

Origins of central Asian silk ikats

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Abstract

This paper is concerned with the development of the silk trade and in particular with silk-ikat production. Early origins are explained and issues relating to the development of long-distance trade are discussed. The principal trading participants are identified and the focus is turned to silk-ikat production in Central Asia. It is recognised that the vast bulk of trade, along what became known as the 'Silk Route' (or 'Silk Road'), did not involve straight-forward or direct exchange between powers to the far east of the route and powers to the far west, but rather was done in stages between adjacent or not too distant locations. Diffusion of ideas was not therefore immediate and operational at one eastern or western extreme of a trading network but, rather, was a gradual process influencing adjacent participants, at stages between the geographic extremes over a long period of time.

I. Introduction

For the past three millennia long-distant trade has played a major role in the rise and fall of civilizations. Various trade routes or networks developed and these acted as avenues for not only exchange of objects and various rare or precious items, but also as platforms for cultural, religious and artistic exchange. By the onset of the Common Era (CE), goods and ideas could be transferred (in principle) from the Roman Mediterranean in the West to Han-dynasty China in the east. There were also several routes or networks taking different directions and making different connections, as well as several maritime routes (e.g. various routes across the seas of Asia and, using prevailing monsoon winds, connecting Asia with parts of Africa). The concern here is principally with the overland trade and networks connecting the eastern part of the

Mediterranean, Central Asia, India and China. The particular focus is on silk-ikat production in Central Asia, a geographical hub for much of the trade between east and west as well as between China and south Asia. It is hypothesised that the development of Central Asian silk-ikat production was influenced by Chinese, Sasanian and Indian sources, and relied on the use of various indigenous motifs and compositions sourced in carpets, felts or embroideries.

II. The Origins of Silk Production

The origins of silk rearing and manufacture are linked closely to China. Early success was facilitated by a range of technological innovations as well as by monopoly knowledge of sericulture (i.e. the knowledge associated with the rearing of silk worms and the reeling of silk fibre in continuous filaments from the silk-worm cocoon)¹. The fibre-manipulation skills

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which developed from the Shang dynasty (c. 16th century - 11th century BCE) onwards acted as the foundation for the further evolution of textile manufacturing techniques displayed in subsequent dynasties, when textile manufacture was highly organised and involved governmental authorities, with quality standards rigorously defined. By the early Han dynasty (second century BCE), a wide range of patterning techniques was used in the production of complex repeating compositions, more sophisticated and complex than achieved elsewhere at the same historical point. Not only were embroidery and warp brocades produced, but weft brocading, knitting and stencil printing were in use also. Knowledge of these techniques and all other technology associated with silk production ultimately diffused to other geographic zones and cultures. This diffusion was initiated through trade and facilitated via a series of networks or trade routes.

3. The development of long-distant trade

Han-dynasty China was a socially and economically sophisticated society, which traded in manufactured silks with nations to the west, as far as the eastern Mediterranean and imperial Rome, via a series of arduous trade networks which became known centuries later as the 'Silk Road' or 'Silk Route', misleading terms as first, there was more than one road or route and, second, the routes did not develop solely for the purpose of trade in silk. Silk and other textiles did however play a key role. An important characteristic was that silk textiles (and textiles from other fibrous raw materials) were easily portable over long distances, compared to, for example, items of glass or of other delicate raw-materials. There is certainly much evidence for the transfer of textiles across vast

distances in ancient times. For example, considering the Pazyryk tombs (in present-day Kazakhstan), dating to around the fourth century BCE, a catalogue of finds includes: embroidered Chinese silks, Persian and Syrian woven woollen textiles and highly decorated pile carpets of dyed wool, as well as indigenous wool felted hangings, floor coverings and saddle cloths (identified by Rubenson, 1990). These suggest the importance of textiles in Central Asian nomadic cultures as well as the extent of distribution through trade or other means during the first millennium BCE.

The phrase Silk Road was coined by the German geographer Baron von Richtofen in the late-nineteenth century. The true nature of the net work and its origins was captured by Behera (2002): '...a series of caravan routes, a network of trails and trading posts, oases and emporia scattered all across the vast Eurasia, with the eastern terminus at the old Chinese capital city of Chang'an or the present-day Xian, and the western termini at Byzantium or Constantinople (present-day Istanbul), Antioch, Damascus and other West Asian cities'.

