Researching textile colours in the Tarim Basin along the Silk Roads
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Citation

Koopen, V. (2024). *Researching textile colours in the Tarim Basin along the Silk Roads.*

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Thesis BA3 1083VBTHEY

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Leiden, 14-12-2023

Final Version

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Introduction

1.1 Introduction / Foreword

The Tarim Basin is an area of 888,000 km² located in the Xinjiang region of China. It lies within the Xinjiang Uyghur Autonomous Region (XAUR). The Uyghur name for the Tarim Basin is Altishahr, meaning six cities. The basin's northern boundary is formed by the Tian Shan mountain range and its southern boundary is similarly formed by the Kunlun mountain range. It should be noted that the region is known by many different names, as the many cultures in the region all have their own names for it. Qing sources often refer to the Tarim Basin as Nanlu or Nanjiang, and the western name for the region is Kashgaria. For the sake of consistency, the region will only be referred to as the Tarim Basin within this work.

The Tarim Basin is home to the Tamaklan desert, and is an extremely arid region. As it lies in the shadows of the Himalayas, the region has a cold desert climate. This icy, dry climate makes it perfect for preservation. Organic material is freeze-dried in the sandy soil, and therefore nothing is lost to decomposition. This makes the Tarim Basin a gold mine for archaeologists, as it is possible here to study and work with organic material that is almost always lost to the ages, and so, the ravages of time. Many intriguing finds have been found all over the Tarim Basin, such as the famous Tarim Mummies. These mummies found within the basin are found in near perfect state, with recognizable facial features. Their clothes, hair and even eyelashes are still perfectly intact. They are wrapped in the textile they were buried in, which makes it possible to research not only their burial customs, but also their artisanry, the materials they used for clothing, their tools, and their fashion. This allows a much greater insight into the cultures and daily lives of the people on the Silk Routes than was previously possible. The state of these mummies makes it possible to do a DNA analysis, to find out where these people came from. This is an interesting question, as many of the mummies had red hair. These people likely had roots to western Europeans as well as Eastern Asians. This strengthens the idea that the Tarim Basin was a melting pot of cultures, languages, religions, and ethnicities.

Besides mummies, there has been an abundance of other perishable materials found in the Tarim Basin, which include documents and textiles. This thesis will be focussing on the second category. The textiles found in this region are incredibly well preserved, and there are many extensive collections of many different kinds of textiles found in the region. These textiles are classified into four categories: material, use, colour, and patterns. These, of course, all overlap, since one piece will have a source material, will be made for a specific use, and will be decorated with certain colours and/or patterns. The textiles found come in a wide variety. The materials used range from silk to felt, and they were used for many different purposes, for example as everyday clothing, part of armour, shoes, bags, or even wall decorations. The textiles came in many distinct colours and with many different patterns, ranging from monochrome to multicoloured. Especially this last category will be examined further within this thesis. Textile decoration is an excellent way to express identity, and so the colours and patterns used in textile production can hopefully tell us more about the culture and lifestyle of their creators.

For example, there are many mummies found with woollen attire, which has been preserved to the extent we can see the patterns in the textile, the way it is fashioned on the body, the colours that were used and even the way of production. Even the items that have not been preserved as well can still give us an insight into the colours and patterns used throughout the Tarim Basin and can help us link different peoples and cultures. Burial sites have been found in the Tarim Basin that are hundreds of miles apart, but show the exact same burial customs.

They use the same method for fashioning their coffins, they bury their deceased in the same clothes, with the same style of grave gifts. In these burials, all the deceased individuals wore felt hats with red thread and feathers on the hat, while the graves were over a hundred miles apart. This indicates the spread of a culture and tribe throughout the Tarim Basin, and it was this specific case study that piqued my interest in this topic. By studying the use of colour in the Tarim Basin, we can possibly connect more ancient peoples and tribes, and study the spread of cultures throughout the basin. We can study the way cultural patterns were influenced by other tribes and the influences of colour itself in the Tarim Basin. From that perspective, this thesis means to contribute to understanding the people in the Tarim Basin by means of my research question:

'Are there noticeable differences in the usage of colour in textiles throughout the civilizations of the Tarim Basin, and what are these differences?'

With this research question I have the following sub-question:

'In the past dating and determinations were always based on visual/cultural style. Has this led to misunderstandings? Can a more scientific approach give new insight?'

1.2 Historical background

The Tarim Basin is located in the northwest of China, but its history is far from being just Chinese. The basin has been home to many peoples, cultures, languages, and religions over the centuries. People who had to leave their home country or province for whatever reason could build a new life here, and the Tarim Basin soon became a melting pot of cultures. This was an extremely useful characteristic for a trade hub, and the region soon became a large and important trade centre. In China, the area became known as 'The Gate to the West' after the construction of the Jade Gate near Dunhuang (Top, 2022). With people from diverse cultures, regions and languages, trade with faraway lands became much easier. There was always someone to translate, and cultures intermingled and mixed, taking over ideas they thought were interesting from the other, and integrating them into their own cultures. Therefore, many items from the region have influences from several cultures and cannot always be pinpointed to one region. Textiles work in the same manner.

Figure 1. The Silk Road routes shown on a geographical map. The Tarim Basin is the area indicated with red arrows.

The famous Tarim mummies and their ancestry tell us a tale of the many cultures of the Tarim Basin, as they have been found to have western ancestry. The mummies have red locks, which is not a hair colour naturally found in Asia, so they might have their origin much further west. This means there was a level of diversity within the Tarim Basin, and active trade routes for travellers from such far-off places to travel to the Tarim Basin.

The fight for power

The Tarim Basin tribes had been subjugated by the Xiongnu and were under their control. The Xiongnu and Han Empire waged war against each other with victories on either side, with the Xiongnu being victorious against Emperor Gaozu after they confederated under Khan Maodun (Loewe 1986b, p.127).

After finally defeating the Xiongnu tribe in 127 BCE (Yü 2008, p. 390).
 and taking control of the Tarim Basin, emperor Wudi (141 to 67 BCE) built the jade gate at Dunhuang in 114BCE, the westernmost city in the empire, thereby literally opening the country to foreigners and allowing a rich trade to start. The Tarim Basin became the westernmost point in the Han empire, and even though it was not officially part of the Han commanderies, the emperor had an administration set up in the area to govern it from afar (Sheng et al. 2020, p.1).

This was done under the "Protectorate of Western Regions", laws put in place around 60 BCE to protect the region from the Xiongnu (Ying-shih 1986, p. 392). These military outposts were called 'tuntian' and encompassed the entire Tarim Basin. While these outposts functioned as the westernmost border of the empire and strengthened the empire's position as an important player in the Silk Roads trade (Sheng et al. 2020, p.1), the Tarim Basin was a remote region, far removed from the capital and imperial court, and the culture of the Han Chinese rulers soon became a part of a large mixing pot of cultures. These tuntian were self-sufficient bases which brought a large number of Han Chinese to the basin, but through exposure to the many local cultures they started taking over some local customs and influenced local cultures themselves. As the Tarim Mummies show us, the tribes of the basin might have origins ranging from East Asia to regions much further west.

Even after the defeat of the Xiongnu and the takeover of the basin by the Han empire, the basin was still a contested region and was anything but quiet. Contemporary Chinese records show that the Kushan empire sent military forces into the Xinjiang region in 90 CE (Hansen 2012, p. 32). The Xiongnu would also remain a very real threat, as Sogdian letters found in Dunhuang state. According to these letters, the Xiongnu had not ceased their attacks on the Han empire, and managed to sack Luoyang in 190 and again in 311CE, this time connected to a general who had suspected ties to the Huns, according to the author of the letters (Hansen 2012, p. 118). The northern Xiongnu would succeed in re-capturing the northern region of the Tarim Basin from 107 to 123 CE, while the southern Xiongnu had been defeated and absorbed. The Xiongnu would once again be defeated in 126 CE, but the Han empire also disappeared as internal struggles finally took their toll. The Kushan empire, which at that point controlled Khotan, used this power vacuum to expand their empire to the entire Southwestern part of the Tarim Basin in the first half of the third empire (Bregel 2003, p. 10). The material culture from the Khotan kingdom in the third century shows coins with Kharosthi (Kushan script) on one side and Chinese script on the other (Hansen 2012, p. 203). It was only in the seventh century that the Chinese would be able to reclaim their territory in the Tarim Basin during the Tang Dynasty.

Once again Xinjiang would face a change in the ruling party after an attack from the Hephthalites in the south and the Xianbi (known for gaining victory over the Xiongnu and driving them west) in the north, before the Xianbi themselves were defeated by the Rouran in the fifth century CE (Bregel 2003, p. 12).

China joins the Silk Road trade

In connecting his empire to the rich and illustrious Silk Roads, Emperor Wudi guided the Han dynasty into a new age of prosperity. The addition of China to the Silk Road trade meant a steady flow of high-quality Chinese silks to the West, earning the Silk Roads their name. Silk was the main currency of the Silk Roads, although it was not the only one. Grains, rugs, and coins were also used as currency, but the preferred currency in the Chinese empire remained bolts of silk cloth. The earliest evidence of Chinese activity in the Silk Road trade is a contract from 273 CE, which details a trade of bolts of Chinese silk, which would most likely be traded for grain or rugs. Glass beads in the Xinjiang province also point to trade. As the Han empire opened its borders to trade, they profited from this by receiving knowledge and technologies previously unknown to them, like the technology to make glass.

Before Emperor Wudi opened the country to trade and Chinese silk gave the Silk Roads their name, it had many other names. It was named in parts, detailing the territories it flowed through, like the 'Persian Royal Road' (Graf 1994, 167-189).

The name Silk Road was given by baron Ferdinand von Richthofen in 1877
(Fuxi et al. 2009, p.41).

This steady influx of trade also meant many travellers and merchants brought their culture and religions with them, which had a substantial influence on the Tarim Basin and the territories along the Silk Road. The spread of Buddhism was facilitated through the Silk Road. Merchants and travellers from India made their way east and brought their religion with them. Buddhism spread fast and caught on in the East and is still a big part of many cultures in East Asia today. Buddhist imagery is visible in material culture throughout the Silk Roads, through many different mediums, like text, rock art and textiles.

While the Tarim Basin peoples were subjugated by the Xiongnu or the Han Empire, they were never one people, or one culture. The basin had many different tribes and kingdoms, who traded amongst each other, but each had their own vibrant culture. In these kingdoms, evidence can be found for the presence of the various Chinese dynasties, like in the kingdom of Kroraina, especially in its cities Loulan and Niya. The kingdom of Kroraina spanned about the length of the United Kingdom in the modern day.

Figure 2. The kingdoms of the Tarim Basin highlighted.

A wealth of documents in the Kharosthi script have been found here, detailing bills of trade, land ownership, letters, and many other events. The city of Niya is part of the kingdom of Kroraina, a lost civilization with no written languages and histories that have survived to this day. That makes the many documents found at Niya and Loulan incredibly important to understanding the culture. All we know of the kingdom either comes from documents found in Loulan or Niya, or from preserved artworks in the cities of Yingpan and Miran (Hansen, 2014, p.27). Many of these documents detail the trade of silks, as bolts of silk cloth were used as currency, and so a significant number of these documents mention textiles.

The ruins of Loulan are an archaeological treasure trove, which produced many textiles, arrowheads, and bronze 'wuzhu' coins, dated to 86 to 1 BCE. The ruins of Niya also produced many textiles, such as Chinese silk and cotton from West Asia (Hansen 2012, pp 38-39), next to wood carvings in the Gandharan style, and Chinese documents. Several mummies found in Niya had phenotypes suggesting an origin in the Iranian Plateau, which again points to trade and contributes to the melting pot of cultures in the Tarim Basin. The burial ground at Niya resembled the pit graves at Sampula and at the Yingpan cemetery, so it is speculated these people belonged to the same culture and travelled to other settlements.

Many of the sites in the Tarim Basin use the same basic colour pattern, which is buff, red, natural black, brown, and grey. These will be supplemented with various shades of blue, green, sometimes even pink, or purple. The patterns are similar to ones found at Niya.

Niya is a site in the southwest of the Tarim Basin that entails a rich cemetery and a wealth of archaeological knowledge. This site is a large burial site and can tell us about burial rituals, different people that might have been living at the site, their culture, and the materials they used and how they used what they could.

The site has given us a large number of textile samples, made from varied materials in distinctive styles, with a large array of colours. According to Sir Aurel Stein, in the plain-weave textiles, there's extensive diversity in texture, although 'coarse' and 'canvas-like' seem to be the most prevalent. In his work, he describes the textiles as having colours like 'brick red, dark pink, crimson, dark grey and dirty white, yellow and buff' (O'Neale, 1936. p. 424).

There are also some carpet fragments, with two woollen fragments in the style of the cotton Darri. Niya even has one example of pile weaving, a carpet similar in production to carpets found at Loulan, apart from the reverse side tufts (O'Neale, 1936. p. 425).

