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Ancient Textiles of the Indus Valley Region
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Introduction

The vast geographical region encompassed by the Indus river and its tributaries has been the setting for the emergence of many diverse cultural traditions, beginning in the early Stone Age over 2 million years ago and continuing up to the present. The heart of the Indus valley is located in the modern country of Pakistan, but its tributaries and adjacent lands extend to the west and north into Afghanistan and east into peninsular India. The textile traditions of the Indus Valley region have their roots in the prehistoric communities of Neolithic farmers and herders who lived and traded along the Indus River and its tributaries more than 9000 years ago (Figure 1). Over the next several thousand years, small villages and eventually towns became established in the rich alluvial plains of the Indus and by 2800 BC, during the Kot Diji Period we see the earliest large towns with evidence for well a developed textile tradition. From around 2600- to 1900 BC, during the Harappan Period of the Indus Civilization textiles appear to have become quite elaborate with many different styles of clothing and also several different types of fibers being used.

Due to the nature of the archaeological deposits in the Indus region, it is difficult to recover anything more than fragmentary and often indirect evidence for early textile production. In fact, most of our evidence for the use of textiles comes from terracotta figurines or inscribed seals depicting various types of clothing such as skirts, shawls or turbans. Another category of indirect evidence is seen in the polychrome and bichrome designs on painted pottery, which provide some insights into the variety of fabric designs. Fabric impressions on pottery of faience vessels are another form of evidence for the different types of weaving and spinning. In terms of actual textiles, the most commonly preserved fragments are those that have been saved from disintegration through contact with corroding metals such as copper or silver. Occasionally some charred fibres have been found adhering to pottery and in very rare instances, actual textiles are preserved under low-fired clay slips.

The most common fibres used in the Indus Valley appear to have been cotton, but various types of wool and possibly jute or hemp fibres were also used. Most recently, the discovery of silk thread inside copper beads from the site of Harappa indicates that wild silk was also known to the ancient inhabitants of the region, though there is no evidence to suggest that it was woven into fabric. In the following article a brief overview of the major cultural traditions of the Indus region will be presented along with a discussion of the current state of research on the most ancient textiles used by ancient peoples of this region.

Early Origins

During the Palaeolithic or Stone Age period, which dates from over 2 million years ago to around 12,000 years ago, communities living in the Indus region were

mobile hunters and gatherers (Kenoyer 1998). These early communities probably used animal skins for clothing but would nevertheless have been familiar with different types of plant fibres made from roots, grasses or the inner bark of trees. Such vegetable fibres, generally referred to as bast, are used even today in many parts of the subcontinent to produce rope and nets, as well as to manufacture net bags and finger woven belts. The early hunter-gatherers also may have used the long hair of wild animals such as wild sheep and goat, to twist into rope, for braiding and netting. It is not unlikely that some individuals may have begun experimenting with the weaving of fabrics from plant or animal fibers, but so far no concrete archaeological evidence has been discovered.

At the end of the Palaeolithic, hunting and gathering communities began to settle down and we see the emergence of small farming and herding communities during the Early Food Producing Era or Neolithic period (7000-5500 BC) (Jarrige and Meadow 1980). The site of Mehrgarh in Baluchistan is one of the most important settlements where excavations have revealed various aspects of early village life in South Asia (Jarrige, C. et al 1995) (Figure 1). Although we have no direct evidence for the weaving of fabric during the earliest occupations at Mehrgarh, this may be the result of preservation factors rather than the actual absence of this important technology. Mehrgarh is located at the foot of the Bolan Pass that leads from the Kachi Plain at the edge of the Indus Valley to the highland plateaus of Baluchistan. During the early Neolithic period the inhabitants practiced farming of wheat and barley, herding of sheep-goat and cattle, supplemented by hunting, fishing and gathering of wild fruits. Although they had elaborate ornament styles and finely woven baskets, and lived in mud brick houses, they did not use pottery or make terracotta figurines, and only one copper bead has been discovered in one of the burials (Samzun and Sellier 1985). As noted above, most preserved fibres are found on metal or impressed into terracotta, so the apparent absence of textile evidence is not conclusive. In fact, there is abundant indirect evidence for spinning of fine threads for stringing beads and some indication that people knew how to knit and/or weave. Wild or domestic cotton, fine wool or even wild silk may have been used to make the necklace strings. Many of the micro-beads have been incorporated into wide bands (Samzun and Sellier 1985) that may have been made on a simple bead loom or through more complex techniques of beading and looping. Neolithic Mehrgarh has abundant evidence for expert basket weavers. Various types of coil baskets and woven baskets, coated with bitumen to make them watertight are found in Neolithic burials (Samzun and Sellier 1985). All of this indirect evidence and the fact that woven bast textiles are found in sites of the Near East during this time period (Barber 1991; Janaway 1995) suggests that future research may reveal the presence of woven textiles during the Neolithic of the Indus Valley.