By the first century of the Common Era, it seems that the bulk of long-distance trade between Asia and Europe was controlled by the Romans (Mediterranean regions), the Parthians (in Persia), the Kushans (in north India) and the Chinese. Initially silk was traded, but not knowledge of sericulture (the rearing of silk worms and the extraction of continuous filaments of silk from the silk-worm cocoon). It seems to be the case that such knowledge was brought first to India sometime after 300 CE; this seemingly complemented an existing tradition of processing wild silk (known as 'tussah' silk) in non-continuous filament form.

¹⁾ In the modern era, as in ancient times, silk worms are raised from larvae and fed mulberry leaves for several weeks. When the insect's silk glands are full of liquid the caterpillar anchors itself to a fixed spot and spins its cocoon, a process which takes a few days. Silk strands are held together by sericin, a natural glue extruded at the same time as the fibre. When complete, cocoons are placed in boiling water to soften the sericin and loosen the fibre. Between five and eight filaments are brought together and reeled. The procedure is, of course, fatal to the caterpillar within (Hann, 2004). A comprehensive historical review of the silk trade was provided by Leggett (1949).-

Raw silk (presumably in twisted continuous-yarn from) was exported from China to both Persia and Byzantine Syria, where it was dyed and woven into twills and brocades, the latter using a draw loom (inspired by Chinese technology though seemingly developed further by producers in Syria). These value-added items were then traded eastwards, back to China or beyond to Japan, or westwards to Byzantium and other parts of Europe (Feltham, 2010: 17). As knowledge of textile processing spread, and associated skills developed, designs were copied widely.

Standard accounts of the chronology of events along the great trading network connecting China with lands to the west, as far as the shores of the Mediterranean, accept that there may well have been some occasional exchanges before the end of the first millennium BCE. However there does seem to be a (false) consensus that the Silk Road proper only came into being in the last century BCE, primarily as a result of demand from commercially minded empires such as the Han Chinese, the Roman Empire, and the Parthian and the Kushan Empires (Boulnois, 1966: 60). Interaction, at least of the military kind, can be identified readily before that time. It is indeed the case that there was clear expansion from the west towards Central Asia from the sixth century BCE; Achaemenid, and later Macedonian and Seleucid conquests are obvious examples, and envoys travelled from China in the late-second century BCE, passing through Central Asia and possibly reached India, Iran and the Caucasus (Christian, 2000). Christian (2000), stressed also much earlier origins and commented: 'Clearly significant trans-Eurasian exchanges of goods, cultures, and ideas precede the conventional date for the origins of the Silk Roads by at least two millennia'.

It was during the Han dynasty (c. 202 BCE to 220 CE) that trade missions set out westwards from China, initially in search of a powerful breed of horse that could be used by the Han cavalry. Many other objects of interest were brought back to the Han court including Ghandaran Buddhist sculpture,

itself strongly influenced by Hellenistic culture (initiated by the conquests of Alexander the Macedonian, a few centuries before). Trade with countries to the west thus developed. Meanwhile small quantities of Chinese silk had reached the eastern Mediterranean and imperial Rome, traded by the Parthians who held dominance on the Iranian Plateau. Many other commodities were traded also. Caravans going east to China carried precious metals, gemstones, ivory and glass (seemingly not manufactured in China until around the 5th century CE). Caravans travelling westwards were loaded with silks, ceramics, jade, lacquer work and furs. Exchange of goods probably occurred several times as there are no known early records of European or Chinese traders reaching the eastern-most parts or western-most parts respectively of the trade networks. The various networks did not just function as conduits for trade; they were also effective channels for cultural diffusion. Buddhism, for example, came to China from northern India.