Niya is also rich in documents which tell us much about civilization in the time of the ancient Silk Roads. Many documents in the Kharosthi script have been found here, detailing anything from trade deals to personal letters to government official business.

1.3 Methodology

Due to the nature of the database and materials, the methodology will be mostly literature-based. I will be looking at several types of sources. These include excavation reports, theses written about the region and/ or on textile production, several academic and peer-reviewed books on textiles from the region and textile patterns, articles in scientific journals, and sources derived from the catalogue of the Textile Research Centre (TRC) in Leiden. I will be researching colours, and, through this, also patterns, to try to discover if I can find connections between patterns in the Tarim Basin, and what that might say about their spread. In this thesis, I plan to put together a dataset consisting of a hundred textile samples from multiple sites in the Tarim Basin. From these one hundred samples, several individuals will be studied further and discussed separately in the case studies chapter. I will return to these in the discussion chapter as well.

Most of the samples in my dataset will come from literary sources, but in a very exciting turn of events, the Textile Research Centre in Leiden has some small pieces of textile from the Xinjiang region, dating back to the Han period which I will be able to use. Initially, I had thought there would be no textiles recovered from the Han dynasty, and certainly not ones available to me. The TRC has allowed me to bring a professional photographer from the faculty of Archaeology with me. Benjamin de Groot, a resident photographer of the faculty of Archaeology, has accompanied me to the TRC to take high-quality pictures of these textiles. The photos have been taken using a professional camera setup to get the best quality pictures, so I will be able to include these in this thesis and use them as case studies. These photos will be property of the faculty of archaeology, and therefore might be used in further university-affiliated projects.

The dataset will provide an overview of the samples used in this thesis, and will be used to analyse pattern and colour changes and similarities throughout the Tarim Basin. A few samples from this dataset will be used as case studies, which will then be compared to the samples from the TRC.

For the technological aspect of this thesis, I have worked with non-invasive methods only, so as to not damage the textile samples. This includes a microscope analysis of the TRC samples. The TRC has allowed me to use a microscope to study the samples on a deeper level. This microscope has been provided by my supervisor, Marike van Aerde, after which we analysed the samples together. With the microscope, it is possible to discern whether a sample has been dyed or woven into a pattern, and so tells us more about the customs of cultures around the Tarim Basin.

A discussion of my results will then follow, especially focussed on the findings from analysing the dataset and the (zoomed-in) case studies.

1.4 Relevance

The Tarim Basin mummies are immensely popular in studies so far, but while the Tarim Basin has often been studied, little attention is still paid to textile samples and what we can learn from them. While there has been more interest in the region's textiles with the discovery of the Tarim Mummies, the site's textile history is still largely ignored. The area, like many on the Silk Roads, has been researched and studied in context of its relationship with the two main powers, China in the east and the Roman Empire in the west. The many Indigenous tribes, nomads, travellers, and merchants in the region are often ignored. The Tarim Basin is a large melting pot of cultures and has a rich history, which goes far beyond being China's gate to the Western world. There is much to still be discovered, this area has yet to reveal many of its secrets. Hopefully, this thesis will help bring to light another small piece of the Tarim Basin's extensive history and help contribute to further research of the area, especially regarding its fascinating textiles.

A second reason why this thesis is relevant is because there is a tendency in the archaeological world to assume everything is of Roman descent. This is because many archaeology schools have a background in the western world, where the Roman Empire is often viewed as the most important point in history. The Roman period is seen as the origin of society, the historical goldmine the western world itself was born from. This is a problematic stance on archaeology and history in general, as this is already not completely accurate within the western world. Using this worldview on cultures and history outside of Europe is therefore problematic in the extreme. Not only is this inaccurate, but it also helps to bury the rich and interesting culture and history of these sites. If the Roman-centric archaeologist is looking for supposedly Roman influences in an archaeological site, they will not spare the effort to look for an answer in local mythology and cultures that would make more sense in context.

For example, if a winged, flying creature with animal legs is discovered, there is an exceedingly high chance it is assumed to be a hippogriff originating from Greek and Roman mythology without further thought. This completely ignores other possible origins, like in Persian mythology, where you will find similar creatures like the Qoqnoos or the Huma bird (Haghighat, 2020).

While doing research, this was also something I often found in many of the sources I used. These would sometimes include claims like stating a background of red and blue colours was distinctly Roman, as if colours did not exist elsewhere in the world. By researching colours and patterns, I am looking at the colours of dye used, the origins of the patterns and the cultural traditions involved in making these textiles, so I can test myself if everything really is, in fact, Roman.

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1.5 Structure

In this thesis an overview can be found of the textiles found in the Tarim Basin. The topics discussed will be the origin of the textiles, the materials used, the textiles' colours and patterns, their possible cultural significance, and their production method. I have created a database of a hundred textile samples found within the Tarim Basin, and will highlight a small number of textiles from this catalogue in a separate chapter of case studies. The Textile Research Centre (TRC) in Leiden has kindly allowed me to work with their collection of textiles from the Xinjiang region, which I will be using for my case studies. The TRC has a collection of six fragments, which will all be represented in the database.

The first chapter of this thesis presents information on the topic and its historical background. It states my research questions and why I have chosen to write about this particular topic.
It also contains the methodology, where I discuss how I will go about my research and the writing of this thesis, and what methods will be used. The chapter continues with the relevance of the topic, explaining why this topic is important to archaeology, and how it might even impact disciplines beyond archaeology. Lastly, this chapter ends with a detailed explanation of the structure of this thesis, and what you can expect of each chapter. This chapter is a more detailed version of the table of contents.

In this second chapter, you will find the state of the research where I explain what research has been done so far and the possibility of future research in the region. In this chapter, I discuss my most prominent sites on a deeper level and talk about my sources.

The third chapter will consist of the data. Here is where an overview of all the textiles used for my research can be found, with information on where they are from and why I chose these sites. In this chapter, I present a database with a hundred textile samples and every piece of information on them available. It will contain, as much as can be found, their origin, which time period they belong to, what colours are used, the patterns present, the source they are derived from, and any additional comments deemed necessary. The dataset was originally placed in the appendix, but after discussing it with my supervisor we deemed it more important for the dataset to be integrated in the work. It is listed as a figure, and has not been counted towards the word limit of this thesis.
This chapter also discusses the six samples from the TRC in a wider context through individual case studies. Here is where you will find detailed information on these six samples and my analysis of them. This chapter's main point is to present the data and information used in this thesis in an organised manner. The database will make the textile samples used for this thesis easily accessible.

Chapter four is the discussion chapter, which will consist of the interpretation of the data presented in chapter three.

After having presented the database, it is then time to discuss what all this information can tell us about the textile samples, and thereby ultimately, the whole of the Tarim Basin. The information in the database will be studied, and this chapter will focus on the following results of my research. The textiles are compared to look for similar colours and patterns, and to study the differences in material and weaving techniques. This chapter will focus on interpreting the data from chapter three and discuss the extent of my research so far.

Then, the fifth chapter will be the conclusion. As the name states, the conclusion will discuss what has been written in the thesis, and will return to the research questions stated in chapter one to finally answer them. Or, if it is not possible to answer them, it will discuss why. This chapter will discuss in short what the research goal was and if it has been achieved, and by what methods. Then it will discuss the possibilities for future research and how this thesis may contribute to knowledge about this topic. In short, in this chapter you will find the results of the research and a brief overview of the entire thesis.

Then, lastly, follows chapter six, the appendix. This will consist of separate lists of the figures, graphs, tables, and maps referenced in the text. Likewise, every piece of valuable information too large to fit into its designated chapter will be found here.

2. State of the research

While the region has been studied extensively, the state of research in this area is sadly not as good as it could be. While there are many sources about the Tarim Basin, only a limited portion of those are about the textiles. Even within these sources, it is very rare to find publications that discuss the textiles in a manner more descriptive than an offhanded mention, in the best cases provided with a photo of the textile being described. The Tarim Basin remains an ever-fascinating topic, but in the last few years publications on the region have dwindled.

The region is based in the northwesternmost part of China, and currently is not very accessible. This makes new research in the area exceedingly difficult, which is part of the reason why the region's textile history is largely unknown. The research conducted in the region is therefore unfortunately somewhat dated. Many of the sources used in this thesis are from the early 20th or even late 19th century, making them close to or over a hundred years old. While there are more recent sources, these are often in Chinese, which I cannot use as I do not speak Chinese.

The older sources are often from explorers in the region like Sir Aurel Stein, and while they do mention the textiles, they are often not the focus of the text. They are still very valuable sources though, as they are detailed about the findings and tell us a lot about the culture and traditions of the tribes in the Tarim Basin.

A very helpful source is always museums. The TRC catalogue has been immensely useful, and so have the collections from the Met in New York, the British Museum in London, and the Turfan expedition in the Humboldt Forum in Berlin.

Although throughout this thesis sites from all over the Tarim Basin have been used, the sites that are most prevalent are Loulan in the Lop Nur area, and Sampula and Niya in the Hotan prefecture. These are the most well-known sites, and are a true treasure trove of information.

The ruins of Loulan in particular are an archaeological gold mine. Many of my textile samples come from this site, but while particularly interesting to me, that is not what the site is most known for. Loulan's main attractions are the perfectly preserved mummies found at the site, in particular the 'Beauty of Loulan.' These mummies have remained so intact, they even still have eyelashes. Their attire tells us a great deal about their funeral rituals, their daily life, the materials at their disposal and their artisanry.
The first archaeological excavations at Loulan have been carried out by Sir Aurel Stein (Sir Hedin discovered the site six years earlier) in one of his many expeditions to the deserts of what was then Chinese Turkestan (modern-day Xinjiang). His written accounts are still one of the most interesting and valuable I have encountered, and many of the sources used refer back to him and his excavations. Loulan would finally be abandoned at the start of the early 4th century A.D.

In his works, Sir Aurel Stein mentions many grave sites containing bodies wrapped in old, worn-out fabrics. These were once garments, heavily worn and when no longer useful as clothing, were used to cover the bodies of deceased loved ones. This is particularly useful to me in my research, as it can show us the use-wear pattern of different textiles, materials, colours, and patterns and how these tribes used their textiles. Textiles were always given a second or third life, once they were no longer usable in one way, they were repurposed into something else.

The site Sampula is mostly known for the 'Sampula trousers', a very well-preserved pair of trousers belonging to a horse rider, which may have been one of the world's oldest trousers. They were made from a large wall tapestry, likely being torn down during a raid or battle and being cut and refashioned into trousers, possibly as a symbol of wealth and power. These trousers show us the technique and artisanry used to make this tapestry, the materials and dyes used, but most importantly, depict contemporary figures and therefore are a firsthand account of fashion and culture of the times.

Another site that is known for its ancient trousers is Yanghai in the Turfan region. Here a pair of trousers belonging to a horse rider have been found dating back 3,000 to 3,300 years, possibly making them the oldest pair of trousers in recorded history. The arid climate of the region has preserved the organic material in its gravesites almost perfectly, so these trousers are in an incredibly well-preserved state.

The nomadic tribes of Western Asia are often credited with the invention of trousers, although there is no clear consensus on exactly where and when this revolutionary invention took place (Beck et al, 2014). Trousers as a one-piece garment was a truly ingenious and completely new idea in fashion, as people wore skirts, dresses, and tunics with simple leg coverings before. These leg coverings/leggings consisted of three parts: a pant-tube for each leg attached to a waistband and a loincloth to protect the genitals. These were separate for ease of mobility and, essential for horseback riders, did not interfere with a wide spread of the legs when on horseback. This new garment was an improvement upon the old system of leg and crotch coverings, while making the garment more durable while maintaining a level of comfort and also retaining the efficiency and ease of use. For nomadic tribes living on horseback this was an absolute necessity.

To gain a more complete understanding of the Tarim Basin textiles and their history, much research remains to be done. The literature gives us many theories, but there are not yet many conclusions to be drawn, and so many questions remain yet unanswered. There is no comprehensive research and understanding of the data, something I hope this thesis will change, albeit slightly.

3. Data

3. Data overview

In this chapter you will find an overview of all the sites I have worked with while writing this thesis, and the materials found there. I will also be discussing a small number of textile fragments from the TRC in separate case studies.

