

A Composite of Indian Textiles: Tradition and Technology

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India, by virtue of its rich cultural heritage, has been the textile production center for countless meters of exquisitely woven and printed textiles. Over the centuries, most of these textiles have been produced in cottage industry type settings, which has allowed them to retain their traditional craftsmanship and beauty. Rustam Mehta in "Masterpieces of Indian Textiles"¹ says, "There is perhaps hardly a village in this vast subcontinent where there is no colony of caste weavers, each member sitting beside his simple loom, weaving out the traditional beauty of India's own precious heritage."

This paper is an overview or collection of parts representing the traditional techniques still being executed in India in contemporary form. Keep in mind these processes have changed very little from those used centuries ago and have been perpetuated by the caste system, even though that system supposedly has been abolished by the Indian government.

Webster defines technology as "the totality of the means employed to provide objects necessary for human sustenance and comfort". It is in that context that the word technology is used.

As one studies the textiles of any culture, one must begin with the raw material that has been used to build that textile. For the traditional Indian textile, one of three fibers is used: cotton, silk, or wool.

For four-thousand years India has produced some of the world's most precious cotton. Mehta² states, "None among the wonderful cotton fabrics was more famous than the exquisite closely woven muslin with such graphically descriptive and poetic names as Abrawan (running water), Bafthawa (woven air), Sharbati (sweet as sherbet), and Shabnam (evening dew). As Sir George Watt has pointed out, the most common method of testing the fineness of the muslin was to determine if the piece

of woven cloth could be passed through a lady's finger ring. In the time of Emperor Jahangir, muslins fifteen yards in length and one yard in width could be made so fine as to weigh a mere nine hundred grains."

Peasant saris and dhotis, the draped garment worn by men around their waists, are and have been primarily made of cotton. An Indian cotton textile of historical significance is khadi. It is a homespun, hand-loomed, rough textured cotton and was promoted by Gandhi as a symbol of self-reliance. He believed that the success of Indian independence and development depended upon the self-reliance of its five-hundred-and-eighty-thousand villages, so he taught himself to spin and encouraged millions of Indians to spin their own cotton and weave their own cloth.

Another well known Indian cotton was and is madras. This hand-woven check or plaid produced in and around the city of Madras, later became a textile primarily for the foreign market. It was popular in this country over twenty years ago for sportswear and had the dubious honor of being labeled "guaranteed to fade and bleed". Its popularity recycled about six or seven years ago.

Silk has always been a prized commodity. By some it was and is considered a holy cloth. It has been said that "it is what you wear if you want to touch God"³. Legend indicates that the mulberry plant was brought secretly into India by a Buddhist monk. The Silk Road, actually a network of routes, aided the flow of silk.

The city of Benares or Varanasi has for centuries been known for the production of woven silk, particularly brocades and using gold and silk threads. These brocades were called kinkhabs and could range from containing a minimal amount of metallic thread to one-hundred per cent gold or silver.

Today India has exclusive control of the muga caterpillar which produces a shimmering golden silk. The eri silkworm, raised on the castor plant, produces silk that is extremely durable. India is second only to China in the production of silk.

Wool has been used to a lesser extent in Indian textiles. It is believed wool had some religious significance in that it was created by Brahma. Black wool thread is commonly used to keep away the evil spirits. "The superb shawls of Kashmir – true works of art and the craftsmen's nimble skill – make up in quality for the low quantitative production of woolen fabrics."⁴ The best quality wool is from the underside of the Himalayan

pashmina goat and when woven was called shatush. It could be drawn through a ring and was called a ring shawl. Today wool production continues to center in northern India.

There is a very rich variety in the techniques, designs, and textures of Indian textiles. The distinctive characteristics are often determined by geographic factors and cultural influences.

Two major categories of textiles are identified by virtue of production techniques. The first group is that of woven fabric the interest is an integral part of the fabric as a result of the way it is woven.

The simplest form of woven techniques producing a fabric with color-changing quality is the iridescent fabric. By using one color in the warp direction and another in the weft direction, a two color effect is achieved. Interest is created as the fabric moves and light reflects, highlighting one color.