Overland transportation required pack animals, especially horses or camels. Both were in fact crucial to the development of long-distance international trade in ancient times. The domestication of pack animals and the development of maritime technology and navigation skills increased the potential reach of trade, over longer distances and within a shorter time. Certain nomadic and semi-nomadic peoples specialised in raising horses and camels; in many cases their milk products and occasionally their meat were part of the local diet. Inner Asia includes vast areas of Steppe lands and major deserts. Given the importance of the horse and camel to the lives (and indeed the survival) of so many peoples in ancient times, it is not surprising that both animals were represented often in the decorative arts of many cultures along the great trading network from east to west. Examples include: various items depicting horses yielded by archaeological digs in the Pazyryk Valley (in Altai Mountains close to the present-day border with China), dating to the second half of the first millennium

BCE; reliefs from Persepolis depicting both horses and camels; royal art of the Sasanian Empire (3rd to 7th centuries CE) showing the ruler hunting on horse-back; narrative scenes in Buddhist murals of caves in western China often depict merchants and travellers accompanied by camel caravans.

Although the Han dynasty saw the initiation of substantial trade along the Silk Routes, it was in the Tang dynasty (618-907 CE) that the peak of importance was reached. In fact it was during this dynasty that Changan (the main focus for trade in China) developed into a large and cosmopolitan city. After the Tang dynasty the trade along the Silk Route decreased owing largely to the activities of neighbouring tribes of bandits who plundered the caravans. It was during the Yuan dynasty (1271-1368 CE), the time of the Mongol Empire, that trade increased, but this was short-lived and by the time of the Ming dynasty (1368-1644 CE) the barriers on trade with countries to the west were drawn again and long-distance overland trade decreased. A good review of patterns and motifs and their diffusion from China, during the course of several dynasties was provided by Wardwell (1987).

Liu (1995) developed a discussion of the long-distant trade in silk by making reference to three convenient (though not all encompassing) components referred to as 'circles': the Sino-Indian circle, involving trade between China and India; the Byzantine and western European circle, involving trade across the Byzantine Empire, between the eastern Mediterranean (e.g. Beirut and Gaza) and parts of west Europe and Constantinople; the Islamic world circle, involving extensive trade from Central Asia to the Mediterranean basin, including North Africa, Sicily, and Spain at various periods (Liu, 1995). Central Asia was a cross roads of various cultures and acted also as a crossover between the Sino-Indian and Islamic trade.

IV. Evidence for Diffusion

It was observed by Behera (2002) that the Silk Road was '...a unique example from history, of inter-continental cooperation and collaboration not only in the field of trade and commerce but also in the realm of ideas and culture'. Several religions spread through the trade networks. Buddhism and Islam are cited most commonly. A good, concise review was provided by Liu (1995). An important point to stress is that many Buddhist monks and missionaries travelled between China and India and would often bring silk objects as gifts. Liu (1995) commented that, '...association of silk with Buddhism, as material expression of the religious function of relics linking life and death, caused more silk textiles and clothes to be carried beyond the borders of Tang China...'. In addition to pilgrims who carried silks to India, rulers were also eager to show their devotion by sending ritual robes to India' (Liu, 1995). These traditions of transporting and using Chinese silk for Buddhist religious and related functions seem to have been a common feature from the seventh century CE to the eleventh century CE (Liu, 1995). Making reference to the use of silk in another religious context, the importance of a particular type of silk textile, woven in Central Asian, was recognised by Liu (1995), who observed: 'Christian churches in Europe also preserved silk samples from a far more remote country, Bukhara in Central Asia. Most of the *zandaniji*, a precious silk named after a village near Bukhara, were preserved in European churches. The Bukhara region continued to produce *zandaniji* after Islamization'. This fabric type is silk brocade, produced in Zandan (near Bukhara). It is strongly influenced by Sasanian (Persian) styles of silk weaving and, typically depicts confronting animals within roundels. Liu (1995) recognised that although *zandaniji* silk textiles were woven in Central Asia, the silk yarns and dye used probably came from China (Liu, 1995). Remarking on a typical example Liu commented that it showed '...a combination of chartreuse, orange, and pink - a very unusual colour combination in Persian

and Byzantine silk, but a very common one in Chinese silk' (Liu, 1995). The dyes on the sample considered by Liu (1995) had however faded, suggesting that although the dyes used by the weavers in Zandan came from China, they were unable to fix the dye effectively without the appropriate mordant (which fixes the dye to the fibres and makes it 'fast'). It can thus be seen that *zandaniji* silk textiles suggest a link between east and west: knowledge of brocade weaving and the particular compositional arrangement may have come from Sasanian Persia while the silk yarn used initially may have been imported along with the dyes (but without an appropriate mordant) from China.