The Tarim Basin is a rich and vast area, with many tribes, cultures, languages, and, of course, a rich material culture. For my research, I have used sites throughout the entire basin, from Loulan in the east to Kashgar in the west. Many of these sites contain a wealth of material culture, and due to the arid climate, this includes many textiles.
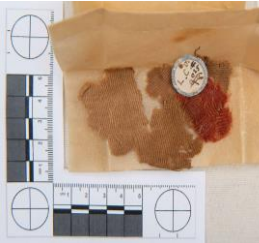
Table 1: Sites used per province in the Tarim Basin

NR.	Prefecture	Site Name	Site Type
1	Lop Nur Area, Bayin'gholin Mongol Autonomous Prefecture	Xiaohe Mudi, Qäwrighul, Töwān, Ancient Loulan Tombs, Yingpan Burial Ground, Zaghnluq, Cherchen, Karashar, Miran	Cemetery/ Ancient city
2	Hotan	Sampula, Niya,Khotan, Keriya, Wuyulaike	Cemetery/ Ancient city, River
3	Gansu	Dunhuang	Ancient City/ Army base
4	Turfan	Gaochang, Yanghai, Jiaohe, Toyok, Sengim	Ancient City/ Cemetery
5	unknown	Aszutana	Cemetery

3.2 Dataset thesis

Number	Picture	Colours	Patterns	Site	Material	Technique	Extra Comments	Source
Example	Insert pic	Red, yellow, blue	Geometric patterns, two patterns (name)	Loulan	Rough fabric, felt, silk etc.	Thin weave, Thick weave	Resembles other textiles from ex. Xiaohe	TRC Xinjiang Textiles
1.		Blue, yellow	Wave-like geometric pattern with two dots in each wave, character visible at the edges	Loulan	Silk	Warp-faced compound weave, Double weave	7.0 x 6.5 cm, 2nd century A.D. L.C.viii. 02 TRC catalogue number: 2000.0009	TRC textiles

2.		Blue, yellow	Wave-like geometric pattern with two dots, Chinese characters in double row at the centre	Loulan	Silk	Warp-faced compound weave	Almost the same as the textile from the TRC, but with different Chinese characters L.C.vii.02.326	Chapter 2 Loulan Textile Ancient Silk Trade Route Page 52 Fig. 13
3.		Dark blue, yellow	Three different geometric patterns	Loulan	Silk	Warp-faced compound weave, double weave	12 x 5.0 cm, 2nd century A.D. L.C.v.025 TRC catalogue number: 2000.0010	TRC Xinjiang textiles

4.		Blue, yellow	Intricate diamond pattern enclosing dragons, with flowers where the diamonds meet	Loulan	Silk	Warp-faced compound weave	8.5 x 4.5 cm 2nd century A.D L.C.v.027.6 TRC catalogue number: 2000.0012	TRC Xinjiang Textiles
5.		Blue, yellow	Intricate diamond pattern enclosing dragons, with flowers where the diamonds meet	Loulan	Silk	Warp-faced compound weave	2nd century A.D L.C.iii.017 TRC catalogue number: 2000.0011	TRC Xinjiang Textiles
6.		Light brown/ red	No pattern	Loulan	Wool	Weft-faced plain weave	2nd century A.D. L.C.V.025 TRC catalogue number: 2000.0013b	TRC Xinjiang Textiles
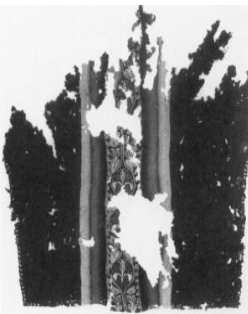
		Blue Yellow	Intricate diamond pattern enclosing dragons, with flowers where the diamonds meet	Loulan	Silk	Warp-faced compound weave	2nd century A.D L.C.iii.017 TRC catalogue number: 2000.0011	TRC Xinjiang Textiles
7.		Blue Yellow	Intricate diamond pattern enclosing dragons, with flowers where the diamonds meet	Loulan	Silk	Warp-faced compound weave	2nd century A.D L.C.iii.017 TRC catalogue number: 2000.0011	TRC Xinjiang Textiles
8.		Dark blue, buff, red, natural	Stripe, geometric pattern	Loulan	Wool			TRC Xinjiang Textiles
9.		Buff cream purple/ brown	Horizontal stripes are woven on top of the cap	Loulan	Felt		6th-7th century L.F.04	Ancient Silk Trade Routes: Cross Cultural Exchanges and their Legacy in Asia Chapter 2 Page 44 Fig. 3

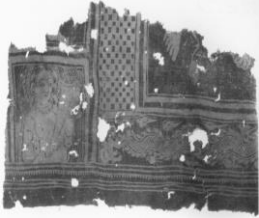|								
10.		Purple/ pinkish white blue/ black	Geometric shape and crooked vertical lines	Loulan	Wool, felt, silk	Embroidery	L.C.V.013 14 cm length lozenge with ribbon	Ancient Silk Trade Routes: Cross Cultural Exchanges and their Legacy in Asia Chapter 2 Page 49 Fig 9
11.		Buff, dull green, light blue, and crimson	Geometric shapes and horizontal stripes	Loulan	Silk		L.C.IV.01a	Ancient Silk Trade Routes: Cross Cultural Exchanges and their Legacy in Asia Chapter 2 Page 46 Fig. 6
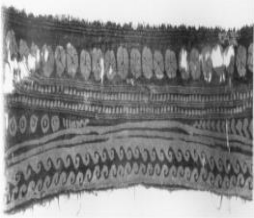
12.		Red, brown	No pattern visible	Loulan	Felt, silk	Two felt and two plain weave fabrics stitched together	L.C.ii.05e	Ancient Silk Trade Routes: Cross Cultural Exchanges and their Legacy in Asia Chapter 2 Page 46 Fig. 6
13.	 Fig. 11: 2000/10/84; L.C.ii.034.	Buff, blue, red, turquoise	No pattern	Loulan	Wool	Hand sewn	L.C.ii.034 Suspended by a blue string	Ancient Silk Trade Routes: Cross Cultural Exchanges and their Legacy in Asia Chapter 2 Page 51 Fig. 11
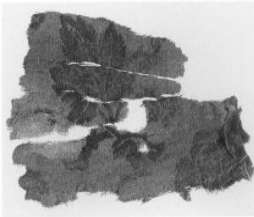
14.	Fig. 14: L.C.iii.017 (iv); 2000/10/46.	Buff, blue	Pattern of peacocks and characters	Loulan	Silk		L.C.iii.017	Ancient Silk Trade Routes: Cross Cultural Exchanges and their Legacy in Asia Chapter 2 Page 52 Fig. 14
15.	Fig. 7: L.C.01.	Buff, blue	One geometric pattern and horizontal stripes	Loulan	Silk		L.C.01.	Ancient Silk Trade Routes: Cross Cultural Exchanges and their Legacy in Asia Chapter 2 Page 47 Fig. 7

16.		Buff, blue	Many animals, mythological or otherwise and vertical stripes	Loulan	Silk	Warp-based design	L.C 07,a,b Chinese characters woven into the design Width: 47 cm	Ancient Silk Trade Routes: Cross Cultural Exchanges and their Legacy in Asia Chapter 2 Page 47 Fig. 8
17.		Unknown	Head of Hermes with chain-linked pattern	Loulan			Tapestry Find original source for colour	Recent finds of Western- related Glassware, Textiles and Metalwork in Central Asia and China By Ellen Johnston Laing Fig. 9
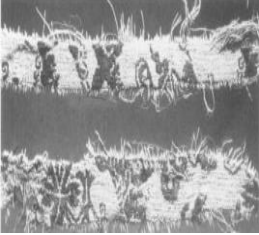
18.		Unknown	Stripe of geometric pattern enclosed by vertical stripes on a single colour background	Loulan	Wool		Tunic Find original source for colour	Recent finds of Western- related Glassware, Textiles and Metalwork in Central Asia and China By Ellen Johnston Laing Fig. 13
19.		Red, pink, white, buff, light blue, black, green	Horizontal stripes, diagonal stripes, and geometric figures	Loulan	Wool	Wool knots, two warps.	Carpet, 3rd-4th century. Excavated by Sir Aurel Stein. According to Stein this was a local product.	The British Museum Xinjiang Collection

20.		Red, blue, buff, white, yellow, turquoise(source says blue)	Centaur surrounded by flowers, below a striped pattern left, a floral pattern centre and a striped/ even yellow pattern right. the other part shows a warrior in a long-belted tunic with a spear.	Sampula	Lightweight wool	Cutting tapestry and stitching parts together to form trousers.	Warrior and centaur textile, originally a wall tapestry fashioned into trousers	The ornamental trousers from Sampula Xinjiang China their origins and biography Fig. 2a
21.		Red, blue, yellow, white, dark blue	Animal combat scene above an even red fabric	Sampula	Lightweight wool		Part of tapestry band with animal combat scene. found in many places in the region. often a winged creature attacking a cloven-hoofed animal	The ornamental trousers from Sampula Xinjiang China their origins and biography Fig. 3a

22.		Unknown	Waves and rosettes	Sampula	Cotton	Wax-resist dyed	Find original source for colour	Recent finds of Western- related Glassware, Textiles and Metalwork in Central Asia and China By Ellen Johnston Laing Fig. 7
23.		Unknown	Square of geometric patterns with even band around it, in square of wide geometric leaf-like patterns. edges are alternating vertical stripes	Sampula	Wool	Knotted	Used as saddle rug Find original source for colour	Recent finds of Western- related Glassware, Textiles and Metalwork in Central Asia and China By Ellen Johnston Laing Fig. 11

24.		Unknown	Stripe of geometric pattern within parallel vertical lines on even fabric	Sampula	Wool	Knotted	Tunic Find original source for colour	Recent finds of Western- related Glassware, Textiles and Metalwork in Central Asia and China By Ellen Johnston Laing Fig. 12
25.		Unknown	Grapevine motif	Sampula		Brocade shuttle woven	Find original source for colour	Recent finds of Western- related Glassware, Textiles and Metalwork in Central Asia and China By Ellen Johnston Laing Fig. 14

26.		Blue and white	Three different geometric patterns	Niya	Cotton		Length 81 cm, width 48 cm, museum of XUAR	Museum of XUAR
27.		Buff, brown, red	Thick vertical stripes separated by smaller stripes	Niya	Wool	Warp-faced plain weave	Similar more complete bands were found in tomb 3 and in Sampula	The British Museum Xinjiang Collection
28.		Blue and white	A nude woman holding a cornucopia, a serpent with birds issuing from a creature's mouth, a lion's paw and tail, and a human foot	Niya	Cotton	Wax-resist dyed	The source says it's blue and white	Recent finds of Western- related Glassware, Textiles and Metalwork in Central Asia and China

By Ellen Johnston Laing

Fig. 3 |

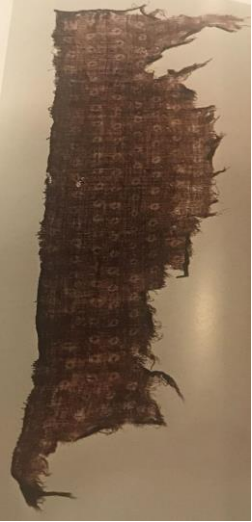| 29.		Unknown	Two-sided pattern of figures, animals, and grape-vines	Niya	Wool		Find original source for colour	Recent finds of Western- related Glassware, Textiles and Metalwork in Central Asia and China By Ellen Johnston Laing Fig. 6
30.		Unknown	Two-sided pattern of figures, animals, and grape-vines	Niya	Wool		Find original source for colour	Recent finds of Western- related Glassware, Textiles and Metalwork in Central Asia and China By Ellen Johnston Laing Fig. 6

31.		Red, white, yellow, blue, turquoise	Embroidered with cloud design (loops)	Niya	Silk	Embroidery	Height 6.2 cm, length 13 cm, width 12 cm.	Museum of XUAR
32.		Red, yellow, blue, blackish brown	Vertical and diagonal stripes, the two black stripes form borders for the diagonal stripes	Niya	Wool		Length 30 cm, width 21 cm	Museum of XUAR
33.		Red, yellow, white, dark blue, buff	Chinese characters geometric patterns	Niya	Silk	Brocade (shuttle woven)	Socks with characters: 'yan nian yi shou da yi zi sun' Meaning 'may you be favoured with many descendants' Length 45,5 cm width 17,5 cm length 43,5 cm width17,3 cm	Museum of XUAR

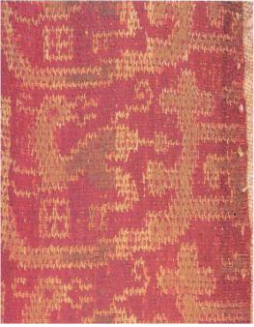| 34.		Red, yellow, pale blue, white	Flowers and leaves	Niya	Silk	Embroidered, attached handles	Diameter mirror 12,3 cm Diameter cover 16 cm	Museum of XUAR
35.		Blue, yellow, green, red, white	Animal motif (fighting animals tiger, dragon)	Niya	Silk	Warp-faced compound tabby weave	Arm guard h inscription "五星出東方利中國 (Five stars arise in the east to benefit the Middle Kingdom)	Genuine Prestige Goods in Mortuary Contexts Emulation in Polychrome Silk and Byzantine Solidi from Northern China Page 24 Fig. 2
36.		Brown, yellow	Vertical striped pattern above monochrome yellow	Niya	Wool		K.70 MAS, 539 3rd-4th century	Glossary of textile terminology based on the documents from Dunhuang and Turfan Page 384