Early Regional Cultures

With the growth of agricultural villages and small towns throughout the Indus valley, many different craft technologies begin to evolve and regional styles of architecture, pottery making and ornaments become established. It is not unlikely that textile traditions also became more elaborate with the emergence of different classes of people and also distinct regional cultures. During the Regionalization Era, from around 5500 to 2600 BC, textile production can be identified on the basis of numerous different categories of evidence.

At the site of Mehrgarh, actual seeds of the cotton plant (*Gossypium* sp.) along with some charred wheat and barley have been recovered from a mud brick building dating to the sixth millennium BC (Costantini 1984). It is not possible to determine if the seeds derive from wild or domestic cotton, but we know that both *Gossypium arborem* (tree cotton) and *G. herbaceum* (short staple cotton) were eventually used in the region and still continue to be cultivated in remote areas of the Indus Valley even today (Janaway 1995:165). Painted pottery from the Kechi Beg phase at Mehrgarh provides evidence for the types of elaborate designs that may have been present on woven or embroidered fabrics (Figure 2). Terracotta figurines from the site of Mehrgarh and the nearby site of Nausharo include female figurines with elaborate headdresses and male figurines with pantaloons and turbans (Figure 3) (Jarrige, C. 1997). The black painted designs on some turbans may indicate black goats wool or deep indigo dye was used to make decorative woven bands (Figure 4). The wide variety of clothing styles and headdresses suggest that textiles and personal ornamentation were an important part of everyday life

During this same time period, terracotta spindle whorls become quite common at sites throughout the Indus valley, and provide indirect evidence for the spinning of yarn. At the site of Harappa, during the Ravi period occupation (3300-2800 BC) (Kenoyer and Meadow 2000), many different sizes of spindle whorls have been found that suggest they may have been used for producing different qualities of threads (Figure 5). Heavier spindle whorls would have been needed to produce thick woolen yarn, while light spindle whorls may have been used for producing fine wool or cotton thread. Highly polished bone tools made from cattle ribs, may have been used in weaving and a rectangular bone plaque with perforations could have been used in a form of card weaving for making belts (Figure 6). The most conclusive evidence for textiles are two small terracotta beads with fabric impression on both faces (Figure 7). The relatively uniform thread size and the simple weave indicate a well-established textile tradition with highly skilled craftspeople. Unfortunately is not possible to determine the type of fibre based on the terracotta impressions.

During the final phase of the Regionalization Era, from 2800 to 2600 BC, the site of Harappa grew to become a regional urban center (Kenoyer 2001). The city was divided into two distinct walled sectors, with evidence for well-planned neighborhoods with mud brick houses oriented in the cardinal directions and north south oriented streets. Terracotta figurines of this period show women wearing long skirts with black cross hatched painted designs (Figure 8). The use of alternating colors in both the warp and the weft is a common technique found in post regions of the world. At Harappa, the early weavers may have used indigo dyed blue yard alternating with natural brown cotton or bleached cotton. Similar patterns are still woven in the head covers or shawls of the Punjab known as *khes*.

Another important development during this period is the use of sequins as a form of decoration (Figure 9). Tiny gold sequins and discs found in the street debris may indicate that some people living in this part of the ancient town were wealthy enough to have gold sequins sewn onto their clothing. While walking along the street a few sequins may have broken off and lost in the dust or mud.

