of the people and social system.[27] Barbieri-Low published an excellent documentation of the artisans their conditions workspaces to give a humanized view to the objects of the Early Imperial dynasties.[28] Other authors have contributed general information; for example Cook and Major's work on the Chu kingdom where the Han dynasty founder, Liu Bang originated.[29] These are social aspects which can be drawn upon for the life of the people.

Many people have written books on the textiles of China, the weaves and the embroidery but few have tried to look at textiles in a more comprehensive manner. Francesca Bray used textiles to explain the role of women in *Textile Production and Gender Roles in China 1000-1700*[30] and *Technology and Culture in Chinese History*.[31] Bray gives us an insight into the people, conditions and manufacture of textiles through state-run and controlled workshops which were probably similar for centuries. These examples are largely limited to examining gender relations. Brett Hinsch also addressed this field of women in one of his books, *Women in Early Imperial China*.[32] Others have also used women as their subject of study in relation to textile production.

Brett Hinsch, an eminent scholar on the life of early Chinese women, looks at how weaving became a symbol of womanly virtue during the Han dynasty. Hinsch proposes that where there is reference to, or a picture of women weaving, it symbolizes the order of society as well as the idea that woman depicted was virtuous since she spent her time

27 Csikszentmihalyi, ed., *Readings in Han Chinese Thought*. Cambridge: Indianapolis: Hackett Publishing Co.206.

28 Anthony Barbieri-Low, *Artisans in Early Imperial China,* Seattle, London: University of Washington Press*, 2007*.

29 Constance Cook, John Major, ed., *Defining Chu: Image and Reality in Ancient China*.1999.

30 Textile Production and Gender Roles in China 1000-1700." Chinese Science 12 (1995): 115-37.

31 Francesca Bray, "Technology and Culture in Chinese History: An Introduction," *Chinese Science*, Vol 12 No 5

Bray, "Textile Production and Gender Roles in China 1000-1700." 1995.

32 Bret Hinsch, *Women in Early Imperial China,* New York, Oxford: Rowman & Littlefield Publishers, inc, 2002. p.191.

weaving. By weaving she helps herself and the economy of the country as well her good name.[33]

These writers display the social side of women but here again there is no specific link with ancient textile technology. This gap has been addressed by Dieter Kuhn in Joseph Needham' *Science and Civilization in China* series and when in 1995 he published *Silk Weaving in Ancient China: from Geometric Patterns to Pictorial Likeness*. Here Kuhn's findings explain the acceleration of technological development in ancient China, including the Han dynasty.[34] The resultant speed of textile production was achieved by the invention of spindle wheel, the first type of spinning wheel, and the various looms from the backstrap, to the huge drawlooms.[35] He discovered that the ancient Chinese used a hand-operated wheel similar to spinning wheel to reel off silk from the cocoon.[36] This type of wheel was then applied to other fibres beside silk and became the first real spinning wheels

Kuhn's works reflect the technical ingenuity of Han inventors. Becker, a Scandinavian weaver, reproduced some of the ancient textiles showing their structure and documenting the results in a technical book *Pattern Weaves in Han China.*[37] A very useful book on the technology compiled by Cheng, *The History of Textiles and Technology in Ancient China*, also helps to relate technologies with particular finished products.[38] Yet Becker replicated some of the early Chinese weaves to investigate the types of loom and his work

33 Bray, "Textile Production and Gender Roles in China 1000-1700." p118.

34 Dieter Kuhn, "Silk Weaving in Ancient China: From Geometric Figures to Patterns of Pictorial Likeness", *Chinese Science*, 12,1995,Vol 12, 1995 Available: <http://www.uni-tuebingen.de/uni/ans/eastm/back/cs12/cs12-4-kuhn.pdf>, 11/09/2004.pp.90-91.

35 Ibid. pp.90-91.

36 Joseph Needham, Dieter Kuhn, *Science and Civilization in China*, Vol 5 Part 1x, Cambridge: Cambridge University Press, 1988. The major part of this book is on spinning and reeling off the silk filaments.

37 John Becker, *Pattern Weaves of Han China,* Copenhagen: Rhodod International Publishers, 1987.

38 Cheng, ed., *History of Textile Technology of Ancient China*. p.26.

emphasises the weaving technology.[39] Similarly, the Nanjing Research Institute has research workers and facilities replicating the intricate patterns of later eras, but it has also worked on the fine gauzes from the Han dynasty.[40]

Kuhn's studies are still the major resource on spinning and weaving technology. Other articles have been published on the web and in magazines devoted to the artistic aspects of Asia such as Arts of Asia and Orientations, but here again, there is no collation of these disparate ideas.[41] The inventions described by Kuhn are an important part of textile history for without them, the study of Chinese textiles lacks depth and contextualisation. Different ideas emerge such as Kuhn believing that the drawloom was used in the Han Dynasty. Becker has different views from Kuhn's about when the complicated drawloom was first used to make brocades, but both have contributed to our overall technical knowledge.[42] The technical aspects and excellent reproductions have also been covered by others such as Zhao Feng who exposed the beauty to the textiles to the international audience.[43] However, without the social background of the people using them the study of textiles is a cold, technical study.

During the past fifteen years several important books on Chinese textiles have been written in both Chinese and English, Zhao Feng's *Treasures in Silk*[44] and Chinese Government productions such as *Textiles and Embroidery*.[45] These books give examples

39 Becker, *Pattern Weaves of Han China*. p.262.

40 Personal discussion and observation at Nanjing, Brocade Centre, during September 2007.

41 Both *Arts of Asia* and *Orientations* are prominent journals on Asian arts.

42 Becker, *Pattern Weaves of Han China*. p.262-267.

43 Feng and Yu Zhao, Zhiyong, ed., *Legacy of the Desert King: Textiles and Treasures Excavated on the Silk Road,* Hong Kong: ISAT Costume Squad Ltd, 2000,

Feng Zhao, *Treasures in Silk,* Hong Kong: ISAT/ Costume Squad Ltd., 1999,

Feng Zhao, ed., *Recent Excavations of Textiles in China,* Hong Kong: ISAT/ Costume Squad Ltd., 2002,

Feng Zhao, "Three Textiles from Turfan," Orientations 34.2 2003.

44 Zhao, *Treasures in Silk*.

45 Zhao Xiuzhen, ed., *Textiles and Embroidery Beijing*. *Gems of Beijing Cultural Relics*, Beijing, p.19.

of the textiles found during the twentieth century archaeological works and allow the English-speaking world access to photos and previously unavailable materials

While the sources listed above are excellent references for artisans and weavers, they still leave a gap in the explanation of the social and symbolic meanings behind the textiles, as well as the relationship between the textiles and those who made and wore them. Many merely describe the technique of the embroidery or analysing the weaves of the cloth or the costume used. They are analytical in so far as they exhibit a piece of cloth or garment, date it, and then discuss the weave patterns so that another weaver might reproduce it. The same applies to the discussions of embroidery designs and techniques.

To go beyond these limitations, this thesis also uses personal observation of the textiles and artefacts to help consolidate existing studies. Therefore, written authoritative texts will not be the only sources. Visiting China in 2006 and 2008 allowed the author to study the early textiles in Changsha, Wuhan and Urumchi and other major textile areas such as Suzhou and Hangzhou. Studying the early textiles found at Changsha, Wuhan and Urumchi as well as minor finds in other museums broadened the range of textiles and artefacts available for analysis and integration into a broader

1.2. Chapter summary

To provide the overarching view of the textiles and place them in their social context this thesis will be divided into the following:

1. Introduction
2. History
3. Textiles and Technology
4. Technical Inventions of the Spinning Wheel During the Han Dynasty

5. Evolution of looms in China
6. Dyeing Printing
7. Textile Designs and Decoration during the Han dynasty
8. Textiles and Society
9. Rites of Passage
10. Clothing
11. Thesis Conclusion

After the Introduction, chapter two will provide a background to in the Han and highlight the importance of the life and government of the people which were imperative to the type of textiles made for the elite.

Chapters three to six explain the technologies used during the Han dynasty and examines why each aspect is important. The discussion of fibres will stress the care taken to obtain high quality fibres, threads and cloth. Then, special emphasis will be placed on the new inventions which emerged at this time and which made the advancements in quality and quantity of cloth possible. This new equipment; the spinning wheel and different looms, demonstrate the inventiveness of the people when pressed to make more cloth and different designs. Production of new dyes to enhance the textiles are examined as dyes are crucially important for providing textiles with colour choices for both plain and patterned textiles. The application of dyes, often overlooked, will also be investigated to compile a list of the new colours developed in this period and chart their sources. Since embroidery, weaving and design are quite technical in their execution, these will also be dealt with to understand the resultant textiles.

To illustrate the importance and impact of technology, the textiles found from three major areas of the Han period will be discussed; textiles from the Mawangdui tombs near Changsha, (Hunan Province); Noin Ula in Mongolia; and graves and former rubbish dumps in the areas of western China once occupied by Han troops. These textiles will show the variety and difference in styles and designs

In Chapters seven, eight and nine, detail the Han people and their lifestyle to demonstrate motivations behind new textiles and the technologies to make them. This places the Han dynasty of China in its social setting to allow a better understanding of a society which demanded such complex textiles. Evaluation of the social conditions will encompass textiles in different settings, for different sections of society and examine why there was a need for such copious amounts of any textiles. The dress of all sections of society will discussed to show the great variety of clothing as well as clothes worn by the upper classes.

This examination will reveal the complex and multifaceted reasons behind textile development and explain how production was able to progress quickly in China when other parts of the world were still making very basic textiles.

1.3. Conclusion

The conclusion will draw together the findings of the various chapters including technology, lifestyle and symbols. The new information on the spinning wheel looms and dyes will be summarized to enable a concise picture of the advanced technology available two thousand years ago. It is the tying together of the textiles and the relationship with the people who made and used them, which gives a unique aspect to this thesis. Archaeological finds during approximately the last hundred years have helped to

illuminate this understanding. The history then becomes alive, two thousand years after the event as it is no longer just a written study, but an understanding of the people who made and used them.

2. Background

This Chapter will give a background history of the Han society to be able to understand why the people could make machinery, and consequently textiles, which would amaze world textile experts, archaeologists and historians and other academics centuries later.

2.1. Pre Han History

The early periods of Chinese history are swathed in supposition and mythology, but as Barber and Barber maintain, all myths surround a degree of truth but can change over time and cannot be accepted as evidence unless they are corroborated by datable evidence.[46] Therefore we should not just discount stories which have been handed down for millennia, but it does show that there must have been history going back into time when writing was not developed.

By the Shang dynasty (1766BCE-1045 BCE), the people in the area around the Yellow River had become farmers. They developed a society with systems of governments and beliefs encompassing the cosmos providing harmony of earth, sky and people.[47] It was a feudal era with great distinctions between the ruling classes and the peasants. The system of honouring ancestors was common, as was the burial of people with their horses and wives or servants as well as huge bronzes for use in the afterlife rituals.[48]

46 Elizabeth Wayland Barber, Barber, Paul T., *When They Served Earth from Sky: How the Human Mind Shapes Myth,* New Jersey: Princeton University Press, 2004.p.6.

47 David Burnett, *The Spirit of China: Roots of Faith in 21st Century China*, Oxford UK, Michigan USA: Monarch Books, 2008.p.18.

48 Constance A. Cook, Major S. John, ed., *Defining Chu: Image and Reality in Ancient China* U.S.A.: University of Hawaii Press, 1999.p.135.

By the Zhou dynasty (1030BCE-222 BCE) people lived in family units surrounded by their farms. Even at this early period there was centralised imperial control over the people and the area where they lived. This systematic imperial control can be explained by information from the *Rites of Zhou* where everything was based on a system of four.[49]

- four houses constituted a well;
- four towns were a *qiu*;
- four qiu were a county;
- four counties were a district;
- four districts were a *du*. [50]

Each level had to help provide for the state, particularly for military association. Each qiu had to provide one warhorse and three head of cattle; each county containing sixty-four wells had to provide one long chariot, four horses, twelve head of cattle, three armoured warriors and seventy-two foot soldiers with weapons.[51] This system provides an insight into how society was controlled. However, within this feudal society, philosophies developed, and artistic qualities of the people became paramount. To produce a philosopher such as Confucius and to be able to make bronzes for sacrificial rituals with such intricate decoration, was the work of sophisticated people.

Philosophers such as Confucius who lived during the Zhou dynasty expounded ideas and doctrine about how life should be lived. These ideas eventually gave the Chinese people standards and morals to live by. Life revolved around rituals to appease the ancestors and give form to life. Even textiles incorporated beliefs about the harmony of the cosmos and earth by using symbolic designs and themes in their decoration. However, even though there were standards to live by, life under the feudal system was hard for most of society.

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49 The *Rites of Zhou* was a document written during the second century BCE.

50 Sun and Francis, *Chinese Social History: Translations of Selected Studies*. Massachusetts, Vol 16 No 2, p.7.

51 Ibid, p.7.

China was a group of seven kingdoms each with their own king identified by a tenuous allegiance to the Zhou dynasty. These kingdoms were the Chu, the Qin, the Qi people, the Wei, the Zhou and the Han.[52] Each society was governed by the aristocracy of similar cultures but with some regional variations.

The Zhou dynasty provided a rich cultural heritage where philosophical thoughts and beliefs began to crystallise and spread throughout the lesser kingdoms. This was the Spring and Autumn Period (771BCE-476BCE) when Confucius spread his ideas and thoughts. His philosophies integrated the ancient beliefs on the cosmos, rituals and harmony with how governments should operate as well as the chain of command and the ideas of filial piety to father, brothers and those in power.[53] Unfortunately, in a time when peace and harmony was being expounded, various kingdoms started to vie for supremacy and a period of wars developed: This was known as the Warring States period under the Eastern Zhou (403BCE-221 BCE).

The period of the Warring States highlighted an important problem: wars need money. It needs to be borne in mind that China was unique in levying taxes of cloth. Therefore greater quantities had to be produced during wars.[54] This increase in demand put a strain on the weavers and farmers. Every woman spun or wove cloth for taxes and cash if time was available. Even wages were paid in cloth. One war was reputedly lost as women did not weave enough.[55] In addition, no matter how much material was needed for war, royalty also demanded copious amounts of silk while such silks, in part to enlist neighbouring tribes as allies. These requirements showed the importance of textiles.

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52 Mark Edward Lewis, *History of Imperial China: The Early Chinese Empire,* USA: President and Fellows of Harvard C Sun and Francis, *Chinese Social History: Translations of Selected Studies*. Massachusetts, Vol 16 No 2, college, 2007 p.27.

53 Mark Csikszentmihalyi, ed., *Readings in Han Chinese Thought Cambridge, Indianapolis*: Hackett Publishing Co, 2006.p.7.

54 Both textiles and grain were the basic forms of tax throughout the whole empire.

55 Hinsch, "Textiles and Female Virtue, Nan Nu Men, Women and Gender in Early China". p118.

Zhou Territory

NOTE:
This figure is included on page 23 of the print copy of the thesis held in the University of Adelaide Library.

Fig 2-1–1 Major kingdoms of the Warring States Period 480-222 BCE[56]

The Warring States period was a very unsettled time, but violence not withstanding, ideas for textiles were exchanged and production increased throughout the empire. In the latter part of this period new inventions appeared not only in textiles, but many other areas, such as the making of paper and the compass. Society itself changed when the last of the kingdoms were overthrown. These wars and upheavals caused a migratory society for many people..[57] This movement of people must have caused disruption to the industries such as textile making. Artisans attached to a household, shifted to cover the lack of skilled traders in another area and to ensure continuation of production necessary in great numbers during wars. The Han dynasty had a more settled population.

56 T'ang-Yi-Pi-Shih, "Crime and Punishment in Ancient China." Thailand: Orchid Press, 1007.

57 E-tu Zen Sun and John De Francis, "Chinese Social History: Translations of Selected Studies", The Journal of Asian Studies, vol. 16, (Massachusetts: 1966.p.294.

2.2. Qin Dynasty

Eventually, two of the states, Qin of the central-west and Chu to the south of the Yangtze River, controlled the other states. Both were very progressive and strong. In the final battle of 221 BCE the Chu kingdom was defeated and the new Qin leader, *Shi Huangdi*, took the title of the First Emperor of China. Yet China was an isolated civilization due to physical barriers of the Gobi and Taklamakan desert, the Tibetan and Yunnan plateaux and the Himalayas. The resultant belief that China was the centre of the world, sustained the feeling of superiority of the Chinese over others. The natural barriers also helped the control and unification of the people and were a means of controlling export of goods such as silk and keeping the knowledge of its production within the kingdom.

Many other aspects of the life in his kingdom were controlled, but Shi Huangdi made several reforms which became the basis of Chinese society for the next 2000 years. Sumptuary laws regulating the use of goods were introduced giving the emperor complete control over aspects of the life of his subjects, from the clothes they wore to the roads on which they could travel. The emperor became the supreme ruler, chief judge, high priest, as well as personifying the empire and the link between heaven and earth.[58] Rituals helped decide activities such as when to plant crops and when to go to war to claim more land.

Shi Hangdui abolished feudalism and gave the farmers land of their own. However, even though it was an era of social change, it was also a time of harsh punishments and the Qin was not a popular regime. Nerveless, despite the short duration of the Qin dynasty, a new social structure was set. Workers were no longer tied to a feudal lord and soldiers were not drawn from the feudal workers, but were recruited within the empire from people

58Mark Edward Lewis, *The Early Empires: Qin and Han*. USA: President and Fellows of Harvard College. 2007. p.28.

who were strong and warlike. Many items such as money and weights and measures were standardised.

When the founder of the Han dynasty, Liu Bang from the Chu kingdom, overthrew the last Qin emperor, he proclaimed himself Emperor Gaozu and began a dynasty of reform and relative peace: the Han dynasty. The major contribution of the early emperors of the Han dynasty was the introduction of government officials based on scholarship, not royalty, but it did require a certain amount of wealth to become a 'gentleman' official.[59] This system produced new elite with money and desire for fine goods. Consequently, commodities such as fine silks were in even greater demand.

2.3. The Han Dynasty

Belief in the afterlife occupied thoughts of the living and because of this we are able to explore not only the religious culture, but the material culture giving an opportunity to analyse one side of their culture, textiles and associated technology.

The Han dynasty was a relatively peaceful time and one where prosperity increased even though there were raids by bordering tribes and natural disasters. The organization and structure of the society which had been adopted by the Han dynasty displayed a hierarchical system where people were used to being controlled throughout their lives and consequently people who had earlier been displaced now had to return to their homelands. Among these people were artisans, spinners, weavers, dyers, designers and technicians.

59 T'ung-tsu Ch'u, ed., Han Social Structure: Han Dynasty China Volume 1, Seattle, London: University of Washington Press, 1972.p.65.

NOTE:
This figure is included on page 26 of the print copy of the thesis held in the University of Adelaide Library.

Fig 2–2 Han Dynasty Kingdom60

All of these changes affected society.[61] Ordinary men could again concentrate on farming and therefore produce better crops with greater yields. As grain, like textiles was taxed, the Empire grew richer. Amongst the crops were the mulberry trees for silk production and growing of hemp or ramie. As long as the required state taxes of grain or textiles were paid, this new freedom enabled workers to keep some of their crops or textiles. However, taxes could not always be paid and land was sold.[62] People were free and independent but farmers and other many other agriculturalists worked for a landlord.

In the Han dynasty the first capital, that of Western Han-was located at Chang'an (largest city in the world at that time). The Eastern Han 25CE-220CE capital located at Loyang. The areas further west were occupied by other kingdoms which came under the control of the Chinese during the Han and other periods of time.

60 Vainker, *Chinese Silk: A Cultural History*. p.73.

61 E-tu Zen Sun and John De Francis,"Chinese Social History: Translations of Selected Studies".p.294.

62 Lewis, *The Early Empires: Qin and Han*. p.21.

The Han dynasty expanded the new system of government in accordance with the emperor's interpretation of the thoughts of Confucius with officials obtaining their position by merit of scholarship, not through bloodlines.[63] This change in hierarchy produced a new and wealthy class. Even though the emperor considered merchants and artisans as unproductive people, these groups also began to acquire wealth and excess goods. These goods could be traded and consequently many merchants became as rich even though this was discouraged. The main change in society was that the newly appointed, learned officials ran their departments more efficiently than previous rulers. Confucian ideals concerning respect for those above you and clearly defined hierarchy encouraged stability when properly administered.

After the breakdown of feudalism, the Confucian ideals of filial piety, respect for those superior to you, and the importance of scholarship to obtain positions of authority, fitted neatly into the well-ordered and structured society required by the Han emperors. China developed into a society where respect for learning became the norm because it was the most legitimate and desirable path to wealth and power. These positions were all characterized by their own symbolic dress which helped reinforce the status of the wearer and his position in society.[64]

The increase in wealth also meant that sumptuary laws were often broken by the new rich to acquire the textiles once only made for royalty. During the latter part of the Han dynasty (Eastern Han) appointments of officials were once again not always given on merit and consequently unworthy people became powerful and rich and did not always adhere to the official morality of Confucianism.[65] Although punishments for non-compliance with laws during the Han dynasty were severe, some took risks and became

63 Hugh Dalziel Duncan, *Symbols and Social Theory,* New York: Oxford University Press, 1969.p.9.

65 Mark Csikszentmihalyi, ed., *Readings in Han Chinese Thoug*ht. pp.40-44.

rich due to corruption. There were others who bought land through legitimate means or as payment for services rendered or money earned.

This increase in wealth by both officers and merchants led to a fragmentation of the landed class wanting the highest quality in all aspects of life. They could afford servants and retainers and magnificent clothes. A wide gap between the wealthy landowners and the working strata of society appeared as 'landlordism' took hold.[66]

This rise in concentration of ownership and power did not concur within imperial ideas of a harmonious society. To try and combat the increase in wealth by people considered by the government to be unworthy landlords, they were often shifted off their land. They either became landless or the government gave them land in a new area where they did not have the same status, control and power.[67] Artisans accompanied their masters to these new areas.

The Western Han rulers even proposed limiting the size of the land and the number of slaves according to rank of the owner, to reduce their power.[68] These restrictions affected the production within households and decreased income and possible loss of prestige resulted. However, the display of wealth through textiles continued. The rich people appeared to gain status by using copious amounts of striking silk with new designs.[69]

Corruption occurred with the textile industry as official government collectors collected cloth which they had said was not up to standard. The excess was either stacked in warehouses or sold to others.[70] With the increase in population and tax demands,

66 Lewis, *History of Imperial China: The Early Chinese Empire*.p.21.

67 Sun, E.-t. Z. and J. D. Francis "Chinese Social History: Translations of Selected Studies. Massachusetts".p.159.

68 Ibid., p105.

69 The tombs from both from Mashan and those Mawangdui yielded extremely fine fabrics both for clothing and as bolts of silk and hemp

70 Lisa Lee Peterson, "Who Does the Weaving, Who Wears the Robe? Didactic Poems and Pictures of Ancient Chinese Weavers," Arts of Asia,Vol26,no3, M1996.p.56.

stockpiling became so common that extra money could be made by the intermediaries. The issue then became the subject of poems as in one quoted by Peterson:

> "Piled high as a hill in the warehouses, great white clouds of cloth"[71]

As the textiles languished in the warehouses ready for tax and sale, women continued to make more cloth: but it was never enough. Hinsch suggests that the Qin dynasty was even overthrown due to the women not making enough cloth, not necessarily just the silk which could be used as currency, but textiles for the taxes as well enough for war needs. Hinsch explains that there was not enough clothing and tents for the soldiers during the cold winters. As textiles were a tax, there was not enough money for the state to live on. Consequently, fewer soldiers could be secured and the war was lost with women being blamed.[72] This example dramatically emphasises the importance of textiles during war. In peace times the extra cloth would be a boost to the economy through Governmental sales However, when tax commitments in the private workshops and homes, these extra textiles could be sold.

Landowners who had workshops would not send more than the required tax of cloth to the government, allowing them to sell the extra cloth. If the cloth was an elaborate multicoloured silk of outstanding weave it must have come from the royal workshop, but many simpler, yet beautifully designed pieces, or fine gauzes, could easily be made in the landlord's workshops. As the workshops increased in size, the landlords made more elaborate brocades on the drawloom. Consequently people could then display their wealth by using silks and other textiles even though the buyers were supposed to conform to the sumptuary laws. If the laws were not carried out, harsh punishments could be enforced. Following is an explanation of the importance of laws for the wellbeing of the society:

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71 Ibid., p56.

72 Hinsch, "Textiles and Female Virtue, Nan Nu Men, Women and Gender in Early China," p.118.

> Edicts are the means to teach the people, and laws are the means to control wrongdoers… When rules are broken it is often due to the fact that there are too many laws which are not clearly understood.[73]

Punishments during the Han dynasty may have been less cruel than in the Qin dynasty, but were very harsh. These consisted of branding, cutting off the nose, castration and lastly cutting off the feet.[74] The rules were enforced by the officials easily distinguished by their symbolic dress. These punishments, for what could be considered minor infringements of the laws, give a picture of a brutal harsh society, but when the artefacts found in Han tombs are studied, a different aspect is revealed of people with a love of life and colour and commerce.[75]

2.3.1. Trade with the West

Trade within the Chinese borders was probably established in very early times as various goods and products were taken from one part of the country for building palaces and to make the canals. Food was also collected from one area and taken to other areas .Trade probable followed these activities. Whether these were traded or requisitioned, is not really know. At the same time towns grew and according to the Han historian Sima Qian there definite trade routes were discernable within China.[76] (See appendix 1) Markets grew which traded many diverse products. The early Han textiles do not appear to have been driven by trade. Since textiles were collected from all parts of the empire for tax purposes, it does not seem to have been a large trade as most of the time for making textiles, would have been utilized for the required taxes. The elaborate textiles which

73 Mark Csikszentmihalyi, ed., *Readings in Han Dynasty Thought*.

74 T'ang-Yi-Pi-Shih, *Crime and Punishment in Ancient China*. p.18.

75 Barbieri-Low *Artisans in Early Imperial China*, p.29.

76 Barbieri-Low*, Artisans in Early Imperial China.* p.119

much later were traded with the west were made for the Chinese people as there is no evidence they were made for export.[77]

Trade with the west officially began during Emperor Wu Di's reign (140 BCE-87BCE) when he desired horses from Fergana to help fight the Xiongnu, and to expand his kingdom. This expansion gave merchants more security, but the caravans were always under the threat of attack. Enough of the exquisite silks and other goods reached Rome for the Romans to want more and for merchants and other traders took risks to obtain high prices. This appears justified due to the length of time taken for each merchant to travel from one part to another and on sell their merchandise.

The Chinese set up watchtowers to protect the traders and especially to keep the minor kingdoms of the area under control. Excavations of graves from these ancient areas of settlement in the Gobi and the Taklamahan desert yielded Chinese textiles as well as clothed mummified corpses of different people from the Chinese Han.

These ancient towns and graveyards provide windows into another area time as some of the sites contained treasures including Han dynasty textiles. The major clothing found in the area was a gift from the Han emperor to the king of Jingjue. These articles were the gifts of royalty as the characters say *wang hou he hun*, marriage of the families of the king, and the Marquis. [78] These textiles have proven the existence of brocades, *jin*, being produced during the Han dynasty. The textiles were polychrome with intricate designs showing they must have been woven on a highly sophisticated loom, such as the drawloom.

77 Barbieri-Low, *Artisans in Early Imperial China*, p.137.

78 Feng Zhao, Zhiyong Yu, *Legacy of the Desert King: Textiles and Treasures Excavated on the Silk Road,* p.28.

2.4. Conclusion

From this chapter it can be surmised that the Chinese civilization had a long history. Though the history had upheavals and wars, there was always a thread of a social structure which supported the elite, throughout the feudal system, or the somewhat more organized society of the Han. However there does not appear to have been any specific events which would have favoured the production of similar textiles as other nations had similar conditions. The use of textiles for taxes was a unique feature, but the majority of textiles made for taxes would have been everyday cloth, not silks and brocades.

The Han dynasty modelled itself on the ideals of Confucius and acquired a society where social structure was important which helped in the making and collection of textiles for taxes. The economy partially relied on taxes of textiles which could be converted to cash. Textiles were an important commodity necessary to the wellbeing of the nation and eventuated with trade to countries such as Rome. From this it can be deduced that China would no longer an isolated nation relying on its own resources and ideas.

3. Textiles and Technology

NOTE:
This figure is included on page 33 of the print copy of the thesis held in the University of Adelaide Library.

Fig 3.1 Han Dynasty tile showing textile activities. Spinning wheel is shown in centre of tile.[79]

To be able to understand and analyse textiles, Mary King, a textile expert, says that four areas should be analysed. These include:

- the nature of the fibres used to make the yarn
- the structure of yarns themselves
- the structure of the cloth
- the dyes used on them.

These are the criteria the author will use to examine the textiles of the Han dynasty throughout this chapter. There will be an emphasis on the technology for making the fibres workable and how these were spun into yarn before being woven into cloth. As well, the dyeing of the threads or finished cloth is important, for most of the textiles still retain their original colours after two thousand years.

The technology of textile production is often a forgotten area of study as it appears quite mundane compared with the uses or appearances of the products. The analysis of the weaves and the designs on the finished cloth are often more attractive to scholars than the

79 Cheng, ed., History of Textile Technology of Ancient China p.245.

means used to create them. When references are made to textile equipment or to the processes involved in the making of the cloth, they usually relate to the development of technology in western societies. According to Bray, "even today, technology in non-western societies gets little attention from the mainstream institutions in the discipline" yet it is these everyday objects which were the indicators of the changes in social fabric. [80]

A background history of textiles in China will demonstrate the advanced nature of Han dynasty textiles and why they were unique. Even though other civilizations made textiles at the same time, e.g. Egypt, none could make the designs and use silk and other fibres like the China's artisans. To be able to create new textiles of quality and patterned weaves, the Chinese must have found some new methods of producing them. New technology had to be invented to obtain the necessary consistency of thread diameter. New looms were required to not only enable new patterns, but also to increase production time to meet the demand of a growing population. The variety of fibres used for the textiles, how they were processed into thread, then woven into intricate patterns and coloured with dyes not used elsewhere at the same period of time will be investigated. What were these new technologies and what caused them to appear in China and not elsewhere? These innovations appeared to have achieved an industrial revolution in the Chinese textile industry: therefore this chapter will describe the technology and the social advancement which brought about this rapid advancement. The introduction of a semi-mechanical spinning wheel to reel silk, albeit one where the wheels were hand turned, produced an impact on the industry as the technology could then be adapted to spinning other fibres beside silk. It was the output of the spinner which was time consuming and a limiting factor in textile making, so this new equipment made thread faster than previously with the drop spindles. Although evidence of drop spindles used for spinning

80 Bray, "Technology and Culture in Chinese History: An Introduction." p.2.

has been found from Neolithic times, they were no longer feature in Han tombs: suggesting their demise. The introduction of the spinning wheel increased thread production at a far greater rate.

As well, the looms must have been of different designs from those in other places to be able to perform such diverse weaves from fine gauzes to heavier damasks and brocades. The polychrome textiles of the Han dynasty would have been made on looms with multiple treadles and heddles to control and manipulate the threads. New complicated multicolour designs made by the end of the Han dynasty, required even more complex mechanisms. These new inventions were the marvels which made the unique progress of China's textiles possible. They provide evidence of spinning wheels and draw looms in use over one thousand years before similar ones in Europe. The technical aspects of the structure of the weaves have been the subject of many studies from outside China, e.g. Becker, and in modern China by the textile writer, Zhao Feng. Both scholars have specialist knowledge of weaving and are highly qualified for this analysis. Due to these well-established studies, a minimal amount will be included on the weaving structures in this thesis. I will concentrate on the technological side of the production of the textiles as well the process of fibres and their production into yarn and then cloth and how they were decorated. I will show how Chinese textile technological development marked the beginning of the mass production of cloth and demonstrate how the long history and expertise was passed down through the millennia.

Han textiles show evidence of a very ancient craft with a diversity of natural sources and skill of the weavers. Silk is the most well documented fibre from China showing the diversity of silk production was widespread in a time when silk was for royalty, not the populace. Other fibres would have been processed all over the country, in homes and workshops. A technical study which encompasses the relevant bast and animal fibres in

use as well their production from the raw product to the technology for making thread and cloth is also investigated to show expertise with other fibres as well as sericulture. The subsequent examination of the consistency of colours shows that the Han dyers were masters of their craft. These developments and expertise are also shown in the diversity of colours used to enhance the cloth. The quantity and diversity of dyes is described to show how they were important as a technological development and related to the demand for different textiles. The increase in the number of new colours during the Han dynasty was not surpassed until early in the 19th Century when synthetic, aniline dyes, were invented to give a greater range of colours.[81]

The invention of the spinning wheel to spin even threads and reel silk; to the looms which make patterns and design not known elsewhere; to the standardized of dyes was an achievement. Evidence will be provided for the early invention and use of the spinning wheel which is usually attributed to medieval Europe, not China. This wheel provided a strong even twist and various grades of yarn. Other evidence will show the evolution of looms in China from the early backstrap loom, through the upright loom to the huge draw looms that were used to make the complicated brocades of the Han and later periods. With each loom development a new phase occurred in the textile industry which enabled production of even greater quantities. An assessment of the labour and expertise involved in the production of silk, hemp, ramie and other bast (vegetable) fibres will help define the technology used. New technological developments and new implements made to reel the silk, to spin threads and to weave and dye the cloth are many inventions which appear to be the forerunners of similar techniques and equipment in European textiles.

3.1. Investigation of Technology of the Han dynasty.

81 Joyce Storey, *Dyes and Fabrics* (London: Thames and Hudson, 1978.p.73.

A patent was taken out for the first synthetic dye by William Henry Perkin in England during 1856.

Buchanan explains the reason why the study of technology is important:

> The history of technology is about people, and the way in which people have made and done things, and the implications of those actions upon each other. It is this human content to the subject which gives it valuable relevance to the temporary questions of our civilization and makes it important in the teaching of history.[82]

Technology then, is not just about a collection of equipment and how it as used, but also about the people who invented and made it. It shows a different aspect of society as it implies the order of society, the roles of the people who operate the technology, fashion and or course the equipment. The technology also gives an understanding of a product which, while it can be luxurious, is really mundane and needed for everyday use. Textiles also contribute to society; not only as clothing, but are part of the sophisticated society.

In past eras, new ideas and inventions did not happen at the pace of twenty first century inventions. Many centuries usually passed before new ideas and equipment came into use. Because of this time lag, it is not always possible to date textile inventions, but modern researchers have the advantage of studying the progress over about 4000 years and fitting all aspects of textiles into a continuum of understanding. However, pictorial and written evidence usually means that the textiles were made much earlier to obtain the expertise shown in the text which been discovered. Vivi Sylwan, who analysed many of the textiles brought back from Sevin Hedin's explorations in Western China, reminds us that China's silk textiles had long progenitors.[83] The same applies to all aspects of textile making, particularly with associated equipment.

In pre-Han China, different plants, such as vines and grasses, were experimented with to make cloth. *Dolichos*, a vine, is mentioned in the *Book of Odes*, (*Shi Jing)* c1000 BCE. This vine was used during the Zhou period in some areas and possibly continued in

82 Kuhn, "Silk Weaving in Ancient China: From Geometric Figures to Patterns of Pictorial Likeness".

83 Selwyn , *Investigation of Silk from Edsen-Gol and Lop-nor and a Survey of Wool and Vegetable Materials*, Reports from the Scientific Expedition to the North-Western Provinces of China under the Leadership of Dr. Sven Hedin. Stockholm: Statens Etnografiska Museum, 1949.p.43.

tropical areas during the Han dynasty.[84] Hemp, ramie and silk proved to be the most satisfactory for ongoing textile production. It is important to recognise that silk was not the only fibre manufactured into cloth during this period. Silk, being such a luxurious commodity and synonymous with China, took precedence in the imagination of most people when thinking about Chinese textiles. However, during the Han dynasty it was not the cloth used by most people. Ramie the nettle fibre, *Boehmeria nivia*, was used in warmer areas and hemp, *Canabis sativa*, of different weights were the common fibres used for clothing and other purposes.[85] These textiles are often mislabelled as linen in modern Chinese museums due to the presence of a slub in the weave. Cheng refers to flax being grown in the Song dynasty, 960CE-1279CE but this was used for medicinal purposes. Only in the Qing dynasty, 1644CE-1911CE was it used for some textiles.[86] Both hemp and ramie had a slight slub of thicker patches in the spinning together of the fibres, and so could be confused with linen.

3.1.1. Early Textile Discoveries in China up to the Han Dynasty

The earliest dated Chinese textiles were discovered in a burial site of the Yangshao culture in present day Qingtai, Yingyang County, Henan province. The Yangshao culture lived in the late Neolithic era approximately 4950BCE-2950 BCE. There was evidence of that a sedentary life formed in the towns and cities. Craft industries also developed during this period as red and black painted pottery was made.

These decorated pieces of pottery made during Neolithic times, indicates a desire for ornamentation. The ornamentation may have been inserted to show religious meanings or pure decoration. Some of the simple painted designs were similar to those found in

84 Robin R. Wang, ed., *Images of Women in Chinese Thought and Culture: Writings from the Pre-Qin Period through the Song Dynasty* Indianapolis/Cambridge: Hackett Publishing Company, Inc., 2003. p.6.

85 Sylwan, *Investigation of Silk from Edsen-Gol and Lop-nor and a Survey of Wool and Vegetable Materials*.p.88.

86 Cheng, ed., *History of Textile Technology of Ancient China*.p.165.

weaving, while coarse cloth was also used as a method of pattern making when pressed on to the wet clay.[87] The content would possibly have been hemp for the coarser markings, but silk could have also been used as artefacts have been found wrapped in silk. Bones of children were also found near some of the houses of the Yangshao dwellers. One of these urns contained the bones of a child wrapped in silk fabric dated from around 3650 BCE.[88] This find reveals that the ability to weave silk was already well advanced by this time because the cloth had a smooth, even weave.

This Yangshao culture was similar to the people from Banpo culture from near modern day Xi'an. More Neolithic textiles, believed to have been made by the Liangzhu Culture, c2750 BCE, in Qianshanyang, Huzhou in the central Yangtze delta. (The Neolithic sites are found in Fig.3.1, Fig,2.2, and Fig.3.3.) These textiles were also evenly woven, again displaying the high standard of spinning and weaving. The number of silk finds increased by the Zhou dynasty and continued to expand into the Han dynasty with the tomb of Lady Dai of the Mawangdui tombs near Changsha becoming the most famous.

