

DESIGN TECHNIQUES OF KASHMIR HANDLOOM TEXTILES

By

RACHAEL G. MOSSMAN

THE hereditary weavers of Kashmir have been master craftsmen for centuries. In portraits of former rulers of India, painted in the very exacting and detailed manner of miniatures, we find representations of Kashmir textiles, particularly shawls, which even in painted form convey the qualities of exquisite softness of material and beauty of design and color. A portrait of Abdullah Qutb-Shah of Golconda, known to have been painted about 1670, shows the ruler draped with a Kashmir shawl, the lightness and delicacy of which have been clearly expressed by the quality of the graceful folds of the garment as it was worn. Also, the basic plan of pattern arrangement, using narrow selvage borders to enclose the field and wider borders of foliated character at each end, is typical of the finest shawls produced at the present time in Kashmir. Both in material and workmanship such a shawl represents a superlative textile of great elegance and subtle beauty. A similar type of shawl, woven today, is appropriately called a "king's shawl" (*shah tus*).

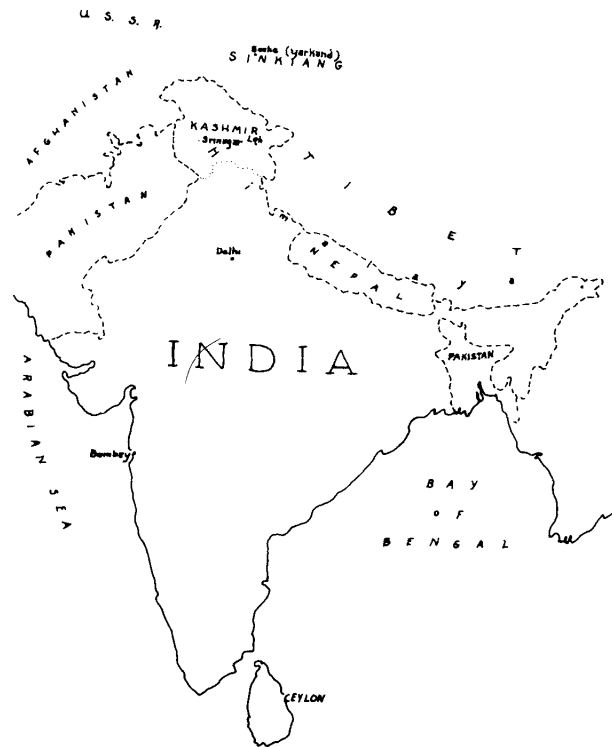
During the period of the great shawl-trade with Europe, magnificent textiles woven in Kashmir became world-famed for their superior softness and skilled workmanship as well as for the beauty of design and color. With the decline, which came rapidly due to the Franco-Prussian War (1870-71) and the development of the Jacquard-woven Paisley shawls of Scotland, which reproduced by mechanical means the laboriously handwoven textiles of Kashmir, the Indian weavers were left in a tragic situation. Bound to their looms by caste, with skill and intensive training gleaned from centuries of weavers before them, able to produce on simple looms textiles of exceedingly complicated pattern and outstanding beauty, they were suddenly cut off without a market. Many starved; many others fled into parts of what is now northern Pakistan and continued to weave for other markets, mainly domestic.

One of the most interesting accounts of the Kashmir side of the shawl-trade is to be found in W. Moorcroft and G. Trebeck, *Travels in the Himalayan Provinces of Hindustan and the Panjab: in Ladakh and Kashmir, 1819 to 25*, (London, 1841). Following the eclipse of the shawl-trade with the west, and the general decline of textile production

in Kashmir, however, little seems to have been written on the subject. The Kashmir weaver dropped from sight and ceased to be of interest to the western world. Although characteristic design patterns, which represent the peak of development of the Kashmir textile arts, remain popular throughout the west and have a permanent place in the design of modern machine-produced textiles, there remains a broad lack of knowledge or appreciation of the remarkable textiles still produced in the Kashmir Valley.

Before one can properly understand the significance of handloom textiles from any given area, it is necessary to consider some of the factors which were instrumental in determining the textile types represented. Geographical and climatic conditions establish the availability of specific fibers and define the need for certain textiles for clothing or other utilitarian purposes. Also, geographical location is important in the consideration of contacts through trade, conquest, or the diffusion of religious ideas, which may be reflected in the textile arts. The prevailing social structure, with its deeply entrenched traditions and taboos, that built in India a system of hereditary craftsmen, cannot be ignored. The type of loom used by the weaver is an important factor, as it limits him to definite techniques and sets the measure of the length and breadth of his textiles. Special processes through which the woven textile must pass, such as milling, stretching, and dyeing, contribute to the esthetic qualities of the final product and must be considered. Also, the methods and materials used in embellishment, such as embroidery or appliqué, play an important part in the creation of the design as a whole. With these factors in mind, let us consider some of the aspects of the Kashmir textile manufacture as it exists today.

Geographically located at the extreme northwest of India, amid the majestic peaks of the Himalayan Mountains (source of India's great rivers, and the traditional home of the gods), Kashmir is difficult of access from any direction. No railroad enters the area. In fact, the nearest town with a railroad is Pathankot, some two hundred and fifty miles from the Kashmir Valley. From Pathankot one must go by a dangerous road, leading over severe grades, which becomes impassable during storms and suffers frequent slumps of the roadbed due to insecure rock structure below. During good weather, small planes fly into the valley from Delhi, bringing government officials, businessmen, summer visitors from other parts of India, who come to escape the oppressive heat of the plains, and a few tourists from foreign countries. Conse-



quently, in spite of its scenic beauty, Kashmir has remained somewhat apart from the huge closely knit area of India to the south, and the inhabitants cling to more of the old established ways of past centuries. The farmer carries his crude wooden plow over his shoulder as he walks barefoot with his bullock to the field, and the Muslim woman still wears the all-enveloping *burqa*, which hides her face except her eyes when she is in public.

The population of Kashmir is made up of approximately ninety per cent Muslims and ten per cent Hindus, and thus, two widely divergent religious concepts contribute motifs and symbolism found in textile design. Floral patterns are highly favored, and the individual forms are transposed from the purely naturalistic to rhythmical conventionalizations of great delicacy. The lotus, which is the sacred flower of the Hindus and which blossoms in abundance in the shallow lakes of Kashmir, is never represented on textiles for Muslim use. Colors, too, have their individual meanings, green being the sacred color of Islam, while red and golden yellow have religious significance to the Hindus. However, while abiding by the traditions of Islam in designing textiles for their own use, the Muslim craftsmen (and practically all of the textile workers of Kashmir are Muslims) do

not hesitate to work on textiles designed for markets of other religious groups (see pl. VIII, an embroidered picture of figures from the *Ramayana*, a Sanskrit epic).

Srinagar, situated on the Jhelum River, at 6,000 ft. elevation, is the center of the Kashmir textile industries. From this town in the heart of the beautiful little valley glistening with lakes and surrounded by mountains, the roads wind off past many tiny hamlets to a number of small mountain villages. In the meager and poverty-stricken homes of these hamlets and villages many of the textile processes are carried on. A home may have one to three looms of the rigid-frame, counterbalanced type, having from four to eight treadles. Most of the looms can handle webs up to thirty-three inches in width and twenty-three yards in length, although many textiles woven on them are considerably smaller. There are no pit-looms in Kashmir such as are found throughout other parts of India.

Hereditary weavers always have been at the low end of the caste structure of India and still are among the most miserable and pitifully underpaid skilled workers, although the government is now making efforts to help them by the formation of co-operative organizations and weavers' service-centers, as well as by attempting to standardize prices for various types of work. The bitter animosity of the Muslims of Kashmir toward the Hindu government presents a serious obstacle to the success of the plan. Many weavers work in the small factories or workshops of Srinagar and own neither the looms on which they labor nor the yarns they handle. They merely do the work as ordered by the master of the shop, and may be paid around nine or ten annas per yard for unpatterned weaving (100 annas equal one rupee, which has a value of twenty-one and a half cents in United States money) and up to one rupee per yard for patterned work. Sometimes they are maintained by the owner and given a small percentage of the profit when a certain amount of goods has been completed.