Painted terracotta bull figurines from the Kot Diji Period suggest that a great deal of attention was being paid to the protection and decoration of animals (Figure 10). Cattle

are often covered with blankets to protect them from the cold or insects and the painted designs on some of the terracotta figurines suggests that some of these blankets may have been woven with patterns or embroidered.

Harappan Period Textiles

With the growth of cities during the Harappan Period (2600-1900 BC), many important craft traditions become highly specialized. Copper working, pottery making, bead making and probably textile production would have all been important technologies for the production of utilitarian and status items to meet the demands of the increasingly diverse communities of the large urban centers. The wide variety of dress depicted on terracotta figurines and carved onto seals indicates that clothing was an important part of Harappan cultural identity.

Many of the female figurines are depicted wearing short skirts that may have been woven on small back strap looms (Figure 11). Other females and some figures in a procession on a seal (Figure 12) are depicted with long skirts that reach to the middle of the calf. Wide pieces of cloth could have been made by sewing together narrow widths of fabric or perhaps they were produced on a larger upright looms. Many examples of what may be loom weights have been found in the excavations at both Harappa and Mohenjo-Daro, so it is not unlikely that many different types of looms were being used. Some of the male figurines are depicted wearing long skirts while other are wearing only narrow loincloths. Pointed conical headdresses as well as different sizes of turbans are also depicted on male figurines (Figure 13).

As was the case during the earlier Kot Diji Period, many animal depictions show the use of coverings that may have been made from textiles or decorated leather. The famous unicorn figures carved onto seals are depicted with a covering that hangs over the front legs or whithers (Figure 14) and some depictions show what appears to be a saddle blanket.

One of the most important discoveries from recent excavations at Harappa is a small toy bed, with fabric impression made on the entire upper surface, apparently indicating the use of bed covers or blankets (Figure 15). The fine twist and compact weave on this example provides incontrovertible evidence for the high quality of Harappan textiles. As noted above, it is not possible to determine the type of fibre based solely on the impression.

Numerous examples of preserved fibres have been recovered from the excavations at Mohenjo-Daro and more recently from the excavations at Harappa (Meadow and Kenoyer 2001). One of the most well studied fibre samples from Mohenjo-Daro was discovered against a corroded silver jar (Marshall 1931, Vol. 1:20, 218-219; Gulati and Turner, 1928). The analysis of this fabric indicated that it was made of cotton threads with a warp count of 20 threads per inch and a weft count of 60 threads per inch. Another fabric sample had a warp and weft count of 44/43 threads per square inch, and the calculated weight of the fabric was around 4 ounces per square yard (Marshall 1931, Vol. 2:585-586). This is clear evidence for the production of fine fabrics, presumably made with cotton.

Vats (1940:466) reports that no remnants of textiles were recovered during the course of his excavations at Harappa, but he does note that textile impressions have been found on the interior of faience vessels. This results from the practice of making faience vessels by building up the shape around a core of sand that was covered with textile.

After the faience paste had hardened, the sand was removed and the textile burned away during the firing, leaving a very detailed impression. Numerous impressions from similar faience bottles have been recovered from recent excavations at Harappa (Figure 16). Although Vats claims that the textile used for this practice was probably cotton, it is not possible to determine the identity of the fibre on the basis of the weave alone. The impressions reveal the use of many different qualities of textile for this process, suggesting that the faience workers used whatever scarps were available to them. Some of the fabrics were made with fine threads and tight weave, while others had fine thread and an open weave like gauze. A few examples show large unevenly spun threads and irregular weave. While the former textiles could represent fine cotton or even wool, the latter might represent a form of hemp or jute fabric.

One of the most famous examples of a textile from the site of Mohenjo-Daro is seen on a small stone sculpture with a cloak thrown over the left shoulder. Often referred to as the "Priest-King" this sculpture shows the use of circular designs comprised of circles, double circles and trefoils (Figure 17). When the sculpture was first discovered, the trefoils and circles were filled with red pigment and the background was filled with a dark pigment that may have originally been green or blue. The white color of the original stone would have been visible in the form of the circle, resulting in a striking pattern made of green or blue with red and white designs. This type of patterning, using indigo, madder and bleached cotton, is still commonly used in the printing of ajrak block prints in modern Sindh, Gujarat and Rajasthan. Due to the lack of repetition in the design, the cloak worn by the "priest-King" probably is not a block printed textile, but may have been made with large embroidered designs or by tie dying.