Other religions were represented also, including Judaism (with Jewish traders active in Europe and the Mediterranean, as well as parts of Central Asia and possibly also India), Nestorian Christians (though estranged from conventional and orthodox Christianity, representatives were known to have been active across wide stretches of the trading networks), Zoroastrians (representatives of this pre-Islamic Persian religion, were well-known traders and preachers in Tang-dynasty China), and Manicheans (who were well represented in Central Asia). Because Central Asia was a crossroads of various cultures, it witnessed transactions '...among the followers of many religions, such as Buddhism, Christianity, Islam, Manichaeism and Zoroastrianism' (Liu, 1995).

During the first half of the first millennium CE, Persia under the Sasanians (224-637) became a powerful force, with Sasanian military and political influence extending to much of Central Asia and parts of northern India (Feltham, 2010: 2).

It was seemingly during Sasanian times that there was a diffusion of knowledge relating to the use of raw-materials, including silk processing, weaving and dyeing techniques. While knowledge of sericulture was seemingly slow to diffuse, the technology associated with the subsequent processing of silk (reeling, twisting, dyeing, warping and weaving) and the production of silk cloth, was relatively well advanced in Iran by

the early years of the Sasanian dynasty (from 222 CE), with the establishment of government-controlled manufacture and the development of distinctive designs. Feltham observed:

'Sasanian weavers... developed [woven silk textiles] with elaborate repeating motifs such as winged lions, hunting scenes, tree of life patterns, and opposing birds, each motif enclosed within a pearl-like roundel and each group of roundels separated by scrolling geometric plant forms. Both the heraldic animal and human elements and the interlocking plant motifs would inspire Eastern and Western design for centuries to come' (Feltham, 2010: 16).

Trade in silk textiles, produced largely in state-controlled Persian workshops, ensured that by the late-eighth century certain compositions, motifs and patterns also became familiar across much of Asia and Europe, from Japan in the east to Byzantium in the west (Feltham, 2010: 5). Copying of Sasanian textiles by Coptic Egyptian, Byzantine, Spanish, Central Asian, Chinese and Japanese weavers, using wool as well as silk, is well documented (Feltham, 2010:16).

A common Persian textile design, from the Sasanian period, is comprised of repeating roundels, each with a border of pearl-necklace-like forms. Frequently, within each roundel pairs of confronting animals, such as lions, griffins, peacocks or stags, are represented. Often these figures are positioned on either side of a tree. Hunting scenes, typically depicting a ruler confronting a wild beast of one type or another, are common also. The compositions typical of Central Asian brocade-woven *zandaniji* silks (mentioned previously) drew much from these Persian originals. No matter where woven (Byzantium, Spain, Persia, Syria, Central Asia, China or Japan) motifs used and compositional arrangements appear to have undergone little if any change when compared to the Sasanian prototypes. Feltham observed:

'...the same design would be woven up from imported Chinese silk thread, or from locally produced silk from Nara to Samarkand, from Alexandria to

Constantinople, from Baghdad to Andalusia, and would be prized both as decorative elements in the costumes of the wealthy and powerful and as wraps for religious treasures and relics' (Feltham, 2010: 22).

Byzantine silk textiles, inspired in their design by Sasanian prototypes, were traded across Europe and, in Charlemagne's court at Aachen (Germany), they acted as inspiration for illuminated manuscript design and were held as treasured possessions in newly built cathedrals. There are many examples of woven silk textiles (either of Sasanian origin or in imitation of such prototypes) used as costume components or accessories by European aristocracy or held in church treasuries and used to wrap and protect religious relics (Feltham, 2010: 33-34).