87 Neolithic pottery with the pattern impressed by cloth can be seen in many museums in China.

88 Vainker, *Chinese Silk: A Cultural History*.p.22

Neolithic Silk Sites

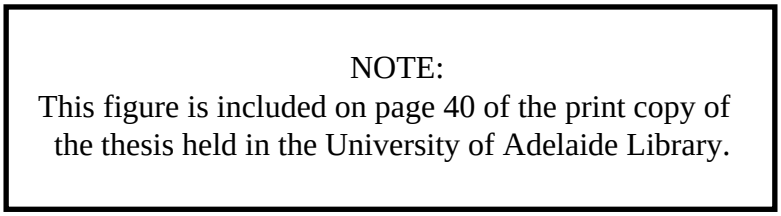

Figure 3-1 Sites from the Neolithic period where the oldest silk was found dating from approximately 5000 BCE-3000BCE [89]

By the Shang dynasty patterned fabrics as well as plain ones were being woven. A patterned damask impression was found on an axe from the Bronze Age village of Anyang.[90] The impressions of the wrapping used for the axe revealed the cloth possessed a woven pattern. For the textile to have been wrapped around such a special artefact indicates that it was probably silk as it was made for royalty.

89 China page, "Neolithic Period in China, (10,000 BCE to 2,000) BCE. "Available: http://www.chinapage.com/archeology/neolithic.html, 20/02/2008.

90 Huang, ed., *The Great Treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery(1)*.p.4.

Neolithic China

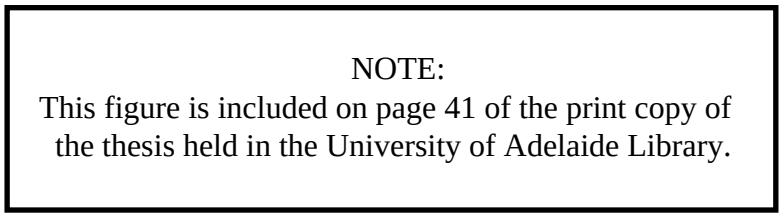

Figure 3-2 Map showing silk sites from the Neolithic, Shang and Zhou dynasties[91]

3.1.2. Pre Han textiles

The textiles of the Zhou period demonstrated advancement in technology. Threads were now more even and new textures with thread manipulation and patterns emerged. This was a breakthrough as it was then possible to form textures and designs on the fabric.

91 Vainker, *Chinese Silk: A Cultural History*.p22.

The early development of different types of textiles can be seen during the Zhou. Different styled gauzes with geometrical designs such as lozenges and small, woven, monochrome patterns emerged. The new textiles would not have been only made in silk, as fine hemp and ramie was available, so it is fair to assume that the patterns would have applied to other fibres as well. Experimentation of fabrics with spot designs was a totally new technique. These small designs progressed and eventually evolved into the heavy brocades found later in the Han dynasty. Brilliant colours and designs contributed to exciting textiles. The plain weaves were made by most people in the home for the required taxes and their own use, but the more elaborate weaves were made for official use in state run workshops.

Fig 3-1a Warring States Textiles showing complex large lozenge weaving design. Warp figured brocade from c300 BCE, Mashan, Jingzhou district museum, Hubei Province [92]

92 Huang, ed., *The Great Treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery(1)*.p.17.

Fig 3-2b Warring States Textiles showing complex geometric weaving pattern of phoenix and wild duck, c300 BCE, Mashan, Jingzhou District Museum, Hubei Province [93]

However, it was not only the new patterns which were amazing, but the quality of the thread used, and the evenness of the weaving. It was important that quality was maintained so clear instructions were distributed. An ancient book from the Warring states period, *Important Arts for the People's Welfare,* (Qi Min Yao Shu*)*, had a section devoted to the production of sericulture including the importance of selecting the correct mulberry leaves and silkworm species to produce the best cloth.[94] This is possibly the earliest known written record on sericulture but there may well have been earlier writings which have been lost. This technical knowledge would have been complemented by oral teachings and the sites of production would have increased. Increases in the quantity of

93 Huang, ed., *The Great Treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery(1)*.p.16.

94 Cheng, ed., *History of Textile Technology of Ancient China*.p.145.

different fabrics allowed more internal and eventually external trade.

Han Dynasty Silk sites and Trade Routes to Central Asia

Fig 3-3 Cities of Silk Production during the Han Dynasty and the Silk Road[95]

3.1.3. Technology

The technology of the Han dynasty is difficult to find and separate from other eras as little is written in either Chinese or English. Dieter Kuhn's writings have contributed specific data on spinning and weaving in of ancient China. Cheng compiled a book on Chinese textile technology through the early Chinese periods, including the Han dynasty. Both show the wealth of technology available, but all the equipment would probably not have been used everywhere in the country at the same time. It must be remembered that most of the knowledge comes from archaeological finds which gives a limited picture of where articles were used or how far they spread. Sivin advocates that the achievements of other civilizations, (including China), should be judged on their own merit and period in

95 Vainker, *Chinese Silk: A Cultural History*.p.73.

history, not on what is the current knowledge and thought in 21st century Europe. Today's finds may only be part of the original picture.[96]

In the case of ancient China the new inventions in textile technology appear to have been an independent progression over time as there was little contact with outside communities except through wars. None of nomadic people in surrounding areas had the technical knowledge or made textiles available similar to those made by Chinese artisans during the Han period. India possibly made silk cloth, but it was from wild silkworms not cultivated ones. When silk is made from uncultivated worms, the resultant filaments are not even and lack the lustre of cultivated silk thread. It is possible that the filaments were not continuous. The unwinding of the continuous filaments was a technique which the Chinese perfected. Short lengths of silk filament had to be spun in a similar manner to cotton and wool. However it was the silk which made China unique,

Since the ancient Chinese considered themselves totally self sufficient in every way, the technology was not invented to support trade with any other country. When external trade became popular, the source and production of silk textiles were also kept as a secret. Since the new textiles appear to have been for home consumption, royalty would have been a driving force for new types.

There were other reasons why the manufacture, if not the styles, increased. With this extra burden of early wars and expeditions, the Han dynasty would have needed more textiles. This would have been adequate incentive to increase technology. However, it is important to remember even though these changes accumulated, they rarely occurred as quickly as we would expect since the eighteenth century, but took place over decades and

96 Nathan Sivin, "Why the Scientific Revolution Did Not Take Place in China—or Didn't It?," *Chinese Science*, revised 2005,pp.45-66,

centuries. Yet, with each peak in Chinese history such as the Han dynasty, there was usually an increase in textile technology and production.

3.1.4. The Expansion of Textiles during the Han Dynasty

There is evidence from the variety of textiles which have been found that new designs and techniques evolved during the Han dynasty, but production must also have increased due to the following:

- Silk, or another fibre textile, was required from every household as a governmental tax and as the population grew, so would the quantity of textiles.
- A governmental system where scholars replaced royal relations as officials in charge of departments of the governing body of the Chinese empire gave rise to more wealthy people than previously.
- An increase in population due to the social stability.
- Wars between lesser kingdoms, nomadic tribes and the Chinese Empire had produced a road system to transport troops and equipment. The roads were then used for trade in times of peace. New canals were built during the Han dynasty to transport grain to the capital, materials for construction of public works and palaces, and the trade of goods.[97] With the movement of people and goods, designs and textiles were spread around the country. [98]

This increase in production and technology is a major factor for the importance of textiles in the Han society; consequently, to study the technological inventions and the finished textiles we need to understand the people who made them, the technology they used and

97 Loewe, Michael, *Everyday life in Early Imperial China*.pp.68,69.

98 Honours thesis by Heather Langford, Chapter 5. Held in Barr Smith Library, University of Adelaide.

the type of designs which were produced. To be able to produce textiles in such quantities and with new equipment producing different designs, there was a well-structured and controlled system of workshops.

3.2. Workshops

During the Han Dynasty development of new patterns continued and therefore more textiles were desired and made for home consumption and then for trade. To maintain the desired output and quality of the textiles, workshops were set up under the control and supervision of the government. The Warring States period had introduced state workshops for textiles which were expanded into various components for sections of manufacture During Emperor Han Gaozu's reign, 202BCE-195 BCE, workshops became the standard practice.[99] Chang'an was the major area where the embroidery was performed under the auspice of the empress who controlled the growing of the silkworms as well as spinning and weaving within the palace. This was not the only place were silkworms were raised and silk spun and woven during to the increase in demand. With the expansion of the well-controlled, specialized workshops, greater quantities of "beautiful, tasteful and exquisite" textiles were created.[100] This enabled many people to have a livelihood and acquire expertise.[101] The weavers with expertise were very desirable in state and private workshops. Most of the new equipment and technology would have been used in state-run workshops; there should have been an improvement in conditions due to the faster, more efficient work conditions. However, Sheng believes

99 Hinsch, "Textiles and Female Virtue, Nan Nu Men, Women and Gender in Early China." p.191.

100 *Textiles and Embroidery, Series of the Gems of Beijing Cultural Relics* Beijing: Beijing Publishing House.p.35.

101 Bray, "Technology and Culture in Chinese History: An Introduction."p.124.

The workers in the state workshops may have been mainly slaves, whereas free people may have been employed in the private workshops which were also beginning to be established.

that they many workshops were run by indentured slaves (*nuli)* who were not able to leave the workshops as their contribution and expertise were a valuable commodity.[102]

Wealthy people could own and run their own workshops with hired labour but still had to produce the specified designs and have the quality controlled by officials.[103] These regulations provided uniformity in textiles. Government textiles used for tax payments were then consistent, as the work (*shishi),* was controlled by the "Lesser Treasury" (*shaofu)*.[104] Excess production could be sold. These large private workshops producing woven cloth were an important part of the economy as they employed large numbers of people. Other workshops sections such as scouring, dyeing, garment making and tailoring shops were controlled by the Lesser Treasury. The *Yu Fu Ling* was one of the official offices in the workshops. The person holding this office was in charge of making royal garments while the official post of *Qi San Fu* made the seasonal ritual garments. Another workshop was for tailoring. Two tailoring workshops made the royal robes for each season at an enormous cost to the economy.[105]

The economy and content was controlled by officials of various ranks according to their importance. The amount of revenue spent in these royal workshops was enormous. Once it was in the eight figures just for royal robes.[106] The royal embroidery workshop, *Sanfuguan*, at Xiangyi only produced ritual and ceremonial dress embroidered with dragons for the imperial household, while other workshops specialized in other areas. To offset the cost of the official robes, everyone had to pay substantial taxes.[107] An official history from the Han dynasty reveals that before 140 BCE, only ten trunks of silk for the

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102 Sheng, "The Disappearance of Silk Weaves with Weft Effects in Early China."

103 Cheng, ed., *History of Textile Technology of Ancient China.* p.154.

104 Vainker, *Chinese Silk: A Cultural History*.p.46.

105 Ibid.p.46.

106 Cheng, ed., *History of Textile Technology of Ancient China*.p.142.

107 Sun and Francis, Chinese Social History: Translations of Selected Studies.

court had been produced per year, whereas later Han production under Emperor Wudi (140-87 BCE) employed about one thousand people in each of the relevant workshops showing the great increase in production. Ten trunks filled with bolts of silk would have only required a small workforce whereas to produce around ten thousand bolts, an enormous workforce would have been needed.[108]

All the manufacturing of textiles was under the control of the lesser treasury who also controlled the production of crafts which included the *zhishi* or weaving workshops. Some workshops involved several thousand workers and produced tens of thousands of pieces of cloth.[109] These workshops were scattered as even the royal workshops were not all in the same city or town. Vainker places the production areas for royal silks at Linzi (Shandong province) and at Xiangyi (Henan province). These workshops were called *sanfung* as they made clothes for the three seasons of spring, summer and winter. Xiangyi also made ceremonial and ritual silks.[110] These were only the workshops for royal attire; many others were needed to make the plain silks and other fabrics, as well as the elaborate ones for export and high officials. The whole structure of the workshops was under state control. This could standardize all areas of production in all parts of the country. This could only be achieved in a well-ordered, hierarchical society where authority was respected.

For example, the official called *Ran Ren*, controlled the dyers of the workshops were given their own separate area of expertise and control which showed the importance of the work. Another department was called *Zhang Ran Cao* official handling herbs. Other officials had titles such as *Z*hang *Shen,* official for the procurement of clamshell powder

108 Vainker*, Chinese Silk: A Cultural History*.p.47.

109 Bray, *Technology and Gender: Fabrics of Power and Late Imperial China.* Berkley and Los Angeles, California: University of California Press, 1997.p.53.

110 Vainker, *Chinese Silk: A Cultural History*.p.45.

which was associated with the materials they collected. All of these departments of weaving came under the office of the Lesser Treasury.[111] It is through this tight control, that official standards were maintained.

Women fulfilled some of the minor roles of command in the workshop.[112] These women supervised areas such as the gathering the goods for the textile production and supervising the spinning and weaving quality. These included the fibres, threads, dyeing materials, as well as distributing these materials and collecting finished work. They also conducted the supervision of the spinning, weaving and dyeing of the fabrics. Lewis considers that the slaves must have undertaken this work as well as dyeing was a messy component of the textile industry.[113]

Women of the working class were the makers of cloth from start to finish, whereas the workshops specialized in different stages of the process. All women wove for the family and the required taxes, while the men were the agriculturists. (Men plough women weave, *nangning nu zhi.)*[114] Taxes were always a priority for the weaver, not the cloth for their own use.

3.3. Fibres in use during the Han dynasty

By the Han dynasty, Chinese textile artisans were a forerunner in textiles as other parts of the world only display plain weaves and coloured warp or weft used to form stripes and checks.[115] The Egyptians used flax, and the Greeks and Romans used mainly wool or flax, but their fabrics which were woven on upright looms only producing plain weave with

111 Hinsch, "Textiles and Female Virtue, Nan Nu Men, Women and Gender in Early China."p.191.

112 Huang, ed., *Chinese Fine Arts, Arts and Crafts 6,Printing Dyeing Weaving and Embroidery*, .p.82.

113 Lewis, *History of Imperial China: The Early Chinese Empire*.p17.

114 Bray, "Technology and Culture in Chinese History, an Introduction."p.118.

115 Barber, *The Mummies of Urumchi* (New York: W.W. Norton & Company, Inc., 1999).plate 13a,p.144.

Tartan style fabrics found in the Taklamahan area of western China.

woven stripes. Han weavers made plain and twill weaves with variations of stripes and checks and even tartan, but it was the fancy weaves which were their speciality.

Several different fibres were used to make textiles during the Han dynasty. The main fibres used by the populace were the bast fibres, ramie the nettle fibre, *Boehmeria nivia*, and hemp, *Canabis sativa*. Both of these fabrics could be used in summer or padded for warmth. Silk could also be treated in the same manner.

3.3.1. Hemp

Hemp (*cannabis sativa*), was probably one of the earliest fibres used in China as it is thought to have been cultivated from approximately around 4000BCE- 3000 BCE.[116] By the time of the Han dynasty, the cultivation and production of hemp had reached such a high level it was no longer a coarse fibre, but one which could be made in various grades. The cultivation, spinning and weaving of hemp is described in the translation of the *Si Min Yue Ling*, a book from the Eastern Han period (25- 220 CE) suggests to, "Plough and fertilize in January. In February sow the female hemp's seeds, then harvest the hemp and spin it into cloth in October".[117] The female hemp plant was used as it produced a much finer fabric than the male, and so was more desirable for textile making.[118] Hemp was described in the pre Han Book of Songs as being 'white as snow' indicating that it was bleached and scoured to produce a quality textile suitable for royalty.[119]

Being a bast fibre, once grown and harvested hemp needed retting, or soaking in water, to loosen the fibres from the interior by degumming and separating the fibre bundles. This process was hastened by beating with a wooden paddle to make it supple and ready to spin. To spin the fibres it was possible that a type of spinning wheel was used by the Han

116 Xiaozhai Lu, Clarke Robert C., "The Cultivation and, "Use of Hemp (Cannabis Sativa L.) in Ancient China,."

117 Lu, "Use of Hemp (Cannabis Sativa L.) in Ancient China,." Available: <http://mojo.calyx.net-olsen/HEMP/IHA/iha02111.html>, 30.06 2008.

118 Ibid., p.2.

119 Kuper, "Costumes and Identity." *Comparative Studies in Society and History* Vol 15 no3.p.95.

dynasty for textiles, due to the even thread with a regular twist. Figure 4.6, shows a spinning wheel in use in the Song dynasty, 960CE–127CE, but it may have been in use for centuries as it is similar to ones found on stone carvings from the Han dynasty as in Figure 4.1. The spinning wheel is for spinning hemp, not silk as signified by the small bowl to hold water to dampen the fingers when spinning the hemp. The spinning wheel would have been an improvement for not just reeling and doubling thread, but for spinning fibres as more yarn could be made in a shorter time. Bray notes that fine spinning could be done on the drop spindle, but the time taken was slower than with a spinning wheel.[120] The spun thread would have been even and could be used for high-grade goods. The poorer grades of hemp were available for clothing of workers, shrouds for the dead, and soldiers' clothing. The finer cloth was used for the wealthy. Cheng talks of hemp from the Warring States period as having threads of 0.2mm in thickness less than most twentieth century fabrics. [121] Therefore, it could be used for delicate clothing. Apart from clothing and household textiles, hemp was the basis for lacquer work bowls and other articles. It could be spun finely or coarsely and easily shaped especially when lacquered, ensuring a stable shape.[122]

120 Bray, *Technology and Gender: Fabrics of Power in Late Imperial China*.p197.

121 Chen, ed., Hunan Provincial Museum: The Exhibition of Mawangdui Tombs ,Changsha: found 1972.

The Catalogue Treasures from the Hunan Provincial Museum, Changsha: Hunan Provincial Museum, 2002.

122 History of Ancient Traditional Chinese Clothing, China Style.:,< http://www.chinastyle.cn/clothing/history/han.htm>, 21/04/2006

Fig 3-4Spinning wheel used for hemp spinning during the Northern Song Dynasty (960-1297CE)

Picture by Wang Juzheng

The quality of the hemp textiles would also depend on the skill of the spinner and weaver. The textiles found in tombs such as those at Masham and Mawangdui (explained later in this thesis) were a mixture of different fibres, but the weave is not mentioned. A fine plain weave hemp cloth is shown in the Hunan Provincial Museum, but this does not mean that hemp patterned weaves were not made as well.

3.3.2. Ramie

Ramie the nettle *Boehmeria nivea* is a fibre similar to hemp which was used from ancient times in China. It was mentioned in the *Tribute to Yu*, and *The Institutions of Zhou* as being used as a tax during the Zhou dynasty. Like hemp, ramie required complex preparation to make it a supple fibre to spin and weave. Cheng describes the process thus:[sic]

> Steep the ramie fibres in water for one night. Take them out again the next day and spin them into yarn. Then steep them in a solution of mulberry –wood ash, millet ash for another night. Take them out again the next day, and put each skein, which weighs five liang, into a cup, where, after being mixed with fine lime, it is made to stay for still another night. Remove from the lime on the following day and boil the ramie in a solution of millet

> straw ash for a certain space of time, at the end of which it will become soft and white. Then hang the ramie up to dry.[123]\

The process was complicated and lengthy, but the ingredients and technique must have been readily available. The long white ramie fibres looked good even when undyed; but they could absorb dye easily.[124] Ramie also gains strength when wet so could be used as a sturdy fabric for everyday use even though it has little natural elasticity. It was possibly used for ropes and nets which then became stronger when wet. Ramie from the Han dynasty was found at the archaeological sites in Baoji and Fufen in Shaanxi Province.[125] Ramie is still grown in these areas as a crop called "China grass".[126]

3.3.3. Wool

Even though the Chinese did not exclusively develop wool for clothing and domestic use, it was still important. Animal fibres from sheep, goats, Mongolian gazelles and antelopes are known to have been felted and spun on drop spindles to make and woven cloth. Finely woven woollen cloth have been found from Nuomuhong Cultural Relic's site in Henan province.[127] Though the fibre type has not been identified by Cheng, it is known that there were different types of sheep raised from the Neolithic period in various parts of China.[128]

A textile with a mix of silk and wool mix was recovered in the western areas of China, indicating that the Chinese weavers were accustomed to combining fibres as has become popular during the twenty first century. Some pieces of woven woollen fabrics unearthed from the Eastern Han tombs at Minfeng, Xinjiang were decorated with grape designs,

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123 Cheng, ed., *History of Textile Technology of Ancient China*.p.303.

124 Barbara; Smith Scruggs, Joyce, Ramie: Old Fibre, New Image, Ohio State University, Available: <http://ohioline.osu.edu/hyg-fact/5000/5501.html> 30/08/2008.

125 Cheng, ed., *History of Textile Technology of Ancient China*.p.56.

126 World Cotton History, Cotton Australia, Available:

13/10/2008.<http://www.cottonaustralia.com.au/factSheets/resources/world%20cotton%20history2.pdf.>, 11/11/2007 2007.

127 Weiji Cheng, ed., *History of Textile Technology of Ancient China*. p.14.

128 Cheng, ed., *History of Textile Technology of Ancient China*. pp.14, 175.

four petal flowers while some were dyed purple.[129] This may have been made in tapestry weave and design more common in later central Asia. Since little woollen textiles have been found in tombs of the Han elite, maybe the Chinese only used the whole sheep's skin as an outer garment for warmth or it was mixed with hemp or silk. Woollen textiles and wool and other fibre textiles have been found in Western China's excavations from around the first century BCE, which belonged to desert kingdoms.[130] The use of wool textiles during this period begs for further investigation.

3.3.4. Silk

Silk from the silkworm *Bombyx mori*, was grown only in ancient China. Other countries have produced silk, but they were not from cultivated silkworms.[131] It was the Chinese who learnt to farm mulberry trees, harvest the leaves and feed the delicate silkworms, then unwind and degum the double filaments to achieve threads and then cloth of such fineness and lustre. It is thought that cultivated silk was used in China from approximately 4000 BCE, showing the knowledge which the Chinese had acquired for animal husbandry and sericulture productions. Silk textiles were always the textile reserved for royalty. This elitism was due to the time and cost of making the textile, as well as the elitist power it gave to the wearer. By the Han dynasty more silk was being produced but it was still only used by those with royal connections or those who had enough money to purchase the cloth.

Within Han China, the price of silk varied with the quality and pattern. The highest grade of brocade silk was sold at 20,000 Chinese copper coins per bolt, the second grade at 10,000 coins and the third grade at least 5000 coins. Normal cloth cost 700 coins a bolt.

129 Cheng, ed., *History of Textile Technology of Ancient China*: p174.

130 Feng Zhao, *Recent Excavations of Textiles in China*. p.31.

131 Irene Good produced a paper in 1998 on the fact that silk was also found in India along the Indus River. The psudonoms and a single strand show that some of the silk was wound as a continuous filament. However, these silks are from the wild, not cultivated as in China.

Brocades, *jin*, were highly valued.[132] Although there is no conversion of the worth of these coins, it is possible to see the increase in cost by the type of designs woven in the cloth. By the time the textiles reached Rome they were sold for much more. Silk was an expensive item but people were willing to pay for it.

Silk was certainly not the first fibre to be spun into cloth by the Chinese people, but it is the most famous and most difficult to spin and weave. Hence, silk is the major textile associated with China. Silk is unique in that it is so strong and could be used for the warp threads on a loom without the breakages of other fibres were prone to. It is extremely lightweight; it absorbs water and is given elasticity when doubled. Hence, it was and still is a very desirable fabric. This knowledge of sericulture enabled the Chinese to make a strong, luxurious thread and overcome the difficulties of weaving it into cloth and obtain an even, straight piece of cloth of plain weave and later patterned weaves.[133]

The first patterned silk textile found from ancient China was discovered was by a Russian team in the late 19th Century at Kerch in the Ukraine.[134] This silk textile from the first century CE was wrapped around human bones. The piece was remarkable in itself as it had a lozenge pattern woven into the cloth. A similar lozenge patterned textile from the Han dynasty is found in Figures 5.4, 5.5. Many earlier Chinese textiles with elaborate patterns have been discovered since this first discovery. In the Tomb of lady Dai of the Mawangdui tombs, her textiles ranged from fine gossamer to heavy brocades. Some

132 Nengfu Huang, ed., *The Great Treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery(1)*. p.9.

133 Silk cloth has been found in other countries, but it is not made from the long, continuous thread of Chinese production, but the short fibres left when the silkworm eats its way out of the silk cocoon.

134 Prior to this discovery, people from around the world assumed that patterned silks had not been invented. Since then many patterned silks have been found from the late Zhou and Han dynasty.

similar fabrics have been found outside China reflecting their value firstly as diplomatic gifts and later as trade goods.[135]

Silk, being a flexible commodity, was also very suited for use as a base for preserving writing as silk pieces could be rolled and stored, unlike oracle bones and bamboo strips.[136] Silk, when treated with a filling substance such as a starch product, could easily be painted on without any bleeding and therefore was useful to record and write on. Examples of silk manuscripts such as charts, books maps and paintings were found in the Mawangdui tombs from around 100 BCE and not discovered until the 1970s.[137]

The most symbolic piece of work on silk was the banner painted on silk depicting the life of Lady Dai and containing well-known symbols such as dragons, ravens and the symbolic depiction of the religious belief prevailing at the time. Early Documents of great importance were written on textiles as early as 300 BCE. A manuscript found in Zidanku, Changsha, Hunan Province in 1942 is completely written on silk textiles.[138] This manuscript was about, and decorated with, symbolic references to the months of the year and the cosmos showing the value and longevity silk could obtain.[139] These writings were still discernable after 2000 years.

3.3.5. Cotton

Cotton was grown in Western China during the Han dynasty period, as a cotton handkerchief and cotton trousers have been found from this area.[140] However it does not

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135 Barber, *Women's Work: The First 20,000 Years, Women Cloth and Society in Early Times*.p.10.

Barber gives a logical explanation of he trade which could have placed this silk in the Ukraine.p.205.

135 Ibid., p.10.

136 Wang, ed., *Images of Women in Chinese Thought and Culture: Writings from the Pre-Qin Period through the Song Dynasty*.p.437.

137 Chen, ed., Hunan Provincial Museum: The Exhibition of Mawangdui Tombs.

The illustrations in this book display the variety of articles found in the tomb of Lady Dai, wife of the Wife of a Marquis.

138 Cook, ed., *Defining Chu: Image and Reality in Ancient China*. P.171.

139 Ibid.p.73-176.

140 Cheng, ed., *History of Textile Technology of Ancient China*.p.180.

appear to have been popular for clothing in the major parts of China during the Han dynasty

Cotton, known as white cloth wool, *bai mao,* was used in western China. Handkerchiefs, trousers and printed calico have been found in Han tombs from this area. Small amounts of cotton material are mentioned by Sylwan in descriptions of textiles found in the Lop-nor area.[141] Whether cotton was imported from India in earlier years is not known. India is thought to have grown and used cotton for over 3000 years and some histories claim that it was grown in China by 2500 BCE.[142] This area of usage needs further investigation; possibly in association with Indian textile history. Cotton certainly still grows in several places around the southern part of the Taklamakan Desert.

3.3.6. Combination of fibres

Several examples of different fibres being used the one cloth have been found. Silk and hemp and silk and wool are examples of these combinations. Some of the quilts and clothes found in the tomb of the Marquis Yi of Zeng dated 433 BCE, are made from silk and hemp.[143] The silk was used for the warp threads and hemp for the weft. Mixing fibres such as silk and wool, or silk and hemp, gave strength to the textile piece and less of the expensive silk was needed for the cloth.[144] Since several silk filaments are twisted together to make one very strong thread they were used for warp threads. The shorter fibres which had to be spun together gave a weak thread, but were very suitable as filler threads.

141 Sylwan, *Investigation of Silk from Edsen-Gol and Lop-nor and a Survey of Wool and Vegetable Materials.* P59.

142 World Cotton History. Cotton Australia.

143 Vainker, *Chinese Silk: A Cultural History.*p36.

144 Loewe, Everyday Life in Early Imperial China: During the Han Period 202 BC-AD 220.

No matter which fibre was used, whether those from plants or the filaments from the silkworm, they could not be used in their original state and had to be treated before being spun into thread ready for the weaving process.

3.4. Conclusion

Without the technology available during the Han dynasty, the textiles of Ancient China would not have produced in leaps in both production and style. Even though hemp was woven in other countries, it would not have been as fine as the Chinese cloth due to the Chinese methods of manufacture. Even silk was far superior to other countries, as it was not just spun from broken filaments, but for centuries silk worms had been cultivated and the Chinese artisans knew the secrets of unwind and degumming continuous threads from the cocoons. It was the introduction of a wheel mechanism, to wind off and twist these threads, was a leap in technology. When transferred either to a reeling mechanism, or a spinning mechanism, it provided a speedier rate of making yarn to be woven into cloth.

4. Technology involved in Spinning and Weaving

NOTE:
This figure is included on page 61 of the print copy of the thesis held in the University of Adelaide Library.

Figure 4-1Han Dynasty tile showing textile activities. Spinning wheel is shown in centre of tile.[145]

The purpose of this chapter is to show that not only did the Han Chinese know how to spin fine threads, but that these threads were made on reeling wheels or spinning wheels. This was different from other civilizations of a similar period where various styles of drop spindles were commonly used for many more centuries. The drop spindle was the common methods of spinning fibres in ancient societies, but this chapter will show that lack of evidence of whorls in Han burials, indicates that another type of making thread must have been available. Whorls were the indicators of drop spindles and their method of making yarn. Other facts will be explained to support the hypothesis that spinning wheels were available during the Han dynasty..

4.1. The Spinning Wheel

A most important process in textiles is not just the cloth and how it was made, or what it was made from, but how the actual threads were made. The twisting of threads for ropes

145 Cheng, ed., History of Textile Technology of Ancient China.p.245.

145Francesca Bray, "Technology and Culture in Chinese History, an Introduction," Chinese Science 12.13 (1995).p13.

145 Joseph Needham, Kuhn, Dieter, Science and Civilization in China Vol 5 Part 1x, Science and Civilization, vol. 5, Part 9 (Cambridge: Cambridge University Press, 1988).p.14.

Henceforth this will be referenced under Deiter Kuhn. 145Bray, "Technology and Culture in Chinese History, an Introduction."p13.

and various form of dress goes back into pre history.[146] This history is well documented by Elizabeth Wayland Barber in her books on the pre history of textiles and women's work.[147] Eric Broudy presents many interesting theories of how spinning started, including the evolution and use of drop spindle in different parts of the world.[148]

Early Chinese spinning technology involved a drop spindle technique to spin all the different fibres from at least the Neolithic era.[149] Drop spindles were made of various weights, sizes and shapes and could range from a lump of wood attached at the middle to a block of wood, to finely sophisticated pottery whorls to accommodate the different fibres and final use.[150] This device is still used in parts of the world as it is portable and therefore used with little effort, but in Neolithic China, it was the only method of processing fibres ready for weaving.

The drop spindle consisted of rod attached to a depression in the centre of a specially made piece of pottery, wood or stone called a whorl. Sevin Hedin, a Sweden geographer working in the Tarim Basin around the turn of the nineteenth and beginning of the twentieth century, took back the spindles with their whorls still attached. This was a rare find as wood usually rots with time. These are shown in Figure 4.1. Many other shapes and sizes of whorls have been found in other Neolithic sites, but few contain the spindle as well as the whorl. The smaller whorls made fine threads, the larger ones were used for

146 Barber, Prehistoric Textiles: The Development of Cloth in the Neolithic and Bronze Ages, with Special Reference to the Aegean, Barber, Women's Work: The First 20,000 Years, Women Cloth and Society in Early Times.p.181.

147 Barber, Women's Work: The First 20,000 Years, Women Cloth and Society in Early Times

148 Eric Broudy, The Book of Looms, Hanover: University Press of New England, 1979, Chapter 1.

149 Barber, Prehistoric Textiles: The Development of Cloth in the Neolithic and Bronze Ages, with Special Reference to the Aegean.p.69.

150 Dieter Kuhn, "Silk Weaving in Ancient China: Textile Technology: Spinning and Reeling, Science and Civilization in China",
Kuhn, Silk Weaving in Ancient China: From Geometric Figures to Patterns of Pictorial Likeness.p.61-132.

yarns to make ropes and thicker threads.[151] Even though this method of thread, or yarn making, was portable, it was very time consuming.

Drop Spindles Complete with Whorls and Unspun and Spun Fibres

NOTE:
This figure is included on page 63 of the print copy of the thesis held in the University of Adelaide Library.

Fig 4-1Drawings of Ancient Chinese spindles, Han dynasty,held in the Museum of Far Eastern Antiquities, Stockholm [152]

A mechanical wheel invented some time before the Han dynasty was used to reel silk from several silk cocoons in one process, the rate of yarn production increased. Cheng makes the comparison of the drop spindle to the spinning wheel as the spindle having to be turned fifty to sixty cycles to one cycle of the wheel. Therefore the production of thread was much quicker as well as being even. This was approximately 1500-2400 cycles per minute maintaining the spinning wheel at a rate of fifteen to twenty times

151 Examples of many different shapes and sizes of different whorls can be found in the Joseph Needham's volume in Science and Civilizations in China, Volume 5 Textile Technology by Dieter Kuhn.

152 Sylwan, *Woollen Textiles of the Lou-Lan People, Reports from the Scientific Expedition to the North-Western Provinces of China under the Leadership of Dr. Sven Hedin.*V11. Archaeology 2, Stockholm, Bangkok: Statens Etnografiska Museum SDI Publications, 1949.p.119.

faster than the drop spindle.[153] This hand-turned wheel, which Kuhn calls a spindle wheel, allowed the filaments from several cocoons to be unravelled at the same time.[154]

This spindle wheel was based on the drop spindle turned on its side and attached to a driving belt connected to another wheel so that it pulled and twisted the filaments from several cocoons or fibres. The addition of the drive belt meant that the spinning process was much faster. Depending on the way the drive belt was place, the twist or the thread would go in different directions giving a Z or S twist. (See Fig 4.2)

NOTE:
This figure is included on page 64 of the print copy of the thesis held in the University of Adelaide Library.

Fig 4-2Diagram showing the development from a drop spindle to a mechanical one [155]

The author believes that when the Chinese invented the reeling wheel for silk they would have understood the potential for using it with other fibres. Chung speaks of a spinning wheel being used to spin the short slub threads from silk cocoons when the moth had eaten its way out of the cocoon. Cheng places its beginnings as early as the Shang and Zhou dynasty but maintains that it didn't have widespread use until around the Qin and Han dynasties when a foot treadle was added. This released the two hands for holding and spinning the fibres. Bray suggests that the spinning wheel commonly used for

153 Cheng, ed., *History of Textile Technology of Ancient China*.p.219.p.219.

154 Kuhn, "Silk Weaving in Ancient China: From Geometric Figures to Patterns of Pictorial Likeness".p.163.

155 Kuhn, ""Silk Weaving in Ancient China: From Geometric Figures to Patterns of Pictorial Likeness".p.163.

spinning hemp and ramie in later dynasties indicating that it already had a long history.[156] Threads which must have been spun on a spinning wheel since the yarn is so fine and has such an even twist were carefully observed by the author at the Hunan provincial Museum. This was one of the hemp textiles found from the tomb of Lady Dai of the Mawangdui archaeological finds.[157] Cheng agrees that these fine threads were spun and given a second twist on a spinning wheel.[158]

Cheng reinforces this assumption when describing a piece of Warring States piece of hemp cloth with threads a diameter of under 0.2 mm.[159] Another piece of evidence for the spinning wheel during the Han dynasty is a copper spindle found at Lijiashan, Yunnan province, dating from the Warring States period and a piece of Warring State ramie textile with a regular twist found during 1957 near Changsha, Hunan province[160]. These Warring States fabrics were older that the textiles from the Han dynasty, but already contained the precision of structure and embroidery which continued into later dynasties. Based on its fineness and regularity in twist of the threads, the author thinks that the spinning wheel may have even been in use during an earlier period than the Han dynasty[161].

Another example of fine even silk thread which almost certainly must have been spun on a spinning wheel, or by a very experienced spinner on a drop spindle, is the twenty-five strings of one musical instrument found in the tomb of Lady Dai from about 100 BCE.

156 Francesca Bray, *Fabrics of Power in Late Imperial China*. p.197.

157 Personal observation at Hunan Provincial Museum September, 2007.

158 Cheng, ed., History of Textile Technology of Ancient China.p.216.

159 Ibid.p.56.

160 Ibid. pp.221, 219.

161 Ibid.p.71.

Cheng believes that there may have been an embryonic form of a spinning wheel during the Shang period due to the evenness of twist found on threads.

This instrument, a *se*, was found in Mawangdui tomb no.1.[162] The threads used for regulating the pitch were of a very even twist. If this was no the case, the pitch of the notes would not maintain any accuracy. The variations in diameter for the strings were made by adding filaments from more cocoons when the threads were being spun, but, the whole string needed to be a constant diameter to produce a pure sound. The diameter of the strings ranged from 1.9 mm to only 0.5mm. For these threads to be made so accurately and in a manner which enabled tightening on the back of the instrument to produce different pitches were an precise accomplishment and a tribute to those who spun the threads and to the apparatus which made them.[163]

4.1.1. Evidence of Use of Spinning Wheels during the Han Dynasty

When writing about spinning wheels, there was usually an assumption in early textile studies of the 1950s and 1960s that the first wheels were found in Europe as seen in the window of Chartres Cathedral (1240-1245C). The European illustrations in the Decretals of Pope Gregory IX during the early Thirteenth Century and the Lutterell Psalters (c1325) shown in Figure 4.4 are very similar in style to those depicted on the Han tiles. These Han rubbings predate the European pictorial references of spinning wheels by over one thousand years. Both of the illustrations indicate the use of other fibres as no cocoons and silk equipment are shown.

All of these wheels have the structure described by Kuhn in his explanation of the change from a drop spindle to a wheel driven mechanism as in Figure 4.1 where the spindle and whorl are part of the drive to operate the larger wheel which produces the twist. Eminent scholars such as Kuhn and Barber in their early writings acknowledged that the spinning wheel only came to Europe during the Middle Ages, but could have been an adaptation of

162 Very smooth, fine hemp cloth is displayed in the Hunan Provincial Museum indicating the use of a spinning wheel to maintain the denier (Diameter of the thread).

163 Cheng, ed., *History of Textile Technology of Ancient China*.p.219.

the reeling wheel from China. A reeling or spindle wheel was used by the Han dynasty to wind off the fine filaments from several silk cocoons and to double and twist the yarn to make it a thicker ply. The ply indicates the number of yarns twisted together to make stronger thicker yarns such as thick weaving threads and rope. Kuhn described the spindle wheel and how it developed from the drop spindle, but did not name it as a spinning wheel. I will explain why this wheel was also a spinning wheel which originated and that it was in use in China by the Han dynasty.