While cotton may be the most commonly preserved form of textile in the Indus cities, there is some new evidence for the use of wool. This is seen in the fabric fragments preserved on corroded copper artifacts from Harappa. Some of the fibres currently being studied by the author are extremely fine and look very much like pashmina and shatoosh, which are the highest quality of wool used in the subcontinent today and come from the northern region of Jammu and Kashmir. Further studies are necessary to confirm this identification but the discovery of this type of wool would not be surprising since recent provenience studies of rocks and minerals such as lead indicate Jammu as a possible resource area (Randall Law Personal Communication). Another possible indicator for the use of wool is the distinctive curved razors or knives, with handles often wrapped in fabric or yarn (Figure 18). Although no prehistoric examples of knotted pile carpets have been recovered from the Indus region, the shape of the blade is very similar to the curved blades used in carpet making throughout West Asia and South Asia.

Silk is another important fibre that has been reported from Nevasa in India (second millennium BC) (Gulati 1961), and now there is clear evidence for the use of silk thread at the site of Harappa in the Indus valley (Irene Good- personal communication). Two different examples of silk have been recovered from different parts of the site and dating to around 2450 BC to 2000 BC. One example is preserved inside of a hollow copper bangle and this may have been some sort of tassel that was threaded through the hollow ornament. The other example is a twisted thread preserved inside of a long copper spiral wire necklace (Figure 19). Studies are underway to analyze the fibres to determine the species of silk moth that they may derive from, but current evidence suggests that the fibres belong to the wild silk moth (*Antheraea* sp). Three different species of silk moth

are currently utilized in the subcontinent, Maga or Munga (Antheraea assamensis), Tussah (Antheraea mylitta) and Eri (Samia cynthia) (Janaway 1995:166). In China, wild silk was used to make threads, but the earliest silk fabrics from Yangshao period settlements dating to around 3300-2250 BC, appear to have been made from domesticated *Bombyx mori*. In contrast with the fine, smooth round fibres produced by the domesticated Chinese silk worms, *Bombyx mori*, the silk fibres produced from the wild silk worms are more irregular (Good 1995). Nevertheless, wild silk can be de-gummed and spun to produce extremely fine strong threads. While there is no direct evidence for woven silk in the prehistoric period of South Asia, early Sanskrit texts reveal that silk technology and production was well established in the subcontinent by around the late first millennium BC, with purely Sanskrit terms used for silk and silk working (Balkrishna 1925: 44-45). Given the long history of the use of silk for making thread and the textual evidence, it is not unlikely that the early South Asian silk industry evolved independently from the silk traditions of China.

Conclusion

Although the evidence for textiles during the prehistoric period is quite limited, this brief overview has provided evidence for the prehistoric textile traditions of the Indus valley. The use of cotton, wool and silk fibres and the development of different styles of clothing in the earliest urban centers became the foundation of later textile traditions of the Indus Valley and South Asia in general. At the end of the Harappan period, around 1900-1500 BC, there is evidence for the emergence of new cultures and ideologies associated with Vedic traditions and the Sanskrit language. Sanskrit texts and later sculptures provide evidence for the use of many different types of textiles, many of which are still in use today. Most of the garments were made from unstitched cloth as seen in the Indus figurines and sculptures. The next major phase of urbanism culminates in the Mauryan Empire (322 -183 BC) during which long distance trade networks are established with China, Iran, Egypt and the Mediterranean. From this time onwards, the history of textiles in South Asia becomes extremely complex due to the cross-fertilization of ideas, technologies and cultural styles (Figure 20). In order to begin sorting out some of the important developments during the Early Historic period it will be necessary to undertake careful archaeological studies in combination with critical analysis of the historical textual information.

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