Looms weaving plain yardage are often equipped with fly-shuttles. These are hand operated by a system of cords so that when the weaver jerks the control cord the shuttle is sent flying across the web. Another jerk sends it back. The operator merely alternates the foot action on the levers with the jerks on the cord and the swing of the lay. From a considerable distance, one can hear the steady "clack-clack" of the shuttles as they strike the leather barrier at the end of each throw and the lesser thud of the reed striking home the wefts. Plain weave, in

either silk or worsted yarns, and some of the twill weaves are woven in this way. But the fleece yarns of the finest quality (*pashmina*) are too delicate to be handled with fly-shuttles, even when the textile has no woven pattern.

Fleece of many different qualities, varying in color from cream-white to dark brown and black, is procured from sources near and far for the looms. The best wools produced in Kashmir and Jammu state are *Gurez* and *Bhadarwah*; the first being almost uniform in shade and color, rather crimped, with practically no coarse hairs; and the second, a very fine wool, which appears to have been obtained from young lambs and is very soft. But the finest qualities of sheep wool and goat fleece come from outside areas and are imported into the Kashmir Valley to be spun and woven. Australian merino, characterized by very long, soft, fine, white fibers, is usually mechanically spun, and hand-woven in twill weave for shawls and other fabrics requiring a worsted yarn of the highest quality. It frequently makes up the warps in textiles having *pashmina* weft patterns (pl. I, all-over patterned [*jamawar*] shawl) and for both warp and weft in shawls ornamented with borders of tapestry weave (*kani*) although the colored pattern wefts are invariably of coarser fibers (pl. VI, merino shawl with tapestry pattern). Many merino shawls (usually woven in two-by-two twill) and scarves varying in size up to forty by eighty inches, are woven without pattern in natural cream-white yarns. Warps are measured to suit the length of six or more standard-sized textiles (e.g. thirty-three by eighty inches for one type of shawl), and the weaver allows the warps to remain uncovered for about three inches at certain spaced intervals. After the web has been cut into individual textiles at these intervals, the uncovered warps become fringe which can be tied, wrapped, or left plain. The entire web may be dyed or the individual shawl lengths may be dyed any desired tint or tone, and later embroidered with silk floss. Gold or silver metallic thread sometimes outlines the floral motifs in couching, and adds a delicate richness to the design. Plate VII shows an excellent example of this type of merino shawl embroidered in chain stitch. Such shawls are designed largely for foreign trade.

The greatest contribution to the textile industry of Kashmir from the highlands to the north and northeast lies in the production of the finest wools and hairs used in textiles of superlative quality. Such fleece is known as *pashmina*, and is generally procured from goats, although a small amount is obtained from certain varieties of Himalayan sheep.

It is divided into a number of qualities mainly determined by the fineness and length of fibers, color, and silkiness or sheen. These characteristics are largely predetermined by the elevation at which the animal lives during the winter. Goats producing *pashmina* fleece, whether wild or domestic, have a common ancestry in the wild Central Asian goat, known by the name of *Capra hircus*. No goats of this type are raised in the Kashmir Valley, which has an elevation of only 6,000 ft. All such fleece, woven on the looms of Srinagar, is transported from higher elevations. As nature provides for the animal according to its need, the wild goats that winter higher in the mountains where the cold is extreme produce fleece superior in fineness, softness, and warmth,—as well as being of lighter, more beautiful tones,—to the fleece of domesticated animals.

The goat's fleece is made up of two distinct types of fibers, a long coarse outer covering which serves as a protection for the skin and a shorter downy under-fleece (*pashmina*) which provides the warmth necessary for survival during the severe cold winters at high altitudes. The inner fleece is shed during the warmth of summer, when it is no longer needed. The finest and silkiest *pashmina* comes from the underside of the wild goats that winter at great heights, and the difficulty of gathering the discarded bits by hand or of killing one of the animals for the fleece makes it extremely scarce and valuable. Plate II shows a shawl woven from yarns of the highest quality wild goat's fleece. It is of pale beige color, which lightens with age, and has highlights of golden-reddish hue. In its pure state, such fleece is too delicate to be pattern-woven on a loom, and it is therefore always woven in plain twill (usually two-by-two), later to be embroidered in silk with exceedingly delicate and beautiful handwork. Such fleece is the *asli tus* that Moorcroft mentioned in his travel account of the Himalayan area. It seems most appropriate that these rare shawls are called king's shawls (*shah tus*), for they have always been the most highly prized of all the shawl types because of the great scarcity of the fiber. It is interesting to note that, in Kashmir, they are sometimes referred to as "bird shawls," due to the old belief that the downy fibers actually came from the throats of mountain birds. A shawl of standard size (forty by eighty inches) weighs approximately five and one half ounces, complete with embroidery, and can easily be drawn through a thumb ring, as were the famous "ring shawls" of the Mughal period.

Only a very small amount of the *pashmina* woven in Kashmir is, or ever was, the fleece of the wild goat. Fleece from herds of domesticated goats has been transported, through the centuries, to Kashmir by two main routes: one leading from western Tibet through Ladakh to Leh, and from there to Srinagar; the other from the area of the Kirghiz nomads in the north, through Yarkand (in Chinese Turkestan) and southward. At the present time the activity of the Chinese Communist Army along the border of Ladakh in eastern Kashmir and Jammu state greatly jeopardizes this ancient trade (see map).

The process of extracting the inner fleece from domesticated goats is done in the same crude way today as it was several centuries ago. At the season of the year when the goat should begin to shed its inner fleece, the coarse outer hair is cut short with a sharp knife. A crude comb, made of several sharpened pegs tied together, is drawn through the fleece in the reverse direction to the growth and combs out the silky fibers which are always more or less mixed with coarse hairs. Loaded on the backs of large sheep, the fleece is transported in caravans over the mountain passes to centers of trade in Leh, where merchants buy it and arrange for its transport on the backs of small horses to Kashmir. There it is sold or given out in small portions to women who do the tedious work of separating the silky fibers from the coarse goat hairs, dirt, and extraneous matter. This process is called "picking" and is entirely done by hand. A skillful picker can separate approximately one ounce in an hour, the pure fine fleece (*tus*) varying between one-third and one-eighth of the original mass. It is further separated according to its color and quality, the lighter tones being considered more choice than the dark, which is of an olive-brown color with slightly greenish cast.

A quantity of rice, which has been steeped in water until soft, is drained and pounded to a coarse flour in a large wooden bowl with a stone. The picked fleece is put in and thoroughly mixed with rice meal for an hour, taken out, shaken, and pulled apart. The process is repeated and the fleece spread out to dry. Then it is shaped into squarish flattened pads (*timbu*), which are drawn out into half yard lengths of roving (*mala*) with fibers arranged suitable for spinning. Eventually, it is spun by hand on the crude spinning wheel (*charka*) which is used throughout north India. The fibers are handled delicately, giving the yarn a very light twist, and spun in single-ply or double-ply yarns as desired. All of the preparation of the yarns, including reeling and winding, are done by women; but all following processes are done by men. These include

the careful measuring of the warp, dipping the yarns in a light starch made from water in which rice has been boiled, drying and arranging yarns, cutting the yarns, threading the heddles, weaving, washing, stretching the textiles, and embroidering them. Looms are the same rigid-frame, counterbalanced type with four treadles as used for other textiles, with the exception that they always have string heddles while a few of the other looms have metal ones. Although the looms often appear poorly constructed, the weavers are so skillful that the textiles turn out remarkably even and well-woven. Temples are employed to help keep selvages even. Slender hardwood boat-type shuttles with metal tips are used, and small reed bobbins wound with yarn are inserted as they are needed. Filled bobbins are kept in a box beside the weaver and are within easy reach so that he works swiftly with scarcely a pause.

After the delicate king's shawl (*shah tus*) has been woven and removed from the loom, it is stretched tightly over a frame with four short legs. A workman sits cross-legged at each end of the frame and using a pair of broad-tipped tongs begins the slow process of plucking from the textile, bits of fuzz (*purz*) and any coarse hairs that were spun in the yarns. The surface of the textile is repeatedly brushed with the dried stringy inside of a gourd, called a "*karella*," to raise any stiff hairs; and the workers slide their hands over the surface to locate them for plucking. After the fabric feels entirely smooth and soft, it is turned over and the process repeated on the opposite side. Probably there are no other textiles known that possess the airy silky quality of a superior shawl of this type. It is composed of the lightest, warmest, and softest fibers among all the wools and hairs woven into textiles.