Spinning is a process where fibres are drawn out and twisted together to make a strong, continuous thread. This process can be done by hand with a drop spindle, or many different types of hand spinning wheels, or since the industrial revolution, by machine. Silk, which is a continuous filament is not really regarded as having to be spun, but a single filament is not useful for weaving and consequently, several filaments are drawn out from different cocoons and then twisted (spun) together twisted during reeling on the spindle wheel. This is also a form of spinning. The author agrees with Cheng who dates the wide use of the spinning wheel for various fibres to having been used by the Qin and Han industry.[164] The evidence of the use of some form of a spinning apparatus is the even thread and twist. Cheng uses the illustrations of hand-operated wheels shown in Figure 4.9, and 4.10 to substantiate his claims. These are from Han dynasty tiles depicting everyday scenes similar to those held in the Sichuan University Museum, Chengdu.[165] These depict a rimless and also a rimmed wheel which could have been used for spinning. There is no indication that these wheels were for silk reeling as the drawings Fig.4.3 and Fig.4.4 contain no presence of silk cocoons.

164 Cheng, ed., History of Textile Technology of Ancient China. p.214.

165 The Author saw similar tiles in Sichuan University Museum, Chengdu. They were also everyday scenes with women dressed in similar clothes.

The early spinning wheels may have evolved through various designs, but all contained the wheel and belt drive. Some of the spinning wheels were rimless as in Figure 4.3. These may also have been used to ply, or double previous threads, of used for spinning with another person turning the wheel. The introduction of treadle-operated wheels brought more freedom as the hands were completely free and could be operated by one person. These were hand operated until a foot treadle was attached as a allowing both hands to be used in the spinning process. Cheng quotes the foot-operated spinning wheel's use by the Han dynasty. It is mentioned in "Lie Nu Zhuan" (Lives of Famous Women) by Liu Xiang (d 179 BCE).[166] One wheel from the Eastern Han dynasty (similar to Figure 3.5 from the Jin dynasty) was depicted on a stone relief at Cao Zhuan, Sihong County, in Jaingsu Province.

NOTE:
This figure is included on page 68 of the print copy of the thesis held in the University of Adelaide Library.

Fig 4-3 A rimless spinning wheel from a Han Dynasty silk drawing. [167]

Found at Mount Yinque, Linyi, Shandong province. silk drawing

166 Cheng, ed., History of Textile Technology of Ancient China. p.225..

167 Cheng, ed., *History of Textile Technology of Ancient China*.p.217.

NOTE:
This figure is included on page 69 of the print copy of the thesis held in the University of Adelaide Library.

Fig 4-4 Rimmed Spinning Wheel from the Han dynasty[168]

Different types of wheels are seen in drawings after the Han dynasty. Cheng includes ones from and were used for plying and reeling as well as spinning fibres. There are even wheels with three spools as in Figure 4.5. All of these wheels predate the earliest drawings, from the Middle Ages in Europe and the thought that the spinning wheel was not invented until about 500 CE.[169]

168 Cheng, ed., *History of Textile Technology of Ancient China*.p.217.

169 If the History of Spinning wheels is researched on the Internet, the dates for the spinning usually date it from around the twelfth century. Some acknowledge that it was first used in China.

Fig 4-5 Woman operating a multiple spindles. Jin dynasty 265-420 showing the similarity to Han dynasty spinning wheel. Painting on silk by Gu Kaizhe.

NOTE:
This figure is included on page 70 of the print copy of the thesis held in the University of Adelaide Library.

Fig 4-6Foot propelled rimless spinning wheel. [170]

170 Cheng, ed., *History of Textile Technology of Ancient China*. 224, 224.

NOTE:
This figure is included on page 71 of the print copy of the thesis held in the University of Adelaide Library.

Fig 4-7 Hand spinning and reeling of silk from the Han dynasty.[171]

European Middle Ages Spinning Wheels a millennium later showing similarity to Chinese Spinning Wheels

NOTE:
This figure is included on page 71 of the print copy of the thesis held in the University of Adelaide Library.

Fig 4-8 Woman spinning: from illuminated manuscript of the Decretals of Gregory IX early 13th Century.[172]

171 Ibid. p.196.

172 British Museum Images Decretals of Gregory 1X: An Amorous Encounter, <:http://www.imagesonline.bl.uk/results.asp?image=023698>, 12/0209.

NOTE:
This figure is included on page 72 of the print copy of the thesis held in the University of Adelaide Library.

Fig 4-9 Spinning wheel as shown in the illuminated manuscript "The Lutterell Psalter of c 1326-1335[173]

These new wheels made yarn about twenty per cent faster than with a drop spindle so weaving would also have proceeded at a faster rate as more yarn was available. Some time during the Warring States, or Han dynasty, the looms for weaving the cloth also started to become more sophisticated and mechanized and differed from other parts of the world during the same time.

4.2. Conclusion

This chapter reveals how innovative the Chinese were in relation to finding a problem in relation to textile manufacture, and solving it. The basic fact was that the Han dynasty needed more cloth, and to have more cloth, more yarn was needed. Hitherto spinning had been a slow process. The answers the Han weavers found were the beginning of

173 Medieval Inventions- the Spinning Wheel, New York Carver, Available:<http://www.newyorkcarver.com/inventions3.htm>, 03/03/2008.

173 Cheng, ed., History of Textile Technology of Ancient China.pp.214-133.

mechanization of the spinning wheel. Whether it was just invented to reel and twist silk threads and ply other yarn, is immaterial. They were the inventors of the spinning wheel used at a much earlier date that has previously been acknowledged in western writings. It puts its invention and use back to the Warring States and the Han dynasty, not the date of 500 CE as is often used.

5. Evolution of Weaving Looms in China

NOTE:
This figure is included on page 74 of the print copy of the thesis held in the University of Adelaide Library.

Fig 5-1 Diagram of a backstrap loom still in use in many parts of Asia[174]

This chapter traces the evolution of the early looms used; particularly those of pre Han and Han China. The evolution of different looms will be demonstrated by contemporary illustrations and texts. This study culminates in a discussion of the huge drawlooms. The author will show that these looms must have been used during the Han dynasty in concordance with the ideas of Kuhn and Cheng. The explanation will also give an idea of what was involved in weaving, including some relevant parts of the components of the looms and patterns which could be made on them.

During prehistory, looms differed in various parts of the world so there is no real evidence as to the origin of the different types of looms, or where the first ones developed. In China as with other parts of the world, there were different types of looms.

174 Cultural Fabric of Nepal, Women's Skills Development Project, Available: <http://images.google.com.au/imgres?imgurl=http://www.wsdp.org.np/images/backstrap_loom.jpg&imgrefurl=http://www.wsdp.org.np/cultural-fabric.php%3Fsubaction%3Dshowfull%26id%3D1177481121%26archive%3D%26start_from%3D%26ucat%3D2%26&usg=__dGPheAKvOFUtHz51EYv8QsxtFLk=&h=283&w=450&sz=44&hl=en&start=29&tbnid=Apx5On5qwA7EwM:&tbnh=80&tbnw=127&prev=/images%3Fq%3Dbackstrap%2Bloom%26start%3D18%26gbv%3D2%26ndsp%3D18%26hl%3Den%26sa%3DN>, 17/01/2009.'

Egypt and Greece both wove on vertical looms where a top beam was used to hold the warp threads. By the latter dynasties a horizontal loom was also used in Egypt, but Greece only appears to have continued using the upright loom. See Figures 5.2, 5.3 and 5.4.

NOTE:
This figure is included on page 75 of the print copy of the thesis held in the University of Adelaide Library.

Fig 5-2 A weaving room from Egypt showing horizontal loom[175]

175 Egyptian weaving room Available: http://images.google.com.au/imgres?imgurl=http://www.touregypt.net/egyptmuseum/27u77.jpg&imgrefurl=http://www.touregypt.net/egyptmuseum/egyptian_museumL5.htm&usg=__kzMR4NrONQt0Z4X0ex_alZcdlfE=&h=396&w=325&sz=26&hl=en&start=28&tbnid=1HqfP6c4X-aymM:&tbnh=124&tbnw=102&prev=/images%3Fq%3Dlooms%2B%252B%2BEgypt%26gbv%3D2%26ndsp%3D18%26hl%3Den%26sa%3DN%26start%3D18

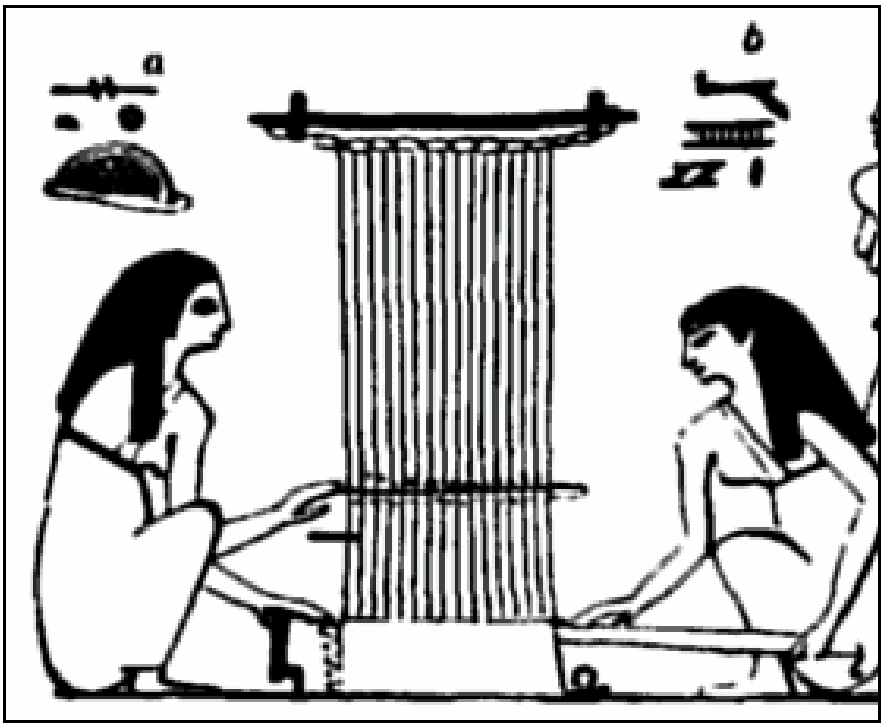

Fig 5-3 Drawing of a vertical loom from a tomb[176]

Fig 5-4 Greek women weaving on a warp weighted loom from a lekythos, small jar[177]

176 Women Weaving taken from the Tomb of Khemhotep at Bani Hassan Middle Kingdom early second millennium BCE.

177 Greek Women Weaving Attic black-figured jug, c.550 BC.

5.1. Looms in China

Archaeological finds of parts of a backstrap loom at Hemudu, Hemudu Town, Yuyao City, Zhejiang Province, indicates that this type of loom was used during the Bronze Age about one thousand years BCE.[178] Since then, there has been a progression of loom structures to the Han dynasty and beyond. This section of the thesis on technology associated with the Han dynasty explains some of the different types of looms known to have been used in China. Looms were operated by women, so they may have played a part in the alterations to the loom structures, just as they put looms together for weaving cotton centuries later.[179]

NOTE:
This figure is included on page 77 of the print copy of the thesis held in the University of Adelaide Library.

Fig 5-5Bronze figure with backstrap loom which is attached to the feet.

Late first century BCE, Yunan, China, bronze180

.Available 20/01/2009.< http://www.mythinglinks.org/ct~weaving.html>

178 Cheng, ed., *History of Textile Technology of Ancient China*:.p.32

179 Ibid p.220.

180 Barber, *Women's Work: The First 20,000 Years, Women Cloth and Society in Early Time*s.p.81.

The backstrap loom, which is still used in many areas of the world, was used in Han China. To keep the warp threads taught, the end rods were secured on a rod attached to the weaver's feet and waist while the weaver sat on the ground. This seated position of the backstrap loom with the threads tied around the waist of the weaver, would have been very uncomfortable for the weaver. It only produced a narrow cloth or around fifty centimetres wide.[181] This backstrap loom is still used in parts of Asia today.

The backstrap loom could produce patterns within the weave by the introduction of rods to raise specific threads worked manually by the weaver or an assistant. The looms used to produce the plain cloth called *wansu* in the early Han dynasty were backstrap looms. These may have been simple looms, but they could produce such cloth as the crossed weave gauze, *sha*. Chinese backstrap looms used rods placed along the warp to be able to produce patterns, so that certain threads could be raised and lowered to form a "shed". However, weaving in this manner must have been very time consuming.

NOTE:
This figure is included on page 78 of the print copy of the thesis held in the University of Adelaide Library.

Fig 5-6 Rubbing of a Han Dynasty tile showing textile activities spinning wheel in centre of tile, loom on the left.[182]

Tile

Semi upright, or oblique warp loom, showing a backstrap loom placed onto a frame.

181 Eric Broudy, *The Book of Looms*, Hanover: University Press of New England, p. 79

182 Cheng, ed., *History of Textile Technology of Ancient China*.p.242.

Fig 5-7 Drawing of a Han semi-upright loom as shown in the preceding stone carving [183]

It was a natural progression for someone to invent a stand so that the weaver could work off the ground. Arguably, this was in use by the Han dynasty for it to be depicted on the stone relief of Figure 5.6 and the drawing in Figure 5.7. The semi-upright loom on a frame would have enabled faster production than the seated ground loom. However, a much better mechanism was required to make complicated patterns and to allow further production. The next improvement was the introduction of heddles and treadles which would have made a considerable improvement in quality and time.

Heddles were the technical development which enabled the faster, rhythmic movements associated with weaving. Cheng thinks that heddles (rods with strings attached which could raise and lower different sets of threads) could have predated the Han dynasty, so they could have been widespread in early Han workshops.[184] Heddles were frames above

183 Cheng, ed., *History of Textile Technology of Ancient China*.p.247.

184 Ibid., p.132.

the loom where different series of threads could be grouped so that they could be raised at the same time. This produced a shed (tunnel) for the bobbin wound with weft thread to pass from one side of the loom, to the other. Then, after a change in heddles, the shuttle returned over a different sequence of threads. The treadles below the loom allowed the feet to operate the process of the heddle. Sometimes there was a pit below the loom to accommodate the treadles and the feet of the weaver. These inventions partially explain the ease in weaving and therefore the increase in textile quantities during this time.

Stone relief of textile activities

NOTE:
This figure is included on page 81 of the print copy of the thesis held in the University of Adelaide Library.

Fig 5-8 Rubbing from a stone relief of the Han Dynasty showing upright frame loom and spinning wheel.[185]

Once various styles of looms were being made, more experimentation generated the innovation of the different, more complicated patterns and wider cloth. The later models of this loom probably changed little from the Han loom described below. These looms can now be seen in silk museums in China, such as the National Silk Museum in Hangzhou and the Silk Museum in Suzhou. The Nanjing Brocade Centre cloth with ancient designs, especially brocades, on the draw looms. These looms require two operators as they did centuries ago.[186] The Brocade Centre has looms which replicated similar ones from the Han dynasty as the same thread and pattern moves were necessary.

185 Cheng, ed., *History of Textile Technology of Ancient China*.p.245.

186The author observed drawlooms making colourful, double-sided reproduction of Ming brocades while in Nanjing during 1997.

NOTE:
This figure is included on page 82 of the print copy of the thesis held in the University of Adelaide Library.

Fig 5-9 Barrel loom or Bamboo cage loom showing a different mechanism for the manipulation of threads[187]

Even though more textiles were available, experimentation continued on both the styles of the looms and the patterns which could then be woven. Looms could also be made to accommodate different widths of cloth. It was the leap to treadles and heddles and other moving parts on the various looms to weave simple brocades, and the huge drawlooms which allowed for the creation of polychromes patterns.

When the first single pattern motifs appeared during the Warring States Period, the looms were only able to use three colours in the design and the design was repeated warp wise, not across the weft. One textile found in the Changsha area had three colours (colours not specified) and the design repeated along the warp every 2.4 cm. by 117cm.[188] During the Han dynasty the five auspicious colours were used.

187 Cheng, ed., *History of Textile Technology of Ancient China*.p.280.

188 Becker, *Pattern Weaves of Han China*.p.48.

5.1.1. Drawloom structure needed to produce Jin brocades and other advanced textiles

It is not know what the early varieties of this drawloom really looked like during the Han dynasty, but it is known that a loom with a tower was in use. These drawlooms were a highlight of weaving evolution up to the European Industrial revolution when power driven looms surpassed them in complexity. The loom consisted of a normal loom with heddles and treadles, but due to the new multicoloured patterns being made on them, they used hundreds of threads. The control of these threads was a major achievement. To manipulate the warp threads, they were gathered into groups by strings forming heddles. This grouped several of the threads together to be raised or lowered according to the pattern. As the patterns became more complicated, more groups of threads were required. It was not possible to have hundreds of headless to support these threads for their different parts of the pattern so a second grouping was necessary. This grouping was controlled by a second person situated up in the tower. The textile museums at Hangzhou and Suzhou had several different styles of drawlooms from later periods. These looms were still used in Qing times (1644 CE-1911).

Some drawlooms used strings to control the thread sequences; others were made with an extra tower where another weaver controlled extra combination of threads. A child was often the person in the tower manipulating the treads[189] There are no writings or pictures available which show a drawloom from the Han dynasty, but according to Kuhn, he is sure that some kind of drawloom was in use to make the patterns of the Eastern Han period.[190]

189 Bray, "Textile Production and Gender Roles in China 1000-1700".p.124.

190 Kuhn, “Silk Weaving in Ancient China: From Geometric Figures to Patterns of Pictorial Likeness” p.97.

Drawlooms

NOTE:
This figure is included on page 84 of the print copy of the thesis held in the University of Adelaide Library.

Fig 5-10 Drawing of drawloom from Exploitation of Works of Nature[191]

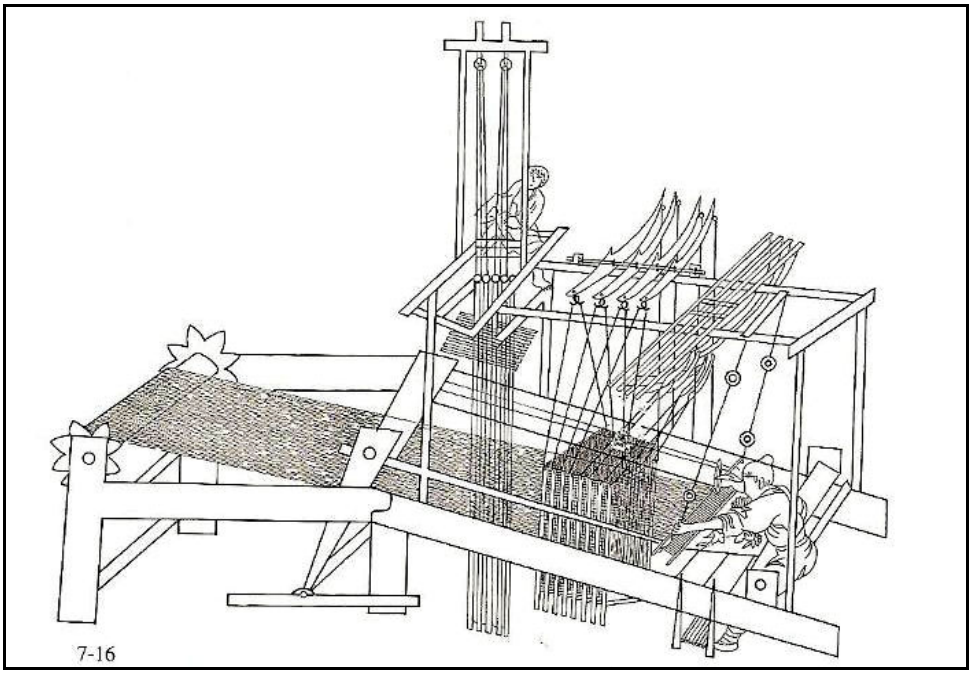

Fig 5-11 Draw loom showing weaver and assistant from the "Complete Treatise of agriculture" Printed 1273 CE

191 Xiangxing Kong ed., Heavenly Creations: Gems of Chinese Inventions (Hong Kong: Hong Kong Museum of History, 1998).p.169.

The gigantic looms were a result of experimentation with different ways to form patterns in a multitude of colours and more naturalistic designs. They were unique for their size, the textiles they made and the skill of the people working them. They would have taken weeks to dress (set up) before the weaving could commence because so many fine warp threads had to be attached and sorted into the different groups, ready to make a sophisticated pattern. Figures 5.10 and 5.11 show the extent and complexity of having to dress a loom. Cheng believes that some of the Han textiles would have been made on the string looms, while some were made on the multi-heddle loom with one used between 73.BCE- 48 BCE even had 120 heddles, and numerous treadles to operate them.[192] The bolt of silk twill brocade made by the wife of Huo Guan sent a present to Chun Yunan during reign of Emperor Xuan (73 BCE-48BCE) of the Han dynasty. This piece of cloth could have been woven on a loom invented by the wife of Cheng Bao Guang of Julu as the silk twill cloth made in sixty days was worth one hundred thousand coins. The Han looms may not have had exactly the same designs of these later ones, but fabrics of the Eastern Han needed some form of similar looms with many sets of threads to manipulate the designs. [193]

The textile designs made during the Eastern Han would have needed hundreds of coloured warp threads and multiple heddles to form the patterns which were coveted at home and abroad. The more complex the designs, the more colours could be included into the textile These large patterns could not be made on a simple loom, but must have been on a loom with ordinary wooden heddles above the loom, and possible thread heddles such as a drawloom.

192 Cheng, ed. *History of Textile Technology of Ancient China*. p. 252.

193 Ibid., p.252.

Fig 5-12 Drawlooms, 1997, Nanjing Brocade Research Institute. Photo, 2007.[194]

Although difficult to see, the number of threads used is apparent, as are the towers.

Kuhn gives a glossary of the different parts of the loom with Chinese names in the article *Weaving in Ancient China: From Geometric Figures to Patterns of Pictorial Likeness*, with parts belonging to a tower. This is an indication that the drawloom was used during the Han dynasty. No other loom has been discovered or written about which contained a tower for a second person to operate extra threads. This amazing loom was the subject of a poem *Rhapsody on Women Weavers*, by Wang Yi (CE177 –CE217). In the poem, Wang writes about the loom with a tower needing two people to operate it. This indicates the existence of a drawloom with a tower being used in the Han dynasty, a fact supported by Dieter Kuhn due to analysis of the weaves.[195] Although the poem by Wang Yi contains metaphors, The *Rhapsody on Woman Weavers* definitely talks about the tower of the loom.

194 Photo taken by author of drawlooms at Nanjing Brocade Research Institute, September 2007.

195 Kuhn, "Silk Weaving in Ancient China: From Geometric Figures to Patterns of Pictorial Likeness".p.77.

> Two high –rising figure towers stand there,
> Gazing downward (as if) on a clear water pond,
> (It appears like) fish catching on to their bait,
> (It sounds like) waves splashing rhythmically against the shore.
> When the pulleys rise in togetherness
> All the fine silk threads move downward.
> Reminiscent of (the movements of an astrological map)
> With its varied lines some contracting (some) extending
> (Thus it goes) One forth one back,
> Without ever getting wearied.[196]

The metaphors describe the loom with its high towers for extra workers is being likened to gazing down into something below, such as the continuous depths of a pool where the lines descend below to collect the required threads. However, there is constant movement as the pulleys (heddles) rise and fall in rhythm to create the changing patterns required for the design. The threads controlling these movements are likened to an astrological map which has constant movement in a preordained order. There is also a description of the movement of the shuttle making the swishing sound of water. The loom never wearies, but keeps the rhythmic pattern as it goes back and forth. This is more solid indication that "Women Weaving" was written about a drawloom during the Eastern Han dynasty.

The author believes that the poem, taken with the colours and weaves which are described in the next section, is strong evidence that some type of drawloom had been developed during this the Han period. There is much debate as to whether these complicated designs of animal and scrolling clouds would have been woven on a multi-shaft loom or the enormous drawlooms. Kuhn believes that there was some form or drawloom. Multishaft looms would not have been big enough to weave the colours and designs from later Han sites.[197] Drooker and Becker do not agree with this assumption of when the drawloom was used, as they believe that complicated textiles could have been woven on the simpler multi-shaft loom[198] Bray points out, even by the Song dynasty only

196 Laumann, The Secret of Excellence in Ancient Chinese Silks.p99.

197 Kuhn, "Silk Weaving in Ancient China: From Geometric Figures to Patterns of Pictorial Likeness" p.97.

198 Becker, *Pattern Weaves of Han China*.p.49.

four percent of all the textiles made were from drawlooms so many of the easier patterns could have been made on smaller multi-heddle looms, but not the extremely complicated patterns. Therefore, even though these are the famous *jin* textiles which fascinate the researcher, they were only for the minority of the whole textile production and few people would have used them.[199]

The equipment made and used by the people of the Han dynasty brought a whole new way of spinning thread and weaving cloth. These pieces were now made at a faster rate giving rise to a greater quantity of textiles made for both tax and ultimately for sale. Due to the new inventions and the resultant amounts of textiles which were made this period could also be equated to the importance of both the medieval wool trade and the cotton mills and their workhouses of the eighteenth century England and then in the southern states of America. The difference being that the Han dynasty improved textiles primarily for their own consumption, whereas the European Industrial Revolution was for wealth and trade. The variety of weaves suggests wide knowledge of weaving techniques.

199 Bray, "Textile Production and Gender Roles in China 1000-1700."p.124.

5.1.2. Weaves

What were the weaves which made the textiles so magnificent? Diagrammatic studies of the common weaves are shown in Figure 5.14. The vertical threads show the weft and the horizontal the warp. During the Han dynasty most of the patterns were made with the warp threads on the surface, not the weft as is common in most ancient and modern weaving.

Most textiles found from the period prior to the Han dynasty were of plain weave, *wansu* which was later called *juan* if it was a very fine textile. Gauze, *sha*; damask *li*, damask, *ling*; and a crepe textile, *hu,* were other common weaves. The crepe textile was similar to gauze but with a wrinkled effect achieved by highly twisting the threads. Two of these weaves were described as "gauze [that] is as thin and light as mist and crepe is even lighter".[200] All these materials were monochrome but could have also been embroidered. The fancy weave such as the damask *ling,* were a monochrome weave where the pattern was woven in the same colour as the background. The patterns were made in a twill weave which then threw the design into relief against the smooth background. The Danish weaver, Becker, describes one of the weaves of the Han period as "tabby and the figures are warp faced twill", showing the diversity available to consumers.

200 .g, ed., *History of Textile Technology of Ancient China*.p349.

Weave Structures Used during the Han dynasty

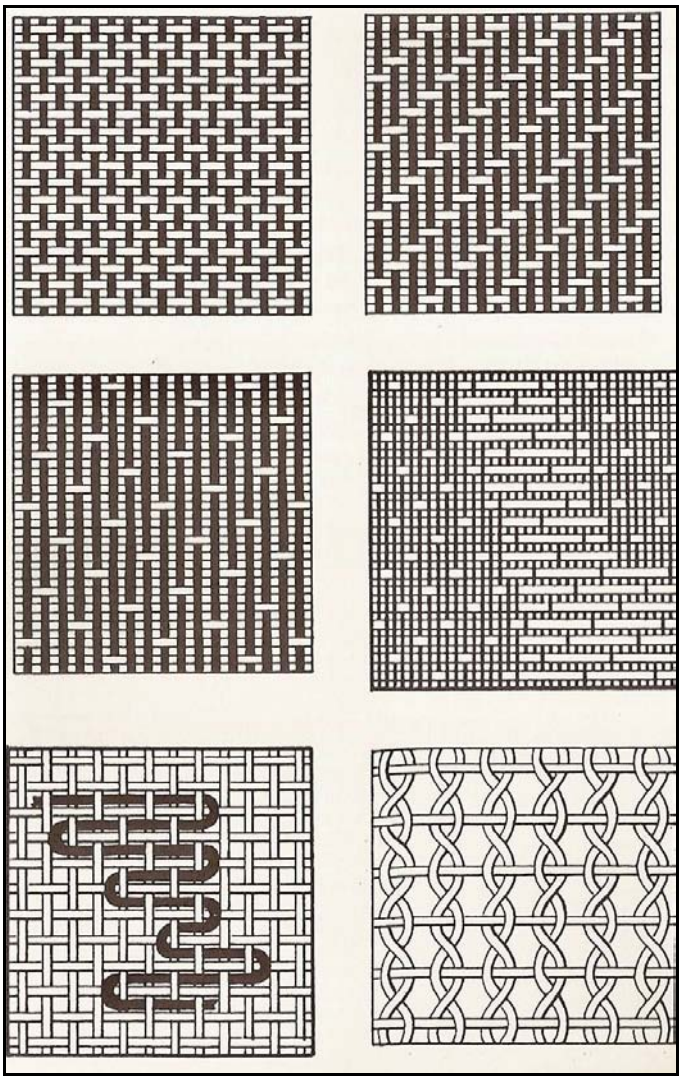

Fig 5-13 Weaves: From top left: Plain or tabby-weave, (pingwen), Twill weave, (xiewen). Middle left: Satin weave, (duanwen), Damask weave, qi. Bottom left, Brocade threads zhuanghua, similar to (jin), which is also a compound weave inserted to form pattern, simple gauze, (sha).[201]

201 Bray, "Technology and Culture in Chinese History: An Introduction", p.194.

NOTE:
This figure is included on page 91 of the print copy of the thesis held in the University of Adelaide Library.

Fig 5-14 Detail of gauze from Warring States period showing the diamond pattern of the crossed threads. Mashan, Hubei province. Jiangling, Hubei Province. Embroidery of phoenix and flowers executed in even chain stitch.[202]

NOTE:
This figure is included on page 91 of the print copy of the thesis held in the University of Adelaide Library.

202 Zhao, *Treasures in Silk*.p.42.

Fig 5-15 Han rhombic, monochrome damask. Mawangdui tomb no.1, Hunan Provincial Museum.[203]

Another weaving variation, found in Lou-lan Western China, displayed a ribbed effect due to the warp threads being greater diameter than the weft ones. These fabrics clearly display the use of the warp weave as the predominant thread to produce the design of the textile. This is a simple weave with the design originating from the sequencing of thick and thin threads in the warp. Most of the weaves were woven with the pattern going along in the warp direction, not in the weft as other countries. In damask weave, the figure of the warp pattern is formed by the warp threads and there forms a kind of dull satin faintly ribbed surface.[204] In the brocades, which have various colours incorporated into the weave, colours are used with floats or cut threads on the reverse side when not required. The different colours could be taken right across a row of the weaving or introduced in spots like tapestry weaving. On the back of the fabric the colours look like large multicoloured spots.[205]

The use of twill weave and warp faced weaves during the Han and Pre- Han dynasties was not really known until the Mawangdui textiles were discovered in the early 1970s. These newly found textiles which Zhou calls “damask on tabby”, or twill damask were not envisaged when early textiles were discovered by Stein.[206] Andrews, in his article on Aurel Stein’s textiles does not mention any twill weaves. Andrews when writing about the textiles Stein found, talks of the difference between the twill weaves of the Coptic, Sassanian and Byzantium textiles as using twill weave before the use of twill weaves

203Huang, *The Great treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery(1)*. p57.

204 F. H. Andrews, "Ancient China Figured Silks Excavated by Sir Aurel Stein, Drawn and Described by F. H. Andrews," *The Burlington Magazine for Connoisseurs* 37.208 July (1920).p.150.

205 Zhao, *Treasures in Silk*.p.52.

206 Ibid., p334.

during the Tang dynasty in China.[207] Stein and Andrews were basing their knowledge on the textiles Stein found in 1914 when only limited Han textiles had been discovered.

Fig 5-16 Vermillion twill weave textile from Han dynasty showing distinct diagonal pattern and vivid colours. Han dynasty, Turfan Museum.[208]

Phillipa Scott refers to a design from a Shang dynasty monochrome textile (1700-1027 B.C.) as, "twill."[209] This pattern may have been performed in twill weave where the pattern progresses each row to form a diagonal line. This pattern consisted of floating

207 Andrews, "Ancient China Figured Silks Excavated by Sir Aurel Stein, Drawn and Described by F. H. Andrews."p.150.

208 Enlarged photo from vermillion and yellow cloth. Taken in Turfan Museum by author.

209 Penelope Drooker, "Chinese Brocades: Development of Supplementary Weft Patterning," *Weavers Journal*. Winter, 1987.p.48.

threads forming the pattern which then reflected light in various directions. As Scott is not sure of the weave, only technical analysis would clarify whether it is twill. [210]

Twill weaves contain a diagonal ribbed appearance on the right side caused by the weft threads, (or warp in the Han textiles), advancing one-step in each pattern row making a distinct ridge on the right side of the material.

Cheng describes the pre Han damasks, made with twill weave of three, (3), weft threads over one, (1), warp.[211] Black material was found from one of the Mawangdui tombs with a wine cup-shaped lozenge pattern executed in twill showing its wide use. Cheng states that this particular textile must have been woven on a loom needing one hundred and sixteen warp threads, and ninety-two picks for each repeat.[212] The setting of the loom would have been complicated as every thread needed to be threaded through the healds (eyes of the threads or frame which separated the warp threads). There is also the possibility that it was either made on one of the large multi-heddle looms or even on a type of draw loom. The single motifs such as those shown in Figures 5.16, found in Western China show a distinctive twill weave. These twill patterns show the progression in learning how to set the loom for individual patterns.

The damasks, gauzes, ribbed textiles and crepe from previous eras, continued to be made during the Han dynasty, but as with all new fashions, the people probably preferred the new weaves, especially the polychrome textiles with interesting patterns. The first polychrome designs just had single motifs. As more complicated designs were able to be woven, these designs were placed in rows of diamonds and lozenges similar to the monochrome designs. Now the designs had colour on a background of another colour.

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210 Phillipa Scott, *The Book of Silk*, London: Thames & Hudson, 1993.p.23.

211 Cheng, ed., *History of Textile Technology of Ancient China*.pp.363, 364.

212 Cheng, ed., *History of Textile Technology of Ancient China*.pp.363, 364.

NOTE:
This figure is included on page 95 of the print copy of the thesis held in the University of Adelaide Library.

Fig 5-17 Early single geometrical patterns in twill weaves introduced into weaving[213]

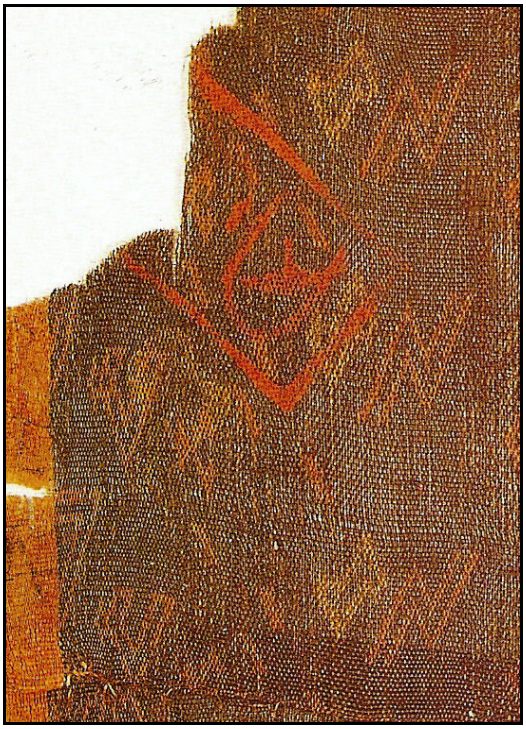

Fig 5-18 Similar textile with spot patterns[214]

213 Kuhn, "Silk Weaving in Ancient China: From Geometric Figures to Patterns of Pictorial Likeness".p.85.

Individual motif became repeats across the textile width as well as soon repeating along the length of the warp. While still quite geometrical, the designs began to have movement and beauty in the final look as in Figures 5.23and 5.24. These designs continued to evolve into the very intricate brocade with more rounded designs. The silk textile, *ling*, was described as a beautiful textile with a very intricate pattern comparable with embroidery.[215]

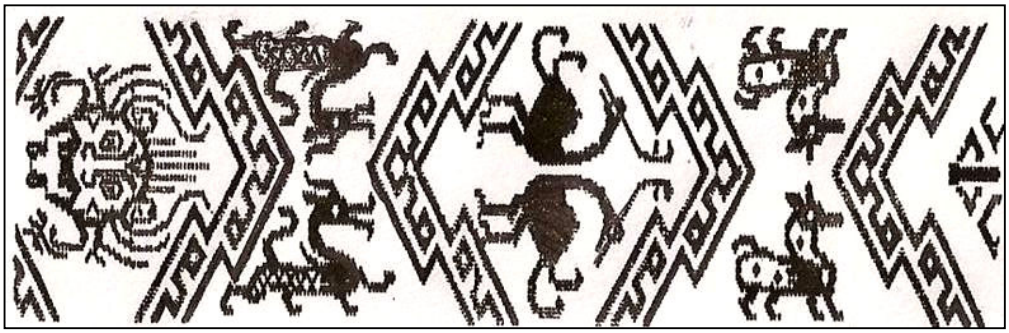

Fig 5-19 Damask monochrome pattern displaying animal motifs [216]

Fig 5-20 Design showing regular rows of animals and placed in a design with curved motifs in rectangular chevron design. 3rd Century BCE, Tomb No.1, Mashan, Jiangling District Museum, Hubei Province.[217]

214 Huang, The Great treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery(1). p.15.

215 Cheng, ed., *History of Textile Technology of Ancient China* pp 375,50.

216Drooker, "Chinese Brocades: Development of Supplementary Weft Patterning" Weavers Journal, Winter,1987

217 Zhao, *Treasures in Silk*. p.59.

NOTE:
This figure is included on page 97 of the print copy of the thesis held in the University of Adelaide Library.

Fig 5-21 Han Textile design of geometrical, single row repeat but introducing curved areas[218]

NOTE:
This figure is included on page 97 of the print copy of the thesis held in the University of Adelaide Library.

Fig 5-22 Design of animals amongst clouds showing progression of curved designs[219] Han dynasty.

218 Ibid., p.68.

Apart from the major introduction of brocades, which imitated embroidery, the Han weavers made other textiles which had a type of pile weave. Extra rods were inserted above the woven fabric before an extra weft thread was passed over it. This raised thread made false loops when removed. This could be left as loops, or cut giving a tufted pattern as in Figure 5.24.

5.1.3. Other Types of Weaves found in China from Han dynasty.

A method of producing texture and colour on a textile could be obtained by knotting. Rugs are made in this manner where tufts of yarn as inserted into the base fabric. Some knotted rug samples have been found in western China. These rugs were possibly from Central Asia where rugs were common from at least the 5th century BCE.[220] The tapestry weaves found in western China may also have been designed or made in central Asia, due to the difference in their designs. One possible textile from the Han period even has a centaur: half-animal, half-human creature. This and other similar pieces show distinctive Greek influences. (See Figure 5.23)

Many of these pieces with Greek style designs appear to have been made in tapestry weave. This is a hand weave where the coloured threads are wound on small bobbins and each section is then filled in by weaving in and out of a section of the warp threads. This continued until the section of that colour of the design was filled. The weft threads do not continue across the loom. One colour can be twisted into the next across the threads or, if worked back and forth a slit appears. The slit was, and still is, a characteristic feature of tapestry. Since the weft rows were usually made of woollen yarn, rows compact together to form a compact textile.

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219 Zhao, *Treasures in Silk*.p.76.

