

# Ancient Indian Cloth Spinning Methodology

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## Synopsis

The present paper is an attempt to throw light on ancient Indian textile technology. Reference to the theme is found since the time of Indus Valley Civilization. Clothes were manufactured by dint of a few implements such as spindle whorls, spools, axle of spinning wheel, weaver's shuttle, needles, thimbles etc.

A few archaeological sites have been discussed where evidence of cloth was found. On the basis of literary sources and foreign accounts the textile technology has been discussed. References to dress and costumes in general and cloth-cotton, silk and linen-in particular are available from early times. Foreign travellers have stated with hence surprise that the stitched clothes were worn by Indians.

## TEXTILE TECHNOLOGY IN ANCIENT INDIA

Textiles are types of cloth or fabric. Numerous spindle-whorls of terracotta and frit (unglazed vitreous paste) are found in Indus settlements, showing that hand-spinning was widespread, presumably as a woman's chore in each household, rich and poor. Of the wooden looms, however, there is no trace. The minute fragments of dyed woven cotton recovered from Mohenjodaro constitute one of the two earliest known examples of cotton cloth in the world (the other example coming from Jordan, dated to a time before 3000 B.C.). The trefoil motifs on the robe of the 'Priest-king' in stone sculpture from Mohenjodaro are obviously the result of embroidery, which copper needles (with 'eyes') must have made easier.<sup>1</sup>

The early evidence regarding cloth comes from Ujjain (c. 600-300 B.C.). At Rairh (c. 300-200 B.C.) was found adhering to a number of Punch marked coins. The coins were tied in a piece of cloth and then placed in the pot. The weight and number of the thread indicate that a fairly heavy cloth has been used. On an average, the cloth has 21 threads per inch in one direction and 27 on the other. The yarns are very low. At Bairat<sup>2</sup> (c. 100 AD) eight punch marked coins were found wrapped in a piece of cloth and kept inside a pot. Analysis reveal, it is cotton fibre and cloth has been woven from 20's and 16's yarns but the warp and weft is difficult to identify. At Paithan<sup>3</sup> ten square copper coins were found tied in a piece of cloth and the cloth has been identified as *crotalaria juncea*. Fragment of a cloth has been found sticking to a Gadhia coin at

<sup>1</sup> Irfan Habib, *The Indus Civilization*, Delhi, 2002, p. 34.

<sup>2</sup> D.R. Sahni, "Archaeological Remains and Excavations at Bairat, Jaipur", *Indian Archaeological Report*, 1962-63, pp. 21-3, Pl.iv.b.

<sup>3</sup> Yusuf Syed, "Paithan Excavations", *Annual Report of the Archaeological Department of His Exalted Highness the Nizams's Dominions*, 1936-37, p. 42, PL. XX (f); S.S. Ghosh, "Study of Ancient fabric and its identification" *Bulletin of the Hyderabad Archaeological Survey*, 17, Pt. 1. 1953.

Baroda<sup>4</sup> (c. 500-600 AD). The cloth is cotton with plain weave consisting of 44 reeds and picks respectively. The count of the yarn of the reeds is 16 and the picks 20.

Though evidence is meager, the details show that prevalence of spun cotton worn by the people during the Early Historic Period. On the other hand, evidences from the sculptural and other plastic arts of contemporary times add sumptuous information to the varied fashionable dresses and costumes worn by the people.

Some vessels were found bearing impressions of textiles which could be accidental or deliberate. Few sites have revealed this evidence. At Kaundinyapura<sup>5</sup> on one of the potsherds impression of (c. 300-200 BC) a square inch of cloth comprised of 32 threads in the warp and 28 in the weft; in another (c. 200-100 BC) they showed 30 and 28 threads respectively. In both, the cloth seems to have been hand-spun *khaddar*. The plys are not visible. Textile impressions on pottery has also been reported at Ujjain<sup>6</sup> (c. 300-200 BC). Quite interestingly potsherds at Rang Mahal<sup>7</sup> have been found with textile impressions on the interior. It seems to have been employed as an element in the technique of manufacture. Impressions of the positive design taken from various shards reveal a series of loosely woven fabrics of both coarse and fine quality carried out in plain weave. Some of them, reveal a fabric of more even structure. The yarn used may be cotton, linen or possibly jute and the fabric is of vegetable fiber. These impressions are found on special type of cooking vessels.

Reference to some implements such as spindle whorls, axle of spinning wheel, weaver's shuttle, needles and thimbles has been found which were used for spinning and weaving.

Spindle whorls of pear-shape occur at Nagda and Ujjain<sup>8</sup> (c 600-300 BC) made in terracotta. Specimens at Ahar<sup>9</sup> and Charsada have<sup>10</sup> in addition been decorated with incised designs. Sankalia<sup>11</sup> has shown that some of the incised designs are remarkably akin to those from sites of Western Asia. From the third century B.C. they occur in large numbers. One of them is made at Nasik<sup>12</sup> in NBP (Northern Black Polished Ware) sherd. All are circular with a plain flat surface of red fabric.