37.		Brown, black	No Pattern	Niya	Silk	Plain weave	Characters on the cloth, translation an option for further research	Glossary of textile terminology based on the documents from Dunhuang and Turfan Page 353 B.10
38.		Red, black, blue(turquoise) yellow	Bird and animal design	Aszutana	Silk	Brocade	Northern Liang Dynasty. Length 94 cm width 25 cm	Museum of XUAR
39.		Red, buff Yellow Dark blue, green, white	*Kui-* dragon design	Aszutana	Silk	Brocade	(Northern Dynasties) length 30 cm width 16,5 cm	Museum of XUAR

40.		Dark blue, buff, red, white, purplish- blue pinkish	Tree pattern and confronting birds and sheep design	Aszutana	Silk	Brocade	Length 26 cm Width 13.8 cm	Museum of XUAR
41		Orange and gold	Dragon with a pearl border	Aszutana	Silk	Damask	Length 25,3 cm Width 21.2 cm	Museum of XUAR
42.		Pinkish red	Rhombic design	Aszutana	Silk		Fancy Leno\n\nLength 47.5 Width 19 cm	Museum of XUAR
43.		Red, white	Floral design	Aszutana	Silk		Length 49 cm Width 14 cm	Museum of XUAR
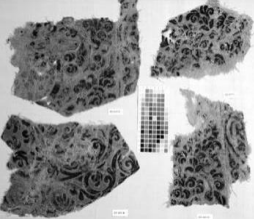
44.		Orange, yellow	Floral pattern	Aszutana	Silk	Wax- resist technique (batik)	Length 34 cm Width 20,5 cm	Museum of XUAR
45.		Pale blue, black	Floral design	Aszutana	Silk		Length 22cm Width 6.5 cm	Museum of XUAR
46.		White, red, black, blue, orange, yellow	Stylized medallion pattern	Aszutana	Silk	Brocade	Shoes Length 297 cm Width 8,8 cm height 8,3 cm	Museum of XUAR
47.		Buff/ yellow, blue, white, red, orange, black, pink, light brownish yellow, deep brown	Lady, part of a second figure	Aszutana	Silk		Painting Height 47 cm Width 20 cm Height appended painting 47 cm width 17 cm	Museum of XUAR

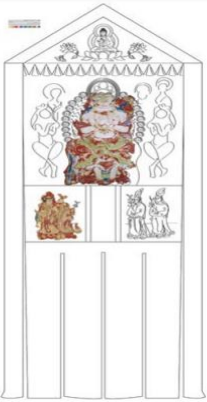| 48.		Light brown, Deep brown, white, black, yellow, red	Fuxi and Nuwa (legendary figures who created the universe)	Aszutana	Silk		Painting Height 220 cm Width 80,9 - 106 cm	Museum of XUAR
49.		Red, white	Dots in a horizontal pattern	Wuyulaike	Silk	Tie-dye process	Length 32 cm width 8 cm	Museum of XUAR
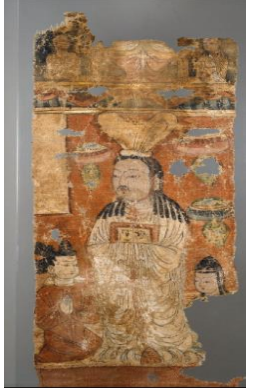
50.		Red, blue, white	Repeating geometric pattern resembling a fighting man or animal	Yingpan	Silk	Warp-faced compound tabby weave	Inscription "deng gao 登高 Meaning 'may you ascend to lofty heights'	Genuine Prestige Goods in Mortuary Contexts Emulation in Polychrome Silk and Byzantine Solidi from Northern China Page 25 Fig.3
51.		Buff, white, red	Monochrome buff/white with red ribbon	Yingpan		Taqueté ribbon embellishment		Genuine Prestige Goods in Mortuary Contexts Emulation in Polychrome Silk and Byzantine Solidi from Northern China Page 30 Fig. 5

52.		Red, yellow	Geometric shapes and Chinese imitation characters	Yingpan		Taqueté	Imitation Chinese character tian 田 [field]	Genuine Prestige Goods in Mortuary Contexts Emulation in Polychrome Silk and Byzantine Solidi from Northern China Page 30 Fig. 6
53.		Red, yellow	A repeated pattern of hunter on horseback with bow and arrow, lion, and dragon with Chinese characters in between them	Zaghunluq	Silk	Weft-faced compound tabby weave (taqueté)	Imitation Chinese characters	Genuine Prestige Goods in Mortuary Contexts Emulation in Polychrome Silk and Byzantine Solidi from Northern China Page 29 Fig. 4
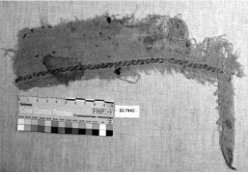
| 54. | | Buff and dark grey (the text says brown and off-white) | Top to bottom: diagonal lines, stripes, stepped pyramid pattern, geometric pattern, zigzag stripes (twice) | Yanghai | Wool | Twill weave, tapestry weaving around the knees, unknown third weaving method at the waistline, unusual twinning method | Horse riding pants with flexible crotch part

(Zoomed in photo in 'how early trousers were designed' same author, Science News) | 'Earliest pants worn by horse riders' By Bruce Bower In Science News, Humans & Society |
|-----|------|------|------|------|------|------|------|------|
| 55. | | Red, yellow, blue, brown | Spirals and half-diamonds, resembling waves. | Cherchen | | | Blue chemise | Characterization of dyestuffs in ancient textiles from Xinjiang

Fig. 2 |
| 56. | | Red, white, dark blue | Stripes, flowers | Cherchen | | | Plaited band skirt | Characterization of dyestuffs in ancient textiles from Xinjiang

Fig. 2 |
| 57. | | Red, yellow, blue, brown | Stripes, a half-diamond pattern, flowers | Cherchen | | | Striped skirt | Characterization of dyestuffs in ancient textiles from Xinjiang Fig. 2 |

58.		Red, blue, yellow	Winged horse	Gaochang (Qocho, Khara-Khoja)	Silk	Weft-faced compound twill		Transcending patterns, Conclusion Page 174

Plate 3 |
| 59. | | Unknown | Swirls and spirals | Gaochang (Qocho, Khara-Khoja) | Silk and linen | Tabby | Four fragments of a saddle cloth. 9th–11th century | Transcending patterns, Chapter 3.

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Fig. 3.3 |
| 60. | | Unknown | Palm tree, grapes, and pañcaṅgulika | Gaochang (Qocho, Khara-Khoja) | | Weft-faced compound twill | 8th-10th century | Transcending patterns, Chapter 2.

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Fig. 2.8 |

61.		Red, yellow, blue, green	Seated Buddha plus attendants	Gaochang (Qocho, Khara-Khoja)	Silk	Weft or warp-faced compound with gilded paper and silk embroidery	Reconstruction of an Uighur banner from two original fragments. 9th–10th century	Transcending patterns, Conclusion Page 175 Plate 6
62.		Yellow, light & dark blue, red, white	Swirls Clouds Plants	Gaochang (Qocho, Khara-Khoja)	Silk and paper	Kesi tapestry with gilded paper threads	11th - 12th century	A Fragmented Treasure on Display The Turfan Textile Collection Page 3

63.		White, black, pink, blue, red, orange	Manichaean Electae	Gaochang (Qocho, Khara-Khoja)	Silk	Temple banner, 10th century, 29.6 x 20 cm	Temple banner, 10th century, 29.6 x 20 cm	LU catalogue Photo
64.		Red, orange, yellow, blue, white, pink, green	Bodhisattva	Gaochang (Qocho, Khara-Khoja)	Silk	Colour is painted on	9th-10th century Length x width: max.: 32 x 25.7 cm Pure object dimensions; Height x width x thickness: 39 x 33 x 1 cm (plate dimensions)	Humboldt Forum Berlin Xinjiang Collection
65.		Red, yellow, blue, orange, black, white, green, brown	Manichaean Donor Portraits, side 1: An Elect Holding a Book	Gaochang (Qocho, Khara-Khoja)	Ramie	Colour is painted on	10th century, 15.5 x 17 cm	LU catalogue photo

66.		Red, white, black, yellow, blue, green, orange	Manichaean Donor Portraits, side 1: An Electa Holding a Book	Gaochang (Qocho, Khara-Khoja)	Ramie	Colour is painted on	Temple flag 10th century, 45.5 x 15.7 cm	LU catalogue photo
67.		Red, orange, yellow, blue, green, pink, black, white	Manichaean Donor Portraits, side 2: Female Lay Follower	Gaochang (Qocho, Khara-Khoja)	Ramie	Colour is painted on	Temple flag 10th century, 45.5 x 15.7 cm	LU catalogue photo
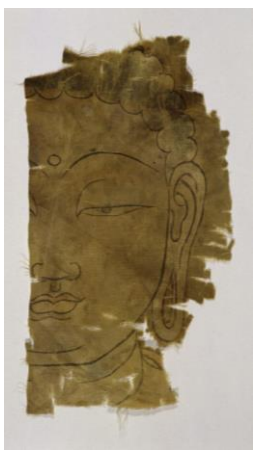
68.		Red, orange, white, black	Manichaean Figure of a Deity	Gaochang (Qocho, Khara-Khoja)	Silk	Colour is painted on, Based on warp alignment		LU catalogue photo
69.		Unknown	A stripe at the edge, dots	Yarkhoto (Jiaohe)	Hemp	Tabby	Fragment with inscription. 9th–11th century	LU catalogue photo
70.		Red, blue, brown, black	Virudhaka with Stupa in the background	Yarkhoto (Jiaohe)	Ramie	Colour is painted on	Temple flag	LU catalogue photo
71.		Red, yellow, orange, black, brown, pink	Goddess Hariti with five children (There are 10 in the painting?)	Yarkhoto (Jiaohe)	Silk	Colour is painted on	9th-10th century 51 x 37 cm	LU catalogue photo

72.		Pink, white, gold, black, red, blue, orange	Head of Bodhisattva	Turfan region	Cotton, bast fabric	Colour is painted on	10th century Length x Width: Max: 13.1 x 10.2 cm; Height x width x thickness: 20 x 17 x 1 cm (plate dimensions) Object number III 609	Humboldt Forum Berlin Xinjiang Collection
73.		Red, black, orange, yellow, blueish grey, white, pink	Mandala of the 1,000 Arms and Eyes of the Bodhisattva Avalokiteshvara	Sengim (Murtuq)	Silk	Colour is painted on	10th-11th century, 27.5 x 38.5 cm	LU catalogue photo
74.		Natural buff/off-white	Monochrome with red string	Miran	Felt		Purse, eighth - ninth century B.C. K.79 MAS.615	Glossary of textile terminology based on the documents from Dunhuang and Turfan Page 385

75.		Buff/ blue/ dark blue or black/ white	Two mythological animals facing each other within a decoration-al banner, likely repeating itself	Unknown site in Xinjiang	Silk	Woven	'Textile with Horned Animals in a Pearl Roundel'	The Met Xinjiang collection 7th to 9th century
76.		Brownish-red/ buff/ dark blue	A procession of rams, per row walking in opposite directions	Unknown site in Xinjiang	Silk samite		'Textile with Processions of Rams' Sassanian cloth ended up in Xinjiang Before Conservation: Warp 19 7/8 in. (50.5 cm); Weft 15 9/16 in. (39.5 cm) 5th to 8th century	The Met Xinjiang collection

77.		Light brown-buff/ blue/ white/ red/ deep brown/ dark blue/ green	Six boar heads encircled in pearl roundels surrounded by peacocks, plants, and decorational shapes	Unknown site in Xinjiang	Silk	Split-stitch embroidery on plain-weave silk	'Textile with Boar's Head Roundels' 7th century Warp 22 1/16 in. (56 cm); weft (selvedge to selvedge) 18 7/8 in. (48 cm) This pattern is an important protective motif popular in Iran, Afghanistan, and Central Asia	The Met Xinjiang collection
78.		Red, white	Two confronting dragons with arch pattern, scroll clouds, paired tigers, and phoenixes	Dunhuang	Jin Silk	Warp-faced compound plain weave	Mogao Caves: Cave 17 Excavated by Sir Aurel Stein 5th - 6th century Northern Dynasty Height: 20.30 centimetres Width: 14 centimetres	British Museum Xinjiang textiles

79.		Red, white	Two confronting dragons with arch pattern, scroll clouds, paired tigers, and phoenixes	Dunhuang	Jin Silk	Warp-faced compound plain weave	Mogao Caves: Cave 17 Excavated by Sir Aurel Stein 5th - 6th century Northern Dynasty Height: 17 centimetres Width:9,5 centimetres Museum number MAS.926.b	British Museum Xinjiang textiles
80.		White, blue, yellow, black, red	The Lokapala Virupaksha	Gaochang (Qocho, Khara-Khoja)	Silk	Colour painted on	Temple flag, 9th -10th century Length x Width: Max.: 17.4 x 12.4 cm; Height x width x thickness: plate dimensions: 24.5 x 19.5 x 1 cm Object number: III 163	Humboldt Forum Berlin Xinjiang Collection