220 The Pazyryk rug dates from the fifth Century BCE.

Tapestry-weave from Han dynasty. Found in Western China

NOTE:
This figure is included on page 99 of the print copy of the thesis held in the University of Adelaide Library.

Fig 5-23 Tapestry showing Greek or Roman Influence[221]

The textile with raised surfaces seen in Figures 5.26 and 5.2 were made by having a rod placed above the warp threads over which an extra weft row is inserted. When the rod is pulled out, the loops remain above. These loops were usually left uncut, but they could be cut, giving the appearance of a pile fabric such as velvet. These textile methods can be seen in Figures 5.25.[222] The other method used to obtain a raised cut or tufted surface was achieved by inserting yarn into a base cloth, knotting it and then cutting the thread. This hand knotting is still used for silk and wool rugs in Xinjiang, western China. This type of knotting is still used in Central Asia.

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222 Chris Walter, "An Ancient Carpet in Urumchi," *Oriental Review* 8.2, 1998.
This particular rug may have been from Central Asia as the design is different from Chinese designs. Other rug knotting and designs will not be addresses during this paper.

Raised Textiles

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This figure is included on page 100 of the print copy of the thesis held in the University of Adelaide Library.

Fig 5-24 Patterned weave with extra tufted areas made by inserting rods above the original weave to form loops. Western Han, Mawangdui tomb No.1, Hunan provincial Museum. [223]

NOTE:
This figure is included on page 100 of the print copy of the thesis held in the University of Adelaide Library.

Fig 5-25 Tufted rug. Eastern Han, Lop Nor, Institute of Archaeology, Xinjiang Uighur Autonomous Region.[224]

223 Zhao, *Treasures in Silk*.p.53.

Most of the patterns of these weaves as well as those made on the different looms, were made with the design travelling up the warp threads. The designs included different patterns which indicated knowledge of using different sets of the warp as well as including supplementary threads in a row, or part of a row to form a thickened, more prominent design throughout the pattern. Most of the Chinese designs went up the warp threads, but some weft direction weaves have been found in textiles used as bands showing that the weavers knew this method as well as the warp faced weaving.[225]

Another unusual fabric from the Han dynasty is seen in Figure 5.27. This fabric looks like knitting, but was actually a needle-looped fabric made by hand. Some of these knitted fabrics had designs worked into the patterns. These needle-looped textiles may have been the forerunner of the Italian handmade laces of the Renaissance where similar techniques were used.[226] The renaissance laces were also needle made laces such as "Reticella" and can be seen on the clothing of paintings from the period.

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224 Huang, "*The Great treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery(1)*". p.101.

225 Sheng, "The Disappearance of Silk Weaves with Weft Effects in Early China".pp43-48.

226 Pat Earnshaw, *Needle–made Laces, Materials, Designs and Techniques, Sydney: Collins Australia. 2000.*

NOTE:
This figure is included on page 102 of the print copy of the thesis held in the University of Adelaide Library.

Fig 5-26 Looped fabric which resembles knitting, but is actually made with interlocking loops using a needle[227] Han Dynasty, Chu tomb, Changsha, Chinese History Museum, Beijing.

By analysing the different types of textiles shown by the illustrations above, several conclusions can be drawn.

- The variety of weaves was diverse and required different types of looms and setting procedures.
- The designs were also very diverse. To be able to perform these textiles techniques, the technology appears very advanced for its time.

227 Zhao, *Treasures in Silk*.p.54.

5.2. Conclusion

The new Han looms were very innovative and used mechanisms that were not improved until the European industrial revolution. The additions, such as heddles and treadles, not only sped up production, but there were mechanisms that enabled the making of new spot designs. As well, new textiles weaves emerged with textures. These were the beginning of pile fabrics such as velvet. Looms increased in size to the extremely large drawlooms to accommodate very complicated designs and colours of the brocades. This was a technical innovation of enormous implications. To enhance these new textiles a greater range of dyes and pigments were desired.

6. Dyeing and printing

This Chapter will investigate ancient Chinese dyes and why they were important to the everyday life of the Han Chinese. As this is a little known area of study, the implications of the use of different colours will be used as a basis for another view as to their importance in everyday life. The origin and source of the dyes will be charted as well as the colours produced.

An important section of dyes and pigments is the method of application onto the textiles. Therefore this chapter will include printing methods, tie-dyeing and the technical yet aesthetic designs of embroidery. The colours and the patterns are part of the wonder of these two thousand year old textiles.

Colours were extremely important because of their symbolic meanings, as were the designs they enhanced. Through the analyses of dyes used to develop the colours of textiles, we can deduce aspects of the technological development and fashions of the period. The knowledge of the dyes is part of the identification of textiles as they can help explain the history of the fabric from the area through plant identification and geography because only some plants or animals can be grown in certain places and climates.

Unfortunately, there are few detailed studies on the dyes used in ancient Chinese textiles. The techniques of printing have been addressed by Kuhn, Laumann and Cheng, but Cheng is the major source available. Mary King recognises this importance and considers it an essential component for textile identification.[228]

228 King, "Analytical Methods and Prehistoric Textiles." American Antiquity, Vol 43,No1, 1978.

According to Laumann:

> Without the knowledge of dyes and pigments and of methods of successfully applying them to textile fibres yarn and fabrics, embroidery for example would make little sense and the weaving of polychrome brocades would be impossible. Hence, it may be concluded that the unusual achievements of art and technology evident in the excavated woven and embroidered silks from the Warring States and Han periods presuppose a long, progressive tradition of experiment, knowledge in dyestuffs, pigments and paints".[229]

Dyes, pigments and their uses are not just the colours, but depict the people who used them.

How the dyes enhance the textiles tell the preferences of colours as well as fashion changes. Colours can be used for enhancement, as well as symbolic references and social standing. Colour had more than just aesthetic qualities as the colours used were based on the beliefs of the ancient Chinese and carried the directions of the earth and the sacred animals.

To twentieth first century textile researchers, the durability or these natural dyes from two thousand year old textiles, was a marvellous site. These colourfast colours can be seen in the many textiles shown throughout this work. Although not from the main area of China, examples of colourfastness is seen in the intense vermillion clothing of the "Cherchen man" and "Cherchen lady" now found in the Xinjiang Uygur Autonomous Region at Urumchi and observed by the author in 2007. The fabrics from Lady Dai's tomb are a major testimony to the quality of the dyes from China. The colours are still very intense and possibly would not have altered over the years.

The textiles found in Hubei from the Warring States period show a glimpse of different colours in their decoration of textiles. By the Han dynasty colours were used with greater emphasis. The brocade fabrics clothes of the King of Jingjue in Figure 6.1, show some of the colourful designs which have lasted for a millennium. The weavers knew how to

229 Laumann, *The Secret of Excellence in Ancient Chinese Silks*.p.91.

combine colours for a dramatic impact. In an article on oriental carpets one author (unknown) attributes, “the secret of the intensely brilliant though exquisitely harmonious colouring of oriental textile fabrics would seem to be the result of a special gift according to the races that produce them”.[230] This applies to all the aspects of the textile production including spinning, weaving and embellishments which people desired for variety and power over others.

NOTE:
This figure is included on page 106 of the print copy of the thesis held in the University of Adelaide Library.

Fig 6-1 Desert King of Jingjue with colourful clothing originating from China. Han dynasty, Niya, Xinjiang Uighur Autonomous Region. [231]

To enhance the people’s passion for colour, the number of dyes used for textiles increased from twenty designated colours during the Zhou period to over thirty in the Han dynasty.[232] This advancement could have been just a general progression of technical aspects, or the elite desiring variety. Many of these colours were based around intense red and yellow which are bright happiness evoking colours. The author believes that this change shows the interest the people had in colour and the demand for a more extensive palette. The colours were extremely important as they carried symbolic meaning based on the Chinese belief system.

230 " On Oriental Carpets, Article V1, the Art of Dyeing," *The Burlington Magazine for Connoisseurs* 4.11 (1904).pp.143-147.

231 Zhao, Legacy of the Desert Kingp.28.

232 Cheng, ed., *History of Textile Technology of Ancient China*.p.67.

6.1.1. Early Dyes and Pigments

From the Neolithic era, people had knowledge of pigments that would colour the surface of objects. Red, white, black, brown and orange colours have been found on pottery as paints from Neolithic sites in China. These pigments would also colour the natural textiles if painted on the surface. This introduced variety as well as symbols with meanings could now be applied.

Colours made from plants and some pigments were able to penetrate the cloth and therefore more permanent. These early experimentations eventually led to the common use of colour until early sumptuary laws and ritual observances governed their use.

The Zhou dynasty disallowed most people from wearing coloured clothes, or certain colours could only be worn by specific people. Even if the laws had not applied, most ordinary people would have been too busy surviving to waste time dyeing and decorating their cloth..[233] The nobility could have servants or others to work for them, so consequently the use of colour showed their wealth and power. To demonstrate status the use of colour for clothing and artefacts continued into the Han dynasty. These colours and clothes are discussed in the section on clothing where these garments showed a range of colours and designs. Barbieri-Low in his investigation on different artisans believes that a tomb model represents a dyeing workshop with a grinder to grind the raw material and vats to dye the cloth. (See Figure 6.2)

233 Jane Schneider, "The Secret of Excellence in Ancient Chinese Silk," Journal of near Eastern Studies , No 2.April 1964.p.154.

NOTE:
This figure is included on page 108 of the print copy of the thesis held in the University of Adelaide Library.

Fig 6-2 Textile dyeing workshop Han dynasty[234]

The Han Chinese still adhered too many of the older beliefs about the harmony of the cosmos and the earth. The five auspicious colours of red, white black azure and yellow were as prominent as the directions the animals the metals and the planet. These were all interrelated and used throughout the textiles from the Han dynasty. The colours and motifs were probably used to remind people of their symbolism and the protection. The desire and opulence of the Han dynasty encouraged this experimentation with even gold silver applied to fabrics and dyes to satisfy desires for something new and different.[235]

234 Anthony Barbieri-Low, *Artisans in Early Imperial China*. p.69.

235 Laumann, The Secret of Excellence in Ancient Chinese Silks.p.84.

NOTE:
This figure is included on page 109 of the print copy of the thesis held in the University of Adelaide Library.

Fig 6-3 Detail of textile with silver printing and white painting. Han dynasty, Mawangdui grave no 1, Hunan Provincial Museum. [236]

For knowledge about the reactions of dyes and their colour retention, the dyers must have known about the properties of the dyes and had specific recipes to make them. Cheng states that the standardization or norms for making dyes was "more empirical than scientifically based"[237] during this period, but the accuracy cannot be denied, since the colours have lasted so well.

Until the 19th century when aniline, synthetic, dyes was discovered, all dyes had to be made from natural products.[238] In ancient China, as elsewhere before any dyeing could be undertaken, the plants, animals or minerals for dyes had to be sourced by either growing the crop or collecting the component. Each potential colour had to be treated differently as some textiles absorb some dyes better than others. Natural fibres have an affinity with dyes, but to produce the correct colour precision wild all the components was necessary. Some of the natural components used needed mordants to help make the dyes reasonably

236 Huang, ed., The Great Treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery(1).p.52.

237 Cheng, ed., History of Textile Technology of Ancient China, p.105.

238 David Green, *Fabric Printing and Dyeing: A Practical Handbook*, London: Mac Gibbon and Key, 1972.p.3.
Aniline was a component of coal tar which produced the first synthetic dye, mauve, in 1856.

colourfast.[239] The addition of various mordants could also change the colour, or its intensity as well as fixing itself to the dye and therefore making it colourfast. Consistency in workmanship was an important factor in maintaining quality, consequently, the accuracy of the mixtures was important. To be able to maintain consistency dyers knew the secrets of keeping the recipe constant to obtain the same colour each time. Officials checked whether the workmanship was satisfactory and rejected poor quality goods

6.1.2. Dyes and Pigments

Most of the early colours probably came from mineral ores such as carbon black which was ground, placed in water, then painted onto the fabric, or strained and used as a bath for the fabric. It gave variations of black depending on whether the textile was a first dipping, or a subsequent one. Other early dyes were mostly variations of red that could be attributed to an adoration of the sun, fire and blood.[240] The red provided a vivid contrast on the textile when used with black. Cinnabar, (sulphide of mercury), often called 'Dragon's blood," became another useful colour of red by the Shang dynasty.[241] By the Late Zhou dynasty these and other minerals, as well as a variety of plants, were being used to dye textiles. An example was white lead (lead carbonate, *hu feng*), which was used as a white dye instead of just a surface pigment. Though taken from a book of the Yuan dynasty, the *Exploitations of the Works of Nature* (*Tian gong kai wu*), the recipe shows the precision required when making dyes. Two bottles of vinegar to a ratio of one hundred jin of thin lead pieces were slowly heated together over a charcoal fire for seven days to produce the white powder used for dyes.[242]

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239 A mordant is a chemical used to change the chemical composition of the dye and helps the chemicals bond to those of the fabric. Alum is often used for this purpose

240 .Vainker, *Chinese Silk: A Cultural History*.p.41.

241 Laumann, The Secret of Excellence in Ancient Chinese Silks.p.41.

Laumann writes that traces of very finely ground cinnabar have been found on and around textiles in a Shang tomb at Luijiahe, and Beijing.

242 Laumann, The Secret of Excellence in Ancient Chinese Silks.p.309.

Before any dye or pigment could be used to colour the natural fibres, whether silk, hemp or ramie, the fibres or spun threads had to be scoured to remove any more dirt or grease.[243] All natural fibres absorb dye, but silk being such a treasured and delicate textile, extra care had to be taken with it to make sure the dye penetrated the fibre and not just sat over the gummed surface. Extra de-gumming of silk was achieved through exposure to carefully controlled amount of sunlight. It was then treated with the liquid from the soaking of ash and the leaves of the lian plant.[244] These processes ensured the dye penetrated the fibres and gave the cloth brightness.

The following involved description shows the complexity needed to obtain the extremely high quality textiles for which China became known: [sic]

> Submerged in water mixed with clamshell ash in a smooth surfaced vessel …dehydrated, spread with clamshell ash and kept for the night: the next day, it is cleansed and dehydrated again, and this is followed by water scouring lasting for seven days and nights[245]

Microbes helped degum the silk filaments as well as the bast fibres and could have enhanced the water scouring. During the Han dynasty this process was refined further and special tools such as a scouring block and pestle were developed. Plant ash was used as well as pounding the silk with a pestle. This was found to expatiate the time needed for degumming and prevented massive tangling.[246] The following poem provides a picture of the pounding of silk to achieve softness and whiteness as well as the processes needed and the care needed to make quality cloth.

> Heavy is the night dew
> and chilly is the autumn wind
> yet amid the pounding sounds rises a picture of silks soft, beautiful and elegant[247]

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243 The process of scouring the finished threads or cloth was known as lian, in ancient China.

244 Cheng, ed., *History of Textile Technology of Ancient China*.p.305.

245.Ibid.,89.

246 Ibid.,p.30.

By the Ming dynasty, a pigs pancreas and plant ash were pounded and mixed together in water for the steeping of the silk. This method was found to be a quicker method for degumming and whiten the silk.

247 Ibid.,p.299.

Silk, being the superior textile of the ancient Chinese, was naturally given the best treatment, but other fibres beside silk were also dyed.

As the dyers understood the processes of dyeing better, they were able to save the dye for a period of time before use by the different fibres. Previously, the dye needed to be used immediately. Indigo was an example of a dye that previously had to be used quickly after preparation. During the Han dynasty the chemicals were developed so that the dye could be stored, thus extending the period of dying. Modern scientists, according to Cheng, have discovered that both mulberry wood ash and millet straw ash have a rich content of potassium carbonate and these could have been used for this process since when lime is added to the ash, it produces a strong basic agent called pottassa, potassium oxide, which degums and bleaches the bast fibres.[248] As all the ingredients for dyeing had to be obtained from natural sources the process became a long arduous one.

6.1.3. Explanation of Dyes

To enable the processes of dyeing to be performed systematically and as quickly as possible, offices and officials of the Han dynasty were examined each stage. One department was called *Zhang ran cao*, official handling herb, while another was known by the name *Rang ren,* dyeing craftsmen. Other officials had titles such as *Zhang shen*, or the official for the procurement of clamshell powder that had an associated with the materials or processes requiring their surveillance.[249] All areas and processes of dyeing and textile enhancement were supervised.

During the dyeing process the dye penetrates the fibres by a chemical bonding and does not just colour the surface of the fabric as in printing or painting. This can be determined

248 Cheng, ed., *History of Textile Technology of Ancient China*.p.303.
When lime is added to the wood ash the lime absorbs water and the chemical reaction produces calcium hydroxide, a whitener.
249 Ibid.,p.302.

by observation of whether the colour is the same on both side of the textile. If the colour appears only on one side is painted or printed.[250] Dyes from plant and animal sources bonded with the molecular structure of the fibre, whereas most mineral pigments remained on the surface and were more useful for printing and painting. The Chinese would not have known the chemistry of dyeing as we understand it, but they understood that different dyes were required to give the desired final colour and that each needed different treatments.

Dyes are classified into two distinct types by the colourfastness which is achieved. The classifications are direct dyes and dyes using a mordant. A mordant was used to set the colour but while doing this it often changed the original colour. Cheng describes the same process for both the dyes in the initial stages. The plant material was chopped and boiled with water to form a soupy bath. After straining, the thread or cloth was dipped and left to dry. Madder roots were chopped and boiled to give a dark red soup, which produced an orangey red fabric. Saffron stamens produced a yellow cloth. These dyes were used during the second millennium BCE by the Minoans in Crete and later by the Greeks.[251] The Greeks also used the dyes from sea snails such as murex, which gave a definite purple indicating that this knowledge may have come from these areas to China.[252] These particular dyes may have come from the trade with Rome.

There have been finds of textiles from the late Warring States and the Han Dynasty which substantiate the fact that China was using similar colours to those found in the Western civilizations of Greece and Rome. The textiles found in the Mashan Tombs of the late Warring States period include nineteen different colours and the Mawangdui tombs

250 Vainker, *Chinese Silk: A Cultural History*.p.43.

251 Barber, *Women's Work: The First 20,000 Years, Women Cloth and Society in Early Times*.p.114.

252 Irene Good, "On the Question of Silk in Pre Han Eurasia," *Antiquity*, 69.226 (1995).

Good is working on the aspect of goods being transported from one area to another in early history.

include more than twenty colours.[253] This variety showed that the Chinese experimented to obtain more colours as this variety of colours is not found in Greek and Roman textiles. Many different dyes were produced by the end of the Eastern Han dynasty but they were based on the five auspicious colours of various shades of red, yellows and oranges, green and green blues black and white (see appendix 2). All the different hues had specific names and therefore must have had specific recipes to obtain that colour. The quantity and variation of the new dyes show the ingenuity and experimentation of the dyers to acquire new colours for their clients.

These new colourfast dyes using a mordant needed a greater knowledge of the reactions between the fibres and the liquid. One of the major dyes was obtained not from plants, but from the secretion of the parasitic insect, Laccifer lacca. Both this insect and the secretion from palm plant called *Qi linj jie*, (*Calamus Draco)*: both produced red dyes.[254] Other dyes used in later eras such as cochineal, and kermes (red) were all extracted from insects.[255] This ongoing action demonstrates how the Chinese were always experimenting with new, more permanent dyes.

The oldest Chinese dictionary, the Erh-ya from 200CE, speaks of a three stages for dyeing, where the Li-chi, another ancient writing mentioned by Laumann, has a process called feathering but it is not explained. [256] It also lists seven steps in the dying process. Mozi, the early Chinese philosopher (b 470-391 BCE) indicates how dyeing must a have been part of an everyday experience as he uses it as an illustration for his philosophy: [sic]

253 Laumann, The Secret of Excellence in Ancient Chinese Silks.pp.992,993.

254 Cheng, ed., *History of Textile Technology of Ancient China*.p.307.

255 "On Oriental Carpets, Article V1, the Art of Dyeing".

256 Laumann, *The Secret of Excellence in Ancient Chinese Silks*.p.93.

> What is dyed in blue comes out blue, what is dyed in yellow becomes yellow. When silk is put in a different dye, its colour also becomes different. Having been dipped in five times, it has changed colour five times therefore dyeing should be done with great care. This is true not only of dyeing; even a country changes its colour in response to its influences. [257]

As these techniques could be applied to either the yarn or the cloth the writing confirms that the dyeing process was well developed by the fifth century BCE. Being so old, the analysis of dyes from ancient textiles is hard for modern researchers due to the breakdown of the dye over the centuries. In 1924-5 a Russian team found a tomb at Noin-ula in Mongolia which contained Han dynasty textiles and Chinese artefacts amongst local Xiongnu ones. Realising the importance of these coverings and clothing, upon return the Russians cleaned and analysed the fabrics.[258] Amongst these was a piece of discarded, dirty fabric containing tar. When this piece was cleaned with "carbon tetrachloride, ether and chloroform under a current of dry vapour with and atmospheric pressure of 0.5, all the dirt was taken off, and as a result of this process we got an example of rare value".[259] The resulting fabric was an embroidered Caucasian warrior with a moustache.[260] The threads appear as if they had just been dyed in brilliant colours. It is known from many other textiles, that Chinese dyers had this expertise during the Han dynasty. (The explanations of the methods used for the recovery are included in Appendix 5.)

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257 Laumann, The Secret of Excellence in Ancient Chinese Silks.

258 A.A. Voskresensky, Tikhonov, Eds., "Technical Study of Textiles from the Burial Mounds of Noin -Ula," *The Bulletin of the Needle and Bobbin Club* 20, Part 2.14.03.2006 1936.pp3-4.

Up until 1932 the Russians, and presumably other nations, found that iron was the only easy dye to identify positively. Photography was another method relied on to help with analysis as colours and dyes During the succeeding years other methods have been employed using hydrochloric acid to extract the dyes from silk and wool, but this leaves a glycosidic residue (sugar like molecules) that can inhibit the clear colour of the original from plants, particularly for the sensitive yellow dyes.

During 2005, Professor Richard Larson and research student Xian Zhang from Boston University refined a technique for analysing the dyes used in these ancient fabrics. Larson and Zhan used a gentle method using the chemicals ethylenediametetracetic acid (ETDA) and formic acid as these do not disturb the glycosidic (sugar) links in place within the dyes. These dyes were then analysed "using a combination of high performance liquid chromatography, mass spectrometry and a diode array detector to determine their solubility properties, molecular weight and exact colour absorption in nanometres" (a measurement using a billionth of a metre).258

259 Voskresensky, "Technical Study of Textiles from the Burial Mounds of Noin -Ula."p.3.

The original translation of this and the second article for the same magazine are held in the Library of the Metropolitan Museum of Art, new York

260 As yet it is not established whether this textile was made in Western China where similar tapestry textiles have been discovered, or whether it came from central Asia. It is classed as a Chinese Han textile in the book, the Great Treasury of Chinese Arts. This area of migration of patterns textiles needs extra research by evaluating textiles, colours and dyes from both comparable textiles from different areas of Central Asia.

Where did the Chinese get the materials to dye these fabrics? Were they found locally or were they imported? Below is a chart showing what Vianker and Laumann consider to be the main sources. These plants and minerals could have been brought from various parts of the country where they grew or were found

The list includes substances which needed great care when being handled. Mercuric sulphide which was used to give white required a high level of competence. This care is evident in the textiles found in Mawangdui tomb Number One, which were printed so perfectly that the dye did not block the holes of the fine gauze.[261] The red coloured mercuric oxide contains lead which produces the colour. It can also contain calcium and magnesium which can be volatile. According to scientific analysis, cinnabar, another dangerous mineral, gives a cinnamon to scarlet red.[262] Fabrics found from the excavations at Lou-lan used a red pigment in their dyeing called calcined ochre.[263] The different sources show the understanding of dyes and minerals. Sources of the dyes are seen in table, Figure 6.4.

Fig 6-4Source of Dyes for Textile used during the Han Dynasty

Colour	Source	Mordant
Red	Cinnabar Madder Rubia tintorum	
Green	Malachite	
Blue	Indigo plant	
Black	Acorn cups rich in titanium	

261 Cheng, ed., *History of Textile Technology of Ancient China*, p.68.

Chen, ed., *Hunan Provincial Museum: The Exhibition of Mawangdui Tombs*.p.73.

262 "The Mineral Cinnabar" .26/09.2008<http://www.galleries.com/minerals/sulfides/cinnabar/cinnabar.htm>.02/03/2009.

263 Sylwan, I*nvestigation of Silk from Edsen-Gol and Lop-nor and a Survey of Wool and Vegetable Materials.*

Sylwan, *Woollen Textiles of the Lou-Lan People*.p.19.

Yellow	Anthraxon hispidus Gardenia	
Bright green	Anthraxon hisidus	vulpic acid
White	Lead and Clam shell powder Sericite, Cinnabar, (Mercuric sulphide) and lead sulphide	
Silver grey and gold	Silver and gold	

Compiled from Vianker [264] **and Laumann**265

6.1.4. Minerals used as Dyes

The following charts Figures 6.4, 5.5, illustrate the diversity of dyes and their uses during the Han dynasty. The extensive use of minerals, animals and plants reflect people who were always trying to improve the basics which had been in use for many years. It also shows the experimentation which must have been made as these colours were consistent from one place to another. This was due to the strict control of the officials who carefully supervised each stage or the project.

Fig 6-5 Minerals and their use as a Textile decoration

NOTE:
This figure is included on pages 117-118 of the print copy of the thesis held in the University of Adelaide Library.

264 Vainker, *Chinese Silk: A Cultural History*.p.43.

265 Laumann, *The Secret of Excellence in Ancient Chinese Silks*.p.93.

Compiled from Cheng, History of Textile Technology of Ancient China266

Gold and silver were applied to the cloth in the same manner as other pigments as they could be ground, an adhesive added then be printed or painted.

266 Cheng, ed., *History of Textile Technology of Ancient China*.p.97.

Based on spectral analysis conducted by the Research institute of Chemistry of the Chinese academy of Sciences.

Fig 6-6 Vegetable Dyes Used During the Han dynasty

Known Name	Colour	Botanical name	Plant	Extraction of dye
Indigo	Blue	*Polygonum tinctorium* (most common plant)	Herb growing to 50-80 cm tall. Leaves extrude a yellow juice which quickly turns blue	Possible early extraction by rubbing leaves onto textiles. Fermentation of leaves and then textiles in dipped in dye bath.
Indian madder	Red or purple	*Rubia Cordifolia*	Perennial climber with yellowish red roots. Grown around the State of Zheng (modern Henan)	Roots dried then chopped and soaked in water Addition of mordent, Aluminium salt for brightest colour. Yellow dye if no mordent added. Mordents give different colours
Gromwell	Purple	*Lithospermum erythorhizon*	unknown	unknown
Gardinia	Yellow	*Gardinia Jasminoides ellis*	unknown	unknown
Black	Hazel Bark	*Corylus chinsis*	unknown	unknown
Black	Not identified	Not identified	Spring and Autumn Warring States	Iron Salt a mordant to obtain black if the plant contained tannic acid
Yellow	Safflower	Not identified	Han dynasty	unknown

Adapted from Cheng, History of Textile Technology of Ancient China267 **and 'China Style'** 268

Indigo was probably been one of the earliest plants used for dyeing.[269] A group of women collecting indigo plants is mentioned in the chapter "*Xiao Ya*" in the Book of S*ongs.* It is

267 Cheng, *The Archaeology of Ancient China*.p.97.

These findings are based on spectral analysis conducted by the Research institute of Chemistry of the Chinese Academy of Sciences.

268 China Style, Available: <http://library.thinkquest.org/05aug/01780/clothing/ancient-dyeing-printing/index.htm>, 06/11/2006.

269 Barber, *Prehistoric Textiles: The Development of Cloth in the Neolithic and Bronze Ages, with Special Reference to the Aegean.*p.224.

also mentioned in the ancient Chinese dictionary where several types of indigo plants are described.[270]

Vivi Sylwan describes how colour variations could occur by using the same dye several times without adding any extra dye. However this does not explain completely different colours unless the dye concentration had been completely eliminated from the dye bath. With each subsequent dipping of cloth, the colour taken up gives a lighter hue.[271] Janet Harvey, in her book on Central Asian Textiles, says that dyes can vary by using the same plant grown in different areas.[272] Since there was constant observation of the colours produced by the dyes in the State controlled workshops, it would be surprising if this method was used to produce paler cloth unless made intentionally. Variations in colour could have been original fading. Or as Janet Harvey says, "dyes can vary by using the same plant grown in different areas".[273]

The Han must have preferred this intense colour range. All textiles were not woven in patterns or left plain as some of the textiles which have been recovered have had extremely accurate printing. This was another technological advancement as the pigment had to adhere to the textile and survive wear and tear associated with all textiles. It also shows the accuracy maintained when using different colours on the various parts of the design.

270 Cheng, *The Archaeology of Ancient China*.p.98.

271 Sylwan, *Woollen Textiles of the Lou-Lan People*.p.19.

272 Janet Harvey, *Traditional Textiles of Central Asia* 1996: Thames and Hudson, 1996. p.60.

273 Ibid., p.60.

6.2. Conclusion

This chapter provides an understanding of the breadth of the dyes and pigments used during this time. The increase of about one third more colours is a considerable amount considering that all the dyes and pigments were from natural sources. The ability to understand the need of mordants to fix dyes and make them colorfast was a very early technical development. The fact that textiles from different areas contained the same colour shows the consistence of quantities in manufacture. Their application onto the cloth is also another feat of technology.

7. Textile designs and decoration from the Han dynasty

Colours enhance and define designs by the manner in which they are chosen and applied. A variety of designs were in common use by the Han dynasty period. The material culture which has been found from Pre Han dynasties shows that the ability to design and make incredible objects was not new. Bronzes decorated with fine intricate designs, statues of mythical animals, pottery and also textiles show the accuracy and attention to detail which were possible at that time. The embroidered textiles found from the Warring States period show beautiful curved designs which were meticulously executed.

The Han dynasty had designs which became traditional with names related to nature, or contained symbolic meanings with mythical animals, plants and the cosmos. Chinese writing characters for long life, prosperity and good health were often included as part of the design. The author thinks that these designs were used in textiles, not only provide interest and beauty, but to remind people of their symbolic meanings with the hope that the powers would be transferred to the wearer: hence the use of different symbols on official clothing for the different offices of the government. There symbolic designs such dragons with five claws, that only the Emperor use as it was his display of power. The phoenix represented the queen. (Appendix 3) gives the symbols for the ranks of the government officials and (Appendix 4) has the symbolic meaning of motifs involved with textiles.

Many of the symbols we know now may or may not have been used during the Han dynasty, but I think that as soon as Buddhism reached China and became popular, many of the Buddhist symbols would have been incorporated, as many designs are similar to Daoist symbols. My assumption for this is related to other symbols having such a high

priority for textiles. There are also eight precious things to be displayed on clothing or within the designs as well as the actual object. *Ba bao*, the first group of precious things used as symbols of wealth consisted of rhinoceros horns, sticks of coral, and rolls of tribute silk.[274] Other important symbols in common use in motifs and are often found in textiles in later centuries were possibly in use earlier, but they have not been found on the excavated Han textiles. Throughout the ages various symbols were not only woven or embroidered into textiles but were often sewn or embroidered on hats and shoes of children to help keep them safe and in good health. The symbolic use of these creatures can still be seen on some children's clothing of the 20th Century. The animals usually looked quite ferocious to drive off the evil spirits and bring good luck.[275]

Probably the most common designs used were the use of clouds to represent the afterlife. The clouds took different shapes throughout the Han period, but they framed and enhanced the animals and astrological signs such as circles representing planets. The author feels that these cloud designs could even be traced to some of the bronzes of earlier periods.

274 Jing Pei, Fang, *Symbols and Rebuses in Chinese Art: Figures, Bugs, Beasts and Flowers, Berkley*, Toronto:10 Speed Press: p.71. .71.

275 Garrett, *A Chinese Dress Accessories*. Singapore: Times Media Pty., Ltd.,1997, p. 54.

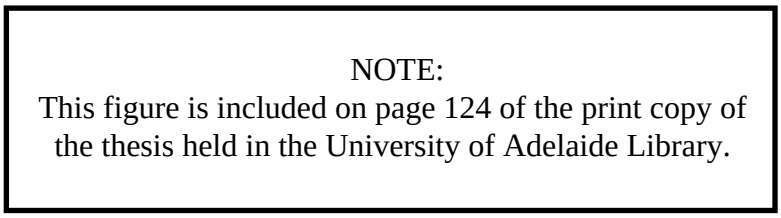

Fig 7-1 Cloud design on bronze bell [276]

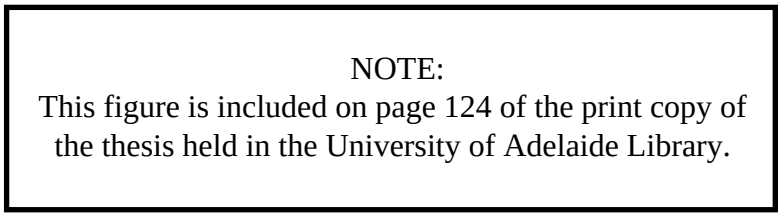

Fig 7-2 Bronze bull showing cloud design on body[277]

276 *Historical Relics Unearthed in New China, Peoples Republic of China*: Peking :Foreign Languages Press, 1972. p.20.

The fluidity of clouds when embroidered transported the viewer into another sphere and when in weaving, they gave woven fabrics a curvilinear nature originally only achieved with embroidered. An example is the Eastern Han textile below, Figure 7.3, with the five auspicious colours, voluted clouds, tigers, deer, tortoises and peacock shows colour and movement. Colours enhanced and defined designs by the manner they were chosen and applied.

NOTE:
This figure is included on page 125 of the print copy of the thesis held in the University of Adelaide Library.

Fig 7-3 Eastern Han Textile depicting auspicious animals and planets amongst clouds. Niya, Xinjiang. Warped face tabby weave. [278]

277 Ibid.,.p.20.

278 Vollmer, *Silks for Thrones and Altars*, Paris: Myrna Myers, p 10.

Fig 7-4 Textiles with astrological symbols. Han dynasty, Turfan Museum. Photo[279]

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NOTE:
This figure is included on page 126 of the print copy of the thesis held in the University of Adelaide Library.

Fig 7-5 Detail, Western Han textile showing astrological symbols and mythical animals. Tomb 2, Yinwan Village, Donghai, Jaingsu, Lianyungangag Museum, Lianyungangag. Chain stitch embroidery on silk.[280]

279 Textiles of t astrological symbols taken by author at Turfan Museum. October 2007.

Lady Dai lived in the old kingdom of Chu that appears to have been a forerunner in arts and crafts and especially designs mainly on lacquer work.

When Liu Bang who came from the Chu kingdom, proclaimed himself, the first emperor of the Han dynasty, he adopted the administrative institutions the Qin, but brought artisans from his home area to continue production of the type of goods he liked. These artefacts reveal that the elite at least, surrounded themselves with beauty for household living, entertainment and clothing.

Many of the artefacts and textiles in this thesis show influences which were common in the Chu kingdom. The textiles found in early Han artefacts testify to being the same styles as those from earlier Chu artefacts such as those from the tomb of the Marquis Yi, 430 BCE.[281] The marquis died pre-Han, yet had designs on his artefacts reflecting early Chu designs. This correlates with the textiles and lacquer of the early Han dynasty which used curvilinear designs known to have come from this area and in the artefacts found in the tomb of Lady Dai in Changsha.

280 Zhao, *Treasures in Silk*.p.73.

281 Many of the artefacts of Marquis of Yi are seen in the Hubei Provincial museum, Wuhan.

Fig 7-6 Painted designs from Chu kingdom. Han Dynasty, Hunan Provincial Museum. Photo[282]

282 Photos taken by author at Hunan Provincial museum. September 2007.

NOTE:
This figure is included on page 129 of the print copy of the thesis held in the University of Adelaide Library.

Fig 7-7 Cheng yun ,Flying birds. Embroidery. Western Han dynasty, Mawangdui tomb No.1, Hunan Provincial Museum. Chain stitch on lozenge design silk [283]

Another example of textiles and design spreading across the kingdom was due to the Han expansion along the Ganzu corridor expanded the great wall to the area to the Gobi desert near Dunhuang and in western China. The people outside the Chinese borders were not liked and considered barbarians, but the Chinese people did adopt the style of pants worn for riding Although not officially acknowledged as part of the Han Empire, troops were stationed in this western area of present day Xinjiang, to keep the trade routes open and for the main empire was not to be attacked by the Xiongnu.[284] The Chinese now wanted domination over the Western area not only for political reasons, but for trade.

283 Jianming Chen, ed., Hunan Provincial Museum: *The Exhibition of Mawangdui Tombs*.p.43.

284 James A. Millward, *Eurasian Crossroads, a History of Xinjiang,* London: C Hurst and Co, 2007.p.19.

7.1.1. Designs on Textiles Found by Aurel Stein.

F.H. Andrews has given detailed accounts of some of the designs of textile fragments found by Aurel Stein early last century during his expeditions around Lop-nor in western China. Animals are a basis of many of these designs. Some of the animals are regularly placed with other motifs in row, while others show the development of machinery where curvilinear designs of animals, clouds and vines are intricately placed within the design which forms the repeat pattern.

7.1.2. Designs found on Chinese textiles at Noin-ula in Mongolia

The textiles found from a tomb in Mongolia contained textiles which were obviously Chinese ones amongst local textiles. Some of these textiles were embroidered while others were woven with unusual designs.

Fig 7-8 Han Chinese textile found in Noin Ula, Mongolia, Hermitage Museum, St Petersburg, Russia[285]

285 Hermitage Museum, Noin –Ula, Available: <http://depts.washington.edu/silkroad/museums/shm/shmnoinula.html>,12/04/2009.

The textiles given to other peoples of were of a high quality as befitted the obligations the recipient required by the Chinese. Below are several of the designs found on woven and embroidered cloth.

NOTE:
This figure is included on page 131 of the print copy of the thesis held in the University of Adelaide Library.

Fig 7-9 Noin Ula textile depicting mountains Noin-Ula. Han Dynasty, Hermitage Museum. St Petersburg. Detail.[286]

NOTE:
This figure is included on page 131 of the print copy of the thesis held in the University of Adelaide Library.

Fig 7-10 Noin Ula textile with unusual designs similar to astrological signs Noin-ula 1st century BCE. Han dynasty. Hermitage Museum St Petersburg. [287]

286 State Heritage Museum, Collection Highlights Oriental Art, Mongolia and Tibet. http://www.hermitagemuseum.org/html_En/03/hm3_5_7.html

287 Ibid.

7.1.3. Printing

Hann, quoting Chen and Liu, attributes the first printed textiles to those found in Han cave burial sites discovered at Guixi, in Jiangxi Province in 1979. These textiles were monochromatic printed "dark brown hemp fabrics, printed with a silver coloured pigment made from a silicone compound".[288] Since squeegees used for spreading the paint have been found, Hann believes that these Guixi textiles were stencil printed; the first in the world.[289] Several textiles from the Mawangdui tombs also show printed and painted designs.