One of them at Dhatwa<sup>13</sup> (600-200 BC) has been decorated with dots divided by arched rectangles. It weighs about 20 gms. which is the weight of modern whorls. Some of them at Taxila<sup>14</sup> (c. 300 BC) are also made from bone and ivory. Specimens at Sirkap (c. 100 AD) are in addition were prepared in schist,

<sup>4</sup> Subba Rao, *Baroda through the Ages*, Baroda, 1953, p. 88, PL.XVII.1.

<sup>5</sup> M.G. Dikshit, *Excavations at Kaundinyapura*, Bombay, 1968, p. 157, PL.XXVII.

<sup>6</sup> *Indian Antiquary*, Vol. I, p. 201.

<sup>7</sup> Martha Lundstrom, "An examination of the textile impressions on the vessels of type 9 and their manufacturer" in Hanna Rydh, *Rang Mahal*, Sweden, 1959, pp. 201-02.

<sup>8</sup> *Indian Antiquary*, Vol. I. pp. 202, 206; *IAR*, 1957-58, p. 34.

<sup>9</sup> H. D. Sankalia, *Excavations at Maheshwar-Navdatoli*, Poona Baroda, 1958, pp. 167, 175, 223 (fn.)

<sup>10</sup> Mortimer Wheeler, *Charsada*, London, 1962, p. 110, PL.XXXIX. 1-4.

<sup>11</sup> Sankalia, Review of Wheeler's book, *Charsada in Indica* I. 1964, pp. 102-05.

<sup>12</sup> H. D. Sankalia and S.D. Deo, *Report on the Excavations of Nasik and Jorwe*, 1950-51, Poona, 1955. p. 47.

<sup>13</sup> R. N. Mehta and S. N.Choudhary, *Excavations at Dhatwa*, Baroda, 1975, pp. 15-16; PL. IV. b; F. 6.9.

<sup>14</sup> J. Marshall, *Taxila*, (3 Vols.) Cambridge, 1951, vol. II, pp. 502,661-52; III. PL. 142.

soapstone and rock-crystal. They occur in profusion from the second century BC<sup>15</sup> mostly made from potsherds. Spindle whorls with two perforations are known from Nevasa.

A general feature noticeable is that the shape has remained the same throughout the Early Historic Period. Spindles were made from broken potsherds by rubbing off the outer sides and making holes. This type of whorls has been in use right upto the Medieval times. Spools were used for winding yarn. They have flat surface circular and concave sides. Many of them have been classified by excavators under the category of car-spools. Some have polished surfaces with decorations. The discs may have served the purpose of spools, whereas, those with surface decorations could have been worn as ear-spools and discs.

Axle for spinning wheel was used. Taxila<sup>16</sup> has yielded an example (c. 400-500 ad) of iron with copper band attached at centre and sharply pointed ends. Weaver's shuttle is a rare object possessing double pointed edges with thick median recess and is considered to be an essential equipment of looms. A shuttle made of ivory occurs at Ujjain<sup>17</sup> (c. 500-400 BC). Plenty of bone points with both edges sharpened are known at sites<sup>18</sup> during c. 200 BC-200 AD. Few of them could have served as a 'composite tool' in weaving, for example, they could have served as teeth of combs to adjust the warp and woof threads.<sup>19</sup> A shuttle of iron also occurs at Sirkap<sup>20</sup> (c. 100 AD). Similar ones are even now used in looms.<sup>21</sup> Needles are made in copper reported at sites from the fourth century B.C to the second century AD.<sup>22</sup> One of them at Taxila<sup>23</sup> (c. 300 BC) is quite big with an expanded head, but the eye is smaller without difference between head and shaft. Some needles of iron also occur at Ter and Taxila. They occur upto the 5th century AD. Thimbles were used for protecting the fingers from the pricks of a needle. Many in copper are reported at Tripuri<sup>24</sup> (c. 300 BC-200 AD), the only site that has furnished the evidence so far.

References to dress and costumes in general and cloth-cotton, silk and linen-in particular are available from early times. Foreign travellers note with much surprise the stitched clothes worn by Indians. Theophrastes (c.350 BC) gives the first definite conception of Indian cotton cultivation. Companions of Alexander noticed the same style of dressing and the costume of the people as at present. Greek<sup>25</sup> writers like Nearchus Strabo, Curtius Rufus affirm that cotton came from India. Buddhist literature is replete with references to cloth and textiles. Buddhist *Jataka*<sup>26</sup> and Jaina works<sup>27</sup> refer to eighteen crafts and occupations organized into guilds, in which are included silk weavers, calico printers and tailors. Cave inscriptions at

<sup>15</sup> Amreli, Bhokardan, Brahmagiri, Karvan, Kasrawad, Maski, Nasik, Nevasa, Paithan, Paunar and Sambhar.