A second woven technique using a separate introduction of yarn, in addition to warp and weft, is called jamdani, sometimes referred to as figured muslin or silk. Dr. J. F. Watson in 1866, prepared an eighteen volume work which included seven-hundred samples of Indian textiles, each described and presented so fabric could be reproduced by a British manufacturer.⁵ Of jamdani, Dr. Watson wrote, "With all our machinery and wondrous appliances we hitherto have been unable to produce a fabric which for fineness and utility can equal the 'woven air of Decca'. Exquisite in look, no wonder the jamdanis of old are today considered the prized heirlooms of many a Bengali family."⁶

Jamdani results in a systematic pattern often of small floral sprays in the field of the sari. The method of weaving is similar to tapestry work where small shuttles of colored or metallic thread produce tiny motifs in the fabric. The most common motif is of Persian origin during the Mughal period and is of a flowering plant with a curling bud at the top. A buta refers to a large motif of this design, while a buti is identified as a small one.⁷ In other forms it was described as a cone, mango, and later the paisley.

More recently weavers of Varanasi have modified the jamdani by throwing the weft across the entire width of the fabric weaving in the pattern as they go. When the weaving is done, the float threads are laboriously trimmed, making the pattern more evident. The trimming is often not done until the textile is purchased.

A number of Indian textiles were designed to meet a particular need and had symbolic meaning. Himroo and mashru are two such fabrics. Himroo is an inferior type of brocade produced primarily in Hyderabad and Aurangabad where both silk and cotton yarns are used – generally cotton in the warp and silk in the weft. The textile was devised to provide courtly clothes for the orthodox Muslim men to wear. They believed that one-hundred per cent silk was too ostentatious for them. The blend with cotton made it acceptable to wear. In comparison to the Benares pure silk brocades, himroo was considered inferior in quality, but it could be quite attractive, with the silk producing a satiny glow.

Mashru means “permitted” and is similar to himroo but lighter in weight. It is woven very fine to give a soft feel, making it more suitable as a fabric to be worn.

The most complex woven structure in this category is the patola or pochampally technique. These textiles truly exhibit the epitome of dyeing and weaving craftsmanship. They are indeed breathtaking, especially when one attempts to comprehend the process. We term the technique ikat in this country. It is an ancient textile process where colored patterns are formed by tying and dyeing threads before weaving takes place and is not indigenous to India. However, it is believed that the intricate technique of patola dyeing and weaving originated in India as far back as the fifth century A.D., and evolved into a refined industry by the eleventh century. The technique itself, has been passed down from generation to generation, again reinforced by the caste system.

The process involves tying portions of thread in bundles and dipping them in dye. The dye penetrates only the unbound portions and does not affect the tied areas. The process may be done on warp or weft threads which is referred to as single ikat if done on one set of threads or if done on both warp and weft is termed double ikat.

The simple black and white example (Photograph 1) can be used to describe the double ikat process. White warp threads were tied with string about three inches apart. When dipped in dye, all but the bound portions turned black. When put on a loom and woven, the result was a black fabric with white crosses. Where the string was tied the tightest, at that intersection in the weaving, the fabric was most white, and out from that center, a more blurry image occurred. This was due to the dye penetrating and seeping under the edges of the bound sections. Thus

ikat is identified by blurry images.

After looking at this simple two color example, consider the complexity of this multi-colored double ikat – the pallou of an Indian silk sari (Photograph 2). Imagine pre-engineering the tying and dyeing of warp and weft so as to result in a peacock – not only a peacock, but a parade of peacocks with each feather, foot, beak, and eye readily defined. As Mehta⁸ describes, “So lovely is the patola in its subtly harmonized charm that it would not be an exaggeration to describe it as an art-fabric of subdued vitality – colorful, vibrant, yet soft in mood – the stuff that dreams are made of . . .”.

Probably one of the most valuable Indian textiles traditionally produced were those woven using gold and silver threads. Benares silk saris are world famous and are identified by bits of sparkle scattered all over the field of the sari, with a heavy gold or silver border. Many are now heirlooms.

The making of metallic thread was again a technique passed from one generation to another. “Artisans began with a bar of silver about the size of a finger and wrapped it three times in gold leaf (the heavier the gold, the yellower the thread). The wrapped bar was heated until the gold diffused with the silver. The gold remained on the surface as the bar was beaten to the size of wire, drawn through ever smaller holes, and flattened with a steel hammer. It could then be used flat, or it would be wound on a core of lightly twisted silk thread.”⁹ Metallic thread has been replaced now with synthetic metallic thread imported from Germany and Japan.

To this point, all of the Indian textile technology presented has been representative of woven fabric whose interest is an integral part of the fabric due to weaving techniques.