Drawing on the cloth would have been the first step to printing. To keep the mixture on the material so that the cloth could be washed or used in rain, a glue of some type had to be added. This may have been a resin or a starch based glue. A design was reproduced on the surface of the cloth by some type of tool. It may have started by dipping of a stick into some ground rock mixed with a liquid and then placing it on the cloth using the end of the stick. This could have been applied randomly and later in patterns. To save time some type of stamp was needed. Small clay stamps, *pintadera*, have been discovered in Europe from Neolithic times, so the Han dynasty artisans may have used the same or similar tools. The repeat designs used for printed and embroidered textiles show that a very accurate template or stamp must have been in use. The example in Figure 7.9 from the Western Han period displays the blocks of bronze for each different colour used in the design needed for printing each stage and colour of the design. Accuracy was essential at every stage. As this design on printed gauze it demonstrated the skill of the printer to be able to print on an uneven surface. Some of the printing implements have been discovered showing how the accuracy was achieved.

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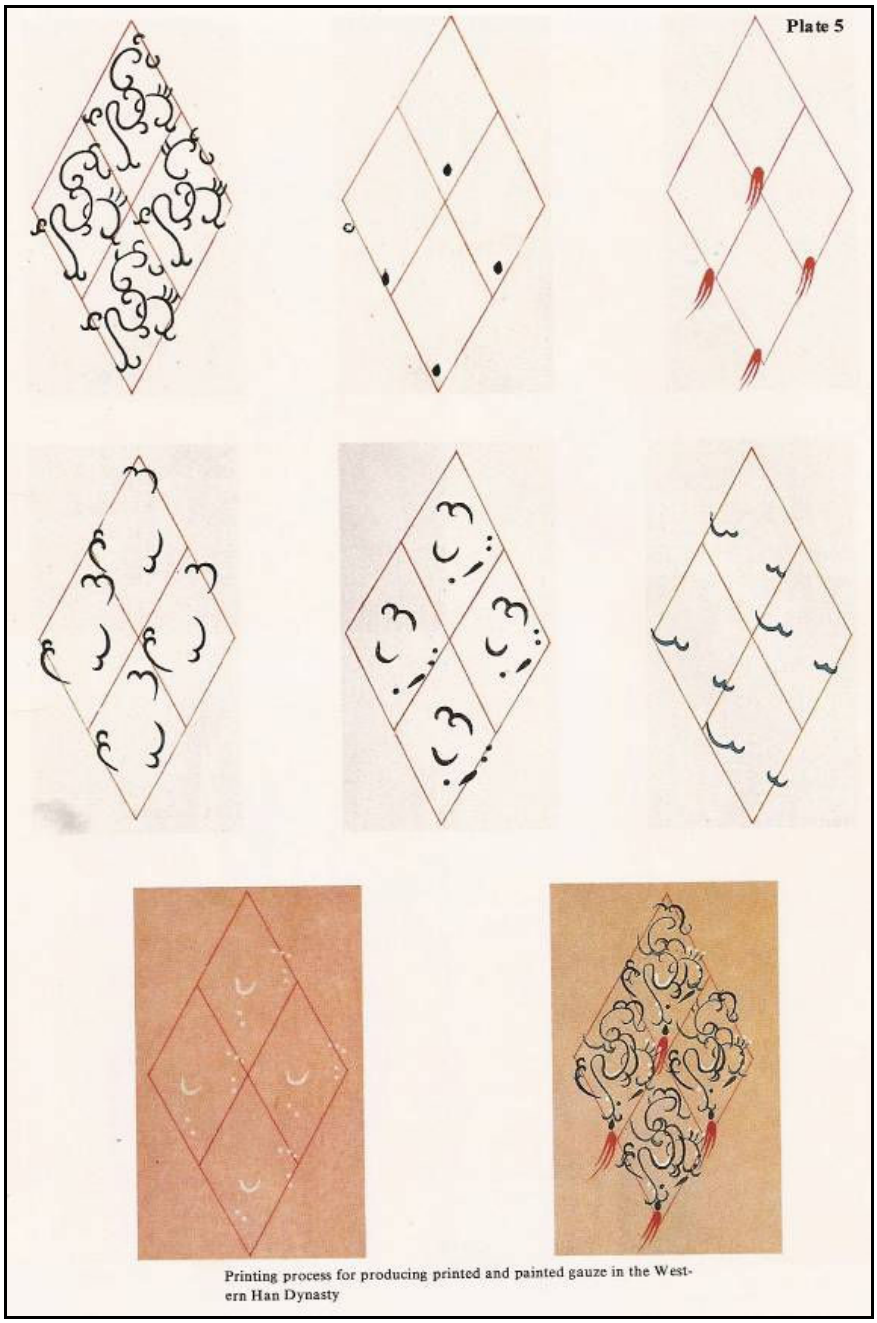
289 M.A Hann, Dragons Unicorns and Phoenixes,, 2004, University of Leeds,, Available: <http://www.leeds.ac.uk/ulita/PDF_downloads/ULITA_Dragons_Unicorns.pdf>, 21/10/2006.p.17.

Wax-resist design

Fig 7-11 Cloud design. Western Han, Moxuizi, Wuwei, Gansu Province[290]

290 Zhao, *Treasures in Silk.* p.74.

Illustration showing pattern blocks required to print a design of five colours



Printing process for producing printed and painted gauze in the Western Han Dynasty

Blocks requires to print design below

Fig 7-12 Block printed gauze with painting decoration. Western Han, Mawangdui No.1 Hunan Provincial Museum.[291]

291 Cheng, ed., *History of Textile Technology of Ancient China*.p.324.

Fig 7-13 Roller, printing blocks and patterns[292]

7.1.4. Pigments used for Printing

Pigment printing used blocks where the pattern was carved onto the block in relief. The blocks were made of bronze, wood or any medium which could be carved and maintain precise edges for the design. Patterns were made that they could be, repeated continuously and usually could be used in any direction on the fabric. With the patterns made in this manner the block did not have to be always in the same direction. This made the printing process easier for the workers. The pigment was applied to the surface of the

292 Cheng, ed., *History of Textile Technology of Ancient China*.pp.324-325.

block or stencil and the block carefully placed in the correct position. The pigment consisted of any of the pigments in the chart above. However, by the Han dynasty gold and silver were also being applied to cloth. This was revealed when the Mawangdui tombs. Two pieces of fine gauze were discovered which had the embroidery executed in gold and silver thread. It is described as having "three colour way pigment-printing process which called for the use of fine and pure paste possessing a very strong covering power".[293] As gauze is extremely fine and has spaces in the weave it needed a thick paste for this covering. The gold and silver dust was added to a strong adhesive so that it would adhere to the cloth. The textile in Figure 6.2 is a piece with its silver lines and gold dots showing an extremely high level of workmanship at all stages.

7.1.5. Block, Stencil Printing, Wax Resist and Tie Dyeing

Stencil Printing developed further and used additional techniques such as resist dyeing where wax was put on the design on the cloth and dyed. The wax is then removed showing the underneath colour. Stencils could be used to apply a wax or some other type of paste that rejects the dye in that area.

293Huang, ed., *The Great Treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery(1)*, Cheng, ed., *History of Textile Technology of Ancient China*.326.

NOTE:
This figure is included on page 138 of the print copy of the thesis held in the University of Adelaide Library.

Fig 7-14 Traditional tie dyed fabric. Front (left) and back (right).Western Liang, Astana, Xinjiang Uighur Autonomous Region Museum [294]

NOTE:
This figure is included on page 138 of the print copy of the thesis held in the University of Adelaide Library.

Fig 7-15 Traditional wax resist pattern of flowers showing back (left)and front (right), Northern Dynasties Wuyulaike, Hetian, Xinjiang, Museum of Xinjiang Uighur Museum,[295]

294 Huang, ed., *The Great Treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery(1)*., p.115.

Wax resist dyeing was developed during the Qin and Han dynasties and not only made use of stencils, but used specially shaped knives of bronze set into a bamboo handle, to paint the wax onto the design. The material was dyed, but the process could be repeated several times to give build-up of colours on top of one another.[296] Tie-dyeing or the gathering of section of material together; left the textile with a different colour where tie and then dipped into dyes. The outline was never sharp as dye seeped into the undyed section, particularly if not tied tightly. Different parts of the fabric could be dipped into different coloured dyes. This was an easy and quick technique used to achieve different defused colours on a piece of cloth.

These methods of decoration were quicker than embroidering a design, or trying to achieve a similar design on a loom. Figure 7.16 demonstrates the perfection and workmanship achieved by the artisans who used resist dyeing. Cheng describes it as "The decorative designs on it (the fabric was found from Niya in 1959) floral patterns as well as Buddhist figures- boast an exquisiteness which few other printing techniques concurrently in use could possibly achieve."[297]

295 Ibid., p.103.

296 Cheng, ed., *History of Textile Technology of Ancient China*.p.330.

297 Ibid.,p.331-332.

Fig 7-16 Wax resist dyeing on a textile from the Eastern Han dynasty.[298]

The artisans of the Han dynasty were experts in all areas of textile production. Whether this was due to the control the state had over the workshops or the quantity and variety of artisans, colourful textiles led to many different techniques being developed. Minority groups, particularly in the Central Asian area of western China, used warp dyeing similar to the ikat textiles of Indonesia and present day Central Asia. However, this method of decoration does not appear to have been popular in the major Chinese textile area of the

298 Cheng, ed., *History of Textile Technology of Ancient China*.p.331.

Han kingdom. They may have been used, but the major finds from Lady Dai's tomb show magnificent embroidery.

7.1.6. Embroidery of the Han textiles

Embroidery is not normally considered a form of technology, but the designing and executing of the embroidery is quite technical. In the case of embroidery, the hands are the machines manipulating the carefully spun and dyed thread and the fine needles which must have been used on the cloth. This all provided another dimension to the art of textiles.

Because of the time required working embroidery, especially for all over designs which were popular with royalty and the elite during the Warring States and Han dynasty, these textiles would not have been abundant. There were state workshops dedicated to making the embroidery for the official and ritual robes for royalty and high officials, but their cost must have been extremely high. Some of these exquisitely embroidered textiles would have been given as gifts high officials, but the lesser officials probably had similar designs made with their own home textiles. As the embroideries of the Han dynasty showed sophistication in design, technique and colour, there must have been a long tradition. Archaeological embroidered textiles as finds date back to the Zhou dynasty. See Figure 7.14.

7.1.7. Stitches

Hand embroidery was, and still remains, a slow and exacting technique. Before looms became sophisticated enough to produce brocades using multiple fine thread to produce curved lines, the best fabrics were embroidered. As can be seen from Figures 7.15, 7.16, the designs were intricate and would have required many, many hours of continuous work. The stitch was mainly variations of chain stitch using a needle during the Han

Dynasty, but pekinese stitch or Chinese knot was also used. One piece shown in Figure, 7.17 has a regulated straight, satin stitch. This was unusual amongst the embroideries and puts the use to a much earlier period.

Fig 7-17 Embroidered silk from the Mid Warring states period. Chu grave, Mashan, Jingling, Hubei Province Dragons tiger and phoenix.[299]

299 Huang, ed., *The Great Treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery(1)*.p.31.

NOTE:
This figure is included on page 143 of the print copy of the thesis held in the University of Adelaide Library.

Fig 7-18 Detail of embroidered silk cloth from Western Han dynasty. Hunan Provincial Museum.[300]

Fig 7-19 Satin Stitch embroidered textile. Tomb MI, Mawangdui. Hunan Provincial Museum. Tree design[301]

300 Huang, ed., *The Great Treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery(1)*.p.31.

301 Photo taken by author at Hunan Provincial Museum, September 2007.

Some of the most beautiful textiles found from the Han period entailed fine, evenly stitched embroideries. These magnificent works of art had stitches around 0.2 millimetres in length and 1.2 millimetres in width and used a thread from 0.2 and0.4 millimetres in width.[302] These were amazingly executed that no variations in technique can be discerned.

As most of the embroideries which have been found from the Han times were usually on silk textiles the reflection of colour is magnificent. The Hunan Provincial Museum has a selection of the embroidered textiles found in Lady Dai's tomb which could surpass similar workmanship by today's embroideries. It is possible to see the individual stitches in these evenly executed pieces. Several of her gowns were fully embroidered which would have taken a considerable amount of time to make.

As the technology progressed and curvilinear designs were being woven more people would have used these as a substitute. The examples below show this development while keeping to traditional curvilinear designs used in other crafts such as lacquer work.

302 Zaoneng Ying, *The Golden Age of Chinese Archaeology: Celebrated Discoveries from the Peoples Republic of China*, Washington: Washington National Gallery, 1999.p.323.

Cosmetic set

Lacquer Bowl

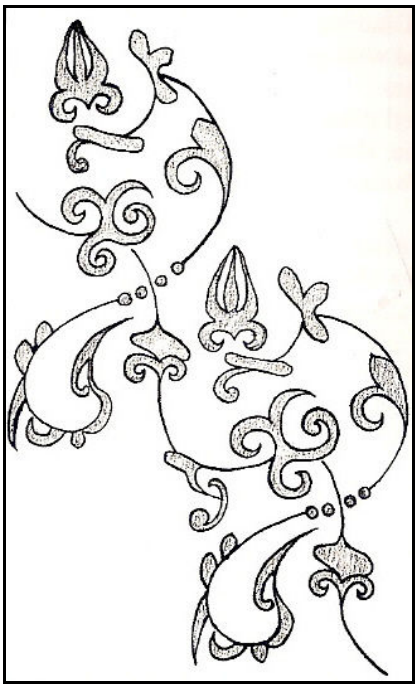


Fig 7-20 Various pieces of lacquer ware from the tomb of Lady Dai and Noin-ula

Cosmetic box decorated with cloud a design. Found in tomb of Lady Dai of Mawangdui Chinese lacquer work from Noin -ula Lacquer design of clouds showing similarity to textile designs

NOTE:
This figure is included on page 146 of the print copy of the thesis held in the University of Adelaide Library.

Fig 7-21 Embroidered textiles with design similar to lacquer work. Mawangdui tomb No 1. Hunan Provincial Museum. Double chain stitch on silk damask.[303]

303 Chen, ed., Hunan Provincial Museum: The Exhibition of Mawangdui Tombs.p.43.

Curvilinear designs on textiles

NOTE:
This figure is included on page 147 of the print copy of the thesis held in the University of Adelaide Library.

Fig 7-22 Embroidered clouds in curvilinear design. Hunan [304]

NOTE:
This figure is included on page 147 of the print copy of the thesis held in the University of Adelaide Library.

Fig 7-23 Early curvilinear woven design rows with clouds surrounding the animals. Niya, Xinjiang Uighur Autonomous region Museum.[305]

304 Huang, ed., *Chinese Fine Arts and Crafts 6 Printing Dyeing and Embroider*. p.91.

305 Zhao, *Treasures in Silk*.p.72.

Fig 7-24 Lines of clouds with animals which appear to float in the sky. Lop-Nor, Xinjiang Autonomous Region Museum. [306]

Fig 7-25 Hill shaped clouds with corn shaped protrusions placed around animals. Xinjiang Autonomous Museum. [307]

306 Zhao, *Treasures in Silk*. p.68.

NOTE:
This figure is included on page 149 of the print copy of the thesis held in the University of Adelaide Library.

Fig 7-26 Woven curvilinear design from Han dynasty showing transition to ribbon designs. Xinjiang Autonomous Region Museum.[308]

7.1.8. Textile Preservation in China

The people of China realize the wealth of textile articles and associated machinery, and display them with pride in their museums. The Hunan Provincial is an example of modern methods of display and restoration. This museum in Changsha houses the textiles and other important artefacts from the Mashan and Mawangdui tombs dating from the Warring States and Han periods. However, early finds of textiles were taken back to England, Russia, Germany and Japan when the explorers of the late 19th and early 20th century discovered the cultural wealth of ancient China in places such as Lop-nor and other deserted towns around the Taklamahan desert. The amazing textiles found in the previously unknown underground palace belonging to the Famen temple, late Eastern Han, revealed a bundle of textiles that were compacted and full of dirt. Many of these

307 Zhao, Treasures in Silk.p.76.

308 Huang, ed., *Chinese Fine Arts and Crafts 6 Printing Dyeing and Embroidery*. p.91.

have been sent to Germany for restoration and analysis.[309] The textiles are so important that many countries are working with the Chinese government to preserve them as the garments and associated textile, no matter how small, are an insight into the craftsmanship used to make them. Studying the real garments, even through a glass case gives a sense of the magnitude of the works.

7.2. Conclusion

It is never extremely clear whether the demands of the people led to new designs and improvements, or whether the technological development created impetus for people to have new textiles and colours. It is a combination of these factors which led to the increase in dyes as well as the fabrics and woven designs. The dyes were quite unique as well as diverse showing the advancement of the technical knowledge in this field. The variety of colours and how they were regulated to obtain consistency were both wonders which deserve greater recognition. The rich dressed and lived extravagantly as will be seen in the next Chapter when the people and society as well as the social system are discussed showing how people 2000 years ago could produce amazing textiles.

Who then, were these people of the Han dynasty who made textiles no one else was making? What kind of life did everyone lead? What were the conditions and beliefs of the period? What did they wear? Could everyone wear these magnificent textiles found in the tombs of the elite? These are the questions which provide reality to modern day readers.

309 Personal conversation with the official (possibly the director) at the Famen Temple Museum during July 2005.

8. Textiles and Society

This chapter will investigate social climate of the people of the Han dynasty to allow us to understand why these people lived in a society which needed such sophisticated textiles. To comprehend how such amazing textiles could be part of the textiles of people from two thousand years ago, it is important to see the people not just as part of history, but of people who lived, worked and had needs, albeit for in a different type of society than we live in. It behoves the researcher to put the Han textiles into a context where the people have a history with a lifestyle to visualize the people in the clothes they wore. In undertaking this task, the importance of the different textiles can be better understood through the following:

- An investigation of government restrictions on the usage of clothing in relations to the colours, fabric and design, which affected the textile
- An explanation the passages of life and the textiles related to these dictums
- A discussion of the costume and dress of the different levels of society
- Housing and lifestyle
- An examination of the social structure of the Han dynasty

To undertake these points an examination will be made of the textiles held from the Mawangdui tombs, Noin-ula and the graves and rubbish sites in the areas of western China occupied by Chinese troops during this period. The examination will include other artefacts found in tombs, and drawing on tiles and other carvings, to illustrate different levels of society. Other museums, where appropriate, will be used to understand the life in the Han dynasty.

Through examination of these topics, a glimpse of the society and people of the Han dynasty can be gained. Not only will the higher strata of society be revealed, but the artisans behind the production of such diverse and beautiful textiles will be explained.

Anthropologist, Mayer Schapiro, suggests that political and economic shifts "are often accompanied or followed by shifts in the centres of art and their styles."[310] This appears natural as work always follows the place of need. Since most of the artisans worked in workshops which were under governmental control, the workers had no option as to where they wanted to live. When movement happened this produced a new market, a spread of technology and a shift in economic power. As previously mentioned, the economy with its reliance on textile production was the mainstay of the ancient Han Chinese culture.

8.1. Life and Beliefs

The religion of the people of the Han dynasty was incorporated into their every day life to the extent that patterned textiles were based on religious symbols. Confucianism was the preferred thought system for society, especially officials, during the Han dynasty. The thoughts of Confucius were collected into books and used as moral teachings for the ideal way of life from how a husband should not be in the same room as a woman, to when a girl should be married and how she should then address her mother in law.[311] Daoism was also popular and formed many of the rituals associated with the ancestors. Early cosmological and folk beliefs were integrated with Daoism and Confucianism.[312] People still went to shamans for help in the same manner that they asked the ancestors for help. The shamans dealt with everyday ailments, the search for immortality, as well as natural events, and to bring back the dead and communicate with the gods to prevent floods to help to give positive blessings.[313] All of these aspects shaped the moral life of the community. There was really a distinct division of what the population believed, as the

310Jane Schneider, "An Anthropology of Cloth," *Journal of Near Eastern Studies* 2.April (1964).pp.409-448.

311 Wang, ed., Images of Women in Chinese Thought and Culture: Writings from the Pre-Qin Period through the Song Dynasty.

312 Hinsch, *Women in Early Imperial China*, Lanham, Boulder, New York, Oxford: Rowman & Littlefield. pp30-31.

313 Michael Loewe, Chinese Ideas of Life and Death: Faith Myth and Reason in the Han Period (202 BC-AD 220) (Taipei: SMC Publishing Inc., 1994).p.21.

learned elite knew the teachings of Confucius, while others may have known a little about the morals ordained from Confucian ideas, they still relied on the local beliefs for help sustain everyday life. Many people were helped by the shamans while others adhered to ancient gods of the universe for their support. However, it was the government who set the rules and punishments for any digression from the official stance on morals and other aspects of everyday life

The Chinese described attention to authority and to a moral life as *li*. Li has been described as "a formative principle, decisively characterizing Chinese way and philosophy of life".[314] This way of life during the Western Han dynasty aimed to set standards for behaviour and respect others as well as create a hierarchical society structured on these beliefs.[315] However, as more people rose to power, the Han dynasty progressed this ideology was not always adhered to. The new power and lack of *li* attributed to the decline in many ideas and values which the government hoped would be acquired, in turn produced more crime and amoral attitude.

The structure of society in the latter part of the Han dynasty (Eastern Han) was still built on Confucian values but many people had become more interested in the material aspects of life. This is reflected by the burial artefacts which had shifted from religious and ceremonial artefacts for worship of ancestors, to an attitude where the person required personal goods in the afterlife.

Showing wealth and luxury in life and through the grave was not considered desirable by everyone. Mozi the Chinese philosopher of Confucian values recognized that fact during his time of 478BCE-391 BCE, "Wealth is squandered and energy wasted…when clothing

314Maryta M. S.SP.S. Laumann, The Secret of Excellence in Ancient Chinese Silks: Factors Contributing to the Extraordinary Development of Textile Design and Technology Achieved in Ancient China (Taipei, The Republic of China: Southern Materials Centre, Inc., 1984). p59.

315 Segraves, " Society, Status, and Sharmans: Symbols Appearing on Warring States Period and Han Dynasty Textiles." .

is made not for the body but for brilliant appearance, the people will be wicked and unruly."[316] This wealth had increased further during the Han dynasty. While trying to return to Confucian ways, the government would not have welcomed attitudes of extravagance as "people were expected to adherence to the will of heaven, the order stipulated by the emperor."[317] Of course this did not always happen. Laumann maintains that incidents such as the ostentatious display by people had an impact on the moral values which then led to the downfall of the Han dynasty.[318]

These new wealth and morals are reflected in the textiles found in the Mawangdui and other tombs. Some of the dresses of Lady Dai contained about thirty-two metres of silk in their construction due to the width of the sleeves and the bias cut of the gown.[319] Considering the length of time required to construct the cloth, this would have been an extravagance imposed on the people who made the cloth.[320] A very social life with fine clothing can be deduced from the textiles and other artefacts found in Lady Dai's tomb. This was not unusual as this had become the expected order for life and death.

8.2. Social Order

As with all forms of life during the Han dynasty social order was extremely important. Order and control even applied to how textiles were designed, produced and who wore them. One of the earliest references to these roles textiles played promoting *li* was during the time of Emperor Shun of the Han dynasty, *Han shun di*, 73BCE- 79BCE. His ministerial advisor, Gao–yao says in the Shang-shu, the book of history:

316 Laumann, The Secret of Excellence in Ancient Chinese Silks.59.

317 Laumann, The Secret of Excellence in Ancient Chinese Silks.p.10.

318 Laumann, The Secret of Excellence in Ancient Chinese Silks. p.60.

319 Tombs have revealed items from weapons, food containers, maps, servants in the form of wooden images of various people. In the tombs 1 and 3 at Mawangdui over 100 pieces of textiles were found.

320 Silk brocade reproduced at the Nanjing Brocade Institute takes one day to make two and half centimetres of cloth. Admittedly this is more complicated that the textiles found in the Tomb of Lady Dai, but many of the textiles were embroidered and therefore time-consuming.

> From Heaven are the social arrangements with their several duties to us it is given to enforce those five duties and then we have the five courses of conduct. From heaven are the social distinctions with their several ceremonies (li), from us precede the observances of those five ceremonies? …When Sovereigns and ministers show a common reverence and respect for these, do they not harmonize the virtuous. Heaven graciously distinguishes the virtuous- are not the five habiliments (official robes), five decorations of them.[321]

The use of different distinguishing textiles in the form of official gowns and colours, as well as the textiles and colours worn by every person in the empire, was decreed and enforced by the sumptuary laws. This use of textiles reinforced the theoretical ideals of the period as well as ancient beliefs of earlier dynasties. The visibility of colours and symbols was a constant reminder to every one of the position, power, the various duties of the wearer as well as who had to obey their commands.

Western Han people adopted the new ideas of the government based on Confucian ideals and the order of serving others in the hierarchical system.

8.3. Symbols of power

The emperor was the pinnacle of the social structure and was entitled to use twelve symbols to show his authority. Symbols painted or embroidered on the emperor's gown, were of the highest order and depicted his power, virtue and dignity. The designs included the celestial symbols of the sun, moon, and stars. The emperor was entitled to use these symbols as he was considered the god of the heavens placed on earth to rule. As only the emperor could make sacrifices to the gods, he had to be displayed in a manner according to his status and to be attired in the best robes. He also needed a variety of robes for each ritual. Dragons with five claws were the prerogative of the emperor, the empress and other close royalty. Other ranks were not allowed to use symbols of higher

321 Laumann, The Secret of Excellence in Ancient Chinese Silks.p16.

This quote translated by James Legge, is not clear whether it is from one of the ancient writings or an official one from the Han dynasty. It does not appear to have been written during the time of the Han Emperor Shun (125-144 CE.

Wang, ed., Images of Women in Chinese Thought and Culture: Writings from the Pre-Qin Period through the Song Dynasty.pp.50-52.

orders. Dragons were only to be used by the first ranking officials and could only have four claws one less than the emperor. The next ranks could not use mountains or dragons. These again were reserved for the emperor and first rank officials. The symbols continued in descending order. The ordinary people were not allowed to wear any ornamentation on their black garments. Every fifth year the emperor would check rituals and ceremonies to see that these conditions were adhered to.[322] The vision of the official person in a specific robe was a display of authority and power. It was a visual reminder that the wearer could administer a certain justice.

Pan Ku, a historian c32 CE of the Han dynasty, explains how clothes distinguished one person from another. He said that clothing was used for "the purpose of distinguishing between the noble and the common and to illustrate virtue so as to encourage the imitation of good example."[323] Kruper indicates that clothing could also be used for social status, identity and culture as well as the indicating the type of technology available.[324] The ordinary people had little or any variety in their clothing, but the elite, had a particular dress to display their authority.[325] No one could dress or live, better than the emperor and all officials had symbols to identify their order in life.

8.4. Life of the Elite and Workers of the Han Dynasty

By the time the Eastern Han dynasty began in 25 CE many royal and great households were complex: consisting of the households of a patrilineal family, of loosely related people who had similar political affiliations as well as economic association.[326] All these people were kept in fine clothes, food and luxuries such as carriages and lived under the authority of the head of the house. To have to feed and clothe everyone at the manorial

322 Laumann, The Secret of Excellence in Ancient Chinese Silks. p.21.

323 Laumann, The Secret of Excellence in Ancient Chinese Silks.p.19.

324Hilda Kuper, "Costumes and Identity," Comparative Studies in Society and History 15. 3, http://www.jstor (1973).p350.

325 Laumann, The Secret of Excellence in Ancient Chinese Silks. p.19.

326 Sun and Francis, Chinese Social History: Translations of Selected Studies.p.109.

type house must have been an extremely expensive luxury; but the amount of people who were able to live in this manner, also indicates the richness of the landowners and the desire to show their wealth.

To illustrate the richness of a royal household, a written piece titled Zhao Hun, from the *Songs of the South* or *Songs of Chu* tells the about the room of a royal palace in the State of Chu which gives an insight to the luxury surrounding the king and his retainers of this period:

> Crossing the hall into the apartments, the ceilings and floors are vermillion. The chambers of polished stone, with kingfisher hangings on jasper hooks: bedspreads of kingfisher seeded with pearls, all dazzling in brightness; arrays of fine silk covers the walls; damasks canopies stretch overhead, coloured ribbons, fastened with rings of precious stone. Many a rare and precious thing is to be seen in the furnishings of the chamber. Bright candles of orchid perfumed-fat light up flower-like faces that await you; Twice eight handmaidens to serve your bed, each night alternating on duty, the lovely daughters of noble families, far excelling common maiden. Women with hair dressed finely in many fashions fill your apartments… In your garden pavilion, by the bed- curtains, they wait your royal pleasure: of kingfisher feathers, the purple curtains and blue hangings that furnish its high hall…Attendants quaintly costumed in spotted leopard skins wait on the sloping bank; An orchid carpet covers the ground: the hedge is of flowering hibiscus… Before the dainties have left the tables girl musicians take up their places…The lovely girls are drunk with wine, their faces flushed and red… Dressed in embroideries, clad in finest silk, splendid but not showy… Their sleeves rise like crossed bamboo stems, then they bring them shimmering downwards. The singing girls of Cheng and Wei come to take their places among the guests. But the dancers of the Whirling Zhou find favour over all the others.[327]

The opulence, setting, entertainment, food and luxury are apparent. The palace setting and way of life for the emperor was possibly more extravagant during the Han dynasty since more textiles were available. This way of life was emulated by the landlords and the rich. It does not follow that life was ideal or even. Although the following explanation is about the Song dynasty, the Han dynasty had similar values, based on Confucius ideals where "the young served the old, and the low served the noble, also in this way".[328]

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327 Laumann, The Secret of Excellence in Ancient Chinese Silks. p63.

This poem is from the Warring states period when it was usual for the conqueror to take the most beautiful girls back to court; hence the reference to the dancing girls from different states. It is possibly about King Gaolie of the Chu kingdom who reigned from 263BCE-238 BCE.

328 Robin R. Wang, ed., Images of Women in Chinese Thought and Culture. p. 52.

Fig 8-1 Portion of textile showing dancing figures 3rd C BCE Tomb No.1 Mashan, Jingzhou Museum, Jailing [329]

Fig 8-2 Entertainment showing musicians, jugglers and dancers. Hong Kong: Lei Cheng Uk. A, Hong Kong Muse um of History[330]

329 Feng Zhao, Treasures in Silk (Hong Kong: ISAT/ Costume Squad Ltd., 1999).p59.

Beside the retainers of the household, there were many more people in royal establishments such as entertainers, especially beautiful girls to entertain with music and dance and household workers. Concubines were still common for the rich during the Han dynasty.[331] The women of the palace were an important part of the royal household, for apart from being potential consorts and entertainers for the emperor, the women also accompanied the empress, acting as attendants to fulfil her duties and entertain her when required. Silks and fashionable designs and patterns were available at the Kings command to be able to dress these people in whatever they desired. There were also servants and other workers doing tasks such as keeping the lands in order cooks and entertainers. The most influential people were often the eunuchs of the royal household. During the Eastern Han dynasty, eunuchs held substantial power, and were often disliked, as they were often the bearers of work which related to extra hardships.

330 Naomi Szeto. Y.Y. TIng. Joseph S.P., Ma.Ray M.K., Honh Fung Chun, *Lei Cheng Uk. A Han Tomb,* Hong Kong: Hong Kong Muse um of History, 1970, p.45.

331 Wang, ed., *Images of Women in Chinese Thought and Culture: Writings from the Pre-Qin Period through the Song Dynasty*.p.59.

> Last Year eunuch envoys relayed the royal wish:
> Patterns from heaven to be woven by human hands,
> Dyed with the hue of Spring Rivers south of the Yangtze,
> Cut broad for making cloak sleeves, long for sweeping skirts
> Hot irons to smooth the wrinkles, scissors to trim the seams
> Rare colours, strange designs that shine and recede again
> Patterns from every angle, patterns never in repose[332]

The women of the elite households dressed well, for they provided sexual favours and looked after the children.[333] Therefore they had a high profile. There was a preference for girls who were quiet and diligent as described in the following passage. This young person died at the age of fourteen, but she was remembered in an epitaph carved on stone and translated by Li shi. Here the girl was the ideal companion and wife, but it also shows the extra attributes required by a wife.

> When she entered the household,
> She was diligent and earnest in attention.
> Keeping herself frugal, she spun thread,
> And planted profitable crops in the orchards and the gardens.
> A wife and instructed the children,
> Rejecting arrogance, never boasting of her kindness.
> The three boys and two girls
> Kept quiet within the apartments.
> She made the girls submissive to rituals,
> While giving boys power.[334]

Women had duties to perform even if servants were also available. The size of the household determined the duties of the wife and how many extra people and servants helped in the household.

Many of the rich landlords may have looked after their retainers and higher attendants, but these same people could make the life of the ordinary worker miserable. Not only did the workers have to produce taxes in the form of grain or textiles thread or cloth, they imposed their own tax by demanding much higher quantities than the amount officially

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332 Peterson, "Who Does the Weaving, Who Wears the Robe? Didactic Poems and Pictures of Ancient Chinese Weavers."p.56.

333 Lewis, *History of Imperial China: The Early Chinese Empire*. P.170.

334 Lewis, History of Imperial China: The Early Chinese Empire. pp.170-171

required by the state. This caused resentment amongst the workers and acute dislike of many of the landlords. As the workers were not slaves or under the old feudal system, the question could be asked as to why they stayed with the particular household when they were not bound to the landlord?

The author thinks that there are four possibilities as to why people did not leave the household and become independent when they had such a hard life.

1. If anyone person left a household, there was the possibility of not having any land to provide taxes of grain. There was always the threat of being expelled from their land if they did not comply with the demands of those above them.

2. Everyone had to pay taxes by law except the literati who paid their tax in the work they contributed to the state running smoothly. The men paid in grain and the women in textiles, therefore land ownership, or rented land was important [335]

3. The Chinese people were used to obeying those superior to them, so were accustomed to acquiescing to the demands of the landlords even if these appeared detrimental to their own well-being.

4. While attached to a household the workers had the protection of the landlord in times of war.

5. Retainers would want to stay where they were fed and clothed and lived a life of luxury, and the workers probably liked the security despite the hard life.

335 Laumann, The Secret of Excellence in Ancient Chinese Silks. p.45-61.

8.5. Lifestyle

The rich people lived life of luxury "safeguarded by the economic, social, political and moral support of the entire population."[336] This lifestyle is reflected in the artefacts found in the Mashan and Mawangdui tombs and can be inferred because of the ubiquity belief that the same status was required in the afterlife as in life. Therefore, the tombs were filled with the same type of goods as the person had on earth. The Han tombs reflected a luxurious lifestyle of good food, good clothing and lots of entertainment as well as religious beliefs for the afterlife.

Since officials were employed by the government there would have been more opportunities for the elite to establish large households during the Han dynasty. In 57CE the Chinese population census was 21,007,820, whereas by 125CE it had risen to 48,690,789.[337] The population also fluctuated from itinerant displaced persons due to wars and famine. Displaced people did not spin, weave and grow grain until they settled again, therefore reducing government supplies. Even though the government provided some relief at these times, the corruption which occurred often meant these itinerant people had very little money for basic commodities. This sector of people incurred a higher death rate than other levels of society.[338]

If the landlords were officials, they were considered worthy of their place in the hierarchical system and consequently did not perform physical work.[339] This meant that these people did not have to pay a tax of grain or cloth. Instead, the educated elite and

336 Laumann, The Secret of Excellence in Ancient Chinese Silks.p.53.

337 Sun and Francis, Chinese Social History: Translations of Selected Studies. 85.

338 Sun and Francis, Chinese Social History: Translations of Selected Studies. p.113.

339 Laumann, The Secret of Excellence in Ancient Chinese Silks.p.50.

distinguished soldiers were supported by the government according to their rank.[340] Consequently, these government officials either had to have households where cloth was made, or they relied on the government money. This reliance on others for their income gave greater power to the learned officials. It was an accepted part of the philosophy of the Han dynasty that the learned people were able have a very high quality of life due to their contribution of scholarship and administration, while others contributed goods. This had been the established practice for centuries. Mencius (372-289 BCE) justified this by:

> Some labour with their minds and some labour with their strength. Those who labour with their minds govern others; those who labour with their strength are governed by others. Those who are governed by others support them; those who are governed by others are supported by them. This is a principle universally recognized.[341]

Often textiles were given as payment for wages as they were considered a form of currency and could be sold or exchanged for land or any other requirement which reinforced the power of the elite.[342] This action distributed the needs of society across a greater variety of people. However, the burden on the workers rose as the population increased in times of relative peace in the same manner as it did during war.

The increase in wealth meant that sumptuary laws were often broken to acquire the desired textiles once only made for royalty. Many officials wanted extra wealth, similar property, housing and clothing as those of royalty and higher rank. Many bribes must have been given to others for unworthy people obtained official ranks which they did not deserve and consequently many did not adhere to the morals of Confucianism.[343] Some took risks and became rich due to corruption. They were others who bought land through legitimate means or as payment for services rendered or money earned.

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340 Laumann, The Secret of Excellence in Ancient Chinese Silks. p.51.

Taken from The works of Confucius by James Legge.

341 Bray, *Technology and Gender: Fabrics of Power and Late Imperial China*.p.119.

342 Csikszentmihalyi, ed., Readings in Han Chinese Thought. pp.40-44.

Corruption did not only occur in relation to agriculture, merchants and other landowners, but in other areas such as the textile industry where government representatives collected cloth which they had said was not of the required standard. The excess was either stacked in warehouses or sold to others at a profit. If extra cloth was made legitimately it could be sold at various prices according to it fibre content. Textiles of elaborate, multicoloured silk must have come from the royal workshops. Whereas, many simpler, yet beautifully designed textiles could have been made in the workshops belonging to the landowner.

Copious amounts of silk accompanied Lady Dai and other elite to the grave. This showed the place of honour silk held. It also symbolized their wealth; for not only did these people surround themselves with silk in life; they also required it in death. The quantity of silks which accompanied Lady Dai of the Mawangdui tomb no 1 to her resting place was varied and ranged from fine gauze gowns, to brocade, damasks, plain uncoloured and coloured silk as well as fine hemp cloth. Many of these were complete bolts of uncut cloth.

8.5.1. Housing

Housing for the rich was large, elaborate and luxurious. Feudalism had been demolished by the Han dynasty, but the housing would not have been too dissimilar to that described during the late Zhou period where these privileged people are said to have lived in quadrangular area surrounded by a tampered earth wall and ditch to protect their property and contents.[344] The great landlord houses were similar to a well-organized town with a rammed earth wall with a ditch surrounding it and a wooden tower at the entrance.[345] A small walled earthen property from the Han dynasty can be seen outside Dunhuang. The

344 Carl Whiting Bishop, "The Beginnings of North and South in China," Pacific Affairs 7.3, September (1934).p.313.

345 Bishop, "The Beginnings of North and South in China."p313.

An example of a city within a city can be seen in the Forbidden City home of Emperors from 1406, at the beginning of the Ming dynasty. Although smaller, the great houses of the Han dynasty would have been built on a similar 0rientationwith a north south direction This was a logical placement as the sun is in the south in the northern hemisphere winter.

walls and parts of the buildings are still apparent.[346]The whole complex was not really large, but as it was in the extreme west of China, it would not have been a house of a high official.