81.		Green, pink, red, white, black	Hand of the Bodhisattva Padmapani (Avalokiteshvara)	Toyok	Silk	Colour painted on	9th- 10th century Length x width: max.: 9 x 4.5 cm; Height x width x thickness: plate dimensions: 16 x 11.5 x 1 cm Object number III 6348	Humboldt Forum Berlin Xinjiang Collection
82.		Yellow/ Natural, Black	Head of Buddha	Toyok	Silk	Colour painted on	8th-9th century Length x width: max.: 14.3 x 8.5 cm; Height x width x thickness: 22 x 16 x 1 cm (plate dimensions Object number III 6420	Humboldt Forum Berlin Xinjiang Collection

83.		Yellow, red, black	Bodhisattva Maitreya	Gaochang (Qocho, Khara-Khoja)	Linen, Silk	Silk embroidery, silk, and metal, possibly gold on linen	10th- 11th century Length x Width x Depth: 40 x 24 x 0.4 cm; Height x width x thickness: 135 x 43 x 1.3 cm, comes with III 4920 b on one plate Object number III 4796	Humboldt Forum Berlin Xinjiang Collection
84.		White, red, gold, black, blue, green	A princess with her daughter	Gaochang (Qocho, Khara-Khoja)	Silk, cotton, paper, metal	Embroidery	10th-11th century Image dimensions: 19.5 x 15 cm (including unrelated fragments); Height x width x thickness: 135 x 30.5 x 1.9 cm Plate dimensions: comes with III 4796 on one plate Object number: III 4920 b	Humboldt Forum Berlin Xinjiang Collection

85.		Pink, white, black, brown	The head of a Lokapala	Toyok	Silk	Colours painted on	8th - 9th century Height x width: 6.3 x 8.4 cm; Height x width x thickness: 13.5 x 15.5 x 1 cm (plate dimensions) Object number III 6350	Humboldt Forum Berlin Xinjiang Collection
86.		White, black, pink, orange Yellow, blue	Bhaishajyaguru	Gaochang (Qocho, Khara-Khoja)	Cotton	Colour painted on	Temple flag, 10th-11th century Length x Width x Depth: Max.: 90.5 x 35.7 x 0.6 cm; Height x width x thickness: 105 x 56.5 x 1.3 cm (plate dimensions) Object number III 4803	Humboldt Forum Berlin Xinjiang Collection

87.		White, black, yellow, orange, red	Bodhisattva Avalokiteshvara	Sengim (Murtuq)	Cotton	Colour painted on	Temple flag, 9th-10th century Length x width x height: max.: 61.5 x 32 x 0.4 cm; Glass dimensions: 73.2 x 41.1 cm; Height x width x thickness: 105 x 43 x 1.3 cm (plate dimensions) Object number III 521	Humboldt Forum Berlin Xinjiang Collection
88.		Blue, yellow, white, red, orange, green, pink	A Buddha, and part of a second Buddha	Toyok	Silk	Colour painted on	Temple Flag, 10th-11th century Length x width: max.: 13.7 x 7.8 cm; Height x width x thickness: 21 x 15 x 1.3 cm (plate dimensions) Object number III 170	Humboldt Forum Berlin Xinjiang Collection

89.		White, blue, yellow, black, red	Two Buddha's	Gaochang (Qocho, Khara-Khoja)	Cotton	Colour painted on	10th-11th century Length x width: max.: 52 x 19 cm; Height x width x thickness: 105 x 29 x 1.3 cm (plate dimensions) Object number III 6301	Humboldt Forum Berlin Xinjiang Collection
90.		Unknown	Uyghur prince	Gaochang (Qocho, Khara-Khoja)	Cotton	Colour painted on	Temple flag. 10th-11th century Length x width x depth: max.: 145 x 51.5 x 0.5 cm; Height x width x thickness: 155 x 61.5 x 1.3 cm (plate dimensions) Object number III 4524	Humboldt Forum Berlin Xinjiang Collection

91.		Yellow, red, black, white, brown	A yelling Arhat man	Turfan Foothills (under the Cave of 84 Siddhas)	Silk	Colour painted on	8th-9th century Height x width: max. 24 x 45 cm; Height x width x thickness: 31 x 52 x 1 cm (plate dimensions) Object number III 7241	Humboldt Forum Berlin Xinjiang Collection
92.		Yellow, blue, green, orange, red, black, white, brown	Two women and a piece of fabric on a very colourful background. Possibly the sea or clouds.	Toyok	Silk	Colour painted on	8th- 9th century Length x width: max.: 10 x 25 cm; Height x width x thickness: 17 x 32 x 1.3 cm (plate dimensions) Object number III 6341	Humboldt Forum Berlin Xinjiang Collection

93.		Pink, red, orange, yellow, blue, black	Bodhisattva Kshitigarba	Gaochang (Qocho, Khara-Khoja)	Silk	Colour painted on	10th-11th century Length x width: max.: Textile: 30.8 x 19 cm; Height x width x depth: glass plate: 40 x 19 x 0.6 cm; Height x width x thickness: 47 x 26 x 1.9 cm (plate dimensions) Object number III 6970 a	Humboldt Forum Berlin Xinjiang Collection
94.		Red, white, black, yellow	Head of a woman with her hair up wearing a hair accessory	Xinjiang area	Silk	Colour painted on	10th-11th century Length x width: max.: 5.8 x 4.7 cm; Height x width x thickness: 13 x 12 x 1 cm (plate dimensions Object number III 160 a	Humboldt Forum Berlin Xinjiang Collection

95.		Black, white, red, pink, yellow, blue	Apsaras (Heavenly Beings)	Gaochang (Qocho, Khara-Khoja)	Silk	Colour painted on	10th century Length x width: max.: 35 x 18.6 cm, shown vertically; Height x width x thickness: plate dimensions: 42 x 25 x 1 cm. Object number III 4534 b	Humboldt Forum Berlin Xinjiang Collection
96.		Yellow, blue, white, orange, red, green	Half-diamonds, arrows	Gaochang (Qocho, Khara-Khoja)	Chinese Damask	Tie-dyed tabby, weft-faced twill	Temple banner, 7th-10th century, 43 x 17 cm	A Fragmented Treasure on Display The Turfan Textile Collection Page 4 Fig. 7

97.		Natural, black	Characters	Turfan	Silk	Damask on plain weave	The inscription states '*ying yun yuan nian shuang liu xian zhe diao xi ling yi pi*'	Glossary of textile terminology based on the documents from Dunhuang and Turfan Page 355 C.13(2)
98.		Natural, pale red, deep brown	Tapestry bands	The North Cemetery, Tamaklan desert, Xinjiang	Undyed Wool	Plain weave	Mantle, shroud 11KB/M3:1	Archaeological Textiles Review nr 55 Page 73 Fig. 6
99		Off white	No pattern	The North Cemetery, Tamaklan desert, Xinjiang	Undyed felt	Plain weave	Fragments of a cap with tying cords 11KB/M3:3	Archaeological Textiles Review nr 55 Page 78 Fig. 154
100.		Yellow(buff), red, blue	Rectangles in step pattern	The North Cemetery, Tamaklan desert, Xinjiang	Wool	Tapestry weave, dyed weft threads	Fragments of a woman's sash/ loin-cloth/ corded skirt 11KB/M3:2	Archaeological Textiles Review nr 55 Page 76 Fig. 11

3. Case studies

3.1 Case Study 1: The samples from the Textile Research Centre

The six samples from the TRC will all be discussed as one case study, as they are part of one collection, and most are quite similar. Four of these samples are made of the same material, a very high-quality silk. The remaining two are wool. This case study will consist of the following samples:

TRC 2000.0009

Figure 4.1

Figure 4.2

TRC 2000.0010

Figure 5.1

Figure 5.2

TRC 2000.0011

Figure 6.1

Figure 6.2
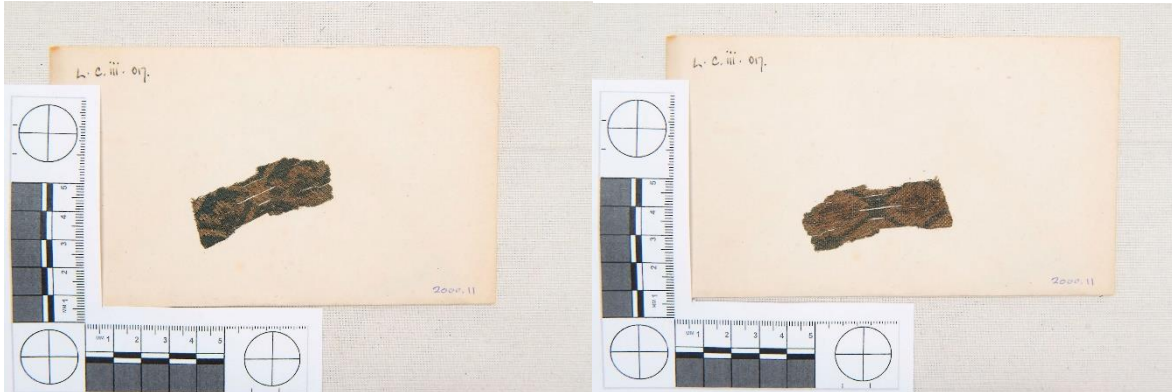
Figure 7.1

Figure 7.2

TRC 2000.0012

Figure 8.1

Figure 8.2

TRC 2000.0013b

Figure 9.1

Figure 9.2

TRC unknown number

Figure 10.1

Figure 10.2

Samples 2000.0009, 2000.0010, 2000.0011 and 2000.0012 are very similar, as they use the same colours, even if this does not appear so with the naked eye. Sample 2000.0010 has a reddish hue over it, and without a microscope it is difficult to see whether this is just discolouration of the fabric or intentional. When zoomed in to the thread level, however, it is clearly visible all four samples have been using only blue and yellow. Previously I had thought these fabrics were dyed, as they are extremely fine and intricately detailed. To my surprise, when examined underneath the microscope, the threads themselves have been dyed and then woven into detailed patterns. This is even more amazing when considering that these samples have two sides with opposite colouring. On such incredibly thin fabric it is almost a requirement to dye the fabric to achieve this, but as we use the microscope to zoom into a tear in sample 2000.009, we can see this piece has been made using a double weave, to create a double-sided fabric in opposite colouring. This is very high-quality work and was no doubt made by a skilled artisan. Fabrics like these were extremely expensive and were a well sought-after luxury, only available to rich merchants and wealthy high-ranking individuals, as they were the only people that could afford such a luxury item.
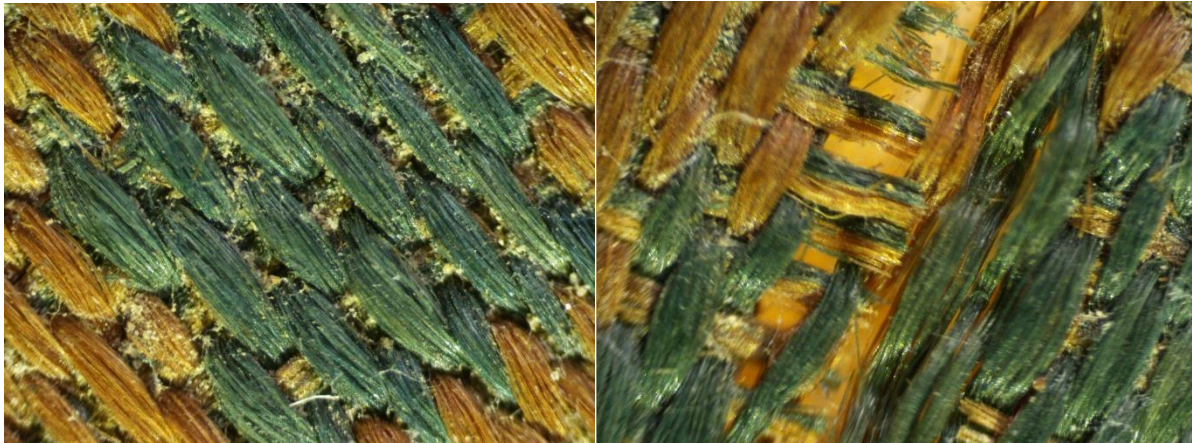
Figure 11.1 (Left) Sample 2000.0009 Microscopic view of the individually dyed threads used to make a dot.

Figure 11.2 (Right) Sample 2000.0009 Microscopic view of a tear in the fabric which makes the double weave technique used visible.

Figure 12. Sample 2000.0010 viewed with the naked eye and viewed using a microscope.

As visible in figure 12, sample 2000.0010 looks mostly red, with a blue pattern in a yellow outline. It does not look similar to the other silk samples from the TRC's collection, but when studied under a microscope the individual threads become visible, and we can see the same blue and yellow threads visible in the other samples. This is attributed to the discolouration and degradation of the fabric over the centuries, although it is unsure what exactly caused the red tint. It has been preserved incredibly well, but as visible in figure 10, we can see the threads look rough and ragged in comparison to the threads in sample 2000.0009. The threads in samples 2000.0011 and 2000.0012 appear to be in better condition, although they have started to fray, creating a 'fuzzy' look.