An interesting variation of *pashmina* shawl-weaving is found in a weft-loop weave which produces an exceptionally warm type of "Turkish towelling." Warps are closely spaced in a two-by-two twill. Two shots of ordinary weft are laid, and the next weft is pulled up between warps in little loops with a pointed wooden needle. A loop is drawn up about every ten warps. As the warps are set about eighty to the inch, this is very fine work, requiring keen eyesight and much patience. One small shawl requires at least a month of swift, steady work.

Pashmina fleece of other qualities is woven into many types of textiles. It may be used as a fine soft weft in shawls made with a silk warp (pls. III and IV). These textiles have a unique quality due to the combination of silk and fleece; the silk warps show in the usual two-by-two twill weave and create diagonal ribs or wales of light across the

dyed fleecy wefts. Concerning dyed *pashmina*, it should be stated that usually it is the dark-toned fleece that is dyed, consequently the colors are deep and rich. Light colored *pashmina* (not as fine as the fleece required for the king's shawls [*shah tus*]) is sometimes dyed for pattern wefts in twill tapestry shawls (pl. I, all-over patterned [*jamawar*] shawl in twill tapestry), and the lighter the natural hue of the fleece, the brighter and clearer the pattern colors of the finished textile. In a shawl of this type, the warps are always of stronger fibers than the delicate *pashmina* wefts, because of the strain and friction on the warps as the pattern is woven. Most frequently, merino yarns of fine quality make up the warp, especially if a light background is desired. It is very difficult to determine the exact fiber of yarns because of the practice of blending various types before spinning. Hence, yarns may be made up of several different types and qualities.

In twill tapestry the weaver does not use a boat-type shuttle. Instead, he has many small bobbins made of hardwood sticks about three inches long, with smooth pointed ends which have been hardened by scorching over charcoal. The various colors of yarn needed for the pattern are wound on individual bobbins called "*tojis*." These textiles are woven face down, and each weft color is interlocked with the adjoining color weft (fig 1a). Formerly, shawls were woven in many pieces and sewed together to form exceedingly intricate patterns. The very few woven at the present time are woven all in one piece, and of much simpler patterns (pl. I), although these, too, require a tremendous amount of skilled labor.

Vegetable matter is still used for the dyeing of *pashmina*, which may be done by dyeing yarns before the weaving is started or after the textile is complete. Lichens from the Himalayas, roots, herbs, flowers and fruits from cultivated or wild plants may be used by the professional dyers (*rangrez*). Safflower grows in abundance in Kashmir and contains two pigment principles which produce saffron yellow or saffron red and also give variations of pink and rose; Indian madder (*manjith*) provides other reds and purplish-reds. *Al* (*Morinda tinctoria*), turmeric (*Circuma longa*) and indigo are some of the other vegetable-dye-producing sources for reds, blues, and greens. The liquor made from iron filings (*kath*) is the basic ingredient for black. Many tones of browns, from buff to deep greenish-olive, are natural shades of sheep or goats' fleece. "Folli-mort," or dead-leaf, is a favored color for shawls, probably because it is the natural hue of some of the rarest and most desirable goat

fleece. Merino and Himalayan sheep's wool textiles are dyed with synthetic dyes imported from Europe. In two-faced textiles, each weft may be of a different natural tone, such as light buff and chocolate brown; or the weft of one side may be a natural tone, and the opposite dyed; or both wefts may be dyed (e.g. green and rose). The dyeing is always done by men from families of hereditary dyers. Large copper pots are set in cement with an oven-like opening below, where a fire can be built to heat the dye. Wools may be kept in the hot dye several hours or may be removed in a few minutes, according to the tint or shade desired. Silk yarns to be dyed are wound in a large hank, dipped in a pot of water, wrung out, and hung on a smooth stick. The hank is then lowered into the hot dye bath, and turned while hanging from the stick so that all parts of it can absorb the dye before it is drawn out. As it is lifted from the dye, another stick is inserted into the opposite end of the hank. By turning these sticks in opposite directions the hank is squeezed tightly and the excess dye wrung out. The hank is then hung in the shade to dry. With the first dipping, the silk acquires a light tint. When deeper tones are desired the silk is repeatedly dipped and dried until the proper shade is reached.

Similar large copper pots are filled with soapy water in which newly woven woolens are soaked and squeezed for an hour or so in a fulling process. Each piece is carefully timed to allow a certain amount of shrinkage, which softens the fibers and gives the textile a fluffy texture. After it has been removed from the water, rinsed, and hung up until it stops dripping, it is spread flat on a very low table. A cylinder, made from a log smooth on the outside and split in half length-wise, is brought to the table and one-half placed, split side up, at the end of the textile. A workman lifts the textile-end and places it smoothly on the split side of the log, and the opposite half of the cylinder is laid on top, holding it fast. The log is then rolled along the table with the textile winding around it, care being taken by the workmen to keep the cloth smooth as it is rolled up. The end is folded under, and with a needle and thread one of the workmen quickly sews it down. Next, the log, with the textile wound around it, is placed on end and a thick wedge driven between the split halves with a sledge hammer. Young boys perform this part of the process with one or two well placed blows. The cylinder is then turned end for end and another wedge driven between the split halves. The wedges must be well centered to give an even stretch to the textile. Even delicate textiles are treated in this crude manner, which stretches the

yarns and holds them tightly until they are thoroughly dry. The wrapped cylinders are placed outside in the sun if the weather is pleasant, but during the winter, or when it is raining, they are stacked like cord wood in a room with a dirt floor, where a metal boat-shaped container of hot charcoal is left to help with the drying. Plate VI shows a shawl with a fold and needlemarks plainly visible at one end, the results of such treatment. Textiles processed in this manner do not shrink.

Beyond the cluster of hamlets and villages surrounding Srinagar rise the snowy heights of the Himalayas. Over the high passes, between the mountains, wind ancient caravan routes that have been followed for several thousand years, connecting Tibet and China on the east, Russia (Siberia) on the north, and Persia and Afghanistan on the west. From each of these directions have come materials and ideas which have influenced the construction and design of textile crafts of the Kashmir people.

From China came the knowledge of the domesticated silk worm (*Bombyx mori*), although the entire silk process was a carefully guarded secret for a long period of time. The use of silk floss and various embroidery techniques have come from the same source, as well as the adaptation of many essentially Chinese motifs. Although the embroidered picture shown on plate VIII is unmistakably Indian, the flying clouds (*t'chi*), the use of a partial form such as the flowering tree-branch with birds, and the particular arrangement of flat color areas in the foreground (which strongly suggests patterns formed by eccentric wefts in Chinese tapestries) are Far Eastern ways of interpreting nature in art. However, the sensitivity of the Kashmir designers enables them to borrow motifs and ideas from other cultures, and to blend them gracefully with typical Indian motifs in a thoroughly harmonious manner which eliminates any feeling of inappropriate, alien additions.