To protect the household, great pots containing water were positioned near the house as there was always the danger of fire breaking out in houses which were made of wood.[347] Many buildings containing unimaginable textiles among other things must have been lost from fires as even within the large cities houses were positioned close together inside their walled area. The provincial cities and towns would have had the palaces of lesser nobles and the rich. They would have been similar in style to the royal palaces.

In smaller towns the major house of the prominent person was in the centre of the double walled city with the houses packed close to one another around it.[348] The major market was positioned outside the inner walls of the town or city, selling goods and cattle. Crops were often sown between the inner and outer wall.[349] Areas were reserved for the manufacture of different crafts as well as textile production. The carved houses were brightly coloured and made from wood displaying the desire for colours which equates to the colourful textiles of the period. The richer the official, the larger and more elaborate the housing the more servants and retainers. It is thought by Bishop that early towns had relatives and workers living in smaller residences around the central area or in the 'palace.' Some of these palace areas also included gardens and areas for hunting and sports. Other towns had these areas outside the fortifications. Life of the rich appears to have been full of leisure and luxury.

346 This ancient building is walled and now stands in a remote area of the Gobi Desert

347 These large pots are still seen around the houses in the Forbidden City in Beijing.

348 Bishop, "The Beginnings of North and South in China."p.314.

349 This type of town can still be seen in rural areas of China.

Different Houses from Tombs in Southern China

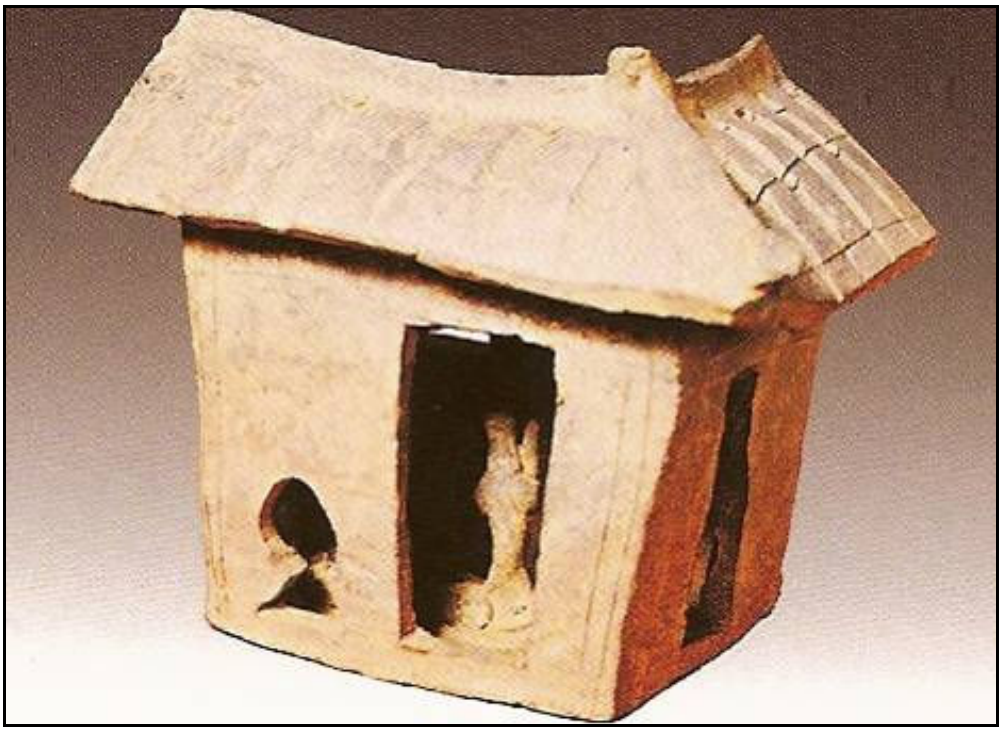

Fig 8-3 Han Pavilion house, Stilt house, Hong Kong house in tomb of Lei Cheng Uk [350]

350 Ronald G. Knapp, The Chinese House: Craft, Symbol and Folk Tradition (Hong kong: Oxford University Press, 1990.p.6.

Fig 8-4 House for drying grapes during Han dynasty[351]

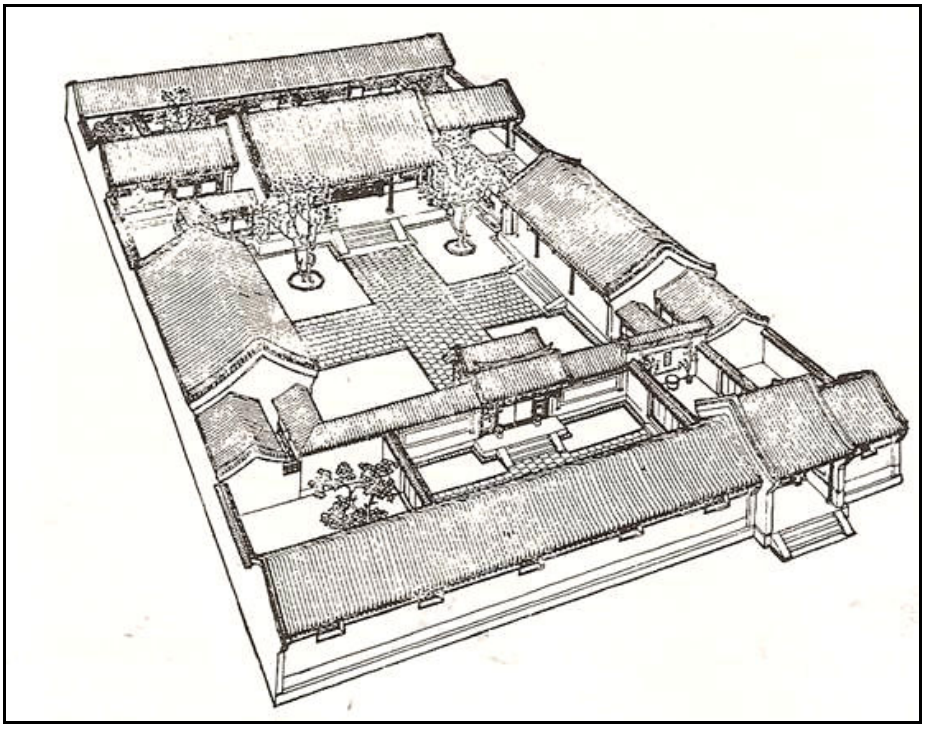

Fig 8-5 Layout of large house complex [352]

351 Ronald G. Knapp, The Chinese House: Craft, Symbol and Folk Tradition (Hong kong: Oxford University Press, 1990.p.6.

352 Knapp, The Chinese House: Craft, Symbol and Folk Tradition.p.12.

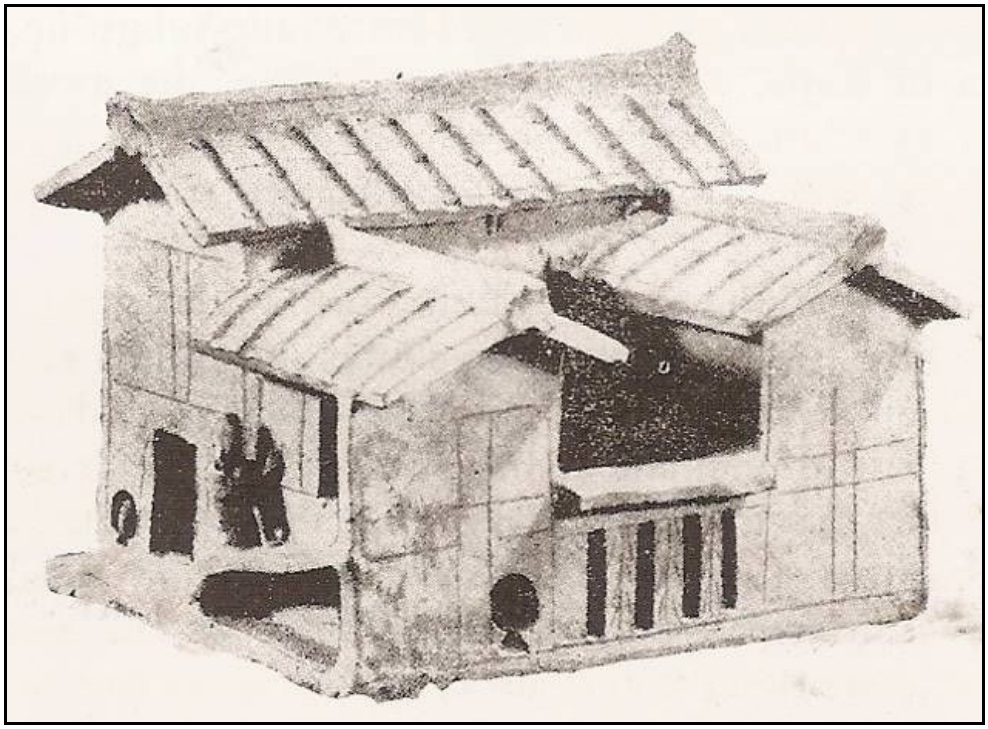

Fig 8-6 Two storied Han house[353]

Other aspects of the lifestyle of the Han elite can be deduced by items found in the Mawangdui tombs. Lacquered bowls, cosmetic sets, games, as well as several musical instruments were found giving an indication of a lifestyle of relaxation and leisure.

353 Ronald G. Knapp, The Chinese House: Craft, Symbol and Folk Tradition (Hong kong: Oxford University Press, 1990.p.6.

Fig 8-7 Close up of liubo box Mawangdui tomb. Han Dynasty. Hunan provincial Museum.[354]

Fig 8-8 Musicians from a Han tomb. Hunan Provincial Museum [355]

354 Chen, ed., Hunan Provincial Museum: *The Exhibition of Mawangdui Tombs*.p.19.

Vainker, *Chinese Silk: A Cultural History*.p.32.

355 Jianming Chen, ed., Hunan Provincial Museum: *The Exhibition of Mawangdui Tombs*.p.19.

Fig 8-9 Leisure activities. Han Dynasty.[356]

It is known that Han people played a form of chess called *liubo*, listened to, and probably played musical instruments as a pastime. Lady Dai had several musical instruments in her tomb indicating a love of music and therefore she required this aspect in her afterlife. Leisure may have even included embroidery, as silk thread and needles were included in Lady Dai's artefacts.[357]

Texts and books were also found in Lady Dai's tomb, showing the importance reading and reliance on beliefs guidance as many manuscripts were religious texts. Even an exercise chart and medical texts were found among her artefacts showing the consciousness of good health and exercise. These special activities needed specific clothing and created a demand for different textiles. Along with the sets of clothing required by these people for the different activities, seasons and for special rituals, there was a tremendous demand for textiles of all kinds to satisfy the social activities. All this indicates a pleasant lifestyle where fine clothing was worn.

356 Edmund Capon, Menzies, Jackie, Yang, Yang, Imperial China: *The Living Past*, Sydney: Art Exhibitions Australia Limited, 1992.

357 These artefacts, needles and threads are to be seen in the Huan Provincial Museum and other museums in China

Although The *Book of Odes*, Shijing, was written during the Zhou period, many of the references to silk, clothing and of lifestyle would apply to the Han dynasty. Of course most of the poems describe the elite wearing fine ceremonial attire; a yellow lined jacket, a brocade robe, a brocade robe and fox fur, a robe adorned with emblems, an embroidered shirt and fox fur and lambs fur being worn at court.[358] Some of the poems about the working people may not describe their clothes, but they describe silk rearing, mulberry trees, cultivation of hemp and silk as well as silk being part of the rural life. Vianker takes these odes as metaphors for strength and beauty as well as defining social positions.[359]

The social position of the new elite was reflected in the clothes which were worn. However, not everyone could obtain new silk for this purpose. Found among the early textiles are silks which have been reused, or embroidered over an older pattern.

NOTE:
This figure is included on page 171 of the print copy of the thesis held in the University of Adelaide Library.

Fig 8-10 An example of a gown which had been made, or patched with different pieces of silk. Warring State Period. Mashan. Hubei Provence. [360]

358 Arthur Waley, *The book of Songs*, p.291.

359 Vainker, *Chinese Silk: A Cultural History.*p.32.

360 Nengfu Huang, The Great treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery(1) p.28.

As the social position of the new landlords changed, the need for high quality textiles would have increased. However, as silk thread and material was so expensive, some clothes would have been passed to those of lesser status, or remade into new clothing. Examples such as Figure 8.10 are found where different materials have been joined together to make a new garment.[361] Seams joined pieces of the material together like a crazy piece of patchwork. Some geometric patterns were also embroidered as in Figure 8.11 with Han designs, but it cannot be seen whether this was part of the original design, or a re-use.[362]

NOTE:
This figure is included on page 172 of the print copy of the thesis held in the University of Adelaide Library.

Fig 8-11 Fine geometrical silk pattern with embroidery[363]

Frugality and the importance of the silk can be assumed by using them in this way. Therefore it is by careful examination of the different cloth in gowns or pieces of textiles that it is possible to see changes in style and patterns; particularly designs. By viewing

361 Careful examination and magnification of some of the early garments show joins where there is a different part of pattern on the other side of the seam.

362 Nengfu Huang, The Great treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery(1) p.67.

363 Nengfu Huang, The Great treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery(1) p.67.

the available textiles, it can be seen how fashions in design changed and the old geometric printing were replaced by the new curvilinear designs. During the Warring States period, most of the garments which found were either embroidered as in Figure 8.12, or the new brocade patterns were used as ribbons. These were used on gowns which gave an impression of stiffness and formality, See Figure 10. in the section on Warring states clothes. By the Eastern Han dynasty, embroidery was still popular, but must more material was involved as gowns used a lapped section crossing over the body. These became more voluminous as the dynasty progressed. There appeared to be more experimentation during this period as brocades became popular for garments, as well, there was printed and tie dyed fabrics. By the end or the dynasty some designs even looked to have western influence as seen in the first example in Figure 9. These textiles were not only used for clothing, but for household goods. The heavier textiles would have been ideal for household items as the thickness would wear well.

NOTE:
This figure is included on page 174 of the print copy of the thesis held in the University of Adelaide Library.

Fig 8-12 Warring States Dynasty floss padded gown. No 1 Chu state grave> Mashan, Jiangling Jingzhou District Museum Hubei Province. Design of phoenix flowers. Band of rhombic pattern. [364]

NOTE:
This figure is included on page 174 of the print copy of the thesis held in the University of Adelaide Library.

Fig 8-13 Han Dynasty gown from tomb of Lady Dai. Hunan Provincial Museum, Hunan Province[365]

364 Nengfu Huang, The Great treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery (1) p.4.

365 Nengfu Huang, The Great treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery (1) p.40.

NOTE:
This figure is included on page 175 of the print copy of the thesis held in the University of Adelaide Library.

Fig 8 1 Eastern Han Dynasty woven design showing possible influence from Greek or Rome. Niya, Museum of Xinjiang Uyghur Autonomous region Wool[366]

NOTE:
This figure is included on page 175 of the print copy of the thesis held in the University of Adelaide Library.

Fig 8-14 Changes in textile designs with Chinese characters. Eastern Han Dynasty, Lop-Nor. Xinjiang. Academy of Social Sciences of Xinjiang Uighur Autonomous region. Detail of Chinese Characters for longevity and good life [367]

365 Nengfu Huang, The Great treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery (1) p.43.

366 Nengfu Huang, The Great treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery (1) p110.

367 The Great treasury of Chinese Fine Art . p.9.

Fig 8-15 Eastern Han Brocade with inscription meaning longevity and good offspring. Eastern Han Dynasty, Lop-Nor. Xinjiang. Academy of Social Sciences of Xinjiang Uighur Autonomous region.[368]

Fig 8-16 Brocaded material used as a head-rest. Eastern Han. Xinjiang Museum of Uighur Autonomous region. [369]

368Huang, The Great treasury of Chinese Fine Art p.910.

8.5.2. The Crafts people and Artisans

Most people worked for the government in various ways. Workshops or official weaving rooms were already in existence in the Warring States period as shown by a seal found on cloth in one of the Mashan tombs indicating that the workshop was under supervision. The characters "*zhong shin bao shu yi*," meaning the "seal of the precious needle central weaving," can still be read.[370] The organization of the whole of Chinese society lent itself to having textiles under government control. This control extended to the four royal workshops, workers' households and large elite rural and urban houses. Family labour, hired helpers and servants were all utilized in the production. State workshops conscripted or hired people to work in the royal and large urban workshops.[371] By the reign of the Han emperor Gaozu, these workshops and weaving rooms were standard practice.[372]

Spinning and weaving was conducted in all homes. The homes the workers only needed a small loom to make the simple weaves, as the loom did not occupy a large space in the house. The more complicated looms the drawlooms with their high towers needed a much larger place required large spaces and so could not be used in an ordinary home.[373] However, control was divided into clearly defined departments and all weaving had to meet the governmental standards.

The weaving process was not always pleasant for the people who worked in their home. Parts of two poems from an earlier period quoted in the article "Who Does the Weaving, Who wears the Robe?" demonstrate the hardships of the home weaver.

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369 Nengfu Huang, The Great treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery (1) p.81.

370 Vainker, *Chinese Silk: A Cultural History*.p.40.

371 Bray, "Textile Production and Gender Roles in China 1000-1700,".p121.

372 Hinsch, "Textiles and Female Virtue, Nan Nu Men, Women and Gender in Early China." p.40.

373 Bray, "Technology and Culture in Chinese History, an Introduction."p.122.

> The wind is cruel. Her clothes are worn and thin,
> The weaver girl blows on her fingers. Piled high as a hill in the warehouses, great white clouds of cloth [374]

Even though this poem is, from an earlier period, it would have still been quite relevant to the Han.

The second poem also shows sympathy for the worker and the contrasts of different people during the Han dynasty.

> Hungry, she still weaves,
> Numbed with cold, she still weaves.
> Shuttle after shuttle after shuttle.
> The days are short,
> The weather chill, Each length hard to finish. [375]

The work was constant as was the preparation for the different threads which were needed to make cloth for each season.

By using various fibres for the weaving process there is an indication that different textiles were not only used for class distinction, but for different seasons. The emperor and his followers required different sets of silk clothes for the different seasons, clothing for rituals, and bolts of silk for gifts and forging social contacts.[376] All women wove or spun yarn to meet the tax requirements. Due to this requirement the weaving room of the Han dynasty became a symbol of virtue as the women were working for the good of the state. By the reign of the Han emperor Gaozu's (202-195 BCE), the weaving room had become standard practice.[377] Although women were the main workers in these workshops for the Han dynasty this changed in later dynasties. Women were replaced by military

374 Peterson, "Who Does the Weaving, Who Wears the Robe? Didactic Poems and Pictures of Ancient Chinese Weavers."p56.

375 Ibid.,p.56.

376 Bray, "Technology and Culture in Chinese History, an Introduction." p.117.

377 Hinsch, "Textiles and Female Virtue, Nan Nu Men, Women and Gender in Early China." p.40.

men who were taught the intricacies of various crafts, including weaving, while in service for the government.[378]

Women worked in the areas of spinning and weaving in the workshop. Since they were contributing to the well-organized state, they were considered virtuous.[379] Some women were even given lesser positions of control.[380] They controlled the areas of gathering the raw products for textile production and supervising the spinning and weaving, including the fibres, threads, dyeing materials, as well as distributing these materials and collecting finished work. Lewis considers that the slaves must have undertaken some of this work to be able to meet the great demand from royalty and everyday needs of society.[381]

378 Bray, Textile Production and Gender Roles in China 1000-1799, Chinese Science 12, 128.

379 Hinsch, Women in Early Imperial China. Chapter 4, "Law".

Hinsch describes how women were able to hold lesser working positions. Women could own property and had rites of their own.

380 Huang, ed., Chinese Fine Arts, Arts and Crafts 6,Printing Dyeing Weaving and Embroidery, .p.82.

381 Lewis, History of Imperial China: The Early Chinese Empire.p17.

9. Rites of Passage

Leisure may have shown the frivolity of the elite society, but the most important parts of living were associated with rituals and rites of passage; some of which will be explained in this chapter for their association with textiles. Whether rich or poor, lifestyle was tied to rituals to help people survive and for the crops to flourish and to be prosperous no matter what their status. Garrett classifies the rituals accompanying male babies as celebrations, taboos and to provide longevity.[382] Textiles played an important part of every stage of a person's life. Specific occasions required new clothes of specific colour and design, or articles made and embroidered to protect the wearer. These were usually specially made and embroidered for, or by the recipients. As textile production was a lengthy process, this investment of time indicated their importance as women not only made the cloth

9.1. Birth

Children in any ancient society were very vulnerable to disease and a high rate of mortality. To ensure that the child had a chance of living many different charms and symbolic designs were used and attached to the clothing. The rituals related to birth and a healthy child arose from the desire for hope. It was a physical and psychological reassurance for the family, particularly the mothers. When a baby was born the girls and the boys were treated in different manners. The following poem from the Book of Songs indicates:

> She bears a son,
> And puts him to sleep upon a bed,
> Clothes him in robes,

382 Valery M. Garrett, Traditional Chinese Clothing (Hong Kong: Oxford university press, 1987).p.16.

> Gives him a jade scepter to play with.
> The child's howling is very lusty: In red armour shall he shine,
> Be lord and king of house and home.
> Then he bears a daughter,
> And puts her upon the ground,
> Wraps her in scraps of cloth,
> Gives her a loom whorl to play with.
> For her no decorations, no emblems;
> Her only care, the wine and food,
> And how to give no trouble to father and mother.[383]

Sons were the most important child since he could carry on the family line and look after the ancestors. On a practical view he could also help on the farm. Disregarding the benefit of women to the country, families considered girls a burden as they would to have to feed, clothe and provide a dowry. The girl would have learnt to spin and weave at a very early age and then to made cloth to help with the dowry to be paid on her marriage.[384] Hence the best family celebrations were associated with the boys.

At three days old ceremonies began. At one month new clothing was given to be put on the baby at six weeks. This celebrated the length of survival time for the boy and the possibility that all would be well. At three months, the hair was shaven, put into a red cloth bag with green trims and hung on the bed. [385] Here two of the auspicious colours were used for protection. One hundred days produced a great celebration when more new clothes were given.

The taboos and rituals surrounding birth related to both the child and the parents to ensure that the baby was raised to bring good fortune, good health to ensure a long life. [386] These clothes were not only an indulgence, but had highly symbolic meanings to protect the child and fight off ill fortune.

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383 Peterson, "Who Does the Weaving, Who Wears the Robe? Didactic Poems and Pictures of Ancient Chinese Weavers." P.54.

384 Valery M. Garrett, Children of the Gods: Dress and Symbolism in China (Hong Kong: Urban Council, 1990)..p.15.

385 Wang, ed., *Images of Women in Chinese Thought and Culture: Writings from the Pre-Qin Period through the Song Dynasty*. p.58-59.

386 Garrett, *Traditional Chinese Clothing*.p.16.

Another special association with textiles for a boy was the capping ceremony. This event happen when a boy reached the marriageable age of twenty. Here he had his hair twisted up ceremoniously into a bun and given a cap, and obtained an adult name to symbolise his passing from a child to an adult.[387] Girls had their hair twisted up at the age of 13 to show she could also marry.

9.1.1. Weddings

Weddings have always been an important component of the life cycle in most societies. The wedding involved new clothes unless the family was too poor to provide this. Sometimes the wedding gown was shared among families. The clothing was made of heavy silk *jian*, densely woven silk *zhou*, fine lightweight silk, *jian*, and degummed lustrous silk, *lian*.[388] This was the case in China especially for the elite who had very expensive magnificent gowns passed down from one generation to the next.[389] For the Han Chinese girl, preparation for the wedding was a path started as soon as she learnt to spin and weave at a very young age. She was expected to be a competent, even spinner and weaver before the marriageable age as this was an important factor in choosing a wife. When married the bride became part of her husband's family, and lived under the rule of the mother in law and expected to contribute to the textiles of the household and the taxes. However, once again reflecting their social importance as the textiles she brought as her dowry were always hers and could be re-claimed in the event of divorce.[390]

When a bride arrived to live with her new family she was considered a better daughter-in-law if she has brought adequate textiles with her. These textiles could be in the form of many plain bolts of variously coloured silks, or hemp if the person was poorer. Some of

387 Huang, ed., *The Great Treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery*(1), Garrett, Children of the Gods: Dress and Symbolism in China.p.21.

388 Laumann, T*he Secret of Excellence in Ancient Chinese Silks*.p.78.

389 Bray, "Technology and Culture in Chinese History, an Introduction," p.118.

390 Hinsch, *Women in Early Imperial China.*, pp35-40.

the textiles would be made into bed coverings and an assortment of clothing for her future life. These items were considered the same value as money and stayed the property of the bride, but could be used to help enhance the fortunes of the family. Not only was the bride obliged to bring a dowry of textiles, the groom's family usually gave cloth to the bride as a measure of their welcome into her new family. The more cloth brought to the new family, the greater the chance of having good relations with her mother-in-law.[391] Francesca Bray quotes an incident of an unmarried twenty-one year old woman in the time of the writer Hong Mai in the twelfth century. The young woman died and was buried with the textiles she had woven for her dowry. The textiles buried with her consisted of thirty-three bolts of open weave silk, presumably gauze, seventy bolts of plain silk and about fifty metres of coarse silk.[392] The procedures for the dowry and burial would probably have been the same into the Han dynasty, as silk bolts as well as clothing were found in the Mawangdui tombs of around 100 BCE. Textiles were reported to have been found in a Warring States multiple tomb burial, showing that the custom must have been used before the Han dynasty.[393]

9.1.2. Death

Death had extremely important rituals which required the correct clothing. During the Han dynasty the deceased was entering the next stage of their journey; the afterlife. To help them ascend to heaven, people often planted trees over a grave [394] Royalty and the rich who were buried in special tombs deep into the ground or later in brick tombs modelled on houses. The tomb of Li Cheng Uk for example in Hong Kong was a brick

391 Bray, "Textile Production and Gender Roles". p.117.

392 Bray, *Technology and Culture in Chinese History, an Introduction*.p.118.

393 Peoples daily online, Chinese Archaeologists Make Ground-Breaking Textile Discovery in 2,500-Year-Old Tomb, 2007, People's Daily Online,,: <http://english.people.com.cn/90001/90782/6228297.html>, 21/11/2007 2007.

The tombs were unusual as forty seven were found in the one pit and many of then contained textiles as well as other artefacts.

394 Lewis, *History of Imperial China: The Early Chinese Empire*.p.182.

structure consisting of a central domed room with four compartments in all four directions. In the funeral rites the dead was adorned with the accoutrements of the living.

> On a grand scale one imitates what he had in life to send him off to the dead. Though dead, but as though alive; though gone, but as though still present, the end and the beginning are one. Thus the form of the grave mound imitates the house. The form of the inner and outer coffins imitates the side, top, front and backboards of a carriage. A cover of the coffin with its decorations imitates the screen, curtains and hangings of a room. The wooden lining and frame of the tomb imitate the beams of a roof and a fence.[395]

This poem also illustrates the care taken with the dead to obtain comfort in the afterlife. To ensure the required comfort of the occupant is known to the gods of the afterlife, records of the rituals to be undertaken and the artefacts were included in the grave. Special rituals and clothes were worn at all different stages of the ritual. The clothing that the dead were buried in was also set by custom. Burial had special formats according to the status of the person and rituals were observed by the relatives to ensure the wellbeing of the deceased in the afterlife. Some of these rituals are set down in Book Two, *The Zhang Gong* of the *Record of Rites*, (*Liji)*, telling how the man and a wife should be buried as well as the rituals associated with death.[396] These rituals and the use of specific clothing revealed some of the earliest silk ever found. One of the earliest textiles made of silk was found wrapped around the bones of a child in a burial pot.[397] This special burial jar practice revealed that a child was still not counted as the full member of the community, as it was buried outside the normal gravesite. The quality and number of extra clothes and textiles displayed the status of the person.

9.1.3. Burial Clothing

The clothing worn for the funeral ritual was important to all. People were usually buried in the clothing they wore in life. The status was exemplified by the clothes and the

395 Ibid., p.189.

396 Wang, ed., *Images of Women in Chinese Thought and Culture: Writings from the Pre-Qin Period through the Song Dynasty*.pp.50-52.

397Zhao, *Treasures in Silk*.p.39.

number of bolts of textiles of various kinds placed in the tomb. The Mawangdui tombs no 1 and no 2 of the Changsha area produced over 100 items of textiles in recognizable condition showing the huge amount included, as well as the cost which would have been involved by using them as grave goods.[398]

For a woman or man, the burial clothing consisted of open pants, a skirt, robe usually a full-length shenyi and then layers of clothing and textiles. A coverlet was then placed on the top. This cover was tied with nine silk bands along the body. Ribbons and material from a Mashan body in tomb no.1 show a coverlet and silk ribbons of a highly technical weave. (See fig 5.12) The lady at Mashan had her fingers tied with red cord and toes had yellow cords. It is not known whether the colour and the tying were significant but they were two auspicious colours. Her hands held small rolls of silk fastened to the middle fingers. These were called *wo,* meaning hold tight and were usually black or red.[399]

NOTE:
This figure is included on page 185 of the print copy of the thesis held in the University of Adelaide Library.

Fig 9-1 Silk coverlet and ribbons from tomb No 1 Mashan Warring states period similar to those of the Han dynasty. Mashan. Hubei .[400]

398Chen, ed., Hunan Provincial Museum: The Exhibition of Mawangdui Tombs. p.39.

399 *The Golden Age of* Chinese Archaeology.p.321.

400 Ibid., p.321.

Hemp clothing worn was worn by the male relatives for the funeral of the deceased. The hemp consisted of various grades depending on the status of the deceased and the mourners. Three grades of hemp were important for those of the higher rank. *Si ma* (or fine cloth) was the best quality as it was processed in a similar manner to the hemp worn at court. The hemp was scoured in alkaline water which degummed the fibres before they were spun, thus producing a smoother, finer thread worthy of the deceased. As the funeral garments were only worn temporarily, the weave was usually loose as it did not have to withstand wear and tear. The second best quality (*xiao gong*) was not scoured like the si ma, but was left in the water until the fibres whitened. Poorer quality of cloth was left in the water but was not bleached, thus producing a rougher, darker cloth. The mourner closest to the deceased wore the very rough hemp cloth.[401] As time passed finer clothes were worn at funerals, not the coarser cloth of the Han dynasty burials. The morning clothes consisted of a two-piece suit complete with headwear but not worn with a belt at the waist.[402]

The richer the deceased, the quality of the artefacts increased in quality and number. Royalty could even be buried in jade body shapes of small pieces of jade sewn together with gold or silk thread Figure 9.2. Jade was thought to keep the person mortal.

401 Cheng, ed., *History of Textile Technology of Ancient China*.p.93.

Weiner A.B, Women of Value, Men of Renown: New Perspectives in Trobriand Exchange.

402 Ibid.,p.93.

NOTE:
This figure is included on page 187 of the print copy of the thesis held in the University of Adelaide Library.

Fig 9-2 Jade suits sewn with gold or silk thread used for members of royalty[403]

9.2. Burials and tombs

Elaborate tombs began to appear in pre-Han times during the Zhou period. The size and quality of tomb furniture related to the position of the deceased. An example of the elaborateness of one of the imperial tombs is given in the translation of tomb records of Shi Hangdui where the building of the tomb began soon after his assent to the throne.

> Seven hundred thousand people were brought from all areas of the empire to work on the underground city with parks and rivers which simmered like silver. The ceiling of the tomb was decorated with the stars and other celestial objects.[404]

It can be imagined how the tomb was then furnished inside so that the deceased would have amusements, clothes and food for the after life. Considering this is the home of the terracotta soldiers guarding the tomb, the internal furnishings must have impressive. Imagination can only conceive the clothes, cloth of gold and other textiles which must have accompanied the emperor to the afterlife. Unfortunately no textiles have been found in tombs of emperors.

The Mashan and Mawangdui tombs are of a comparable style to those of royalty. The occupants of the Mashan and Mawangdui tombs were not extremely high status, yet their

403 "Education , Washington, Ancient Tombs, Washington Edu". <: http://depts.washington.edu/chinaciv/tg/tarchae.pdf.> 21/11/2007.

404 Chinese Tomb Art, Available: <http://www.art-antiques.ch/resouce/tombart.html>, 04/05 2007.

textiles were amazingly sophisticated.[405] Evaluation of the grave goods found from the Chu graves of Mashan (late Warring States) and the Mawangdui graves (Western Han), provide an indication of what may have been in the tombs of the emperors, and those of much higher status.

Thankfully for those interested in early Chinese culture, many other tombs from various eras have been found. Not all of these have textiles but many are sources of bronzes, war implements, writings and many other artefacts which help open the window to the Han dynasty. The tombs changed over the four hundred years of the Han dynasty. The early tombs of the Western Han were similar to the late Zhou, or Warring State tombs. These tombs had deep shafts stepping down to the main burial chambers. The coffins were often packed with charcoal and white clay which is thought to have kept the coffins dry and exclude air.[406] Lady Dai's Tomb no1 from Mawangdui measured 19.6 m from North to South and 17.5m from East to West and was 20 metres deep. The packing of the coffin and the depth of burial are thought to be part of the reason why the body was so well preserved.[407] No similar preserved bodies have been found from Eastern Han possibly due to the change in tomb architecture. These tombs were not as deep as the Mawangdui ones of the Western Han as they consisted of vaulted tunnels, usually of a cross configuration. One of these tombs can be seen in Hong Kong.[408]

405 Chinese Grave Customs, Antiques Digest: Lost Knowledge of the Past, Translation by Dr de Groot, 1922.Available < http://www/oldandsold.com/articles03/china_ceramics3.shtml> , 03/10/2008

406 This is one of the theories for preservation, but as many tombs didn't contain a body such as the pliable one of Lady Dai it must not have been the only factor in preservation. Another reason it thought to be the acidic or alkaline conditions, but bodies and textiles have been found in both conditions.

407 Other tombs have had similar construction and not been able to preserve the body of the person.

408 Joseph Ting, The Lei Cheng UK Han Tomb. P.27.

NOTE:
This figure is included on page 189 of the print copy of the thesis held in the University of Adelaide Library.

Fig 9-3 Tomb structure of Li Cheng in Hong Kong. Eastern Han period. Hong Kong[409]

409 Joseph Ting, The Lei Cheng UK Han Tomb. .p.6.

9.3. Funeral banner of the Wife of a Marquis: Xin Zhui, Lady Dai.

The best-preserved artefacts documented in English are those in the Tomb of Lady Dai; wife of Marquis Zhui. Several articles of her clothing are recorded in Chapter 10 on Clothing. Articles which accompanied her to the after life included food, clothing and reading matter including religious and ancient texts. There was also a banner placed over her coffin (one of four). The silk banner was painted with scenes which are now considered to be a representation of her life and the religious symbols.

The unique funeral banner was an excellent example of how the Han people used symbolism to convey meaning. It also displayed the afterlife and its importance. Apart from a similar banner which was unfinished when her son died, there have been no other examples which have conveyed so much about the beliefs of the Han people of that area of the old Chu kingdom where Liu Bang, the first emperor of the Han dynasty, originally lived.

Many symbolic images are depicted in the well-proportioned and extremely finely painted, T shaped banner, *fei yi*. It is considered to be a symbolic representation of the beliefs of the Han dynasty. According to the interpretation of the Chinese academics Mr Shang Zhitan and Mr Sun the *fei yi*, helped the assent of the soul, Mr Yu believes that it is to get the soul to return to the body of the deceased. Both agree that it was used to help the soul of the deceased progress into the afterlife.

From an excellent description of the banner in the books *Mawang Ti,* and *The Legend of Mawangdui*, it is possible to understand many of the symbols. The banner is divided into three major sections representing the underworld, the life on earth where people celebrated life through eating and other activities and the top section which shows the Lady Dai, accompanied by benevolent dragons, being admitted to the afterlife after

passing the guards of the after world. In the centre top is a curled serpent with a human head above two men facing each other and surrounded by the spirits of the afterlife riding mythical creatures. The presence of the sun and the moon and their animals are symbolic of the afterlife. The sun contains the three-legged raven, the moon the toad. Underneath is a tree, *fu sang*, and eight small suns amongst the dragons and birds. The top section of the banner showed the afterlife as symbolized by the sun and the moon and the animals which were thought to live there. The tigers under the platform and the dragons in surrounding areas are symbolic of yin and yang to give a force to direct ch'i in the universe. By itself, the dragon is the most powerful animal which controlled the earth and heavens and brought the rain to flourish the crops. The dragon was also the symbol of the powerful Emperor. The dragon and the phoenix, when seen together, came to symbolise the Emperor and the Empress during the Han dynasty. As can be seen the dragon was a complex symbol with many meanings and consequently an extremely important symbol depicted in many shapes and forms. The middle section shows an old woman supported by a cane which it thought to represent Lady Dai at her last feast. She is being offered food by two men who would have been attendants. Below the old lady is a scene at a banquet. It is known by the contents of the stomach and conditions of the arteries of Lady Dai that she ate copious amounts so the picture would represent the life she like on earth and hoped for in the afterlife. The bat in this section of the banner signifies good luck for lady Dai. The word for bat, *fu*, had the same sound as the word for god fortune, *fu.* During the Han dynasty the toad was thought to reside in the moon; hence its addition on the banner.[410]

The lower section is thought to represent the sea and land being held up by the giant of the underworld. The banquet on this lower part of the banner is thought to be on the

410 Chen, *Mawang Tui: Painting of the Han Tomb* No.1, p.76.

Island of the Immortals. On the banner in the lower there is a circle with two dragons intertwined through its centre. This same symbol is seen on other objects found in the tomb and is thought to be the symbol of the marquis.[411] There are many other symbols and animals which are not explained. This banner of Lady Dai was accompanied by many other interesting artefacts which reflected her ideas of life.

411 This interpretation of the symbol of the Marquis was given during a discussion with the author and an assistant at the Hunan Museum.

Funeral Banner of Lady Dai, of Mawangdui

NOTE:
This figure is included on page 193 of the print copy of the thesis held in the University of Adelaide Library.

Fig 9-4 Funeral banner of the Tomb of Lady Dai, Mawangdui tomb no. 1. Han Dynasty. Hunan provincial Museum.[412]

412 Chen, *Mawang Tui: painting of the Han Tomb No.*1, Hong Kong: 10XX, p.5.

Sections of the Banner

Fig 9-5 Top section of banner representing the afterlife

NOTE:
This figure is included on page 194 of the print copy of the thesis held in the University of Adelaide Library.