Figure 13. A comparison between the threads of sample 2000.0010 (left) and those of sample 2000.0009 (right)
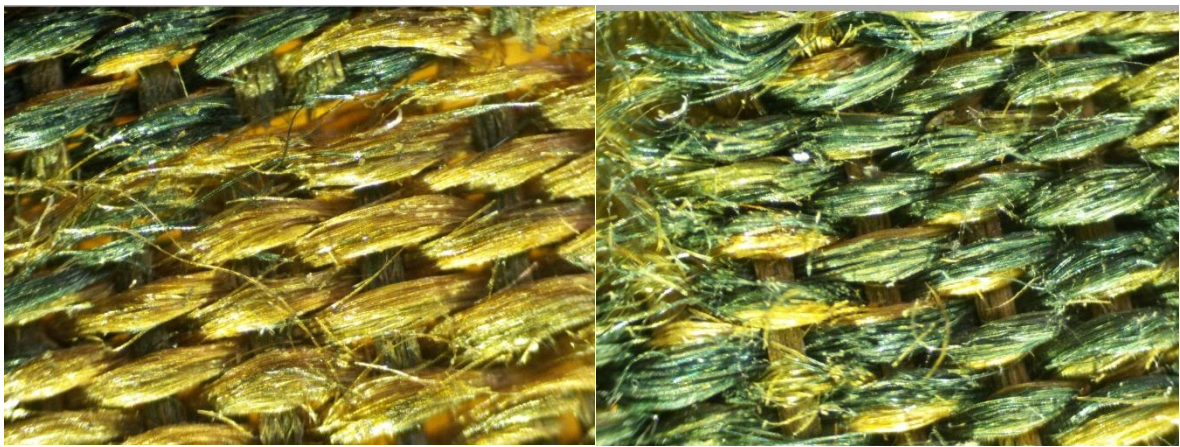
Figure 14. The fraying threads of sample 2000.0011 (right) and those of sample 2000.0012(right)

According to the TRC, the fabric for these samples was probably produced further east in China, and was then transported to Xinjiang. The samples themselves were recovered at Loulan and were only some of the many textiles excavated by Sir Aurel Stein on his expeditions into the desert in 1913- 1915.

The samples all came with a note that stated the letters L.C., followed by Roman numerals and then a number, sometimes with another letter behind it. Objects labelled with the letters L.C. have all been found in the Mesa L.C., an elevation with mass graves which had been given Roman Numerals. Any finds from these mass graves were named L.C., the corresponding Roman numeral, and then the find number.
The four silk samples all follow the same colour scheme of blue and yellow patterns, but that is not true for the woollen samples. As visible in figures 9 and 10, the woollen samples from Loulan use brown, red, white, and blue, instead of only blue and yellow.

In sample 2000.0013b we see a small cloth fragment made of brown wool with a smaller red piece of wool attached to it. On the red wool, a metal pin has been fastened with. The button stated the number L.C.V.025, and so we know it was found in the Mesa L.C. elevation with the other textiles from the TRC.

In figure 15 we can see this woollen sample is exactly what it seems, a plain weave simple fabric with no hidden surprises. This sample would have belonged to a 'common' individual and was likely used for everyday purposes. This was no luxury garment.
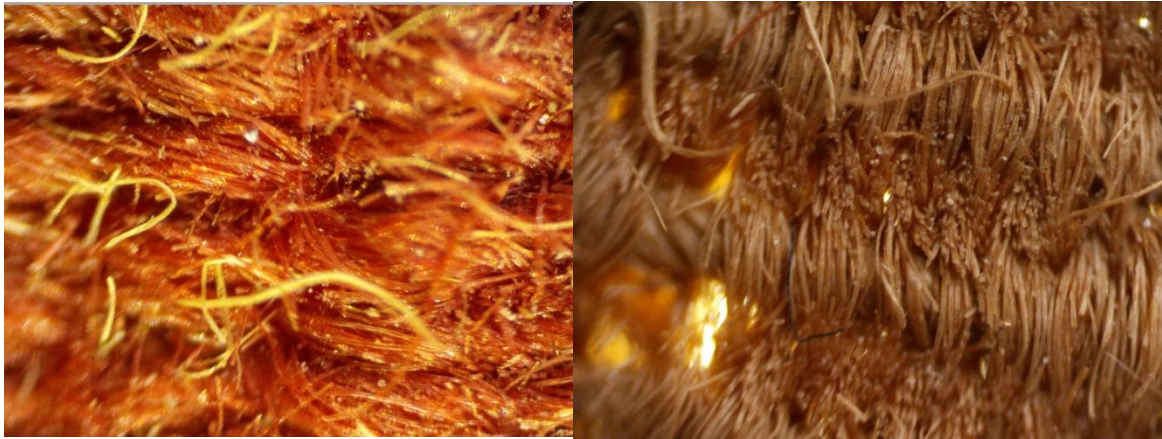
Figure 15. A microscopic view of the individual threads and the weaving pattern of sample 2000.013b

Figure 16. A microscopic view of the pin shows the corrosion and tiny sand particles on the metal frame.

3.2 Case Study 2: Loulan textiles

The second case study will be about textiles from Loulan used in the Catalogue. These are textile samples found in the literature, and will not be studied in the same manner, as the physical samples are not available to me.

Figure 27. A textile sample from Loulan found in the British Museum's Catalogue

Figure 17 shows a woollen sample found at Loulan from the British Museum. This sample was once part of a carpet and dates back to the 3rd-4th century. Similar to one of the textiles from the TRC, it was made using the colour scheme red, white, and blue, but adds pink and black into the mix. This sample is dated to the 3rd-4th century, which is only one century later than the textiles from the TRC.
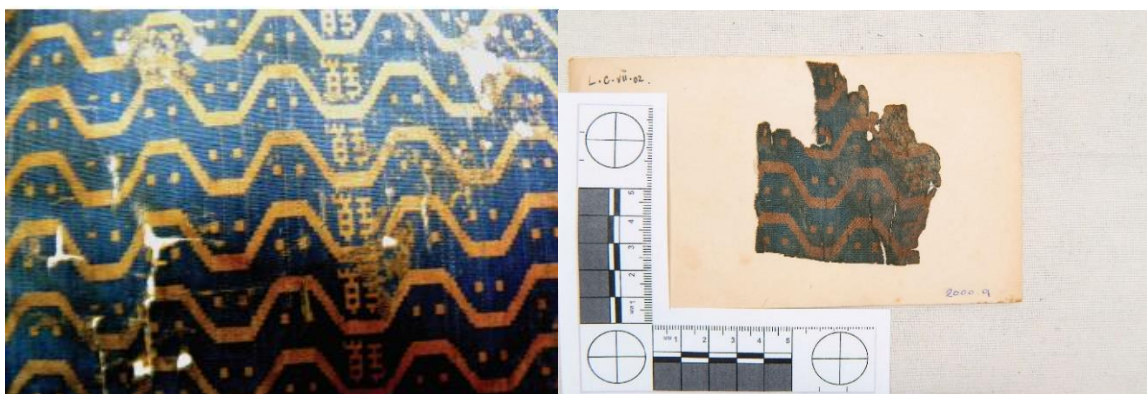
Figure 18. A comparison between a sample from the literature (left) and sample 2000.0009 from the Textile Research Centre (right).

When comparing the samples from the literature with the samples from the TRC's collection, the results are strikingly similar, as seen in figure 18. These samples use the same pattern and the same colour scheme, the only difference seems to be the characters woven into the fabric. Both samples have an L.C. label, so these samples were both excavated from the Mesa L.C. elevation. The sample from the literature is labelled 'L.C.vii.02.326', while sample 2000.009 is labelled L.C.viii. 02. This means these two samples came from the same grave, and have the same find number, and therefore were most likely various parts of the same garment. That is especially fascinating given that one of the samples ended up at the Textile Research Centre in Leiden, the Netherlands, while the other one is from the Stein Collection in the National Museum of New Delhi, India.

Figure 19. A drawn reconstruction of the characters woven into the fabric in sample 2000.0009, as visible with a loop (left) and with the naked eye (right)

Figures 19 and 20 show a drawn reconstruction of the characters visible on the samples in figure 18. Unfortunately, I am not sure what language these characters belong to. It could possibly be Chinese but could also be Tocharian or another language entirely. This could be a fascinating topic for further research, and perhaps tell us more about the fabric and the culture it came from.
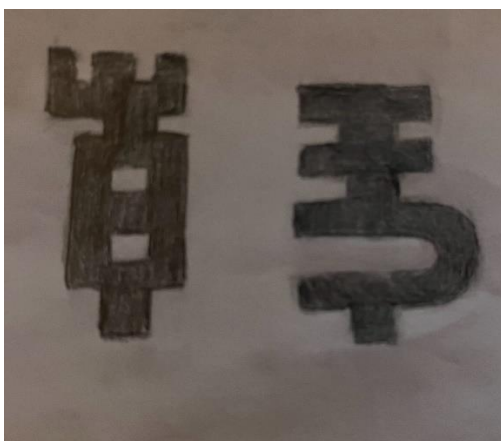
Figure 20. A drawn reconstruction of the characters woven into the fabric in the sample labelled 'L.C.vii. 02.326'.

3.3 Case Study 3: Humboldt Boddhisatva

Figure 21. A Boddhisatva painted on silk found in the catalogue of the Humboldt Forum in Berlin.

The third case study discusses a figurative image of a Bodhisattva, painted on silk cloth in the Xinjiang collection of the Humboldt Forum in Berlin.

This piece is a fabric painting dating back to the 10th-11th century, and was excavated in Gaochang in the second Turfan Expedition, between October 1904 and December 1905. This sample shows a range of colours, we see yellow, light, dark green and red in the background, and the Bodhisattva is incredibly colourful. The Bodhisattva is outlined in blue, and wearing an outfit of red, orange, and white, adorned with white clouds and blue decorations, pink and white flowers, and golden jewellery. The headpiece is painted a shade of gold with red, pink, white, and blue ornaments.

While also silk, this sample is vastly different from the Loulan samples discussed in the previous case studies. There, the patterns were created by using coloured threads to weave a pattern into the fabric, while in this sample, the pattern is painted on. It is also much more figurative, as earlier patterns depicted various geometric shapes and characters, and these later samples contain figurative, and mostly Buddhist, art.

4. Discussion

In the case studies chapter, I highlighted six samples from the TRC, and compared them with some samples from Loulan. I have also analysed my dataset, and the following four points are evident:

1. Loulan's colour scheme is unique
2. There are many claims of Roman influences in my sources, but not many in the samples to prove that claim.
3. There is a clear difference when comparing sites from the same site, but a different chronology.
4. Earlier textiles are woven into patterns, while later patterns are painted on much more frequently, so techniques change.
5. A substantial portion of the samples in my dataset consists of silk samples. Thus, silks were not purely used as currency, but also as clothing.

As mentioned in the case studies, the silk samples from Loulan in the 2nd century AD all seem to have the same colour scheme of yellow and blue, although the patterns themselves vary. This is a colour scheme I have not found in any other site, and is therefore possibly specific to Loulan, at least in this time period. It is worth noting this is only the case with silk textiles, as the samples made of other fabrics like wool or felt do deviate from this and use a larger range of colours. The woollen and felt samples also use red, blue, pink, black, white, and brown. However, I have a range of silk samples hailing from Loulan of an indeterminate time and thus I cannot say if the above is merely an assumption.

While I expected to find much Roman influence or at least many finds labelled as such, I must say I was pleasantly surprised to find that this was not the case. Many of my sources stated a much larger Roman influence than I have been able to find within my dataset. There were, of course, sources which stated the soldier depicted on the famous Sampula trousers (Fig 21.) was a Greek or Roman soldier, depicted with a centaur in the pattern above, but just as easily I found sources to disprove this claim. The true heritage of this man is unknown, as many sources I found were contradictory, and so label him as either Parthian, Macedonian, Xiongnu, or Yuezhi. The literature used was fickle, and this is something I encountered more than once. While much of the literature points to a Roman influence, whenever I found samples with figurative patterns these were almost all Buddhist. The Roman influence described in reality turns out to be a heavy Buddhist influence, as many of my later samples show Buddhist imagery, which coincides with the spread of Buddhism along the Silk Roads into the Tarim Basin and into China.

When comparing textiles from one site, I noticed a substantial difference in samples from different centuries. A site may use specific colours and patterns consistently for one century, and completely different patterns and colours in the next. In hindsight, this should not have been much of a surprise to me when you regard fashion trends in the last two centuries. It is an everyday occurrence that styles go out of fashion after some time and are replaced with new trends. As style changes and evolves over time, so do artisanry and production methods. The dataset shows that samples from the 2nd and 3rd century have patterns woven into the fabric, using individually dyed fabric strands to create a pattern. Samples from later centuries often have patterns painted on the fabric instead, displaying a shift in the use of dye and changing production methods in the fabric industry.