<sup>16</sup> Marshall, *op. cit.*, p. 544; III, PL. 164.55.

<sup>17</sup> *Indian Antiquary*, vol. I, p. 206; from pre-NBP phase.

<sup>18</sup> Kaundinyapura, Nasik, Rairh and Sambhar.

<sup>19</sup> Flinders Petrie, *Tools and Weapons*, London, 1901, p. 54.

<sup>20</sup> Marshall, *op. cit.*, II, p. 561, III, PL. 170. j.

<sup>21</sup> Many sites have yielded bone points, both sides sharpened and could have been used as shuttles. They have been discussed under 'weapons'.

<sup>22</sup> Bairat, Kondapur, Maheshwar, Rairh, Sambhar, Taxila and Ter.

<sup>23</sup> Marshall, *op. cit.*, III, PL. 173.11.

<sup>24</sup> Dikshit, *op. cit.*, pp. 104-05; PL. XXXIX. 4.

<sup>25</sup> J. W. McCrindle, J. W. *The invasion of India by Alexander the Great*, (Rev) London, 1969 pp. 186-88.

<sup>26</sup> Mati Chandra, *Bhar, Vidya*, I. 1939-40, pp. 28-56; *JUPHS*, XXIV-XXV, 1951-52, pp. 164- 88; Lallanji Gopal, "Organisation of Industries in Ancient India," *Journal of Indian History*, XI, 1964, pp. 887-914.

<sup>27</sup> Jain, J.C., *Life in Ancient India as Depicted in Jain Cannons*, Bombay, 1947. p. 109, Mati Chandra, *JUPHS*, XXIV-XXV, 1951-52, p. 165.

Nasik mention guilds of weavers during Satavahana times. Literatures of the early periods also refer to spinning and weaving. In the Vedic period<sup>28</sup> manufacture of cloth was already known. *Mahavagga* mentions six items: linen, cotton, silk, wool, coarse cloth and hempen-cloth. Panini mentions the various tools of cloth manufacture. viz. axle (*aksha*) loom (*tantra*) and shuttle (*Pravani*).

The *Sabhaparvan* of *Mahabharata* refers to cotton growing country called Karpasika, as well as wool and linen from Kambhoja and Valhika. The *Arthasastra* also mentions the best cotton cloth from Mathura, Aparantaka, Kalinga, Kasi, Vanga, Vatsa and Mahisha. The manufacturer of cloth reaches its perfection and it formed a principle item of export in the shape of fine muslins, held in high esteem and fetching high prices in the Roman markets. Periplus<sup>29</sup> records that Indian cotton cloth and a few muslins were produced in Gujarat were exported of East Africa from Berygaza along with a third kind of coarse mallow coloured cloth. Warmington<sup>30</sup> notes that "from about 100A.D. onwards much raw cotton was submitted to the looms of Alexandria and Syria". The mention of cotton cloth and muslin in the Digest list shows their entry into Alexandria enroute to Rome by the sea. The *Indica* of Arian<sup>31</sup> records that Indian cotton is whiter and brighter than that of any other country.

Tamil literature speaks of the flourishing cotton and silk industry at Madurai, Uraiyur and Kaverippattinam. *Silappadikaram* speaks of the streets of Madura peopled with cloth merchants and also describes Puhar and its streets where weavers were seen dealing in fine fabrics made of silk, fur and cotton. Periplus includes in the exports from Chola land "the pearls.... and a kind of fine muslin called Argaritic from Uraiyur. A variety of thin muslin cloth woven by Tamil weavers was *tuhil*. Pliny says that the Roman ladies exposed their charms much too immodestly by clothing themselves in the "web of woven wind" as he called the muslins imported from India.

Thus the manufacturer of various textiles had a vast domestic market, since textiles featured prominently in the north-south trade within India, and there was also considerable demand for Indian textiles in Asian markets. Silk, muslin, calico, linen, wool and cotton were produced in quantity and western India was one of the centers of silk-weaving. Later in the Gupta period the production of silk may have declined, since many members of an important guild of silk-weavers in western India migrated inland to follow other occupation.<sup>32</sup>

<sup>28</sup> Majumdar, *Ind. Cult.* I, 1934-35, p. 193.

<sup>29</sup> W. H. Schoff (tr.) *Peri plus of the Erythrean Sea*, New York, 1912.

<sup>30</sup> *The Commerce between Roman empire and Indian*, Cambridge, 1928, p. 306.

<sup>31</sup> McCrindle, *Ancient India as described by Megasthenes and Arrian* (Rep) 1960, p. 224; Mati Chandra, *Journal of the Indian Society of Oriental Art*, VIII. 1940, p. 180.

<sup>32</sup> Romila Thaper, *Early India*, New Delhi, 2002, p. 300.