Sericulture was established in Kashmir during the last quarter of the nineteenth century, with *Bombyx mori* eggs from France and Italy, after it was determined that mulberry trees suitable for feeding the worms were plentiful in the valley. The first silks were produced in 1894. It was largely through the efforts of Sir Thomas Wardle that this industry was started, and early in the 1900's he arranged for two hundred looms to be sent there for the instruction of Kashmirians in the art of patterned silk weaving. Sericulture is now a government monopoly in Kashmir and is highly controlled. Eggs are distributed to the villagers who rear the silk worms and sell back the cocoons to the factory, where

they are processed and the silk reeled. Handsome raw silk textiles of several varieties are woven, either in natural tints, or in processed silk warps (which are very fine and almost transparent), crossed with dyed raw silk wefts. The practice of using processed undyed silk warps (e.g. whose silk has been degummed and separated into fibrillae which are spun) with dyed raw silk wefts gives a subtle richness to the textile by creating minute variations of tone, by adding a quality of light (raw silk has a more subdued lustre than processed silk), by allowing greater flexibility in the warps, and by establishing a notable difference in the diameter of warp and weft yarns. The latter produces the effect of very fine weft ribbing in the web. Processed silk is woven into yardage of many varieties, including very sheer, medium and heavy weight "China silks," and striped, checked and plaid patterns of heavier varieties. Also, processed silk is used in the twill weaves of all-silk shawls, and as warp in shawls having dyed *pashmina* wefts (pl. IV). Saris may be woven entirely of processed silk yarns of many hues with tapestry-patterned (*kani*) decorated ends (*pallav*), or may be block printed or embroidered. One favored sari type is composed of processed silk in the body of the textile, and both processed and dyed raw silks in the decorative end (*pallav*) (fig. 2). Kashmir saris often feature colorful plain weave tapestry decorated ends (pl. IX) and laid-in weft spots throughout the body of the cloth. One unusual technique combines weaving and dyeing processes in the following manner: the sari is woven in undyed silk with design motifs in colored cotton wefts; after weaving is complete the textile is dipped in dye which has no effect upon the cotton yarns but tints the silk background. Silk tapestry, called "*kani*" from *kanikar*, meaning a woven pattern, is woven face down, with small bobbins of colored silk instead of a shuttle. Each weft is interlocked with the adjoining one at the edge of a color area (see fig. 1e and pl. IX). The tussah silk worm (*Anthereae mylitta*), which has been domesticated in several parts of India, also provides some of the silk woven in Kashmir. Although this silk is more intractable than that of the *Bombyx mori*, ways were found to reel it, to separate the many fibrillae making up one filament, and to weave, dye, and block print the fiber. Gentlemen's wrappers (rectangular garments composed of two sections of material twenty-seven inches wide, either of silk or fleece, sewed together) are frequently woven of tussah silk. The fabric may be designed with narrow horizontal stripes in dark colors, or with tiny flame or cone forms (*kalkas*) in all-over (*jama-war*) pattern. The small all-over motifs are worked on a twill base by lifting a specified number of warps with a small pointed stick

and inserting short lengths of colored silk in laid-in technique. (For the technique, see fig. 1d.) Twill tapestry technique is also used in silks of this type.

From tomb finds in the Altai Mountains (Pazyrik) it is known that the processes for felt-making were practised by the central Asiatic nomads long before the Christian era. Large decorative wall-hangings and saddle-bags were found which had been highly ornamented with appliqué motifs of animals, birds, human shapes, and graceful leaf-like forms. By the study of other artifacts associated with such textiles, it has been determined that these nomads had contacts with the Chinese, the Persians, and other neighboring people. Whether the felt-making processes of Kashmir actually had their origin in this land to the north is not established, but it seems most likely. In Kashmir, today, the ancient methods of felting are practised in their simplest forms. No machine tools whatsoever are employed in the making of felt rugs (*numdahs*). They are embroidered with chain stitch designs in colored wool yarns, done with a metal hook known as "*ara kunj*." The hook is set in a wooden base which fits smoothly against the palm of the hand and is forced through the entire felted mass to bring up the yarn, which is held under the rug in the left hand. The technique is not indigenous to India, but has become an established method of design on *numdahs*. Its characteristic pattern gives an interesting outline to conventionalized floral, animal, or bird motifs, when worked on a natural-colored background; and more elaborate designs of considerable charm may result from combining chain stitch with set-in pieces of colored felt, or felt appliqué. As *numdahs* are not products of the handlooms, felting methods used in their construction are not included in this study. However, one related type of textile (possibly an outgrowth of felt appliqué) should be mentioned. The *gabbah* is a carpet utilizing pieces of old discarded woolen fabrics dyed in bright colors ornamented in one of the three following methods: appliqué, chain stitch embroidery of colored worsted yarns; or appliqué and chain stitch embroidery. This is a utilitarian folk art and makes use of old woolen garments, much as early Americans did in their patchwork quilts. Patterns are simple, usually consisting of large conventionalized floral shapes, and the colors generally favored are bright primary hues—such as red, green, and yellow outlined in chain stitch of a dark tone. Designs have none of the subtle qualities of patterns used on fine shawls or saris, and obviously spring from an entirely different source.

Although the Kashmir weaver owes much to the lands to the north and east for the finest fleece for his yarns and for certain techniques, he owes as much to the west (particularly Persia) for a rich heritage of design principles and motifs. The flame or cone form (*kalka*) in its many varieties has long been a favorite motif in Kashmir textile design (pls. I, III, and IX). It is believed to have originated in Persia, inspired by the flame-shaped cypress tree with its tip bent to one side. Also, the creeper with flowers which forms a delicate network (*jhal*) between cones or flames (*kalkas*) (pls. III and IV), or runs a continuous border of repetitive floral and curling vine motifs along the edges of shawls (pls. II and III) in a notable contribution from the same source. The illumination of sacred manuscripts with foliated designs was widely practised in Persia, and this delicate decorative patterning spread with the diffusion of Islam into India. By A.D. 1587 Kashmir was under the control of the Mughals, and it became a pleasure spot for the rulers because of its cool climate and delightful setting. Textiles woven for their use were designed in accordance with their taste, and thus Persian motifs and color arrangements were favored. To the Persian, living in a hot parched land, the picturing of flowers, vines, trees and water symbolized paradise. Likewise, they preferred colors such as greenish-blues, deep greens, burnt orange, violet, and old gold; muted tones of secondary hues were arranged to give a very rich but somewhat cool effect. With the establishment of special workshops to provide the Mughal palaces with the most luxurious handicrafts, and the importation of Persian craftsmen to instruct the Indians, many graceful and intricate design practices became a part of India's heritage. Textile design, in particular, was enriched with many new motifs of foliated character and rhythmic composition, which became gracefully mingled with the stripes and geometric patterns of earlier periods. Plate IX shows the decorated end border (*pallav*) of a sari beautifully designed with both geometrical patterns and conventionalized floral patterns. Even the particular flowers selected for textile patterns in Kashmir at the present time, such as roses, lilies, carnations, tulips, pansies and clusters of fruit blossoms, as well as their arrangement in mixed bouquets springing from a common stem, are typical of Persian decorative art. Also, the suggestion of a vase or container, sometimes root or base, (pl. VII) is a reflection of a Persian trait. The use of the diagonal line (usual plan for arrangement of floral sprigs [*buti*] in shawl field), the ogee arch interpreted in vine and tendrils (pl. V), and the diaper arrangement of floral forms are decorative patterns in Kashmir weaving

and embroidery derived from Persian architectural ornament. The delicate black outline which encloses each petal and miniature leaf embroidered in silk floss on the finest king's shawls (*shah tus*) (pl. II) is a Persian device for setting each hue apart, so that colors do not neutralize each other by direct contact. The result is an exquisite pattern with the rich beauty of jewelled inlay.

Whether the actual technique of the twill tapestry shawls of Kashmir originated in Persia has not been determined, but according to Reath and Sachs, *Persian Textiles* (New Haven, 1937), pp. 8, 43, two fabrics in this weave, claimed to be Persian, predate the earliest known examples of Kashmir. Twill tapestry technique is not found in other parts of India. It is interesting to note that the technique of tapestry with dove-tailed wefts, as practised in Kashmir at the present time (pl. VI), was woven in Persia prior to the Mughal period of India, and may be the source of this method of weft join, which does not occur in Chinese silk tapestry (*k'o ssu*). However, this technique destroys the clean linear outline in which the Persians generally delighted, and creates a diffusion of color in a feathery line.

Chain stitch appears to have come from the west, for it is practised in various ways along the western side of India as far south as Kutch. Some authorities feel that it originated in Asia Minor and was brought to Kashmir by Turkish tradesmen. It has become firmly established in Kashmir and is worked on a great variety of textiles, ranging from rugs with solid worsted patterns to graceful semi-conventionalized floral borders on merino shawls worked in silk floss. All types of chain stitch embroidery, whether very fine or coarse, are worked with a hook. Patterns may be block printed with colored starchy paste, or may be reproduced on the textile by pouncing with charcoal dust or chalk and the line strengthened with pencil or a creamy ink containing fleeting color, that is, color which will wash out. Some large motifs are drawn directly on the textile with charcoal, when it is a coarse material. Color areas are kept flat, with shading, but direction of the rows of chain may follow the outline or be rhythmically arranged to contribute to texture and to the design as a whole.