Fig 9-6 The bat of happiness above the lady and her attendants

Fig 9-7 Section of banner showing strength the god of the underworld holding up the earth and showing the harmony between the stages of life

9.4. Conclusion

The Han dynasty was systematically controlled over all the country by officers of the state. This helped the organization of all parts of society. The crafts and particularly the areas associated with weaving were extremely well structured and therefore able to produce enough cloth for everyday needs as well as spin fine silks, damask and brocades for royalty and the elite.

The elite as well as Royalty desired exquisite textiles for themselves and to place in their well decorated homes that were a kaleidoscope of colour. Even life after death was opulent for the rich, as the tombs had the same decorations as if the occupant was alive.

Not everyone could live the life of royalty, rich, officials and wealthy merchants Most of the population wore plain clothes and had humble housing and tombs. Only a small portion of the population such as royalty, the elite and unofficially, the merchants, ever used and wore the brocade and silks of the royal shops. The new textiles of the Han era had to be grand to fulfill the expectation of what appears to be an exuberant, cultured and fun loving society, who liked clothes and colour.

10. Clothing

This chapter details one of the final uses for most of the textiles of the Han dynasty: clothing. To the Chinese clothing was essential. Bray refers to the *Book of Master Zun, Xunzi,* when she writes, "Clothing was fundamental to the Chinese idea of dignity and propriety; the naked body was neither beautiful of erotic".[413] Therefore the end product of the textile process was mainly for self-enhancement. Even textiles sent on diplomatic missions for gifts and the others which were traded, still ended as clothing. Therefore, it is important to understand the need of clothing and the messages it conveys as clothing is not just a list of garments; it is a picture of how the people looked, how they regarded society and one another. It depicts the people as a society and their position within it.

Bray agrees with the Chinese aspect that clothes are" a mark of civilization, but broadens it to the distinguishing of ranks and provides ornament, it is also "linked to the reproduction of human society through descent care of the old the raising of children and the proper distinction of the complimentary between sexes."[414] Kuper points out that "Clothing is a bundle of cultural symbols that has been dealt with somewhat eclectically and indiscriminately in the anthropological wash"[415] .

With these statements, Bray and Kuper give comprehensive reasons for clothing to be treated not just as a study of fashion; a study of design; study of textiles; or the moralistic, religious or identification of people, but for cultural and anthropological reasons. There is much more which can be deduced from the clothing. It is the people who wear these clothes that become the focus. Kuper reminds the reader that power and relationships are

413 Bray, *Technology and Gender: Fabrics of Power in Late Imperial China* p 190.

414 Ibid., p.114.

415 Kuper, "Costumes and Identity." http://www.jstor.org/stable/178260 p.348.

given by dress, uniforms and significantly, costumes.[416] The rank of a person can easily determined by their clothing. People around the wearer must know the meanings of the symbols displayed for them to be effective. This idea was fully developed by the system of ancient Chinese officials having specific clothing according to their rank. Power and order was maintained by people recognising the clothing. Kuper attributes the power of clothing to a political symbol such as lifestyle and religion.[417]

Kuper also `suggests the terminology used in clothing can be ambiguous and not only means the dress but the whole outfit of a person from the headdress to the shoes. Consequently it is necessary to have a definition describing the types of clothing for consistency and to give the impressions to others.

Kuper divides clothes in the following categories:

1. Clothing: reserved for the most inclusive range or set an overarching name to cover all categories
2. Dress: clothing worn on everyday secular occasions.
3. Uniform: prescribed clothing for ceremonies
4. Costume: necessary for the effectiveness of rituals.[418]

The differences between these four classifications can become blurred even with these definitions. Uniforms are not only used for ceremonies, but for people belonging to an organization, or a type of work where clothes dictate specific clothes. For example the word uniform can have different connotations: the clothing of the officials of different ranks of the Han society wore special clothes and could therefore be classed as a uniform. This uniform was different from the clothing worn by the agricultural workers who

416 Kuper, "Costumes and Identity."p.149.

417 Kuper, "Costumes and Identity." p 148.

418 Kuper, "Costumes and Identity." P.349.

therefore wore another type of uniform. Therefore, even though we have these categories, they can overlap and careful explanation is necessary when using these terms.

Costume encompasses clothing only used for very special, ceremonial, or those worn in past eras. The Han emperor and dignitaries had special outfits which were only used for specific rituals such as ancestor veneration and seasonal festivals. Therefore, clothing plays a symbolic role as it is a method of reading information about the wearer, what the wearer does, their status is in society, and how the person perceives themselves.

Clothing was the most important commodity to the ancient Chinese who considered that fine clothing distinguished between the civilized and uncivilized peoples of their known world. Clothing represented dignity and propriety to the early people of China.[419] Since the ancient Chinese had the ability to make clothes from fibres spun and woven into cloth, they were the civilized race above all others, such as the barbarians, who only used animal skins for their clothing.

> The nobles wear sweeping robes, resplendent as mountain dragons they rule the empire: the humble wear course wool or hemp garments in winter to protect them from the cold, in summer to shield their bodies.[420]

Clothing was an essential need in life as it was a means of protecting the body from the elements then the past as it does today. In the very ancient times of Shang and into the Zhou dynasty, only the Chinese who had little contact with other people outside their kingdom had clothing made from fibres spun into thread and woven into cloth.

Whether a person was rich or poor can usually be determined by their clothing. The clothes worn by a rich person who does not do manual labour differs considerably from the worker who grows the food and makes the cloth. Rich people of the Han dynasty

419 Bray, "Textile Production and Gender Roles in China 1000-1700."p.117.

420 Ibid., p.116.

wore expensive clothing. Servants were distinguished from the master by the quality and design of their clothing. Quality and quantity of the material used, the colours, the condition and design all tell differences about people.

A second observation can determine the use of a garment. Was the garment one only used for special occasions, or was it for everyday use? Unfortunately not many everyday garments passed down through history so worker's clothing, styles and uses have to be obtained from other sources than the textiles themselves. The material object or even a picture can determine whether the garment is for religious or ceremonial occasions by the design and patterns displayed on the garment. Every day scenes such as picking leaves from mulberry trees, to pictures of aristocrats going hunting, all carefully observed, depict outer garments. Obvious religious symbols on the garment convey the fact that the garment was possibly used for religious purposes such as rituals. This then opens the study of the religious practices of the period and how textiles played an important role; an area not covered extensively in this thesis.

10.1. Clothing as a symbol

Clothes are "an expression of an individual's social identities, origins, commitments and allegiances".[421] Textiles tell a story of the people, their beliefs their life. The usage of the textiles during life and death all convey meanings and information. Differences about the lives of people can be deduced from whether their clothes are clean or dirty, whether they are elaborate or ragged of if they are an official uniform or the normal mode of dress. Many had symbolic cut or added pieces.

421 Hilda Kuper, "Costume and Identity", Comparative Studies in Society and History, Vol. 5, No3, June 1973, 348-367.

Not only were the clothes decorated with symbols such as those of authority, but ordinary textiles for the rich in the Han dynasty, were often embroidered, printed, or woven in the five auspicious colours of the universe displaying their symbolic use.

The ritual clothing the emperor wore was embellished with symbols which were emblematic of power, virtue and dignity. There were twelve symbols to depict these meanings to his subjects. These consisted of the sun, the moon, the stars, mountains, the imperial dragon with five claws, and the pheasant on the upper robe. The symbols on the lower robe contained two goblets, a spray of pondweed, fiery flames, rice grains, an axe and the character *ya*.[422] The Han emperor Shun (125CE -144) thought symbols so important that he decreed the following:

> I wish to spread the influence of my government through the four quarters, I wish to see the emblematic symbols of the ancients, the sun, the moon, the stars, the mountains, the dragon, and the flowery fowl, which are depicted on the upper garment: the temple cup, the aquatic grass the flames the grains of rice and the hatchet, and the symbols of distinction which are embroidered on the lower garment: I wish to see all these displayed with the five colours, so as to form the official robes.[423]

The highest officials could not use the symbols of the sun, moon and stars as they were part of the celestial realm which was the emperor's realm. The next rank of official was not allowed the mountain and the dragon. This decrease continues through the ranks of officials for all their ceremonial wear on different seasons.[424] It wasn't until 1391CE when the positioning of the symbols changed and put on detachable squares, not embroidered straight onto the gown. (See Appendix 4 for chart of official symbols of Mandarin squares. These symbols came from ancient times and may only have changed in design but not the symbol of the animal.

422 Mary Gostelow, A World of Embroidery, London: Mills and Boon Ltd., 1975.p.175. p.41

423 Ibid, p.20.

424 Mary Gostelow, *A World of Embroidery*, London: Mills and Boon Ltd., 1975. p.145.

As yet, no imperial robes of any ancient Chinese emperor have been found, but they must have rivalled those available from later dynasties. The twelve symbols of sovereignty were developed in the Zhou dynasty and subsequently used on sacrificial robes of the emperor. Imagination can only provide the splendour of these items from the past and how the rich displayed their symbol of authority and richness through the clothes made for the different seasons.

10.2. Pre-Han Clothing- Warring States Period

The earliest clothing available for study is those of the warring States Period These gowns of the Warring States period appear two have some major differences from the later Han ones. They appear to be heavier from their appearance. The Warring States have straight fronts whereas the gowns from later Han times all have crossover fronts. The belts and girdles were very prominent and were decorated with jade ornaments or of the new type of complicated woven as shown in the sections on weaving. Capes and headdresses appear to be different from later ones. However it must be remembered that there have been so few discoveries indicating the clothing worn during this period, so there may have been different styles available.

Fig 10-1 Late Zhou clothing showing various gowns decorated with jade ornamentation.[425]

The clothing would not always have been of silk as other fibres were in common use during this time. The finest coloured or undyed ramie or hemp was worn at court. The following poem by Mozi, (400sBCE-300s BCE) gives the origins and use of clothing. [426]

425 Laumann, The Secret of Excellence in Ancient Chinese Silks.p.121.

426 The words linen and flax in this translation should be replaces by hemp, as per previous discussion on the locations where flax was grown.

Before clothing was known the primitive people wore coats of fur and straw…… The sage king thought this did not satisfy the needs of man. So he taught the women to produce silk and flax (hemp?) and to weave cloth and linen (hemp?), thereby to make clothing for the people… …the sages made their clothes just to fit their stature and size and not for the purpose of pleasing the senses or to dazzle the common people.[427]

NOTE:
This figure is included on page 204 of the print copy of the thesis held in the University of Adelaide Library.

Fig 10-2 Gauze dress of Lady Dai from the Mawangdui tombs weighing 49 grams. Western han Dynasty. Hunan Provincial Museum.[428]

Fig 10-3 Outer garment showing padding used for warmth. Photo detail. Han Dynasty. Xinjiang Uighur Autonomous Region Turfan Museum.[429]

427 Laumann, The Secret of Excellence in Ancient Chinese Silks..p60.

428 The Catalogue Treasures from the Hunan Provincial Museum, Changsha: Hunan Provincial Museum, Changsha: Hunan Provincial Museum,2002.p.52.

Women of wealth or with husbands of royal status, and official rank were known to spin and weave and also embroidered all or part of their own highly decorated robes.

10.3. Han Dynasty Clothing

The Han dynasty clothing is well represented by the finds of Lady Dai, (Lady Xin Zhui) Lady Dai lived about one century BCE and in an area around Changsha that was renowned for its culture. However, it must be remembered that the dynasty lasted another two hundred years and there would have been subtle changes, particularly to women's dress, as they were the showpiece of the emperor and the rich. Even though the styles were fixed by imperial decree, it is not know whether the styles changed officially, or by subtle changes from the people who wore these elaborate gowns; particularly the women. We can only take the styles from the textiles found and illustrations on tiles or writing. The clothing seen on tiles from the Han dynasty at the Sichuan University Museum appears to have more fullness, than illustrations in available texts showing that there was variation in amount of fabric used compared with those seen in Lady Dai's clothing at the Hunan Provincial Museum. As well there were variations in the type of textile worn depending on the cost and personal desires. If a person was able to afford good textiles they ranged from the heavy damasks to the fine gauze dress found in Lady Dai's tomb as shown in Figure 9.2.Although very fine, a similar length of material took three and a half years to duplicate on a drawloom in the Nanjing Brocade Research institute showing that it must have been a very special dress. [430] These two examples show the versatility of textiles which the Chinese made. They made padded clothes for warmth to floating gowns like gossamer when even worn over another robe gave the illusion of lightness and

429 Photo from by author at Turfan Museum October 2007.

430 Information obtained from a visit to the Nanjing Brocade Research Institute. September 2007..

the coolness of a breeze.[431] This was only one of the many articles found in the tomb of lady Dai

Textiles from the graves of poorer citizens have not survived in the main part of China, but the artefacts found in these poorer graves were of a poorer quality; seemingly made just for burial.[432] There are pieces clothing from the Xinjiang area which have survived, but these tribes may have worn different clothes to those in the main parts of China.[433]

In Western China small examples of better quality textiles have been discovered in rubbish heaps around Han garrisons and forts. Many were from the Han dynasty, but these belonged to Han soldiers and their followers and would not have been the equivalent of those found in a wealthy tomb. The styles of the original garments may have been quite different from those worn within the large cities.

10.4. Design of Gowns of the Han dynasty

From the author's personal observation and illustrations in books of the gowns of the Han dynasty all had a lapped front and were cut on the cross, (bias cut), requiring a considerable amount of material. [434] This cut of the material was on the clothes of the elite, but the possible cut their clothes on the straight grain to save material.

The technique of cutting on the bias also showed ability to design and draft patterns to be able to enhance the material and the wearer. In Rome at the same time, the garments were straight and only draped by the use of bands and brooches across the chest and shoulder line. This type of gown contrasted with the ability of the Chinese. To make fitted and complicated patterns for clothing showed the complex thought processes involved.

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431 In China this fine transparent silk robe would not have been worn without an undergarment as the naked body was not considered erotic.

432 Wagner, "The Dating of the Chu Graves of Changsha."p.111p111.

433 If textiles of the ordinary people has survived, documentation is not available in English. As the workers would not have been buried so deeply and with such care as those of the elite who were buried in tombs structured to keep the person immortal.

434 Sylwan, Investigation of Silk from Edsen-Gol and Lop-nor and a Survey of Wool and Vegetable Materials,.p.47.

NOTE:
This figure is included on page 207 of the print copy of the thesis held in the University of Adelaide Library.

Fig 10-4 Parts of the shenyi [435]

Fig 10-5 Silk gauze gown of Lady Dai

435 History of Ancient Traditional Chinese Clothing. Available http://library.thinkquest.org/05aug/01780/clothing/history.htm. 20/03/2008.

There were probably slight variations in the gowns for the women, but they always fully covered the body, whereas men appear to have had different length gowns and trousers showing underneath.

Varieties of dress for Lady Dai and officials

NOTE:
This figure is included on page 209 of the print copy of the thesis held in the University of Adelaide Library.

Fig 10-6 Western Han gowns showing narrow hemline, crossover fronts and patterned fabrics[436]

Composite picture including photo taken by author at Hunan provincial Museum

10.5. Clothing associated with the Emperor and Court

We can only imagine the clothing of the emperor from official paintings, frescoes on walls of tombs and caves, and the clothing from statues found in tombs of lesser officials. The clothing of the Han emperors would have been far more extravagant than any found in other tombs and there would be a predominance of the official colour; red (possibly vermillion) and yellow for his status. One description known to have been the emperor's

436 China Style Ancient Art Life Culture, China Style, <: http://library.thinkquest.org/05aug/01780/clothing/colorful-costumes.htm, 30/05 2007, History of Ancient Traditional Chinese Clothing, Available: <http://library.thinkquest.org/05aug/01780/clothing/history.htm>, "Costume in the Han Dynasty, China Style,, Available:<http://www.chinastyle.cn/clothing/history/han.htm>, 21/04/2006.

clothing is of a textile which was given to the Xiongnu border tribe. According to the emperor:

> An embroidered garment, worn by myself, unwadded robe, made of silk and woven with flowers; a long tunic embroidered unwadded; an unwadded robe made of silk and embroidered with multicoloured; ten pieces of embroidered silk, woven with multicoloured figures; forty pieces of heavy red silk; forty pieces of green silk.[437]

Most of the gowns worn by the elite would have been colourful like those of the emperor but by the Eastern Han Dynasty a black silk gown adorned with purple was worn for court as well as civil and ritual occasions. At first, just wearing an appropriately coloured ribbon with his seal at the end sufficed to show the rank of the wearer. The emperor and princes used pure red ribbon. The prime minister had a red and green ribbon and the general and nobles used purple ribbons. Even the type of hat and its decoration was enforced by law as everybody had to be clearly distinguished by their rank. Once again these regulations were set by law; probably to show the order maintained throughout the ranking system and the power each person maintained. The officials who received two thousand dan of grain used a green ribbon for their decoration, those who received one thousand dan or six hundred dan used black ribbon, those who received four hundred, three hundred and two hundred dan used yellow ribbon and if one hundred dan a greenish purple on. The colours probably related to the religious and symbolic meanings as the highest red and red and green were the auspicious colours, whereas nobles and those of official status had the secondary colours. Purple does not appear to have been the colour of royalty, as it was in Rome and western civilizations.

10.6. The Clothing of the Emperor

The emperor as the head of the whole system was able to order and change clothing regulations on clothing as he desired. He was able to order new gowns for his court

437Alfred Salmony, The Archaeological Background of Textile Production in Soviet Russian Territory, 1942, The Bulletin of the Needle and Bobbin Club, Available: <http://www.cs.arizona.edu/patterns/weaving/topic_ancient.html>, p.5.

without giving any consideration as to how and when they were made. His desires carried down the hierarchical line to the weavers and dyers who usually had to make them in record time.

The emperor required specially made elaborately embroidered outfits of auspicious colours for each sacred ritual and different season, red for summer, white for white autumn, black for winter, a blue green for spring and red for summer. The same rules applied to officials as the colour and design on the outfit designated the power, wealth and virtue of the wearer.[438] The emperor chose the colour of the dynasty and a system of colours. This was set up officially during the Han dynasty, even though it was based on earlier examples.

The emperor had strictly defined clothing for sacrifices to the ancestors where royalty wore dark or sombre clothes. When used for the worship of the agricultural and sericulture gods, a set of green clothing was worn. On ordinary days the emperor and officials dressed in cold colours. These colours were the ones the Han emperors based their colour system

The following chart, Figure 10.7, *Outfits Required by the Han Emperor and Officials for Special Occasions*, indicates the amount of superior quality textiles which had to be woven and usually embroidered for the emperor's wardrobe.

Laumann The secret of excellence in Ancient Chinese Textiles, p.19.

Outfits Required by the Emperor and Empress for Official Occasions

Emperor	nine sets official attire for ceremonies and rituals	six sets of sacrificial robes (mien fu)	three sets for government affairs, hunting and warfare (pien fu)
	seven sets of morning wear	Design and character on each gown depended on association of the deceased to the Emperor	Unknown
Empress	six sets clothing	Unknown	Unknown

Fig 10-7 Clothing of Emperor. Compiled from Laumann.[439]

10.7. Clothing of Officials

The elite lived a luxurious lifestyle with many different activities and rituals which like the emperor, all required special clothing. It appears that the women were not restricted by so many colours and designs as the men as the clothing found in lady Dai's tomb has a variety of colours and different styles. As there were many officials the amount of high quality textiles for ritual, court and everyday use would have been considerable. This could explain the need for new textiles and faster production.[440]

All the officials had to conform to wearing the correct clothing and accessories according to their rank. Even Hats and hairstyles appear to have been different as different styles can be seen in Figure 10.10. Although the officials wore symbolic animals and plants on their ritual robes, they were not squares like in the Ming dynasty, but embroidered straight onto the gown. Specific colours and symbols for officials are described fully in the in appendix 5, as both had symbolic meaning related to their office.

439 Laumann, The Secret of Excellence in Ancient Chinese Silks.pp.20-23.

440 The technology developed to achieve greater production of textiles is explained in the chapter on Textiles and Technology..

Ladies of the court and officials' wives	Clothing sets according to rank	Grades of cloth	Grades of cloth
Nobility and highest rank officials	eight sets of official attire	five sets mien fu fine clothing	three sets pien fu medium quality clothing
Lesser by degrees	One set less than the officials above		

Fig 10-8 Officials clothing list. Compiled from Laumann[441]

NOTE:
This figure is included on page 213 of the print copy of the thesis held in the University of Adelaide Library.

Fig 10-9 Han Officials reporting to superior Tomb of Yinan, Shandong Province and others showing different head dresses.[442]

441 Laumann, The Secret of Excellence in Ancient Chinese Silks.pp.20-23.

NOTE:
This figure is included on page 214 of the print copy of the thesis held in the University of Adelaide Library.

Fig 10-10 Headdresses and hairstyles of Han officials[443]

NOTE:
This figure is included on page 214 of the print copy of the thesis held in the University of Adelaide Library.

Fig 10-11 Court official Western Han. Mawangdui tomb, Hunan provincial museum.

It is unusual that the robe crossed to the left and not the right like other clothing. The Gown: Shenyi and the Paofu used for both women and men[444]

442 Laumann, The Secret of Excellence in Ancient Chinese Silks.p.119, 123.

443 Laumann, The Secret of Excellence in Ancient Chinese Silks.p.123.

NOTE:
This figure is included on page 215 of the print copy of the thesis held in the University of Adelaide Library.

Fig 10-12 Eastern Han brick carving depicting scenes from the life of the official Zhao Bo-ya, Honan Province.

These scenes depicted clothing of a fuller, draped style than those of the Western Han era.445

NOTE:
This figure is included on page 215 of the print copy of the thesis held in the University of Adelaide Library.

Fig 10-13 Gowns of officials with very large full sleeves. Women's clothing and head- dresses at bottom right hand side.[446]

444 Chen, ed., *Hunan Provincial Museum: The Exhibition of Mawangdui Tombs*.p.24.

445 Laumann, T*he Secret of Excellence in Ancient Chinese Silks*.p. 120.

446 Laumann, The Secret of Excellence in Ancient Chinese Silks.p.120.

10.8. Ladies

Legends tell of the garment known as *hanfu* was adopted by the Yellow Emperor more than three thousand years ago in the semi legendary Xia dynasty about the 21st century BCE. Then it was two separate garments, the coat, *yi* and the skirt, *shang*. Together the gown was known as the *hanfu*. The gown was called the *shenyi* which meant "wrapping the body deep within the clothes".[447] The cut of the gown needed to be long to show no skin. Another gown, called the *paofu*, had a lining and could be padded. This was called *jiapao* or *mianpao*. The sleeves were usually wide with a tight band at the wrist and a plain band as a collar, cuffs and at the hemline. It could be cut lower than the shenyi, but was then worn showing the undergarment. The lower triangular or curved part of the shenyi and paofu were cut on the bias, but the top was on the straight grain. Sleeves of dancing girls had much longer sleeves as seen in some of the attendants of the tombs. Maybe the increase in the use and desire for fuller gowns which have been calculated by Laumann to exceed twenty-three metres by a width of fifty centimetres, equated to the materialism which increased throughout the dynasty.[448]

This basic style of crossover gown worn by the Han people continued until the Manchu dress was enforced in the Qing dynasty (after 1644 CE). Skirts were also worn used and must have been worn under the outer garment serving the function of a modest garment particularly under the women's wrapped gowns, or worn with a separate top as in the Ming dynasty.[449] Unlined skirts comprised of four gores of material sewn together. The centre two pieces were narrower than the side ones. A belt was attached or worn

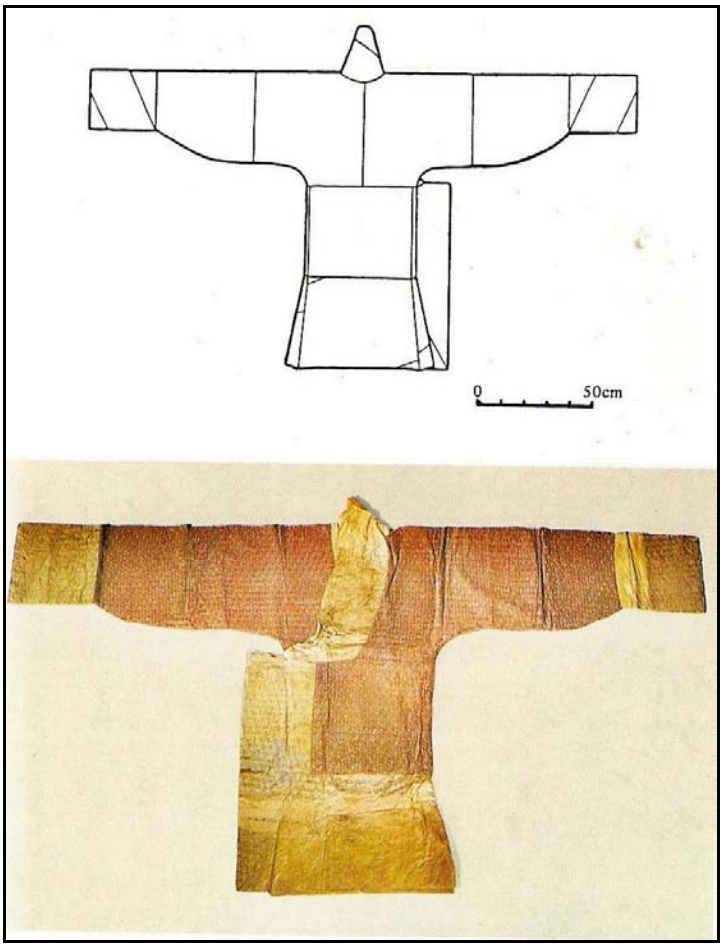
447 Mei Hua, Chinese Clothing, trans. Zhang Lei , China: China International Press, 2004.p.2.

448 Laumann, The Secret of Excellence in Ancient Chinese Silks.p.61.

449 Garrett, *Traditional Chinese Clothing*.

separately.[450] This description given in a translation of a Han text by Bauer and Frank is different from other Han clothes seen in diagrams and paintings. It is possibly of an ethnic group as many of the ethnic groups of Southern China (e.g. Miao) still wear pleated skirts. This skirt was worn by one of the sisters who were presented to the emperor and later became the empress. When presented to the court she wore, "a short traditional costume with embroidered skirt, shortened sleeves, and matching stockings that were decorated with plum-blossom patterns."[451]

Cutting lines of the Han Shenyi and Paofu



450 Yingchun Zang, *Chinese Traditional Costumes and Ornaments China: China Intercontinental Press, 2003*.p.36.

451 Bamber Gascoigne, *The Golden Casket, The Treasures and Dynasties of China* London: Johathan Cape Ltd, 1973. No indication is given as to the name of the Emperor in the book by Bamber.

Fig 10-14 Complicated cut of a relatively straight gown (shenyi) and the gown with the large crossed front (paofu)[452]

All the garments which the women wore would have been treated with great care and when dressing they were accompanied by a ritual, as is shown in the translated writing below:

> At the first crowing of the cock, they(wives) should wash their hands and rinse their mouths; comb their hair, draw over it the covering of silk, fixing this with the hairpin, and tie the hair at the roots with the filler. They should put on the jacket and over it a sash. On the left side they should hang and handkerchief, the knife and whetstone, the small spike, and the metal speculum to get the fire with and on the right, the needle case, thread and floss, all bestowed in a satchel, the great spike, and the borer with which to get the fire from wood. They will also fasten on their necklaces and adjust their shoestrings. [453]

452 Laumann, The Secret of Excellence in Ancient Chinese Silks.p.128-129.

453 Yi-T-Ung Wang, "The Origins of Chinese Books Review," Pacific Affairs 37.4 (2006),

Wang, ed., *Images of Women in Chinese Thought and Culture: Writings from the Pre-Qin Period through the Song Dynasty*. p.53

Record of Rites, Book Ten; Section 1; Number 3:quoted. Shoestrings were hangings from the hair which betrothed and married women wore.

This description shows the wife dressing and that the use of silk head cover and a necklace were necessary for her designated status. These are all facets which show a pride in appearance. The fact that she needed the implements for the fire, for cleaning and for sewing on her person indicates that these duties were performed in other areas of the house and once again revealing her status. Probably people such as Lady Dai, the wife of a Marquis, did not have to work to the same extent as the women in the poem as her grave goods contained large numbers of attendants in highly decorated clothing.

10.9. Gentlemen

The poem of a gentleman describes the type of man he was as well as his clothes he used for warmth. They also display his wealth with the facings made of leopard skin. Although wool was not used for clothing by the majority of people, the skin was considered luxurious and warm.

> His furs of lamb's wools glossy!
> Truly he is steadfast and tough.
> That great gentleman
> His furs of lamb's wool, facings of leopard fur!
> He is very martial and strong.
> That great gentleman
> Is the upholder of right in the land.
> Would give his life rather than fail his lord
> His furs of lamb's wool, facings of leopard fur!
> He is very martial and strong.
> That great gentleman
> Is the upholder of right in the land.
> His furs of lamb's wool so splendid,
> His three festoons so gay!
> Is the first in our land. [454]

Different types of clothing were stored from one season to another in the household. In The book of Songs No. 159 the words read, "In the ninth month I hand out coats".[455] The poems display the orderliness and structure of the whole society and the seasons.

454Arthur Waley, The Books of Songs (London: Bedford and Dickens, 1937). Song No.118, 119ong

455Ibid, The Books of Songs. Song No. 159,165.

10.10. Children's Clothing

Although not specifically mentioned, children of the elite would have had similar garments to the parents. Since life in the Han dynasty was precarious for infants, clothes would have been given at special milestones of life such as the ceremony called *zhuazhou*, when special clothing was traditionally given to the male child at the end of the first year of life.[456] He would have been given an embroidered silk jacket which fastened either at the centre or the side and a pair of embroidered divided trousers. The trousers were two pieces of cloth attached to a broad waistband and only stitched from the ankle to the knee. These pants were first mentioned 1436CE, but due to their practicability something similar might possibly have been worn during the Han dynasty as most adult pants were of the same construction.[457] Poorer babies would have worn nothing under their jacket.[458] In the hot summer they only wore a triangular piece called a *tou tou* with ties for the neck and waist. As children grew they wore various length gowns similar to adults. One gown worn from about four was a loose, side fastening, grey or blue gown called a *pui sum* with an embroidered coat over it.

The girls did not have the advantages of education and new clothes like the boys so they would have made and embroidered or woven or embroidered their own clothes. This workload would not have changed from ancient times as girls were taught to spin weave and embroider at a very early age. When old enough, they made themselves embroidered, generously fitting clothes so that they would last as they grew older.

10.11. Attendants

There appears to have been a hierarchical system in the clothing of officials as the wooden representation of attendants in the tomb of Lady Dai and others, where some of

456 Garrett, Children of the Gods: Dress and Symbolism in China. p.17.

457 Mei Hua, Chinese Clothing p12.

458 Garrett, Children of the Gods: Dress and Symbolism in China. P.52.

the attendants dressed in silk material and others had the colours and designs painted on them can be seen on the ladies in Figures 10.17 to 10.20. These differences indicate that there must have been a hierarchical structure among these women.

Fig 10-15 Major attendants from tomb of Lady Dai decorated in silk instead of painted clothes. Western Han. Mawangdui tomb. Hunan Provincial Museum.

Fig 10-16 Tomb artefacts of attendants showing variations in the gown. Western Han. Mawangdui tombs, Hunan Provincial Museum.[459]

459 Found in the Mawangdui tombs. Photos by Author . Hunan and Wuhan Provincial Museums.

NOTE:
This figure is included on page 223 of the print copy of the thesis held in the University of Adelaide Library.

Fig 10-17 A reconstruction of the exercise chart found in tomb No 3 of the Mawangdui tombs with different styles of gowns. Mawangdui tomb. Hunan Provincial Museum.[460]

The dresses of the attendants of Lady Dai of Mawangdui all depict a slim silhouette where the front is either just crossed over to the right and falling straight to the ground, or a similar top with a curved hem line and continuous lap over which continued around the back and to the right side again. Both of these gowns were edged with a plain silk band. The longer one gave the illusion of layered skirts as it wrapped around. The materials varied from extremely fine gauze, to damasks and patterned fabrics of fine silks. The gowns of both the male and female attendants appear tight around the ankle which would have been difficult to walk in. The slim silhouette saved material, which would still have still have need copious quantities, as the women attendants also had patterned cloth, not just plain, dyed cloth.

460 Reconstructed plan of exercises taken from the tomb of Lady Dai.

NOTE:
This figure is included on page 224 of the print copy of the thesis held in the University of Adelaide Library.

Fig 10-18 Statues of attendants from the Tomb of Lady Dai. Han dynasty. Hunan Provincial Museum.[461]

NOTE:
This figure is included on page 224 of the print copy of the thesis held in the University of Adelaide Library.

461 Chen, ed., *Hunan Provincial Museum: The Exhibition of Mawangdui Tombs*. p.24.

NOTE:
This figure is included on page 225 of the print copy of the thesis held in the University of Adelaide Library.

Fig 10-19 Variety of gowns on attendants and worker[462]

10.12. Merchants

Merchants not only meant those who traded and were shopkeepers, but those associated and engaged in mining such as iron, cinnabar, salt, animal breeding manufacturing and money lending. Officially, the merchants were despised by law, but in reality, once they accrued money and property, this view was often surpassed.[463] Although not allowed to buy land by law from 119 BCE, many still managed nevertheless. Many merchants became extremely rich and could therefore afford the best textiles for their garments. As Laumann writes, some had accrued more money than royalty so it is possible to imagine the splendour of their homes, entertaining and clothes.[464] It appears that even though the merchants were officially of a low social rank, they managed to surpass the sumptuary laws about clothes a, land and goods. Although not specifically mentioned, these

462 Ya Zhu Shi, ed., *Treasures of the Han*, China: The Empress Palace, 1990. p.111.

463 T'ung-tsu Ch'u, ed., Han Social Structure: Han Dynasty China Volume 1, vol. 1 (Seattle, London: University of Washington Press, 1972).p.111.

464 Laumann, The Secret of Excellence in Ancient Chinese Silks.75.

activities were probably during the latter Eastern Han dynasty when social norms were beginning to break down.

10.13. Soldiers

During the Han dynasty, wars were a display of colours from textiles used for clothing of different ranks, banners and flags. The rank of the officer soldiers determined dress in the same manner as for civil servants. The terracotta soldiers from both the Qin and Han dynasties contain traces of colours showing how the different ranks used colours for identification. Silk banners were used to identify the different divisions and to frighten the enemy.

As with civil officials the different officers had symbolic animals to identify their rank and power. These are listed in Appendix 3. The various parts of the army could be distinguished by their armour, their headdress and hairstyles. These headdresses would have varied with the occupation of the soldier in the same manner as those of the Qin dynasty in Figure 10.20.For example, such foot soldiers, archers, cavalry and charioteers all had different styles of armour and headdress. Traces of these colours can be seen on the smaller terracotta soldiers of the Han soldiers in Figure 10.21.

NOTE:
This figure is included on page 227 of the print copy of the thesis held in the University of Adelaide Library.

Fig 10-20 Colours possibly used in soldiers clothes taken from fragments of paint surviving on the Terracotta Warriors[465]

465 Edmund Capon, Qin Shihuang New South Wales: Art Gallery, 1983.p.51.

Fig 10-21 Foot soldiers from the Han Dynasty. Hunan Provincial Museum[466]

These wars had beneficial effects for the textile production, as more fabrics were needed for uniforms and clothing to outfit the soldiers. It is interesting that the soldiers all wore uniforms. To designate their rank as well as they were an organized army.

Other textiles were needed for tents and war paraphernalia. The roads built to transport the soldiers also acted as highway for the exchange of textile ideas and technology.[467] The variety and amount of textiles needed to sustain the army, as well as the other parts of society, is unimaginable.

10.14. Working people

Depictions of the clothing of the general workers can easily be obtained from stone reliefs, artefacts found in tomb excavations and from governmental rules. One

466 The Catalogue Treasures from the Hunan Provincial Museum.p.40.

467 Julie M. Segraves, " Society, Status, and Sharmans: Symbols Appearing on Warring States Period and Han Dynasty Textiles," Arts of Asia 26.May June (1996).p.44.

government rule said that workers could not dye the cloth they were to wear, but some used a black dye.[468] However, the poor workers often suffered from lack of adequate clothing as shown by the following memorandum to the emperor by Dung Zhong Zu in 100BCE, "therefore, the poor were forced to wear clothing fit only for cattle or horses."[469]

Miniature clay or wooden representation of workers from the household and agriculturalists were often included in tombs to assist in the afterlife. Their clothing can be inferred from these little statues. Other clothing can be seen on people in tomb decorations and stone reliefs and bricks. From these artefacts it can be seen that the ordinary working people wore a similar crossover robe or tunic to those of the upper class, but of a much shorter length. This gave greater freedom of movement which would be necessary for the work involved. Underneath the gown or upper garment trousers of varying lengths were worn. The textile fabric would have been a natural coloured hemp or ramie.

NOTE:
This figure is included on page 229 of the print copy of the thesis held in the University of Adelaide Library.

Fig 10-22 Mulberry leaf gatherers showing their short tops and trousers [470]

468Frances Wood, The Silk Road: 2000 Years in the Heart of Asia (Berkley, California: University of California press, 2002). 13

10.15. Slaves

Since slaves were the lowest stratum of every strand of society during the Han dynasty, there appears to be little record of their clothing. This would be due to the fact that they were not considered important, or even a person, as they had no rights. Even though these slaves contributed to the function of society, they were not worthy of recognition. However, some of the slaves may have been attendants at court or for wealthy elite and if so, they would have been dressed in the fine silks the same as other attendants. Zhu quotes the Han official and gentleman during 15BCE-12 BCE as saying:

> Whereas the commoners were half starved and wearing ragged clothes, the slaves of the powerful families enjoyed wine and meat.

Slaves had to have their head shaven, but some masters let them wear caps. Many slaves were cruelly treated. Punishment of both sexes consisted of an iron collar which was placed around the neck.[471] It seems unlikely that even the lowest slaves were not clothed in some type of garment as the clothing was a part of the ancient Chinese culture. However, by the Eastern Han dynasty when selling slaves, owners demanded high prices to show their own prestige and wealth. To support this idea, landlords and other owners often dressed the slaves as fine beautiful people. This attitude is shown in a passage taken from the Han Social History.

> Nowadays when people sell their slaves, they dress them up in embroidered clothes and silk shoes with braided trimmings on the edges, and put them in the pens. There were in ancient times the garments of the Empress or the Son of heaven that were to be used in ancestral temples not for ordinary wear. And yet the common people (meaning those who were not of royal blood but obviously rich) are allowed to use them to clothe their female slaves.[472]

Sometimes slaves or their offspring managed to escape their class and consequently were able to wear superior clothing. One female, “Wei Tzu who was the daughter of a slave

471 Ch'u, ed., Han Social Structure: Han Dynasty China Volume 1.p.335.

472 Laumann, *The Secret of Excellence in Ancient Chinese Silks*.p.81.

maid in the family of a princess, was favored by Emperor Wu, became a concubine in the palace, and later became Empress".[473] This would probably have been a very rare occurrence.