In the third decade of the seventh century, Persia became vulnerable to the unexpected rise of Arab tribes in the south, following the call of Islam. By 637, Persia was incorporated into the Islamic world, and there was a consolidation of Arab power across much of Central Asia which followed the defeat of the Chinese Tang army in 751 (Feltham, 2010: 3). So although Persia's power waned, throughout much of the seventh century (and subsequently), aspects of Sasanian visual arts and associated techniques, particularly those related to textile manufacture, continued to be felt across many parts of Asia and Europe. So Sasanian trade seems to have acted as a stimulus for other developments, including the diffusion of textile techniques between countries outside Persia. It seems that silk-ikat weaving in Central Asia may well be one such development. For this reason further attention is focused on this technique below.

V. Silk Ikat

The word *ikat* is derived from the Malay (or Indonesian) word *mengikat* meaning to tie (Kramer & Koen, 1993: 265). The *ikat* process is a resist-dyeing process, which involves the binding of sections of warp and/or weft threads with dye-resistant material

(such as strips of palm leaf or polypropylene string) prior to fabric construction. On immersion in a dye bath, the uncovered areas of the threads take up the dye. Further colours can be obtained by rearranging the resist-protected areas prior to further dye-bath treatment. The resist may be applied to the warp, the weft, or both sets of threads. The resultant product is referred to as warp-ikat, weft-ikat or either double-ikat or compound-ikat. In warp-ikat, only the warp threads are patterned. In weft-ikat, only the weft threads are patterned. In compound-ikat both warp and weft threads are patterned, each set producing an independent design not reliant on the other. In double-ikat, both sets of threads are patterned and overlap in the final woven design. As pointed out by Weiner, double ikat is the most difficult to dye and to weave, as the dyed and undyed sections must line up, often to form a complicated pattern (Weiner, 1992). So it can be seen that prior to weaving, threads are pre-dyed, according to the pattern which the weaver wishes to create. This is a delicate and time-consuming process. On completion of dyeing, the resist material is removed and the threads are carefully arranged before weaving. In order to enhance the clarity of an ikat motif or pattern the decorated yarns should be allowed to dominate within the final woven cloth (Larsen, 1976: 29). So in the case of a warp ikat (the most common variety in Central Asia) the warp threads should be allowed to dominate, as these will hold the main components of the finished design. Typically, the stages in the preparation of a sheet of warp threads for an ikat fabric are as follows:

- First, all the threads which are to be dyed the same colour in precisely the same areas along their lengths are bundled together.
- Areas of these threads which are not to be exposed to the dye are bound tightly using a dye-resistant material (e.g. polypropylene).
- The bundles of yarn are soaked in the dye; those areas which are bound in the dye-resistant

material remain unexposed to the dye so that only the unbound areas are dyed.

- The bundles of threads are removed from the dye and allowed to dry.
- The dye-resistant bindings are removed.
- The threads are then bundled again and rebound, so that the previously dyed sections are covered up and some or all of the previously bound sections are exposed.
- The dyeing process is then repeated.
- When dyeing is complete, the dyed threads are carefully laid out on the weaving frame and weaving can commence.

A typical visual characteristic of an ikat-type cloth is a feather-like effect which is caused by the colour in the dye bath bleeding under the resisting material, and by the slight movement of threads caused by the strains imposed by the weaving process.

The constituent fibres of yarns used for ikat production vary depending upon the location of production and the nature of the fibres readily available. Historically these have included: cotton, silk, ramie, hemp, banana fibres, and some other plant fibres. Ikat manufacture is surprisingly wide spread. Important regions of production include South, Central and South-east Asia, as well as Japan, Central and South America, and parts of Africa. Indonesian production is particularly renowned. The concern here, however, is not with these numerous regional variations in general, but simply with Central Asia production and on commenting initially on silk-ikat production in India, for it is believed by the author that it may have been from this origin that ikat production diffused to Central Asia.