Needleworked embroideries of many types and qualities form decorative patterns on caps, tunics, saris, shawls, and many other textiles. Shawls patterned entirely in needlework (termed '*amli*, from '*amlikar*—“needleworked”) appeared at the beginning of the nineteenth century. The technique was brought to Kashmir by an Armenian named Khwaja

Yusuf, who came for trading purposes. There are several methods of working, depending upon the quality of the textile and the type of weave. The embroiderers (*rafugars*) make up a large group of very specialized hereditary craftsmen, and those who embroider in chain stitch never do needlework on textiles of fine quality. At an early age boys begin to learn the craft, sitting cross-legged beside the father and doing simple parts of a pattern. Each type of flower or other motif must be embroidered in a precise way with a definite number of stitches, and so expert do the *rafugars* become that three men may work on one shawl with no apparent difference in the result. Needles are held pointing outward, contrary to our usual method of holding them.

Three varieties of embroidered shawls are represented on plates II, III, IV, and V. Plate II shows the exceedingly fine and delicate type of embroidery suited to the superlative quality of the king's shawl (*shah tus*). Plates III and IV each show a complicated pattern requiring a variety of stitches in many tones which creates a rich effect by multitudes of tiny flecks of color in close proximity. Plate V shows a type of embroidery particularly planned for a double-faced fabric. After the pattern is marked on the shawl, it is embroidered in two different color arrangements, one on the face and one on the reverse side, both worked in one operation. Certain stitches penetrate the cloth, so that the return of the silk yarn, preparatory to the second stitch, becomes a part of the pattern on the reverse side. Other stitches penetrate but only nip up a small bit, forming a dot of color on the reverse side, and lay the main stitch on the face, with another nipped-up spot to hold it. Directly over that stitch another stitch is worked in reverse arrangement with a contrasting color, so that the long stitch is on the reverse side and the tiny dots of color holding it are on the face of the textile. By varying the colors and emphasis, the completed pattern on one side appears to have a completely different color scheme from that on the reverse. However, close examination shows minute flecks of color from the opposite color harmony, which actually add to the richness of the design. Certain necessary stitches are planned so they they will be largely hidden by later stitches. Such meticulous ways of working do not allow for any stray stitches on the reverse side, as that would break the pattern sequence. No knots are visible; in fact, it appears that none are used. All ends are carefully concealed. The amount of necessary planning by specially trained designers and craftsmen is amazing.

Another source of influence on Kashmir textile design should be

mentioned. During the period of the great shawl trade, designs prepared in Kashmir were sent to Europe, particularly to France, where they were redrawn to suit better the prospective buyers. The rearranged patterns were sent back to Kashmir, where other alterations frequently took place before the shawl weavers copied them. Some of the European modifications of ancient motifs (such as the elongation of the pendent tip of the cone form [*kalka*]) have survived and are found on present day textiles from Kashmir.

Altogether, influences and resources from many lands far removed from Kashmir have shared in shaping the types and the distinguishing characteristics of textiles now produced there. The artistic sensitivity of Kashmir designers and craftsmen has made it possible for them to accept many contributions and to select and blend various materials and design concepts in a harmonious manner which has become distinctly their own. There seems always to be a beauty of proportion and a gracefulness of arrangement which entirely suits the basic character of the textile. Patterns are worked in flat color areas, whether loom-woven or embroidered, with no attempt at creating a feeling of a third dimension. In embroidery, the larger abstract forms are filled with inner foliations of broken colors in secondary tones; this produces a quality of rich vibrant color. In woven patterns, the larger color areas are relieved by allowing the contrasting warps to show, or by creating minor breaks in the form (e.g. the three narrow transverse white areas carried through the blue cones [*kalkas*] in pl. I). Other methods of breaking up large areas are found in the changes of background colors between motifs, or the variation in hues of repeated forms of the same motif (pl. IX). Textiles often show a very skillful blending of geometric and conventionalized forms, and also a subtle variation in texture by changing the number, size or character of pattern wefts. The remarkably fine artistic sensitivity of the Kashmir designer, together with the great patience and technical skill of the weaver and embroiderer, creates unusual textiles of beautiful design and lasting charm.

SOURCES

Much of the material for this paper was gathered by the author during a recent visit to India. Through the courtesy of Mr. R. K. Tiku, director of the Kashmir Silk Industries, she was able to visit homes, workshops, and small factories, while craftsmen were actively engaged in their work. Thus she was able to see many of the complicated technical processes that lie behind the finished textiles of Kashmir.

Other information was found in exhibits of Kashmir textiles in Indian museums of Madras, Bombay, and Delhi, but the most notable collection, by far, was found in the Textile Museum (also called The Calico Museum of Textiles, as it is located on property of the Calico Mills Co.), Ahmedabad, India.

All textiles shown on plates I-IX are from the author's collection of Indian textiles; technical studies were made of these and of others not included in the plates.

BIBLIOGRAPHY

- Abu'l-Fadl, 'Allami. *The Ain-i-Akbari (The Institutes of Akbar)*, translated from the original Persian by H. Blochmann and Col. H. S. Jarrett. Calcutta, Baptist Mission press, 1873-1894.
- Ackerman, Phyllis. "Persian Textiles," *Ciba Review*, 1953, no. 98.
- All India Handicrafts Board. "The Kashmir Shawl," *Marg*, 1952, vol. VI, no. 1.
- All India Handicrafts Board. "Handlooms," *Marg*, 1962, vol. XV, no. 4.
- All India Handicrafts Board, Government of India Publications. *Handicrafts of India*.
- Baden-Powell, B. H. *Handbook of the Economic Products of the Punjab*, vol. II of *Handbook of the Manufacturers and Arts of the Punjab*. Lahore, 1872.
- Barker, A. F. "The Textile Industries of Kashmir," *Indian Textile Journal*, 1933, vol. XLIII, no. 508.
- Bhushan, Jamila Brij. *The Costumes and Textiles of India*. Bombay, D. B. Taraporevala and sons, 1958.
- Bhushan, Jamila Brij. *Indian Jewelry, Ornaments, and Decorative Designs*, Bombay, D. B. Taraporevala and sons, 1955.
- Birrell, Verla. *The Textile Arts*. New York, Harper Brothers, 1959.
- Coomaraswamy, Ananda K. *The Arts and Crafts of India and Ceylon*. New York, Farrar, Straus, 1964.
- Cyclopaedia of India and of Eastern and Southern Asia*. 2nd edition, 5 vols. Madras, 1871.

- Irwin, John. *Shawls*. London, Victoria and Albert Museum, 1955.
- Journal of Indian Art 1884-1916*. 17 vols. (nos. 1-136). London, 1884-1917.
- Journal of Indian Textile History*, 1955-1959, nos. 1-4.
- Karpinski, Caroline. "Kashmir to Paisley," *The Metropolitan Museum of Art Bulletin*, November, 1963, pp. 116-123.
- King, Margaret R. *Cashmere Shawls*. Cincinnati, 1921 (Cincinnati Museum. Textile series no. 2).
- Leix, Alfred. "Turkestan and Its Textile Crafts," *Ciba Review*, 1941, no. 40.
- Leix, Alfred. "Early Oriental Textiles," *Ciba Review*, 1942, no. 43.
- Mehta, Rustam Jehangir. *The Handicrafts and Industrial Arts of India*. Bombay, Taraporevala's Treasure House of Books, 1960.
- Mookerjee, Ajitcoomar (ed.). *Designs in Indian Textiles*. Calcutta, Indian Institute of Art in Industry, 1955.
- Moorcroft, W. and Trebeck, G. *Travels in the Himalayan Provinces of Hindustan and the Panjab . . . 1819-1825*; ed. by H. H. Wilson. London, J. Murray, 1841.
- Museum of Modern Art. *Textiles and Ornaments of India*. New York, 1956 (Exhibition catalogue).
- Reath, Nancy and Sachs, Eleanor. *Persian Textiles*. New Haven, Yale University Press for Pennsylvania Museum of Art, 1937.
- Riefstahl, Rudolph M. *Persian and Indian Textiles from the late sixteenth to the early nineteenth century* (folio of plates with introduction). New York, 1923.
- Riefstahl, Rudolph and Elizabeth. "Notes on the Study of the Trade Routes of Central Asia," *Bulletin of the Needle and Bobbin Club*, 1937, vol. 21, nos. 1 and 2.
- Swarup, Shanti. *The Arts and Crafts of India and Pakistan*. Bombay, Taraporevala's Treasure House of Books, 1957.
- Victoria and Albert Museum. *Indian Embroidery*. London, 1951.
- Weibel, Adèle Coulin. *Two Thousand Years of Textiles*. New York, published for the Detroit Institute of Arts by Pantheon Books, 1952.
- Wool, Hosiery and Fabrics of India and Pakistan*. Oldham, John Worrall, Ltd., twelfth edition, 1961.