The second major category of Indian textiles identified by production technique are those which are formed by applying design onto woven fabric. The base fabric is first woven and then becomes of interest when something is done to it. Batik, bandhani, block printing, hand painting, and embroidery are all techniques of application onto a base fabric.

Batik, of course, did not originate in India, but much use was made of this resist technique. There are various forms of this process that have developed over the years. Some contemporary forms are done with ap-

plication of wax and paraffin onto the fabric. The wax acts as a resist to block parts not to be dyed or lighter shades. The process of wax application and dyeing continues part by part until the pattern is complete. The fabric is purposely handled so the wax cracks, resulting in thin hair-like cracks characteristic of more contemporary batiks. The wax is removed with boiling water and soap.

The term *bandhani* refers to a tie dyeing technique used in the fabric state. In some geographic areas, the term may also be used for tie dyeing yarns. *Chunari* is a term used for the tie dyed fabric when it is in veil form for married women and is worn in this manner primarily in Gujarat. Traditionally it is red with a spotted pattern and is symbolic of girlhood, love, and marital happiness. *Chunari* is identified in sixth century literature and is evident on fifth century murals in the caves at Ajanta. "To the Hindu women everywhere, this is the most auspicious of bridal garments, a fabric ever reminiscent of youth and romance."¹⁰ In other parts of India, *bandhani* is worn as a drape over embroidered skirts or in standard sari form.

The process of tie dyeing the fabric is a multi-step procedure involving usually as many tie and dye steps as colors in the fabric. One method used to tie the fabric is to dampen the cloth, place it over a block of wood that has nails imbedded into it in the form of a design, pinch up a tiny bit of the fabric at the tip of each nail and wrap it with waxed thread. A pointed metal fingernail may be worn or young women cut and shape their fingernails to assist in the tying process. If points are tied at the base, leaving the tip free to receive the dye, a ring-shaped pattern occurs. If the entire point is wrapped, the result is a spot. The tied fabric is placed in the lightest dye bath, and is tied and dyed again as many times as needed to achieve the desired color pattern. The tied areas resist the dye leaving the pattern in the color of the previous dye bath. The ties generally remain on the textile until it is sold; the fabric may be opened at one corner to show the color scheme. If the ties are left, the purchaser knows it is not a printed imitation. As the tied threads are removed and tiny spots, squares, or circles emerge, some are in the form of birds, elephants, flowers, or dancing girls.

This textile process is most often done in Rajasthan and is done by the women of an extended family in their home, all working on one piece. The Western *bandana* kerchief or scarf is a derivative of this tra-

ditional bandhani technique, even down to the tiny dots and squares now stamped on the fabric.

Block printing is a third method of applying design on base fabric. The process has existed for years. Various media may and have been used for the blocks, but generally they are made of wood, either carved in relief or with tiny metal strips imbedded in the wood to produce a fine line design. A block is produced for each color and then stamped on the fabric to produce the pattern.

As early as 1670 it was reported that those doing the designing of the block were of caste groups different from those doing the dyeing. "In Gujarat the wooden blocks used to print textiles are also designed and carved by special groups in no way connected with the dyeing process, although a printer or merchant may suggest a design."¹¹ Often a blockmaker will have a book of sample designs and orders may be chosen from that book. It contains elements that may be selected for an entire composition: borders, stripes, center motifs, or corner treatments all available using one design theme. Once the block is carved, it is more difficult to be creative as one does the printing, because the block is already completed.

Decorating of cloth with painting was probably one of the most exciting methods used for applying ornamentation. The brush and kalam or pen are tools that allowed the creator more flexibility as the piece was being produced. It took different forms in different regions and each developed its own distinctive qualities. Historical pieces have been found in the form of temple cloths and other decorative pieces. Distinct brush strokes are often visible in this medium of surface design.

India's exquisite examples of embroidery have a long historical past. Early writings make reference to the technique of needlework. Bronze embroidery needles dating back to 1500 B.C. have been found in excavations and embroidered textiles can be found in the ancient Buddhist stupa sculptures.¹²

All the embroidery stitches used by the rest of the world have also been used by the Indians but each geographic location has developed its own modifications and distinctive specialties. The old social values continue to be retained in the embroidered textiles and still are among the treasures given to the bride.