10.16. Underwear

Women and men wore undergarments which showed at the neckline under the crossover outer gown. Yang Chung suggests that women wore wearing crotch- less pants before the Han dynasty, so this probably continued into the Han dynasty. These were not visible under the clothing. Yang suggests that the large crossover front of the lower part of the gown made the number of undergarments unnecessary.[474] Chinese babies still often wear open pants similar to the ancient pants.[475]

An unnamed corpse of a woman found in Tomb no 1 Mashan (340BCE-278BCE) was dressed in open seated trousers, a skirt, a lined robe, a short embroidered gown and a long patterned shenyi which had been padded for warmth. These are clothes she wore in life, and then she was covered with other textiles.[476] Like Lady Dai of Mawangdui who was wrapped in twenty layers of clothing, all of the clothes would not have been worn at once. It appears that the same basic burial garments were needed to dress the deceased up until the demise of Imperial China and were similar to those worn in life.

473 Ch'u, ed., *Han Social Structure: Han Dynasty China Volume 1*.p.157.

474 Zang, Chinese Traditional Costumes and Ornaments..p.32.

475 Personal observation, 2005.

476 The Golden Age of Archaeology.p.321

Fig 10-23 Wooden statues showing under-dress at neckline. Western Han Dynasty. Mawangdui tomb No1. Hunan Provincial Museum[477]

477 Chen, ed., Hunan Provincial Museum: The Exhibition of Mawangdui Tombs p.24

10.17. Shoes

The early people of China wore shoes made from hemp, vines and grasses for both the upper and the sole. Later, these fibres were only used on the soles. By the Han dynasty people were wearing shoes with separate uppers and soles which could be made of hemp, leather or silk for indoors. Woven or embroidered designs were used on these shoes. Han dynasty shoes were often forked at the front and quite often it appears that socks were worn with shoes and boots. Outdoor shoes had to be far more practical so the soles were usually of coarse hemp. The different types of shoes reflected the occupation of the wearer, but the embroidered slippers began a long life of fashion.

In the Eastern Han Dynasty (206BC-23AD), the toecap of the cloth shoe was usually biforked, and the tread was made with hemp thread. Such a shoe was called s*huangjian qiaotou fanglü,* square shoe with double tips and a rising head.[478] Shoes were pointed upwards at the front to eliminate the necessity of raising the hem of the dress when walking.

NOTE:
This figure is included on page 233 of the print copy of the thesis held in the University of Adelaide Library.

Fig.10.24a Pointed shoes with woven tops. Han Dynasty. Mawangdui tomb. Hunan Provincial Museum[479]

478 History of Shoes in China, China Culture.org, Ministry of Culture, China. Available: <http://www.chinesecultureonline.org/past.jsp?catName=costume&centerName=shoe>, 03/04/2009.

479 Chen, ed., Hunan Provincial Museum: The Exhibition of Mawangdui Tombs.p.49.

NOTE:
This figure is included on page 234 of the print copy of the thesis held in the University of Adelaide Library.

Fig 10-24 b. Stiffened cloth biforked toes and shoes uppers knitted silk and soles of hemp. Han – Jin dynasty, Niya, Xinjiang Uyghur Autonomous Museum.[480]

NOTE:
This figure is included on page 234 of the print copy of the thesis held in the University of Adelaide Library.

Fig 10-25 Han dynasty shoes with bi-forked toes[481]

480 Chen, ed., *Hunan Provincial Museum: The Exhibition of Mawangdui Tombs*.p.49.

481 Brian Pang, *History of Shoes*, Han Mo Xuan Publishing Co. Ltd. Available: <http://www.chinavoc.comlife/>, 22/03/2009.

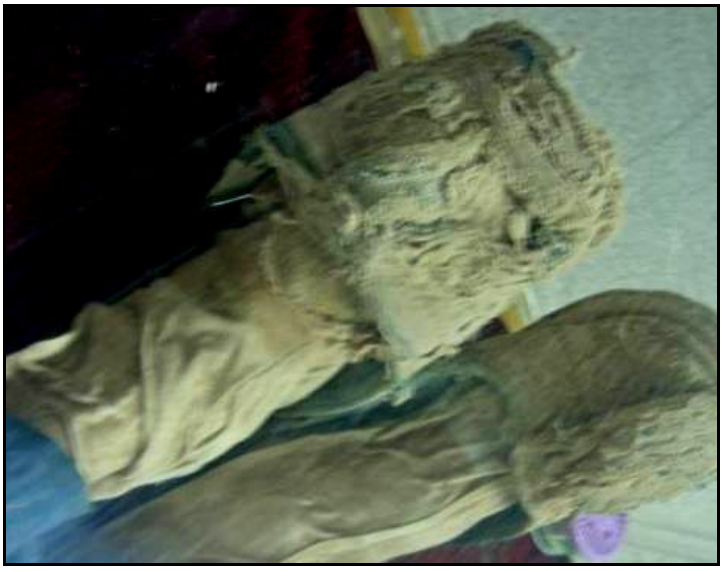


Fig 10-26 Hemp shoes. Shoes on the right show the shoes on a mummy found in the desert in Xinjiang Han dynasty Turfan Museum. Photos[482].

10.18. Socks and Mittens

Various types of socks and mittens have been found in Han Dynasty tomb. Brocaded material which was the highly prized textile of the Han dynasty was included in some of the finds from the Xinjiang area.

482 Photos taken by author Turfan Museum. October 2007.

Fig 10-27 Han silk and brocade socks. Han dynasty. Mawangdui tomb. Hunan Provincial Museum.[483]

483 Huang, ed., The Great Treasury of Chinese Fine Art: Arts and Crafts: Printing Dyeing and Embroidery(1).p.48.

NOTE:
This figure is included on page 237 of the print copy of the thesis held in the University of Adelaide Library.

Fig 10-28 Yellow silk gloves with woven band. Han- Jin dynasty. Xinjiang[484]

10.19. Hats

Hats and caps were worn by workers. Part of the design on a piece of textile found by Aurel Stein contains a person riding on a horse with a pointed hat.[485] This indicates that hats for ordinary people varied from the formal hats of officials seen in Figures 10.29 and 10.30.

NOTE:
This figure is included on page 237 of the print copy of the thesis held in the University of Adelaide Library.

Fig 10-29 a. Hat with cock on the front.

484 Zhao, ed., *Legacy of the Desert King: Textiles and Treasure Excavated on the Silk Road*. Hong Kong: ISAT Costume Squad Ltdp.2000.p.65.

485 F. H. Andrews, "Ancient China Figured Silks Excavated by Sir Aurel Stein, Drawn and Described by F. H. Andrews," The *Burlington Magazine for Connoisseurs,* Vol 3 July,1920, 74.

Fig 10-30 b. and pinnacle hat [486]

Fig 10-31 Textile of a men with a pointed hat. Han dynasty. Xinjiang. Detail[487]

486 Zhao, ed., *Legacy of the Desert King: Textiles and Treasures Excavated on the Silk Road*.p.61.

487 Zhao, *Treasures in Silk*.p.68.

10.20. Wigs

It is known that wigs from poems and drawings were worn to enhance hairstyles, for an anchorage of the headdress and to make the person taller. Lady Dai was buried in a wig so they may have been a common occurrence.

> Her tall wig nods
> at dawn of night, while she plies her task,.
> With till wig gently swaying
> Here she comes back into the room. [488]

10.21. Ornamentation

The Zhou dynasty used embroidery and accessories as ornamentation. The poem crossing the river by Li Sao of the warring states describes the following:

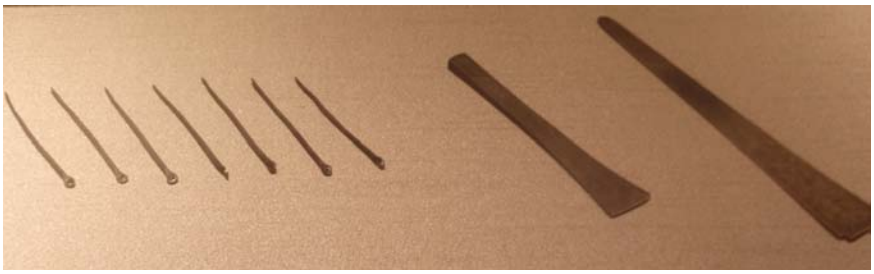
> A long gem-stud hangs at my side, and a tall hat I wear…..
> My headdress then high pinnacle I raised, Lengthened my pendants, where bright jewels blazed
> From: Crossing of the river. Li Sao'[489]

When the woven multicoloured patterns were used during the Han dynasty, gowns did not appear to need any other major ornamentation. Women did use other ornamentation, and accessories such as jade and gold bangles, necklaces and hairpins, as well as bronze mirrors carved hair combs and the accessories of a Han woman's status; scissors and needles.

488 Waley, *The Books of Songs*.p.90.

489 *New Archaeological Finds in China 2*, vol. 2 Beijing: Foreign Language Press.p.10.

Ornaments



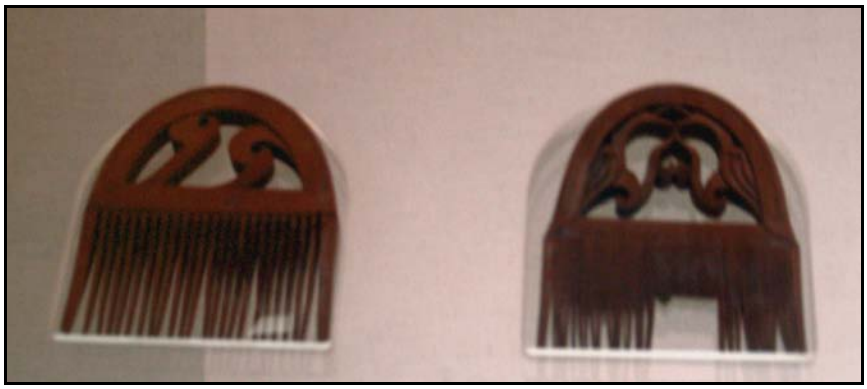


Fig 10-32 combs, needles and scissors. Han Dynasty. Xinjiang. Turfan Museum[490]

490 Photos of jewellery and other artefacts associated with women.

Fig 10-33 bronze mirror. Han dynasty. Xinjiang. Turfan Museum. Photo[491]

Ear rings

Fig 10-34 Jewellery from the Han dynasty. Xinjiang. Turfan Museum. Photo. [492]

491 Photo taken by author, Turfan Museum, October 2007.

492 Photo taken by author in Turfan Museum 2007.

Summary of Society and Social Life

Several observations can be drawn from the lifestyle of the people and the clothing they wore.

1. Clothing varied according to occupation and social standing therefore causing class distinction.

2. .Clothing was used as a means of authority as the various emblematic decorations portrayed the position of the wearer and therefore his duties.

3. The wars from the previous dynasty and the constant fighting tribal wars to secure boundaries, increased the need for extra textile product from the spinners and weavers.

4. Lavish lifestyle, colourful housing and dress for royalty and the rich made great demands on production, but must have contributed to a colourful society.

5. The artisans who moved to another area acquired textile skills in design and technology different from those previously known. These were then included in traditional designs. This did not indicate that there was total freedom to produce any textiles they desired as the government still maintained control, productivity and quantities of textiles produced throughout the kingdom. One of the methods of control was the standardization of acceptable textiles.

Without the continual production of textiles the people would have suffered cold and exposure lessening the chances of successful combat and progression of society.[493] The Han expanded their territories along the Gansu corridor and the kingdoms around the Tarim Basin. More elaborate and plain textiles were then required to keep these people contented. As the wars dwindled many wandering and displaced people returned to their place of origin and settled into a more prosperous lifestyle. Diasporas of people and their culture had lasting effects which were seen in the designs of textiles as designs and ideas spread across wider areas. Apart from the lavishness of the gifts, and the quantities given it can be ascertained that

6. Silk was the converted textile of those who could obtain it to display wealth and
7. Robes were of different lengths.
8. The robes were unpadded and by the corollary, clothes could be padded, obviously for warmth.
9. Colours were of the silk were well defined.
10. It was not considered improper to give used clothing from one person to another. If this was the case for the emperor it would have been similar through all strata of society.

By these observations, it is clear to see why the textiles were so beautiful and converted. It is also understandable than people wanted more and more of these fine quality clothes and therefore to keep up with this demand, even only within the palaces, the production increased when tied with the increase in new technology.

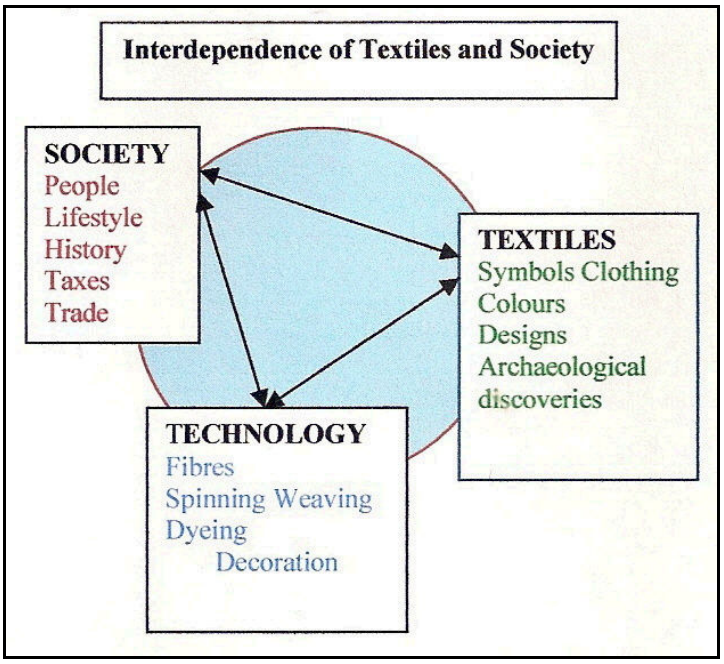
493 Bray, "Textile Production and Gender Roles in China 1000-1700."

10.22. Conclusion

Clothing was not just used for a body covering even though this was extremely important. Great emphasis was placed on the type of clothes as well as their care and rituals associated with them. The clothes were very distinctive and designated who the wearer was as well as the office they held, or their occupation and wealth or poverty. Since everyone was only supposed to wear specific clothing, corruption must have been common to satisfy the needs of everyone. Most information about clothing is about the clothing of the wealthy and elite, therefore, it is important to try and find out what others wore. By doing this there is also an understanding of how people conducted their lives, and what the social structure was. Since the elite were only a small percentage of the population, the textiles made for them formed a major part of production. Most of the population was not colourful like the elite, but dressed in quite mundane, dull clothes so overall the streets would be monochrome. The farmers and many others needed short gowns to conduct their work as they heeded more movement and shorter clothes. As it is throughout history, only the elite could ever hope to wear the magnificent clothes made on the new machinery and in the new colours. The rest of society was the workforce to provide them with their finery.

11. Thesis Conclusion

This thesis has shown how textiles play an integral role in the social life and structure of the Han Dynasty Chinese and in doing so has textiles were in fact central to the imperial coffers and the welfare of the country. Without their production, the dynasty would have floundered.



This interdependence of the textiles, society and the technology was a major faction why the textiles developed as they did. (As shown in Fig 1-1, reproduced above) Elsewhere, textiles were not nearly as an important part of the imperial economy as they were in China. There textiles in all forms were collected as tax and consequently were of values equivalent to coined money. There was not a system of barter, but one where even wages were sometimes paid in cloth. The cloth was also a form of tribute and when trade opened with the west, it became an important part of trade. Since textiles were so important, key aspects of production came under government control innovations and increased the imperial wealth. Imperial wealth was not the major driver for the new innovative textiles as even the plain ordinary cloth was valuable. The ornate textiles became more popular

when given as gifts and external trade began with western countries. However, when thread could be made faster, and looms advanced, it is understandable why new patterns and complex weaves developed. These textiles then produced greater revenue for the government. The interaction between the people, the technology and the textiles was inevitable.

The interdependence of textiles, technology and society brings a new meaning to textiles. By taking them from the mundane, everyday product, it elevates them to a previously unconsidered economic commodity, yet one of unbelievable quality. The manner the textiles were made, the quality control, distribution, collection and use of the textiles as an economic commodity, displays a method which I consider worthy of any modern industrialized company.

The artisans, the workers and the people who wore them wanted new designs and for the cloth to be made faster. This led to improvement and introduction of new technology to improve techniques and production time, yet this was note done for economic trade as is important in the modern world, but for the empire itself. Textiles were the backbone of the well run empire during the Han dynasty. The immense scale of production could not have taken place anywhere but in such a tightly controlled, well-organized people who relied on their beliefs as well as a belief in the system for every part of their existence. To have produced such quantities and quality of textiles was revolutionary in the ancient world of hand produced commodities, and justifies the name of an ancient industrial revolution.

This revolution of textile production provided new techniques to make thread and cloth by using equipment which was revolutionary. Wheels invented for reeling, spinning and winding thread, streamlined the production of more yarn which could then be woven on

the new, faster looms which then developed to such an extent, that new types, textures and designs were made from those light as gossamer to the new heavy brocades. Many of the exquisite textiles were made in a unique yarn, silk, whose development was unique to China.

In Han times there were also decorations and textures for the silk and other materials as well as other fibres, which contributed to their uniqueness. and interest. The variety and diversity of these were amazing. No matter which piece of cloth is examined, the wonder of its making is apparent. The designs, the dyes used and the finishes which were achieved are worthy of their makers for these pieces of treasure have somehow endured the passage of time to show similarities to the industrialized world to day.

The elaborate textiles probably cannot be considered as works of art, as most were mass produced, (even the embroidered articles were not made as a work of art, but for consumption) but the designs, combination of colours, contrast of textures and beauty could easily classify them as art.

This thesis placed these textiles into their social context to help to enable us to understand why they were so important and how they could have been made to such high standards at such an early stage compared with the west. To achieve this mystery, the whole textile production cycle as well as their consumption in life and death needed analysis. This work places the textiles of the Han dynasty into their wider social context. Nor is the thesis just an anthropological or technical study alone, but an investigation of the importance and benefits of the inter-relationship.

These relationships were seen through the divisions of the thesis into sections on technology and on the people and their lives. The questions of how, why, when and what were the textiles and who were people who made them were underlying thoughts in each

chapter. The explanations and conclusions to these questions are interesting in themselves, but also raise many other questions.

As a consequence of looking at the history of the people prior to, and during the Han dynasty, several reasons arise as to why the textile production advances so quickly. Nowhere else used textiles for tax. Other civilizations such as Egypt, Greece and Rome had similar lifestyles and people under the control of great leaders, high standards of living and lifestyles, complex philosophies, and many other common characteristics, but they never achieved the advances in textile production of China. Others people had inquisitive inventive minds and therefore could have advanced technology of spinning and weaving; but did not.

The uniqueness of China was possibly due to type of governmental control and the ways the Chinese drew their taxes from produce, not money. The Chinese people paid their taxes during the Han dynasty in grain and textiles. It is the author's opinion that this was a catalyst to speeding the production of textiles to hasten economic development. There was constant incentive to make cloth both quicker and in ever-greater quantities. However, one major conclusion was that the textile changes were not for the benefit of others, but for the Han dynasty China. Foreign trade, as a proportion of the size of China's domestic economy was inconsequential. This attitude was quite different from other civilizations which wanted power and money and where external trade was much more important.

As a consequence of the system of government and control of the people in their everyday lives it was possible for textiles to be made and collected for the state in a systematic, orderly manner with the uppermost speed. The unique, hierarchical control of people, whose obligation was to serve the Emperor in such a highly controlled manner,

meant that no matter where the artisans lived, the same quality of articles could be produced. This must only have been due to the line of officials who controlled every stage of production and did not only apply to textiles, as the artisans of pottery and other crafts were all eventually answerable to the officials who were answerable to the emperor. [494]

With the emperor in ultimate control of textiles, the emperor could also change fashions and produce new ones. This was a very strong impetus for making a variety of textiles. The emperor commanded new clothes, new colours or different colours, and they had to be produced as quickly as possible. As a poem quoted earlier pointed out; the emperor commands, the eunuchs convey the message and the ordinary workers work day and night to meet this demand. This chain of command may not have been unique, but it worked in the Han dynasty to spread knowledge, customs and laws to various parts of the empire

However, the dispersal of knowledge does not explain how the textiles could be completed so quickly and on such a large scale. The answer to this question lies in the equipment the Chinese used for this mass production of cloth. To be able find the secret of degumming and reeling off the fine silk filaments from silk cocoons was a gigantic step. While other nations were spinning thread on drop spindles, the Chinese had invented a mechanism, sometimes called a spindle wheel or reeling wheel or maybe just a spinning wheel, which could draw out and twist thread in a much more productive manner. Then, not only was this wheel used for reeling and twisting silk filaments together to make them thicker, it could also spin, and twist the short fibres from hemp and other sources to be able to make them into continuous thread. No longer was there only the slow method of making yarn on a drop spindle.

494 Peterson, "Who Does the Weaving, Who Wears the Robe? Didactic Poems and Pictures of Ancient Chinese Weavers."

The fact that whorls used on drop spindles have not been a common find in Han tombs, leads to the conclusion that some other device might have been used for spinning. Therefore the spinning wheel almost certainly seems to be the device that replaced the drop spindle. This paper shows how the author, along with a few other textile authors such as Kuhn, Cheng, Shang and other sinologists believe that the spinning wheel was a Chinese invention. However while these other people suggest it wasn't a real spinning wheel until much later, the author of this study believes that it was also a spinning devise during the Han dynasty, not just used for reeling threads; particularly silk.

The common western belief is that the spinning wheel originated in Europe. The author proposes the idea that the spinning wheel's used much earlier in the Chinese history, or at least by the Han dynasty. By careful study of anything found on spinning technology and the fabrics, more seemed to indicate that some sort of spinning wheel must have been used on other fibres such as hemp. It may have originally have been invented to reel the silk and plying several threads to give thickness and strength, but observance of the evenness of the twist of the threads in the various examples of hemp in the Chinese museums convinced the author that the twists of the yarn were too even for a drop spindle. were found which tended to support this fact even though the women looked to have been wearing more voluminous dresses than in the ascribed costume of the day. The author concluded that these tiles and illustrations were correctly labelled, as the women were attired in similar clothes in the Han tiles in Chengdu. This style of dress is similar to the one included by Cheng in the History of textiles of Ancient China which was a major source of textile technology in China, including the Han dynasty. He says it was in use by the Han dynasty; a statement the author agrees with due to the evidence supplied in this thesis.

Labelled "a Primitive Spinning wheel" Cheng Fig111-4-3 P.217

There are other reasons for the theory of the spinning wheel development appears conclusive. Firstly, as just mentioned, whorls from the Han tombs and other burials are not listed by either Cheng of Kuhn. They may have been found in graves outside the major ones, but do not warrant mention. No whorls from this period were seen by the author in museums in China. Needles and threads have been found amongst other textile implements, and yet the apparent absence of whorls strongly indicates that something else must have been used to make the yarn from hemp, ramie and other fibres. These fibres, not silk were the mainstay of clothing in Han times. Secondly, the evenness of twist in the materials from the Han dynasty, suggests that a wheel was used, not a drop spindle. This even twist is due to the constant motion of a wheel against having to start and stop the spinning thread to wind it on when using a drop spindle. The use of two hands when spinning helps to feed in new fibres so they do not cause unnecessary lumps in the thread.

The horticulture and agriculture of the farmers of the Han dynasty is clearly an achievement for to have been able to grow the crops and process the fibres so carefully and quite scientifically is an achievement for the period. The use of a continuous thread made from an unlikely animal as the caterpillar is an achievement, but to have been cultivating the silkworms, degumming the thread and using it for fine woven cloth for

millennia by the Han dynasty, shows the expertise the artisans of China as here again, even though wild silk was used elsewhere, no-one else had the secrets the Chinese had. This is yet another testimony to the importance given to textiles and the people who made them.

Despite the art of spinning and weaving being a tedious form of work, even in workshops, there appears to have been a similarity to the workers of the cotton mills of Lancashire in England during the Industrial Revolution in China. Both places worked under harsh conditions to be able to output the required amount of textiles. The workshops appear to have a similarity to those of the Lancaster Cotton mills of England centuries later where production was also the driving force. Speed and accuracy was the desired outcome in both places, not care of the workers. However, to many workers of the Han dynasty the imperial workshops and even the private workshops would have been preferable to having to spin and weave at home in cramped areas with little natural light. The work may have been arduous, unpleasant and involve long hours, but the alternative was probably worse.

The garments made from both simple and the most complicated textiles showed the capability of the cutters, as the prominent gown for both men and women was cut from many different shaped pieces of cloth. Both the patternmaking and the making of the garments took huge amounts of material in their making and expertise by the makers. This once again demonstrates the high quality of workmanship in an era where everything was done by hand.

One other conclusion obtained by the author is the conformation that linen was not used in China during the Han dynasty and consequently many of the labels on this type of textile in Chinese museums is incorrect. Flax (linen) was not a textile developed or used

by the Ancient Chinese. They had their own very fine hemp and ramie which they grew and consequently had no need to import flax, or linen thread. The Han Chinese Empire was an extremely self sufficient and progressive society.

The people lived under a system where life was extremely structured, yet there were people with wealth who desired luxury similar to that of the emperors. This leads to an assumption that the desires of the emperors and elites drove the demand for new textile designs of magnificent colours and designs. Though this assumption may be a matter of which came first, the elite wanting something new, or the new textiles were made and the desire came later. Probably there was some of each force driving the finished products.

The lives of the people their history, politics, religion their social structure gave the textiles meaning and made their uniqueness understandable. The textiles were not made by primitive people just because they lived two thousand years ago, but they were made by and for a highly sophisticated well developed society who were systematic, controlled, respected others. However, it was still a society where the rulers and the rich were the major beneficiaries of the lifestyle, while the major part of the population serviced their needs. This is particularly evident in the textiles which have survived from the Han era as only the rich could have the silks of many colours and designs which still provide amazement and wonder.

The system the Han Chinese used to make the textiles and to use them for tax must have been extremely organized and efficient. To be able to control the quality of the textiles, to then bring them to storage areas or the capital Chang'an, shows experienced organizational ability. This amazing feat could not have been performed under any other system but the structured, well organized, pyramid system of government which existed under the Han dynasty.

The textiles themselves were the major source of enjoyment in the research for this thesis. The few recent books which have been published in English or English and Chinese provide excellent reproductions of textiles which could then be magnified to discover the intricate designs, the quality of the cloth, and the vibrant colours of the restored textiles as well as the evenness of embroidery stitches. This research was enhanced by the trips to China where people were ever willing to discuss their textiles. No reproduction, can equate to the real object and the chance to study them. So much more awaits the researcher in this area.

This study of the Han society and textiles has revealed other textile related questions worthy of answers and could provide fertile areas of research. For example, was the ancient silk found in Central Asia and Russia silk from cultivated silkworms, or wild ones as well as what other Chinese textiles have been discovered in Central Asia from around the same, or earlier periods of time and were these all of Chinese origin and design?

Some of the textiles found from the Han dynasty and later in western China have Caucasian features, designs such as winged beasts and roundels which might have spread from the West. Were textiles from Central Asia using these designs ot the same period or were they older, or later? Were other animals from the Chinese or was there influence from further afield? Egypt has a drawing of a woman in a transparent dress which is assumed to be fine linen, Could this have been silk? Therefore can any evidence be found which may link it to the silk of China, or was it transparent linen?

India and China appear to claim the honour of transporting silk to the West about the same time. What was the silk used in India? Have any archaeological sites revealed any clues to this as there are now many excavations taking place in the ancient sites along the

Indus and other ancient areas? Trade with the west officially started during the Han dynasty, but could there been trade or before this time?

The introduction of Buddhism and its influences on textiles would open many areas of study. The Buddhist caves in Xinjiang contain many pictures of clothing and textiles as often the caves have pictures of the donors. There costumes are quite varied. Where did all of these people originate and have their clothes ever been analysed? The origin of the people, the designs on their clothes and the gifts they carry with them would enlarge upon present knowledge about the transfer of Buddhism into China.

There are possibly many more questions which could arise out of this study such as a more detailed study of the textiles themselves as well as the spinning wheel and the weaving. An interesting comparative study would be the similarities and effects of the wool and cotton industry of the Middle Ages and Industrial revolution in England.

Hopefully, others will take up these challenges.

Heather Langford

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Appendixes

Appendix 1

Trade Map Showing Regions and Directions of Trade

NOTE:
This appendix is included on page 262 of the print copy
of the thesis held in the University of Adelaide Library.

TFrom Barbieri-Low, *Artisans in Early Imperial China*.p.119.

Appendix 2 Classification of Colours by Han Dynasty

Compiled from Cheng Part 2, chapter 6, Part 3 chapter 6 and Zhao Feng

Category	Name Western Han	Colour Western Han	Name Eastern Han	Colour Eastern Han
Red tones	*Ran*	Deep red	*unknown*	unknown
	Jiang	Red	*unknown*	Deep red
	Jin	Light red	*unknown*	Pale red
	Unknown colour	unknown	*Xun*	Pale red
	unknown colour	unknown	*Fei*	red
	unknown colour	unknown	*Zuan*	Ribbon colour with a red tinge
	unknown colour	unknown	*Chu*	Deep red
	unknown colour	unknown	*Guan*	Deep red
	unknown colour	unknown	*Qing*	Red
	unknown colour	unknown	*Zhu*	Pure red
Orange tones	*Ti*	Yellowish red	*unknown*	unknown
	unknown colour	unknown	*Wu*	Reddish yellow
Yellow tones	*Yu Jin*	Pale yellow	*unknown*	unknown
	Ban Jian	Yellowish white	*unknown*	unknown
	Zheng Li	Dark yellow	*unknown*	unknown
	Xiang	Pale yellow	*unknown*	Pale yellow
	Juan	Straw colour	*unknown*	Straw colour
Green tones	*unknown*	green	*unknown*	unknown
	Li	Bluish green like wormwood	*unknown*	Colour dyed with hispid anthraxon
	unknown colour	unknown	*Lu*	Bluish yellow
	unknown colour	Tan	*unknown*	wheat green
Blue tones	*Unknown colour*	Blue	*unknown*	unknown
	unknown colour	unknown	*Yu*	Blue warp and bluish

				white weft
	unknown colour	unknown	*Cong*	Blue
	Piao	Bluish purple	*unknown*	Bluish white
	unknown colour	unknown	*Gua*	Purplish blue
Purple tones	*unknown colour*	Purple	*unknown*	purple
	Gan	Reddish dark blue	*unknown*	Reddish dark blue
	unknown colour	unknown	*Giao*	Reddish dark blue
	unknown colour	unknown	*Qu*	Bluish red
	unknown colour	unknown	*unknown*	unknown
Black Tones	*Zao*	Black	*Zi*	unknown
	unknown colour	unknown	*Can*	Pale black
White tones	*Bai Yue*	Utmost white of degummed silk	*unknown*	unknown
	Wan	White like fine silk	*unknown*	White like fine silk
	Not made	Not made	*Yue*	Fresh white
	Not made	Not made	*Fu*	Bright white
	Not made	Not made	*Bu*	Clear white
	Not made	Not made	*Yan*	Brilliant white
Others	*Dan*	Coloured by rubbing silk fabric on stone	*Not made*	Not made
	Not made	Not made	*Gao*	Brilliant colour
	Not made	Not made	*Su*	Colour of ordinary white silk
	Not made	Not made	*Xu*	Multicoloured silk
	Not made	Not made	*Ru*	Multicoloured and dense pattern silk
	Not made	Not made	*Guan*	Blue silk ribbon
	unknown	unknown	*Sou*	Deep red ply yarn

Compiled from 'History of Textile Technology Ancient China' by Cheng and 'Treasures in Silk' by Zhao

Colours with unknown names were often new dyes or the renaming of older colours.

Appendix 3

Chinese Mandarin Squares

NOTE:
This appendix is included on page 265 of the print copy
of the thesis held in the University of Adelaide Library.

Higher ranked officials could wear either two birds or two animals or both on their mandarin squares, but lower ranked officials could only wear one bird or animal, unless the Emperor granted them the right to wear another.

Mandarin squares Spurlock Museum, University of Illinois.
http://www.spurlock.illinois.edu/explorations/online/MandarinSquares/patterns.html

Appendix 4 Chinese names for Textile terms

Terms associated with the Looms

Bamboo barrel loom	*zhulong ji*
Cloth beam	*buzhou*
Double beam loom of Lu	*shangzhou Lu ji*
Float	fu
Heddle rod	*tiaohua gan*
Heddles	*zhongyan*
Loom	*zhiji*
Monochrome cloth	su
Pattern tower	hualou
Pick an extra thread going cross the loom to form patterns	*wei xian*
Shaft	Zongpian
Shed	*suokou*
Shed opening for the shuttle to pass through	suokou
Shed stick	Kiakou gan
Shed stick	*kaikou gan*
Shuttle	*suo*
Silk floss	kuang
Silk tabby or plain silk	*juan*
Silk pictorial tapestry	kesi
Silk twill	ling
Silk yarn	*si*
Slanted loom	*xie zhiji*

Slanted loom with two treadles	*Xie zhiji*
Shuttle	*suo*
Tapestry weave term used after Eastern jin	*zhicheng*
Textile	*zhipin*
twill	*xiewen*
Warp	*jing*
Warp beam	*jingzhou*
Warp threads stretched	*jingxian*
Warp, warp ends	*jingxian*
Weft	*wei*
Wool tapestry	*kemao*
Wool twill	*xiehe*
Backstrap loom	*yaoji*

Taken from Angela Sheng's description of the weaving process[495]

495 Angela Sheng, "The Disappearance of Silk Weaves with Weft Effects in Early China," Chinese Science 12 (1995).pp.63-65.

Names associated with cloth

Ancient term for knitted silk band done with a needle	*xun*
Ancient term for silk band	*zu*
Ancient wool twill	*xiehe*
Band, belt	*dai*
Belt hooks	*daigou*
Braided silk band with "thousand gold" words	*qianjin tao*
Central weaving workshop seal	*zhong zhi shi shu*
Cloth	*bu*
Cloth-beam	*buzhou*
Colour: black	*xuan*
Colour: yellowish red	*xun*
Creeper vine	*ge*
Crossed opening of front of gown	*quju*
Dress style with left side front coming across to the right side of the person	*zhisi*
Extended silk tabby of 2 warps (or 2 wefts), jian	*hufu*
Extended tabby of 2 warps or 2 wefts in silk	*jian*
Fine cloth of creeper-vine	*Chi,*
Fine wool	*je*
Fine wool tabby	*ji*
Float, floating warp or weft	*fu, fuxian*
Han warp-faced tabby with warp floats 3/1 on every row	*qi*
Hemp cloth	*xi*
Leather	*ge*
Lined cloth	*jiayi*
lined clothing	*jiayi*
Loose long robe with crossed front	*shenyi*
nomadic dress	*hufu*
Pattern	*hua*
Patterned wool tabby	*huaji*
Patterned wool tabby	*huaji*
Pearl	*ji*
Purple plain cloth	*zhibei*

Ramie	*zhu*
Robe padded with silk floss	*mianpo*
Satin weave, only of silk	*duanwen*
Selvedge	*zhibian*
Shaft	*zongpian*
Shuttle thrown	*paosuo*
Silk Band (ancient term)	*tao*
Silk polychrome warp-faced compound tabby or twill with piled loops (pseudo-velvet)also called qimaojin	*qirongjin*
Silk satin	*duan*
Silk twill (ancient Chinese)	*ling*
Single layered clothing	*danyi*
Single-layered clothing	*danyi*
Tabby of bast fibres	*bu*
Tabby of wool	*he*
Tabby weave	*pingwen, bo then zheng*
Tapestry band or belt	*kedai*
Threading through and crossing back	*chuanrao*
Trim of edge of clothing	*yuan*
Twill	*xiewen*
Unbleached and undyed tabby (ancient meaning, after 5th CE all tabby weaves)	*juan*
Weave or binding system at edge of cloth	*zuzhi*
Weaving master	*zhisi*
Woven patterns	*zhiwen*
Woven wool	*dazhi*

Appendix 5

Russian Studies of Noin–ula Textiles

Up until 1932 the Russians, and presumably other nations, found that iron was the only easy dye to identify positively. Photography was another method relied on to help with analysis as colours and dyes During the succeeding years other methods have been employed using hydrochloric acid to extract the dyes from silk and wool, but this leaves a glycosidic residue (sugar like molecules) that can inhibit the clear colour of the original from plants, particularly for the sensitive yellow dyes.[496] During 2005, Professor Richard Larson and research student Xian Zhang from Boston University refined a technique for analysing the dyes used in these ancient fabrics. Larson and Zhan used a gentle method using the chemicals ethylenediametetraacetic acid (ETDA) and formic acid as these do not disturb the glycosidic (sugar) links in place within the dyes. These dyes were then analysed "using a combination of high performance liquid chromatography, mass spectrometry and a diode array detector to determine their solubility properties, molecular weight and exact colour absorption in nanometres" (a measurement using a billionth of a metre).[497]

496Ann Marie Menting, Boston University Chemists Probe Secrets in Ancient Textiles Dyes from China, Peru, 2005, Eurek Alert, Available: http://wwww.eurekalert.org/pub_releases/2005-03/bu033105.php, 9/10/2006 2005.

497 Menting, Boston University Chemists Probe Secrets in Ancient Textiles Dyes from China, Peru.

Appendix 6

Some Common Symbols found in Woven Fabric and Embroideries

Bamboo symbolizes longevity and courage, and an honest official.

Bat has the same homonym as fu meaning happiness, so bats are considered to bring happiness especially when more than one is shown. If five bats were used they symbolize the five blessings as well. The blessings are longevity, health, wealth, virtue and natural death.

Buddha's hand is the name of a citrus fruit looks like a hand outstretched to receive money so it is considered to bring wealth and divine protection.

A butterfly suggests great age and is shown as a symbol of joy and marital happiness. The butterfly is an ancient symbol and would have been recognized as to its meaning during the Han period.

Cats known as silkworm protectors as they could see in the dark were revered. The word for cat and octogenarian has the same sound. Therefore the cat is considered to bring protection and long life.

Chrysanthemums are one of the important flowers in China as they flower in autumn and so are considered to represent contentment in middle age. Other important flowers used as symbols are the magnolia blossom for female beauty, narcissus for a sign that winter and the New Year, peony is for summer and love, lotus for purity.

Wan is one of the oldest symbols used in designs. It is thought to belong to very ancient shaman rituals in China. It is the ancient swastika sign of prosperity and good life. It represented the revolving sun, the giver of life.

Yin and Yang symbolizes the opposites in nature. The light part is male and the dark side female.