PLATE I

All-over patterned (*jamawar*) shawl, hand-woven. Kashmir, India, 1963.

Size: length 2.16 m. width 1.15 m.

Fibers: warp—fine white merino fleece, 1z, 2s, medium twist; set 50 per 2.5 cm.

weft—fine cream white goat fleece (*pashmina*), 1z, 2s, soft twist; count 50 per 2.5 cm.

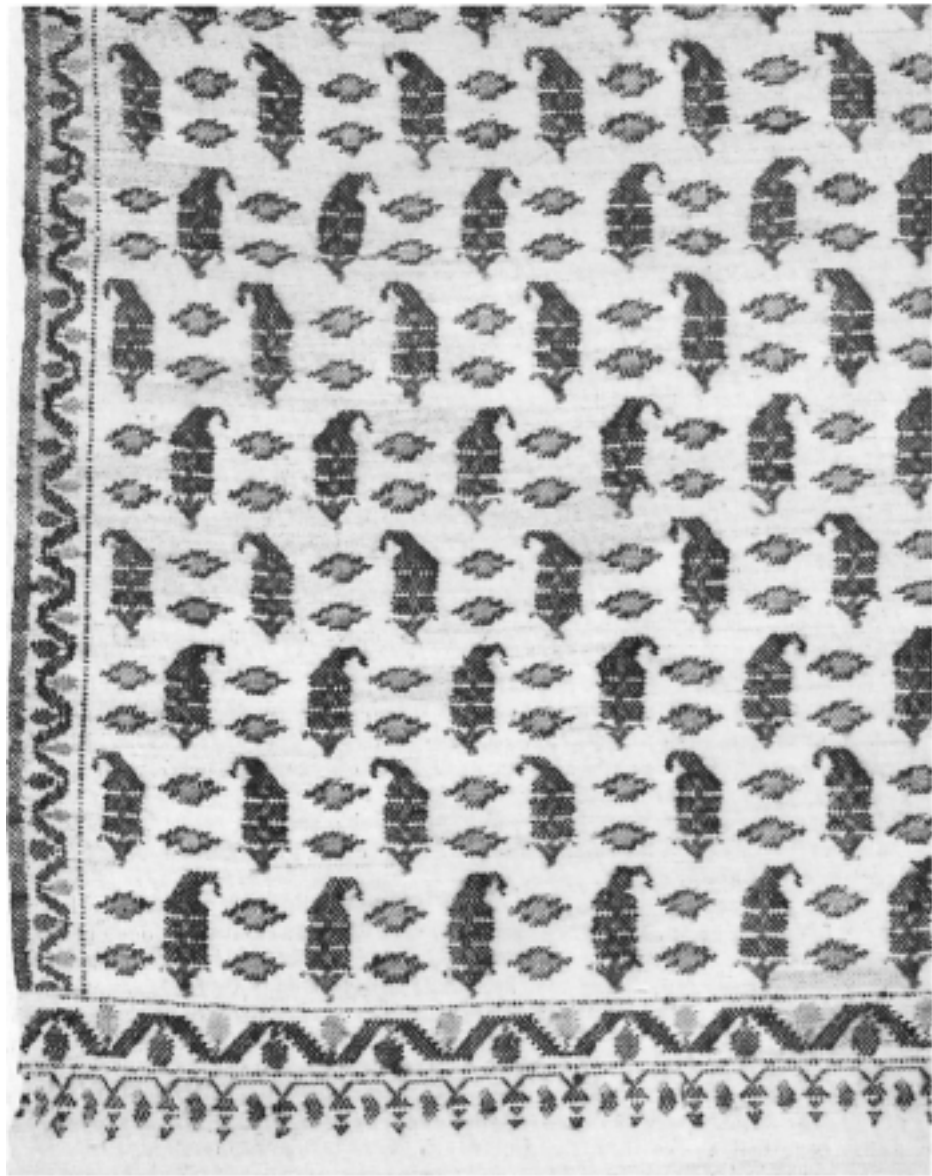
pattern weft—same in deep royal blue, lavender, rust, viridian green, cerise; spun 1z, 2s, soft twist.

Weave: evensided twill tapestry with interlocking wefts (see fig. 1 a). The inverted row of small motifs at both ends of the shawl shows some wefts floated on the reverse side between motifs, and the small lozenge shapes between the larger cones (*kalkas*) of the field show outline wefts floated from one side of the motif to the other on the reverse side. The remainder of the pattern, including the small dots of color, is woven with interlocking wefts.

Pattern: rows of cone forms (*kalkas*) with pendent tips, facing right in one row and left in the next and separated by two irregular lozenge forms, are repeated in alternate arrangement over the entire central field (*matan*). A narrow undulating ribbon with conventionalized flower and stem motifs in repetitive pattern borders the central field on the sides, edged by green weft selvages. A fine line of rust-colored dots separates the side borders from the central field, and changes to alternate dots of rust and lavender at the ends of the shawl. Below the field of cones (*kalkas*) an enlarged version of the ribbon and flower motif runs from selvage to selvage. Completing the pattern area of the shawl, and locking it to the plain twill ends, an inverted border of vine and pendant flowers in conventionalized forms runs from selvage to selvage. Cones (*kalkas*) are royal blue, broken in two places by white wefts which soften the form, and centered with five cerise spots like a stem with a green recurved leaf on either side at the base. The lozenges are lavender with an outline of rust. A very handsome and complicated woven pattern. *Kalka* is 4 cm. long.

Selvages: green wefts interlocked with white background wefts extend along edges of central field, in a stripe 1 cm. wide. Remaining selvage shows no special treatment.

Fringe: cut warp-ends left as fringe (2 cm. long) at one end; at opposite end warps have been grouped (25 to 30) and tied in a tight knot 2 cm. from end of web, the uneven ends extending approximately 4 cm. (It appears that a rod, around which the warps had been tied while on the loom, had been removed and the warps left as they were tied.)



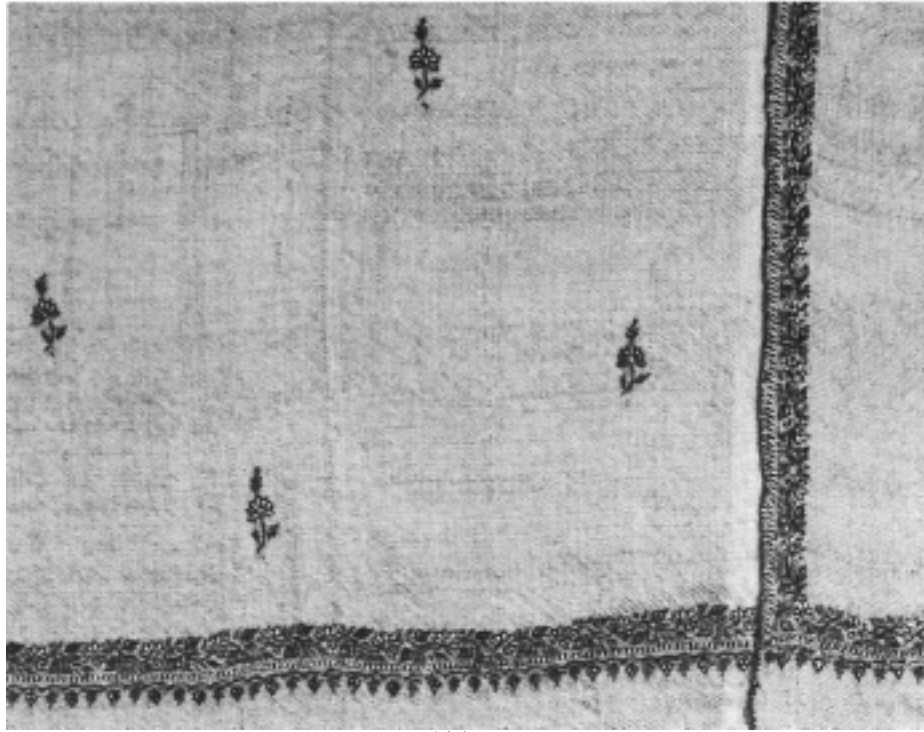


PLATE II

King's shawl (*shah tus*), hand-woven and embroidered. Kashmir, India, 1963.