When looking at my dataset, it soon becomes clear that a sizeable portion of the data is made up of samples of silk, more than any other material. These samples are often part of clothing, used in accessories, or in a religious fashion, like a temple banner. There is a claim often made in literature that states silk was only used as a form of currency, and not used as clothing or other purposes. It's intriguing to see that my dataset refutes this claim. While silk was abundant enough to give the Silk Roads their name, it was an expensive material, and clothing or accessories made of silk were luxury garments. Many rich merchants and individuals of high status used silk garments as a way to show off their wealth and status. While silk bolts were used as a currency, that was certainly not their only use.

Although I have reached some fascinating conclusions, based on the four main points described above I must also state that my dataset proves it impossible to place cultural labels on my samples, and on Xinjiang textiles as a whole. In literature and in society as a whole, it is often preferred to have clear-cut labels and be able to refer to your finds as Chinese or Indian textiles, but this is something I have not been able to do. The samples in the Tarim Basin have influences from many distinct sources and can therefore not be claimed by one culture. Take for instance the painted Boddhisatva on the cover of this thesis. While the silk may originate from China, the Buddhist imagery painted on it is Indian in origin. The Tarim Basin is a melting pot of many distinct cultures, languages, and religions, and these all leave their influence in these textiles.

5. Conclusion

In this chapter I will finally answer my research question, as stated below:

'Are there noticeable differences in the usage of colour and patterns in textiles throughout the civilizations of the Tarim Basin, and what are these differences?'

There are certainly differences within the use of colours and patterns in the textiles of the Tarim Basin, but it is impossible to label these according to the civilizations living there. When looking at my database, there are some fascinating trends to be seen. First of all, the textiles from Loulan really stand out, especially the silk samples. The samples from the TRC form the bulk of these. The silk samples in question are all made using a colour scheme of only yellow and blue, and microscopic analysis shows these textiles were made using individually dyed threads woven into a pattern, instead of dyeing the fabric. However, the woollen samples from the same era use a different colour scheme. The dataset also presents silk samples from Loulan with different colour schemes, although there is no known dating for these samples. Loulan is also not the only site to use yellow and blue in their textiles, as these are commonly found in sites all around the Tarim Basin. Most sites use a combination of the primary colours: red, blue, and yellow. This is often in combination with the natural textile colour.

What stands out in this thesis is the lack of cultural labels. The cultures and patterns are not homogenous, and frequently overlap.

Within this thesis, it has often become clear to me that it is often preferred to have clear-cut and neat labels. People like to see something and be able to classify it into a category, place a label on it and call it a day. This is often much harder than expected, and especially in archaeology, often impossible. Many archaeologists and historians will look for familiar elements to be able to classify something into easy categories. Often, as discussed in this thesis, archaeological finds are labelled as Roman because the person in question is looking for aspects that could be Roman, while the truth is often much more complicated. Within my research, I have found the same to be true. The Tarim Basin is a melting pot of different peoples, cultures, languages, and religions, and it is very difficult to label its textiles as one culture only. These samples, and by extension their artisans have been influenced by many distinct cultures, using techniques from one culture, patterns from another and characters in their own language. The Roman influence I expected to find was not accounted for within my dataset. If a sample uses figurative art, it is mainly of a Buddhist nature. A very large part of the later samples in my dataset has Buddhist influences, coinciding with the spread of Buddhism through the Tarim Basin to China.

The sub-question I posed was the following:

'In the past dating and determinations were always based on visual/cultural style. Has this led to misunderstandings? Can a more scientific approach give new insight?'

The answer to this is a resounding yes. There are so many assumptions and interpretations made in literary sources that are simply proven false when tested against research of the data, as my dataset proves. Many of my sources mention the Roman origins of patterns and figures and sometimes even colours of textiles in the Tarim Basin. Textiles are labelled as 'Roman' because the person in charge is looking for Roman elements, ignoring the possible other origins, which may be more likely. This Roman influence was not something I found while analysing my dataset. Many earlier textile samples mainly use geometric shapes and characters as patterns.

The figurative art is not, as expected, Roman in origin, but mainly Buddhist. The bulk of the figurative samples in my dataset are depictions of Buddhist imagery like Boddhisatva's, Buddhas and Buddhist monks.

Without studying the data by using a microscope for my physically available samples and comparing the samples from the literature in my dataset, I would have come to vastly different conclusions. It is because of these methods I found out the Loulan textiles from the TRC were not dyed, as previously thought, but used individually dyed threads to create patterns in the fabric, something I never would have imagined otherwise. Because of this discovery, I can state that the techniques used in the textile industry shifted over the centuries from patterns woven into the fabric to patterns that have been painted on.

Most of the samples in my dataset consist of silk, the textile that gave the Silk Roads their name, and for good reason. Although it gave the Silk Roads its name, finding such a large quantity of silk samples is exceptional. The literature often argues silk is only used as a valuta, as bolts of silk are a well-known form of payment along the Silk Roads. My dataset proves this wrong, as many samples in my dataset are part of a garment or accessory, proving that although silk was a luxury commodity, it was used in other ways besides as currency.

For further research, I suggest a deeper look into the textiles in a technological manner. My original plan was to look at the origins of the dyes used, but I sadly did not have the time or the equipment possible to make this a reality. It would be fascinating to return to the TRC to be able to study the textiles more, and to find out what kind of dye was used and where it originated from. Different areas along the Silk Road tend to use more local ingredients, for example, some parts use indigo for a blue dye, while others use woad.

A second narrative for further research would be to study the characters woven into the textile samples and learn more about the contemporary customs of the cultures involved. As I do not know what language and culture these belong to, it would be a fascinating topic for further research, and could expand our knowledge of the textile history of the Tarim Basin.

6. Abstract

This thesis provides an insight into the textiles of the Tarim Basin, focussing on colours and patterns. It provides a dataset of a hundred samples to compare and study the basin's textiles and through them, the cultures they came from. It discusses the Roman-centric view of western archaeologists and whether this is visible when studying the available archaeological data. There is a clear difference in chronology visible in the textiles, as earlier textiles were made using individually dyed threads woven into patterns, while later textiles have patterns painted on the fabric. There is also a shift in the use of colour and patterns within sites over the centuries, much like fashion trends come and go in the modern day. Most of the samples in the dataset are silks, proving that silk was not purely used as a valuta within the Silk Roads, but was also used for luxury garments, accessories and for religious use. The site of Loulan is an archaeological treasure, and within this thesis there is a focus on textiles from this site in particular, next to other sites like Niya and Sampula. Comparing the textiles show that it is almost impossible to attach cultural labels on these samples through colours and patterns, as they are a product of a melting pot of cultures coming together in the Tarim Basin. One sample will have multiple cultural influences, and can therefore not be placed in one category. Much remains unknown about these textiles and further research is necessary to be able to shed more light on a fascinating piece of history of the ancient Silk Roads.

Appendix

Bibliography

Literature

Beck, U., Wagner, M., Li, X., Durkin-Meisterernst, D., & Tarasov, P. E. (2014, October 20). The invention of trousers and its likely affiliation with horseback riding and mobility: A case study of late 2nd millennium BC finds from Turfan in eastern Central Asia. Quarternary International, 348, 224–235. https://doi.org/10.1016/j.quaint.2014.04.056

Bergman, F. (1939). Archaeological Researches in Sinkiang, Especially the Lop-Nor Region. Bokförlags aktiebolaget Thule.

Bregel, Y., 2003, An historical atlas of Central Asia, Journal Asiatique 291(1), p. 10

Bower, B. (2014, June 18). Earliest pants worn by horse riders. Science News, 16.

Bower, B. (2022, March 12). How early trousers were designed. Science News (Washington), 201 (5), 14, 15.

Chen, K. T., & Hiebert, F. T. (1995). The late prehistory of Xinjiang in relation to its neighbours. Journal of World Prehistory, 9(2), 243–300. https://doi.org/10.1007/bf02221840

Fuxi, G., R. Brill, and T. Shouyun, 2009, Ancient Glass Research Along The Silk Road, Singapore: World Scientific Publishing Co. Pte. Ltd

Gasparini, M., Yang, A. A., & Matteson, K. (2020, December 31). *Transcending Patterns: Silk Road Cultural and Artistic Interactions through Central Asian Textile Images (Perspectives on the Global Past)*. University of Hawaii Press.

Graf, D. F., 1994, Continuity & Change: Proceedings of the Last Achaemenid History Workshop 1990, H. Sancisi-Weerdenburg, A. Kuhrt and M.C. Root (eds.), Achaemenid History 8, pp 167- 189)

Hildebrandt, B. (2017, February 22). Silk: Trade and Exchange along the Silk Roads between Rome and China in Antiquity (Ancient Textiles) (1st ed.). (p. 104?). Chapter 6-8. Oxbow Books

Haghighat, S. (2020, October 23). *Persian Mythological Creatures and Their Stories*. Termeh Travel. https://blog.termehtravel.com/persian-mythological-creatures-and-their-stories/#Qoqnoos_or_Phoenix_The_Magical_Bird

Hansen, V., 2015. The Open Empire: A History of China to 1800. New York (NY) & London: W.W. Norton & Company.

Mair, V. H., Hickman, J., & Renfrew, C. (2014, September 2). *Reconfiguring the Silk Road: New Research on East-West Exchange in Antiquity*. University of Pennsylvania Museum Archaeology and Anthropology.

Loewe, M., 1986, The Former Han dynasty, in D. Twitchett and M. Loewe (eds.), The Cambridge History of China. Vol. 1: Ch'in and Han Empires, 221 BC-AD 220. Cambridge: Cambridge University Press, pp 103-222, DOI: https://doiorg.ezproxy.leidenuniv.nl/10.1017/CHOL9780521243278.004

Mair, V. H. (2008). The rediscovery and complete excavation of Ordek's Necropolis. Journal of Indo- European Studies, 34 (3-4), 273–318.

Mark, J. J. (2022, November 25). *Twelve Ancient Persian Mythological Creatures*. World History Encyclopedia. https://www.worldhistory.org/article/1484/twelve-ancient-persian-mythological-creatures/

O'neale, L. M. (1936, July - September). A Survey of the Woolen Textiles in the Sir Aurel Stein Collections. American Anthropologist, volume 38, no 3, part 1, 414–432.

Persson, H. (2008, September 24-27). Ethnicity Mobility and Status – Textiles from the Taklamakan Desert. Textile Society of America Symposium Proceedings, 235.

Qin, D., & Yuan, J. (2015, January 6). Ancient Silk Trade Routes: Selected Works From Symposium On Cross Cultural Exchanges And Their Legacies In Asia. Wspc. Chapter 2. P 39-52.

Sassen, M. (2020). *On the Silk Road to China: The Material Reach of Interaction between the Roman Empire and Han Imperial China* [MA/MSc Thesis]. Leiden University.

Selbitschka, A. (2018). Genuine Prestige Goods in Mortuary Contexts: Emulation in Polychrome Silk and Byzantine Solidi from Northern China. Asian Perspectives, 57(1), 2–50. University of Hawaii press. https://doi.org/10.1353/asi.2018.0001

Sheng, P., M.J. Storozum, X. Tian and Y. Wu, 2020, A military garrison or cultural mixing pot? Renewed investigations at Shichengzi, a Han Dynasty settlement in Xinjiang, Antiquity 94(373), pp 1-9, DOI: https://doi.org/10.15184/aqy.2019.229

Stein, A., & Andrews, F. H. (1920, July). Ancient Chinese Figured Silks Excavated by Sir Aurel Stein. Drawn and Described by F. H. Andrews. The Burlington Magazine for Connoisseurs, 38(no 208), 210– 221. https://www.jstor.org/stable/861046

Top, M. (2022). *Silk Road interaction in the Xinjiang province during the Han and Jin dynasties* [BA thesis]. Leiden University.