Most renowned of the resist-dyed cloths from India are the double-ikat silks from Gujarat and Orissa. Known as *patola* in Gujarat and as *banha* in Orissa, these cloths were traded extensively throughout much of Asia, initially through the activities of Indian, Arab and Chinese traders and, from the seventeenth

century onwards, Portuguese, British and Dutch merchants who used them as exchange goods for precious spices such as nutmeg, mace, cloves and pepper (Sreenivasam, 1989: 11 and 35). According to Weiner, *patola* were used as temple hangings, bridal gifts and shrouds, and were worn at court appearances, classical-dance events, weddings and funerals (Weiner, 1992). Besides double-ikat *patola*, there were numerous examples of other ikat types, particularly silk warp ikats used often as saree fabrics. Not surprisingly, in coastal Indian towns such as Orissa, ikat designs were inspired by the sea and included various sea animals and fish. Flowers and stripes were also common and arrowhead-type effects were in widespread use on the borders of saris (Weiner, 1992). Such arrowhead effects are depicted occasionally on Central Asian silk ikats. These and other similarities between Indian and Central Asian silk ikat production are identified and discussed in sub-section 7.5 below. Prior to this, general comments relating to Central Asian ikats and their production are presented in section 6 below.

VI. Central Asian Ikats

Central Asia is both a geographical entity and a region of various related cultures, although components have not in the past been combined as a single political entity (even during Soviet times). Parts of the wider territory have been sought after by various Colonising powers (e.g. Greek, Mongol, Chinese and Russian). The term Central Asia is used to refer to a vast geographical configuration. The concern here is principally with textiles produced in Uzbekistan and Tajikistan, though mentions will be made also to Kazakhstan. A comprehensive review of twentieth century geographical features and historical developments was produced by Adle, Palat and Tabyshalieva (2005). Central Asia is of great historical significance to developments in trade between east and west, especially because its location was on the direct route between the Roman and Han Chinese worlds. Silk

was probably introduced at a very early date compared to other zones or regions. Indeed it may well have been the case that silk skeins were given to Central Asian weavers for return (when woven) to China (probably the earliest example of outward processing, a phenomenon evident in textile manufacture in modern times and associated with industrial globalisation). Common sense suggests that Central Asian producers ultimately obtained silkworm cocoons, and from these were able to unwind their own silk yarn. It is clear that Central Asian weavers were producing large quantities of silk textiles, from locally produced silk yarn, by the late-first millennium CE. Informative reviews of Central Asian ikat production were provided by Hale and Fitz Gibbon (1988) and Fitz Gibbon and Hale (1997). A useful review of Uzbekistani ikats in relatively modern times was provided by Dusenbury (2008).

Adle et al. (2005) observed that by the nineteenth century Central Asia was producing a wide variety of plain and patterned fabrics using cotton, wool, silk and silk mixtures. In all cases associated techniques were probably acquired in ancient times when the Silk Route was fully operational. Probably the most renowned textile produced in the region was silk ikat. Rivers (2004) commented: 'Ikat textiles were perhaps the most important craft product from Central Asian towns, and they were obviously held in high esteem throughout Central Asian society...These textiles were presented at weddings and important events, displayed in homes and worn to indicate status'. In the context of Uzbekistan, Maxkamoba (1979) referred to ikats as the 'national cloth', thus drawing an association between ikat and national identity. Commenting in 2008, Dusenbury observed that: 'In Uzbekistan today, women's ikat garments, in a variety of shapes, styles and materials, have become an emblem of cultural heritage and national or ethnic identity' (Dusenbury, 2008).

Traditionally, Central Asian ikats were used for clothing, mainly in the form of robes used by both men and women. As is the case in many cultures, exquisite clothing such as ikat was symbolic of social

and economic status. Unlike the patterned textiles from other cultures, it seems that the motifs used did not hold deep symbolism, but rather were taken (as suggested previously) from a range of indigenous sources such as carpets, felts and embroideries. Some motifs or compositions may however have held some significance to dominant Islamic beliefs, though this is by no means clear. It seems that women were the main sericulturists, and men were responsible for the wrapping, dyeing, and tying of the warp, as well as for the weaving process. Important locations of silk-ikat production included Bukhara and Samarkand as well as various towns and villages in the Ferghana Valley. Warp ikats were, by far, the most prevalent. Occasionally cotton was used, sometimes in combination with silk. Satin weave was typical, though occasionally a velvet construction was used. The stages, procedures and techniques associated with sericulture practiced traditionally in Central Asia were closely similar to those practiced in China, suggesting an introduction in ancient times, possibly by experienced Chinese workers or by returning Central Asians who had spent prolonged periods as sericulture workers in China.