Size: length 2.05 m. width 1.02 m.

Weight: 5½ oz.

Fibers: warp—natural color light beige, finest quality goat fleece, 1z, 2s, medium light twist; set 75 per 2.5 cm.

weft—light beige, same as warp, 1z, 2s, light twist; count 75 per 2.5 cm.

Weave: even-sided twill (2 by 2) (see fig. 1 a).

Embroidery fibers: silk floss, 1z, 2s; single or double strands.

Embroidery colors: buff, dark brown, Persian blue, rose, golden brown, gold, cream, and black.

Embroidery pattern: traditional Kashmir arrangement of a central field with floral sprigs in diagonal rows, enclosed with undulating vine-and-flower motifs at both selvages, and with the same vine motif repeated at either end, the pattern broadened by the addition of an inverted row of miniature leaves. All embroidery is of the finest and most exquisite workmanship imaginable; the vine-and-flower bands measure only 6 mm. in width, but each petal glows like a tiny jewel outlined in black.

Embroidery stitches: buttonhole stitch, very fine couching, satin, stem, or outline stitch. All work is so skillfully done that the reverse side appears as beautiful as the face. See pl. II where right-hand side shows reverse of fabric folded over face.

Selvages: no unusual treatment. Edges strengthened by very fine couching and buttonhole stitches.

Fringe: cut warps left as fringe 6 cm. at one end, 1.5 cm. at the other.

Finish-lines: seven shots of brown goat fleece yarn, 1z, 2s, marking end of standard shawl length.

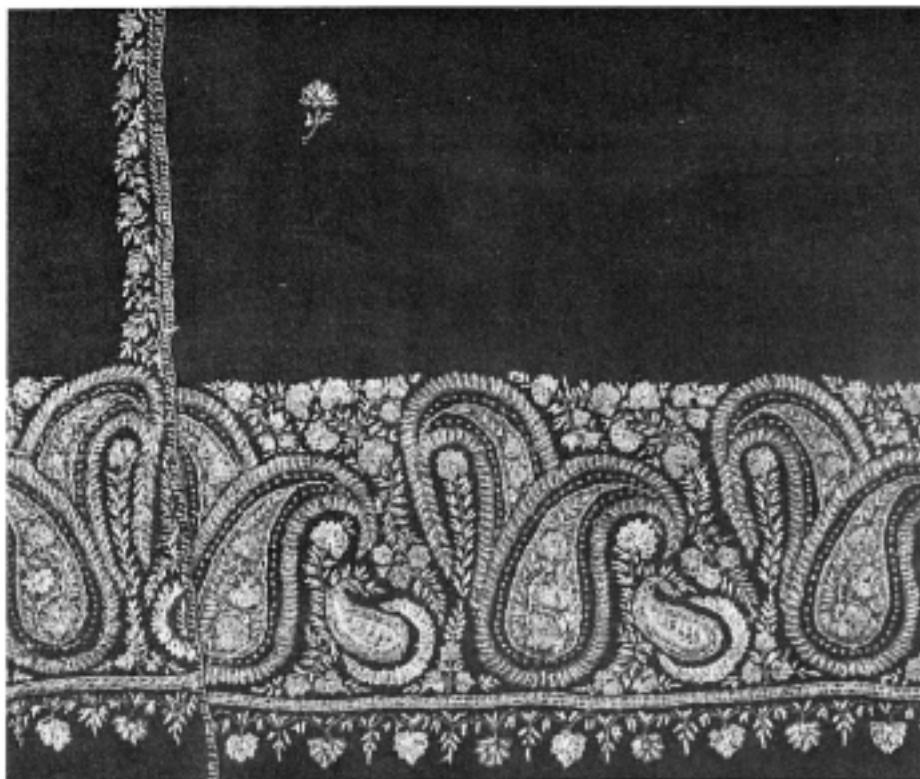


PLATE III

Shawl, hand-woven and embroidered. Kashmir, India, 1964.

Size: length 2.08 m. width 75 cm.

Fibers: warp—very fine wild silk (*tussah*), 1z, 2s, dyed plum; set 100 per 2.5 cm.
weft—very fine goat fleece (*pashmina*), 1z, light twist, dyed deep red;
count 50 per 2.5 cm.

Weave: evensided twill (2 by 2) (see fig. 1 a).

Embroidery fibers: fine silk floss, 1z, 2s; single or double strands.

Embroidery colors: two tints pink, medium blue, Persian blue, buff, apple green,
lavender, red-violet, gold, light blue.

Embroidery pattern: arrangement follows traditional Kashmir plan of wide end
borders of two parts—large cone forms (*kalka*), here in pairs overlapped
at base with pendent tips curving one to the right and one to the left,
in a network pattern (*jhal*) of stems, flowers, and smaller cones, with a
narrow inverted flower-and-leaf border below; a central field sprinkled
with floral sprigs (*buti*) and enclosed at the sides with an undulating
vine-and-flower border.

Embroidery stitches: buttonhole, satin, stem or outline stitch, and very fine couching.
Remarkable workmanship. See pl. III, where left side of textile is
folded back to show reverse side.

Selvages: paired warps 6mm. at each side of textile; extra strengthening provided
by couching and fine buttonhole stitch along selvage.

Fringe: cut warps left as fringe 2cm. long, except for 1 cm. of web adjoining
selvage left to prevent raveling.

Finish lines: band of deep purple wefts 8mm. wide marking standard length.



PLATE IV

Shawl, hand-woven and embroidered. Kashmir, India, 1964.

Fibers: warp—very fine silk, 1z, 2s, light twist, pale grey; set 100 per 2.5 cm.

weft—fine goat fleece (*pashmina*), 1z, 2s, soft twist, dyed deep apple green; count 80 per 2.5 cm.

Weave: evensided twill (2 by 2) (see fig. 1 a).

Embroidery yarns: fine silk floss, 1z, 2s; single and double strands.

Embroidery colors: three tints of pink, deep red, white, cream, yellow, brown, red-violet, medium blue.

Embroidery pattern: arrangement follows traditional Kashmir plan of wide end borders of two parts—large cone forms (*kalkas*) set in network of flowers and vines with a narrow inverted border of flowers and leaves below and narrow side borders of undulating vine and floral motifs. End-border is 10 cm. wide.

Embroidery stitches: buttonhole, couching, satin, stem or outline stitch.

Selvages: paired warps 1 cm. along edge; couching and buttonhole stitch strengthen edge.

Fringe: cut warp ends 2.5 cm. at both ends of textile, with 1 cm. of web left at either side to prevent raveling.

Finish lines: 8 shots of dark green *pashmina* yarn marking standard length.

PLATE V

Double-faced shawl, hand-woven and embroidered (*shuni shawl, duranga aksi*).
Kashmir, India, 1963.

Size: length 2.05 m. width 96 cm.

Fibers: warp—fine Himalayan sheep fleece, natural milk-chocolate brown, 1z, 2s, medium twist; set 60 per 2.5 cm.

weft—two separate weft yarns used alternately: 1) fine sheep fleece, same as warp, 1z, light twist; count 62 per 2.5 cm.; 2) fine sheep fleece dyed rose pink, 1z, light twist; count 62 per 2.5 cm. *Note*: combined wefts total 124 per 2.5 cm.