In the Kashmiri embroidery all motifs seemed to be depicting the

richness and beauty of the Kashmiri landscape. "In fact all creative forms seem caught up in nature's exuberance, flowers in their inexhaustible display of colors, the majestic snow peaks, the shimmering lakes, the variegated birds, the luscious fruits, all find an abiding place in the art expressions."¹³ Motifs commonly used were cypress cones, chinar-leaf, lotus, and the almond, a variation of the mango design. The shawl was the recipient of much of this superior embroidery with some types employing only stitches that showed uniformity on both sides of the material.

Just south and west of Kashmir is Punjab, known for its phulkari embroidery work. The word, phulkari, means "flowered work" and was originally applied only to textiles made for everyday wear. In the traditional work, patterns were dispersed at intervals over a colored, generally madder brown, rust red, or indigo, cotton background. The stitches were done in brightly colored silk floss, mainly in golden yellow, white, and/or green.

A second form of phulkari was known as bagh and resulted in cloth used for ceremonial occasions. Most were in the form of interior furnishings: hangings, table runners, and bed covers. The bagh or garden style has the entire surface covered with a darning stitch, using intricate geometric designs in horizontal, vertical, and diagonal stitches. "In bagh work, the stitch is so refined that the embroidery becomes the fabric itself. The quality of the workmanship is measured by the smoothness at the back that can only result from the evenness of the stitches."¹⁴ The more simple and geometric the pattern, generally the older the work.

In rural areas, a girl is supposed to embroider her own bridal garment. This is begun at an early age, because it is believed that her chances of marriage depend on her skill at embroidery. As Mehta¹⁵ writes, "Here is embroidery done patiently and lovingly, in which are centered all the dreams of the young woman preparing for the future, hoping for love, marriage bliss, children – all the blessings of a happy married life. It is 'A work of fate, savouring somewhat of sowing in the red-ground soil . . . Its beauty is to be manifested later on, with the rare holiday-making, when the worker will, perhaps, for the first time, unfold the veil to see and wear the fruits of her labor.'"

One of the most lively and colorful examples of embroidery comes from the northwestern states of Gujarat and Rajasthan. "The women

seem to show almost a passion for embroidery and decorate practically everything they use, and cover everything they can with embroidered fabrics.”¹⁶ Mirror embroidery was used to add sparkle and interest. Tiny circular mirror pieces were held in place with a buttonhole, stem, or herringbone stitch around the circumference. The mirrors acted as a protective element since it was believed they repelled the evil eye through their reflective surfaces.

India is one of the few cultures that has maintained traditional techniques for producing and decorating textiles. Whether it be with interest created in woven fabric structures or pattern applied to the fabric, the complex technique and technology used is truly awesome.

In this contemporary world of increasing automation and specialization of activities, few people concentrate on performing a work that consumes their entire attention, one that involves their physical, mental, and emotional being. What an expressive statement has been made in the creation of these textiles using their respective technologies. Our daily lives have been enriched by their contributions.

Footnotes

1. Mehta, Rustam J., "Masterpieces of Indian Textiles", Bombay, India, 1970, p. 3.
2. Ibid., p. 4-5.
3. Hyde, Nina, "The Queen of Textiles", "National Geographic", Washington D.C., January, 1984, p. 30.
4. Mehta, Rustam J. "Masterpieces of Indian Textiles", Bombay, India, 1970, p. 13.
5. Levine, Betsy, "Costumes of Royal India", "Threads", Newtown, Connecticut, October/November, 1986, p. 65.
6. Mehta, Rustam J., "Masterpieces of Indian Textiles", Bombay, India, 1970, p. 5.
7. Irwin, John and Margaret Hall, "Indian Painted and Printed Fabrics", Bombay, India, 1971, p. 175.
8. Mehta, Rustam J., "Masterpieces of Indian Textiles", Bombay, India, 1970, p. 41.
9. Levine, Betsy, "Costumes of Royal India", "Threads", Newton, Connecticut, October/November, 1986, p. 66.
10. Mehta, Rustam J., "Masterpieces of Indian Textiles", Bombay, India, 1970, p. 38.
11. Gittinger, Mattiebelle, "Master Dyers to the World," Washington D.C., 1982, p. 61.
12. Chattopadhyay, Kamaladevi, "Handicrafts of India", New Delhi, India, 1975, p. 51.
13. Ibid.
14. Ibid., p. 53.

15. Mehta, Rustam J., "Masterpieces of Indian Textiles", Bombay, India, 1975, p. 24–25.
16. Chattopadhyay, Kamaladevi, "Handicrafts of India", New Delhi, India, 1975, p. 52.