The most prevalent colours used in traditional Central Asian ikats were primary red and yellow, and indigo-blue. Seemingly, division of labour along ethnic or tribal lines was common (at least traditionally), with Tajiks specialising in the dyeing of red and yellow colours, Uzbeks and Iranians were the weavers and the Jewish community controlled the dyeing trade in indigo blue. The warp threads were tied with dye-resistant material prior to dyeing, and after each dyeing stage would be retied in preparation for the next colour. Dyeing could be an extremely lengthy process; the most prestigious and expensive silk-ikat type was known as the seven-colour ikat, which required numerous dyeing stages, each with an accompanying re-tying.

VII. Hypotheses on Origins

It is hypothesised first that quantities of silk yarn

were traded initially from China into Central Asia, and second that knowledge of sericulture was transferred or communicated through experienced sericulture workers (either Chinese or Central Asians or others who had worked for a prolonged time in China and learnt the rules and techniques associated with sericulture). Third, it is hypothesised that silk-weaving skills diffused from Sasanian Persia, and fourth that knowledge of ikat manufacture was transferred from India. Fifth, it is hypothesised that constituent motifs used and colour palettes employed were drawn largely from local Central Asian embroideries, rugs and felts. Each hypothesised component is examined further below.

1. Source of silk yarn

There is much evidence to suggest that silk yarn was exported to countries close to the eastern shores of the Mediterranean. Certainly Chinese silk yarns appear to have been woven in Egypt, Syria, Constantinople and Persia and possibly many other locations, including parts of south and south-east Asia, as well as Central Asia. Indeed much of the relevant primary and secondary research literature maintains that early trade contacts were made between China and Central Asia, including Samarkand and Bukhara and other key points at the eastern-most part of the trade networks outside the western border of China. There is even the suggestion of Chinese silk skeins being woven in central Asia under Chinese instructions. So it seems reasonable to conclude that the initial use of silk yarn in Central Asia was associated with these early contacts.

2. Knowledge of sericulture

Commonsense suggests that Central Asian entrepreneurs or manufacturers, located close to trading towns or oases, would have been keen to establish a home source for the prized and highly valuable fibre. As Central Asia is located close geographically to the original Chinese source and as it appears also to be an early travelling direction for Chinese diplomats

and others in search of high-quality horses, it seems likely that Central Asian producers gained relatively early access to sericulture knowledge. A remarkable characteristic of central Asian sericulture processes and techniques (as noted previously in section 6 above) is that these bear a close similarity to those practiced typically in China, suggesting that the initial first stage of diffusion was communicated through skilled and knowledgeable workers, possibly of Chinese origin or returning Central Asians.

3. Silk-weaving skills

There was substantial Persian influence in Central Asia particularly in pre-Islamic times (e.g. Parthian and then Sasanian). Strong influence in the weaving traditions of Central Asia is manifested, for example, in the *zandaniji* silk brocades produced close to Bukhara. The Persian weaving industry appears to have been well advanced and, initially, probably used silk yarns sourced from China and probably also traded these through Central Asia. It appears to be the case therefore that Central Asian silk weaving techniques were introduced and encouraged through contacts with Persians, particularly during the early part of the first millennium CE.

4. Knowledge of ikat-weaving techniques

Warp ikat, weft ikat and double ikat are all produced in South Asia. Indeed the varieties of silk and cotton textiles, from the area encompassed by present-day India, Pakistan, Sri Lanka and Bangladesh, are probably greater in range than for any other single equivalent geographical area globally. Various archaeological excavations in Southern Uzbekistan as well as parts of Kazakhstan provide evidence for the existence of political, cultural and religious links between India and Central Asia in ancient times. The diffusion of Buddhism occurred in parallel. Dynasties were established following various invasions into South Asia, including Kushans, Huns, Turks, Mongols and Pashtuns. There is also extensive reference to Central Asian peoples

in Indian literature. Some ancient sources of literature suggest a common lineage for Indians, Iranians, Pakistanis, Afghans and various ethnic or nationalist groups of Central Asia. With this in mind it certainly seems feasible to claim that Central Asian weaving techniques diffused from south Asian sources.