Wagner, M., Bo, W., Tarasov, P., Westh-Hansen, S., Völling, E., & Heller, J. (2009, December 1). The ornamental trousers from Sampula (Xinjiang, China): their origins and biography. *Antiquity*, *83*(322), 1065–1075. https://doi.org/10.1017/s0003598x0009935x

Xianyang, B., Xiaojuan, M., & Fashion & Art Design Institute, Donghua University. (2014, October 8). Study on Geometric Pattern of Unearthed Woolen Fabric from Xinjiang. Advanced Materials Research, 1048. https://doi.org/10.4028/www.scientific.net/AMR.1048.3

Ying-shih, Y., 1986, Han foreign relations, in D. Twitchett and M. Loewe (eds.), The Cambridge History of China. Vol. 1: Ch'in and Han Empires, 221 BC-AD 220. Cambridge: Cambridge University Press, pp 377-462, DOI: https://doiorg.ezproxy.leidenuniv.nl/10.1017/CHOL9780521243278.008

Zhang, X., Good, I., & Laursen, R. (2008, April). Characterization of dyestuffs in ancient textiles from Xinjiang. *Journal of Archaeological Science*, *35*(4), 1095–1103. https://doi.org/10.1016/j.jas.2007.08.001

Museum Catalogues

The British Museum Catalogue, Xinjiang Collection.

https://www.britishmuseum.org/collection/search?keyword=xinjiang&material=textile&view=grid&sort=object_name__asc&page=1

The Humboldt Forum Catalogue, Berlin. Xinjiang collection.

https://sammlungenonline.humboldtforum.org/object-catalogue?query=Xinjiang+textile

The Metropolitan Museum, New York. Xinjiang collection
https://www.metmuseum.org/art/collection/search?q=xinjiang+textile

The Textile Research Centre, Leiden. Xinjiang collection
https://trc-leiden.nl/collection/?trc=&zoek=xinjiang

Figures

Figure 1: The Silk Road in the 1st century. Author : Kaidor (Wikipedia user id).
https://en.wikipedia.org/wiki/Silk_Road#/media/File:Silk_Road_in_the_I_century_AD_-_en.svg

Figure 2: Created with Inkscape (using Image:Bm taklamakan.jpg). Data based on: Marylin M. Rhie, Early Buddhist Art of China, and Central Asia (Handbook of Oriental Studies / Handbuch der Orientalistik - Part 4: China, 12, Vol. 1) (Handbook of Oriental Studies/Handbuch Der Orientalistik). Brill Academic Publishers, ISBN 90-04-11201-4 Author: Schreiber (Wikipedia user id).
https://upload.wikimedia.org/wikipedia/commons/d/d0/Tarimbecken_3._Jahrhundert.png

Figure 3: Dataset created by Author.

Figure 4-16: Professional photos of samples from the Textile Research Centre in Leiden. Photos made by Benjamin de Groot. These photos belong to the faculty of Leiden.

Figure 17: Textile sample from the British Museum's catalogue.
https://www.britishmuseum.org/collection/object/A_MAS-693

Figure 18: (Left) Textile sample in the Stein collection in the National Museum in New Delhi, India. (Right) Textile sample in the Xinjiang collection of the TRC in Leiden, the Netherlands.

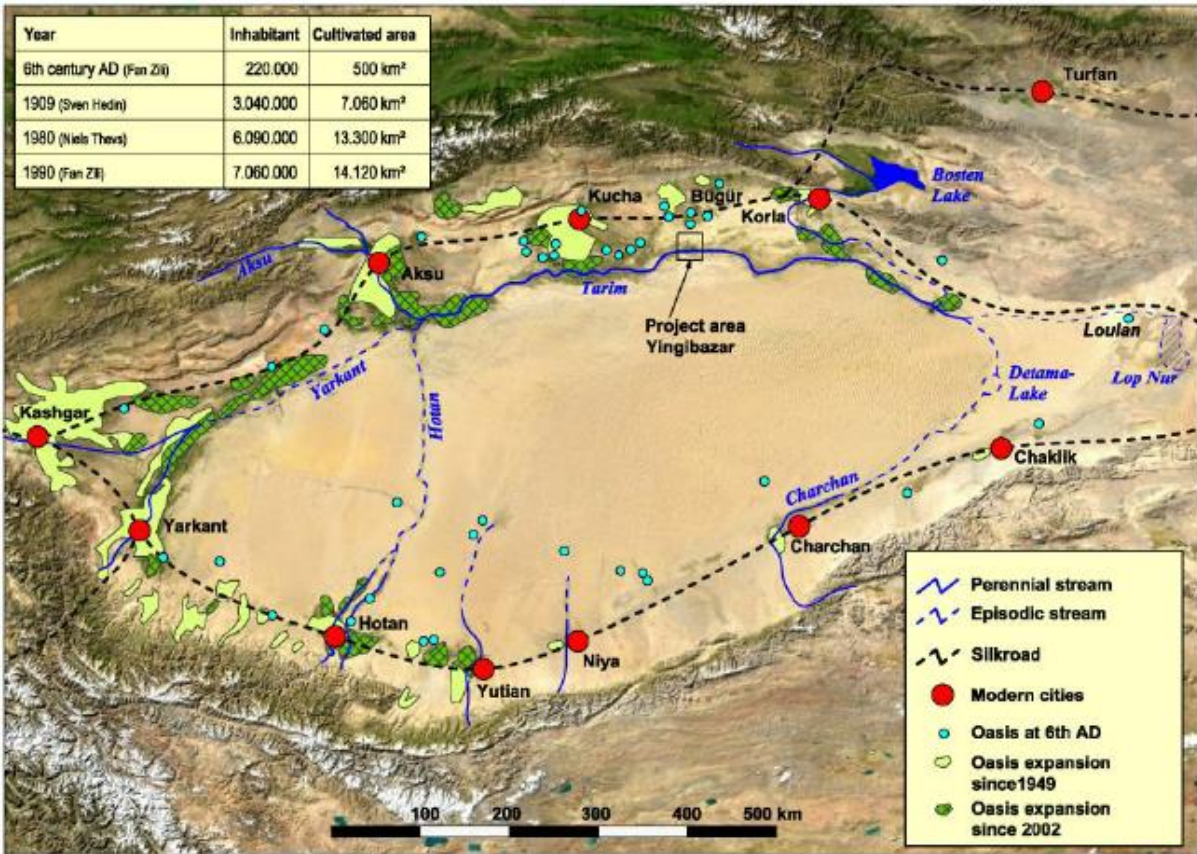Figure 19: Drawn reconstruction of characters on the sample made by Author.

Figure 20: Drawn reconstruction of characters on the sample made by Author.
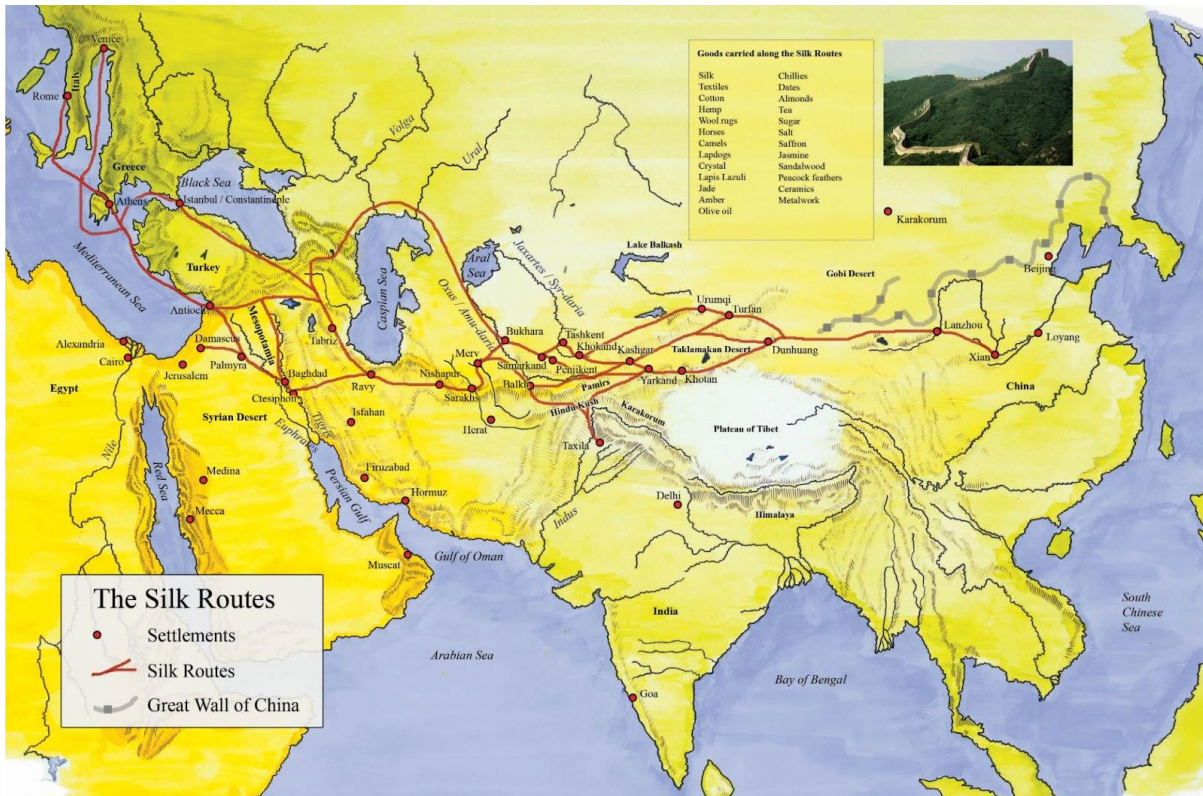
Maps

1. Map depicting the Tarim Basin and its location within China.
Kmusser 2008, https://en.wikipedia.org/wiki/Tarim_Basin#/media/File:Tarimrivermap.png

Year	Inhabitant	Cultivated area
6th century AD (Fan Zili)	220.000	500 km²
1909 (Sven Hedin)	3.040.000	7.060 km²
1980 (Niels Thevs)	6.090.000	13.300 km²
1990 (Fan Zili)	7.060.000	14.120 km²

2. Map showing historic oasis expansion on the Tarim Basin.

3. Map showing the Silk Routes, settlement points and the Great Wall of China on the Eurasian continent.
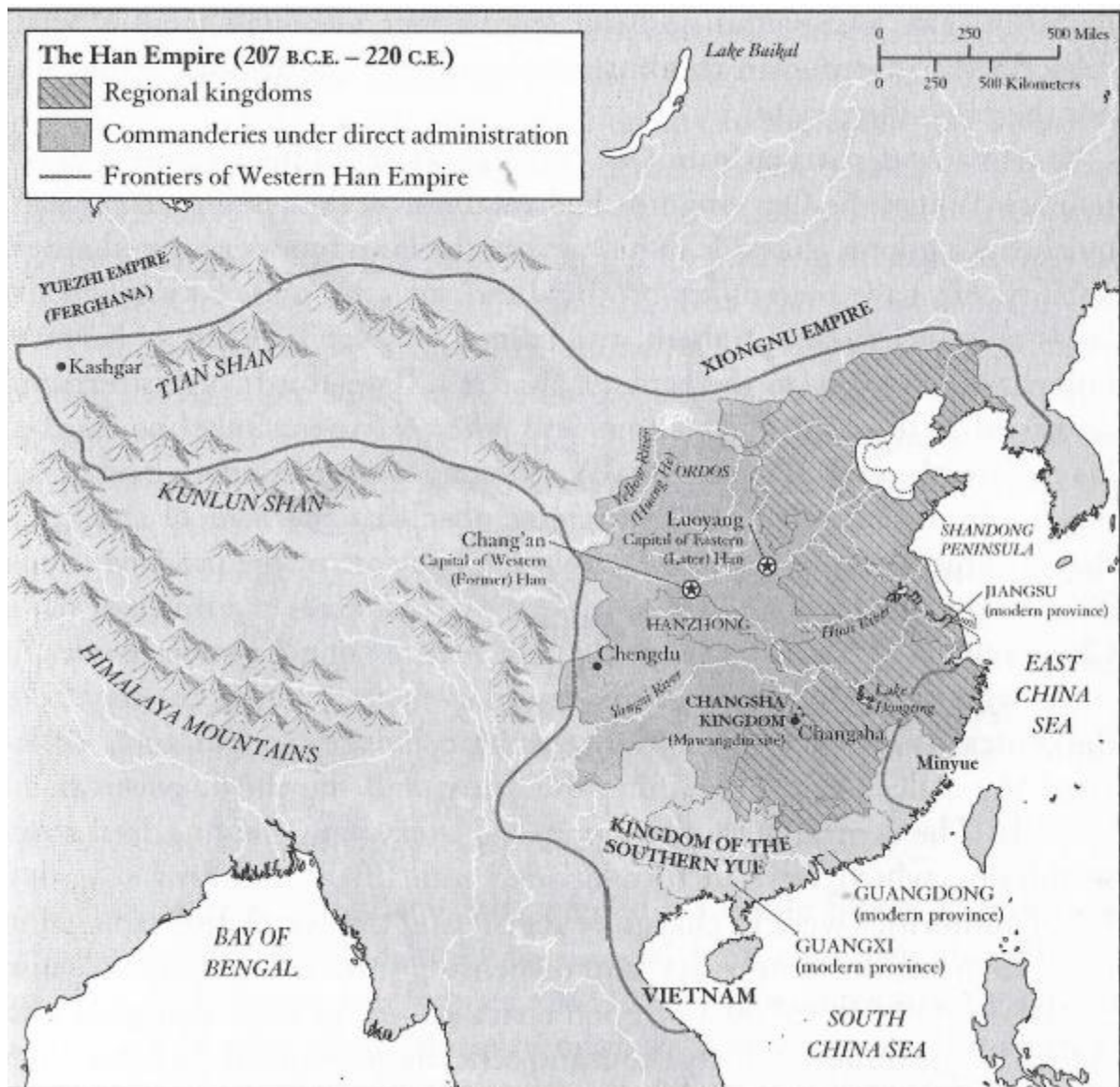
4. Map of the Han Empire at its height.
Hansen, V., 2015. The Open Empire: A History of China to 1800. New York (NY) & London:
W.W. Norton & Company. P.107