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- Mingei International Museum, "Ikat of India," Mingei International Museum of World Folk Art, La Jolla, California, 1981.

Figures

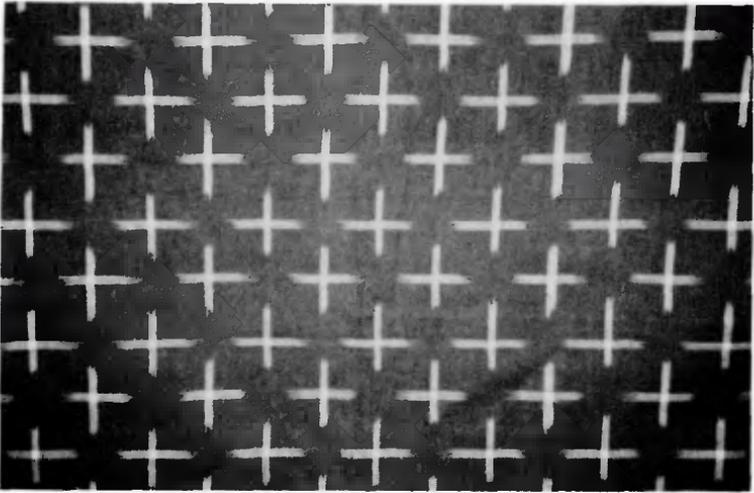


Figure 1
Simple double ikat process

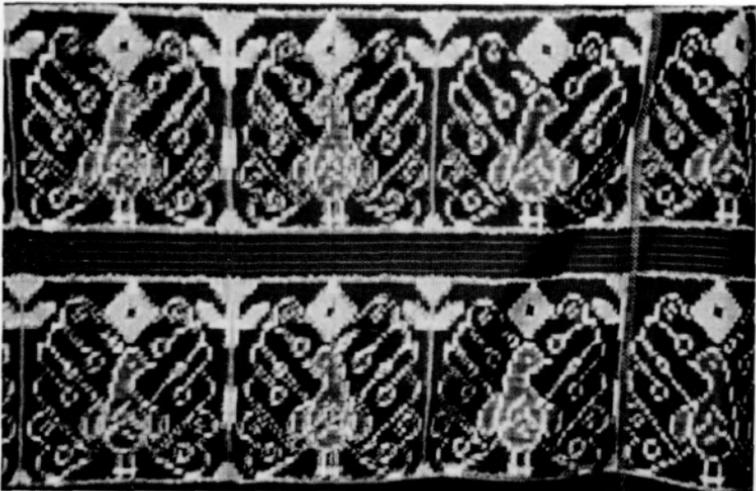


Figure 2
Complex double ikat process

In the middle ages, Indian cotton textile products were in great demand in the Eastern and European markets. The muslins of Dhaka, chintzes of Masulipatnam, calicos of Calicut, baftas of Cambay and gold-wrought cotton piece goods of Burhanpur, Surat and Vadodara acquired a worldwide celebrity by virtue of their quality and design. ADVERTISEMENTSÂ The first modern cotton textile mill was set up in 1818 at Fort Glaster near Kolkata. But this mill could not survive and had to be closed down. The first successful modern cotton textile mill was established in Mumbai in 1854 by a local Parsi entrepreneur C.N. Dewar.Â About three-fourths were spinning mills and the remaining one-fourth composite mills. Apart from the mill sector, there are several thousand small factories comprising 5 to 10 looms. The Indian textile industry is as diverse and complex as country itself and it combines with equal equanimity this immense diversity into a cohesive whole.Â This is typical of capital- and technology-intensive industries such as automobiles, aircraft, computers, semiconductors and heavy machinery.Â However, there is discernible, though hazy, trend of revival of composite mills. Composite segment is the second largest beneficiary under TUFSA.Â It has a long tradition of excellence in its craftsmanship. The handloom industry has an advantage of flexibility of small production quantities, openness to innovations, low investment, labour intensive and adaptability to market requirements etc., is trying to innovate and produce high level products. The textile industry in India traditionally, after agriculture, is the only industry that has generated huge employment for both skilled and unskilled labour in textiles. The textile industry continues to be the second-largest employment generating sector in India. It offers direct employment to over 35 million in the country. The share of textiles in total exports was 11.04% during Aprilâ€“July 2010, as per the Ministry of Textiles. During 2009â€“2010, the Indian textile industry was pegged at US\$55