5. Sources of motifs and colour palettes

Many of the motif shapes and forms are not easily recognisable, probably because they have been copied by successive generations of weavers from more ancient pieces and, at each stage of copying, have deviated one step further from the intended original form. This is a common problem when considering motif origins of many varieties of hand-crafted textiles (e.g. batiks, kilims and pile carpets). There appears also to be the tendency to superimpose one series of motifs or one particular composition on top of another, which adds to the difficulty in identification.

An important difference between the ikats of much of south and south-east Asia and those of Central Asia is the relative size of the component motifs. In the ikats from Central Asia the tendency is to use relatively large-scale motifs. It may be worth noting that a common sense consideration is that larger-scale motifs require less preparation time than complicated smaller motifs. Also, the scale used may have been dictated simply by scales familiar from local textiles (felts, embroideries and carpets) from which ikat motifs may have been adopted.

On occasions, arrow-like designs can be detected among Central Asian silk ikats. These arrow-like compositions are similar to designs on some ikats found in many producing areas across Asia. This may be simply as a consequence of the nature of the process and the mechanical tendency for patterned warp threads to shift and form arrow-like effects during the weaving process. The effect achieved may have induced producers to create a more substantial and planned movement of the patterned threads and thus the enhancement of the effect itself. It is worth

remarking that the scale of Central Asian arrow-like effects (on silk ikats) is similar to that used typically in various silk ikat saree fabrics of south Asia (present-day India). The direction of diffusion (if that indeed is the case) is not known.

Occasionally, elongated, Paisley-type motifs are depicted on Central Asian ikats; these have an origin in Kashmiri (north-west India) woollen shawl design or possibly Persian floral ornament. Other motif types, particularly circular wheel or floral motifs appear to have been abstracted from local embroideries, felted wools or pile carpets. Ikat colour palettes (comprised mainly of primary red and yellow and indigo blue on a white background) are broadly similar to those used on traditional Central Asian embroideries, many of which employ coloured silk on bleached (white) cotton.

Much insight was provided by Rivers (2004) when commenting on probable origins and influences on the design of ikats from nineteenth century Central Asia: 'Some designs reflected the same motifs seen on domestic embroideries, or were drawn from geometricized tribal weavings, and the rhythmic patterns of architectural tiles. Designs such as flowers, palmate forms and trees of life echoed nature and evolved into highly stylised forms. Many ikat motifs are pre-Islamic in origin, descended from Uzbek, Turkic tribal groups and relate to old beliefs in the magic or protective qualities of designs'.

VIII. In Conclusion

The vast bulk of trade, along what became known as the 'Silk Route' did not involve direct exchange between powerful empires (Romans and Han Chinese) at geographic extremes to the west and east of the Europe and Asia landmass, but rather was progressed in stages between adjacent locations. Diffusion of ideas was not immediate but, was a gradual process influencing adjacent participants, at stages over a long period of time. On considering the origins of

Central Asian ikats, it appears that the characteristics of these textiles were influenced by divergent sources. Knowledge of sericulture appears to have diffused directly from China, probably through notable trading towns, such as Bukara or Samarkand. Silk yarn of Chinese origin probably reached Central Asia before knowledge of sericulture, and seemingly also before knowledge of silk-dyeing techniques and the use of appropriate mordant types. Silk-weaving techniques and design compositions used in silk brocades probably diffused from Sasanian Persia, which had exceedingly sophisticated and advanced figured weaving skills. Meanwhile knowledge of ikat production itself probably diffused from India where it had reached an advanced stage of development (exhibited by the use of advanced double ikat techniques). The origins of motifs and compositions present a mystery. Although there are minor parallels with ikats and other textile designs from south Asian sources, it seems that various indigenous sources, especially embroideries, felted fabrics and carpets, played an important role in the patterning of Central Asian ikats.

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