Weave: double-faced twill, weft-faced (see fig. 1 c and explanation of weaving techniques).

Embroidery fibers: silk floss, 1z, 2s, light twist, single or double strands.

Embroidery colors: on dark weft face of textile—muted orange, deep wine red, viridian green, blue, rose-pink; on rose-pink weft face of textile—medium blue, periwinkle blue, Persian blue, viridian green, gold, muted orange.

Embroidery pattern: palmate leaf from native plane tree (*chenar* leaf) repeated over the main field and as narrow border along selvages; a row of *chenar* leaves in clustered arrangement with reversed flower-head forming each graceful end border (12 cm. wide); inverted *chenar* leaves hang as pendants from the vine scrolls below main borders.

Embroidery stitches: satin, stem or outline, a variety of back stitch, spaced button-hole stitch used as couching over another color strand.

Embroidery technique: The same pattern is worked on the face and the reverse side in one process. Some colors are worked through the entire fabric and take their place in the design on the reverse side. Other color yarns are only nipped into the outer wefts, or show as a tiny spot on one side with the main stitch on the opposite side. The work has been so carefully planned that a distinct color contrast results to suit each face of the two-color material. (See left side of plate V.)

Selvages: strengthened by six paired warps.

Fringe: cut warps left as fringe 2.5 cm. at both ends of shawl, except for 1.5 cm. of web next to selvage which is left to prevent raveling.



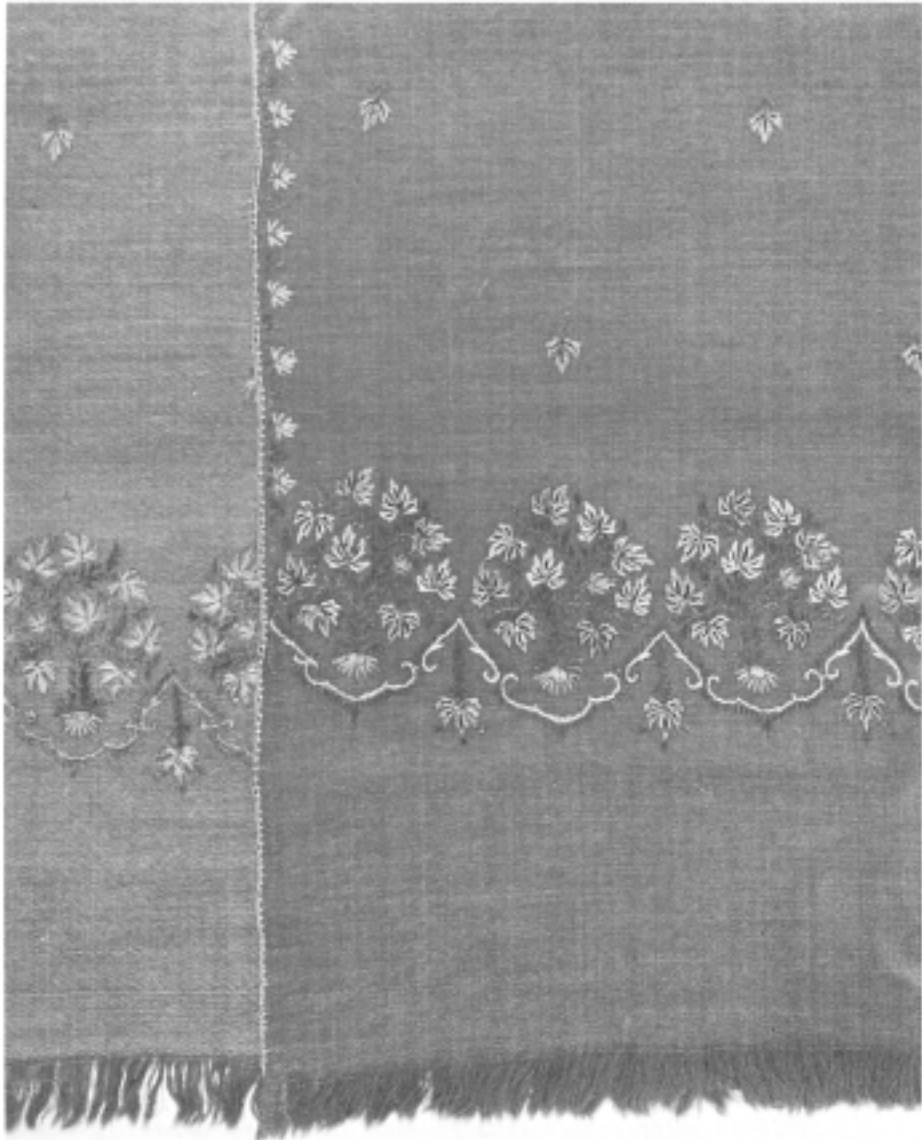


PLATE V

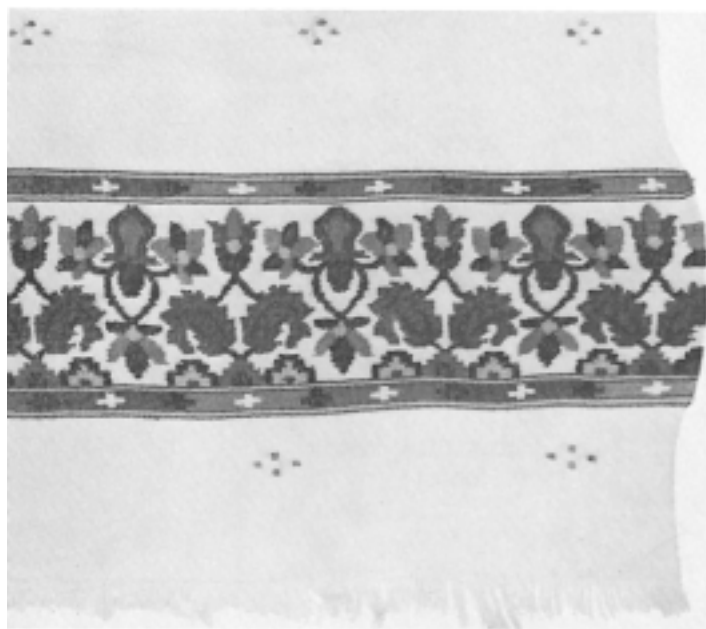


PLATE VI

Shawl, loom-patterned (*kanikar*). Kashmir, India, 1963.

Size: length 2 m. width 82 cm.

Fibers: warp—fine, cream-white merino fleece, 1z, 2s; set 60 per 2.5 cm.

ground weft—fine, cream-white merino fleece, 1z, soft spin; 70 per 2.5 cm. in body and ends of shawl.

pattern weft—wool, 1z, soft twist, paired, not as fine as ground wefts; colors—red, Persian blue, deep green, brilliant pink, dark royal blue, orange, yellow; 30 per 2.5 cm.

Weave: evensided twill (2 by 2) with laid-in extra weft spots (see fig. 1 d) in field and ends of shawl below border. Basket-weave tapestry with dove-tailed wefts around one pair of common warps or around multiple pairs of common warps (see fig. 1 b), used in wide pattern border only.

Pattern: small repeats (*buti*) composed of four laid-in extra-weft spots (with each *buta* woven in two complimentary colors—orange and blue, or pink and green) in diagonal rows across body of shawl and in an additional horizontal row below wide border. Patterned border divided into three parts: a wide band (16 cm.) of conventionalized flower, leaf and stem shapes springing from a band of geometrical floral forms in groups of three at the lower side of the border, edged above and below by a narrow weft band of color enclosing simple geometric cross motifs repeated in a background of varied color areas. Entire pattern reversed in band at opposite end of shawl. These end borders (22.5 cm. including main band and two narrow borders) have been placed 12 cm. above the fringe at either end of shawl.

Selvages: evensided twill, same as body of shawl with exception of basket-weave area; three paired warps at edges.

Shawl-ends: warp fringe 2.4 cm. long at one end, 1.2 cm. at other. Horizontal crease and needle impressions at one end result from stretching process.

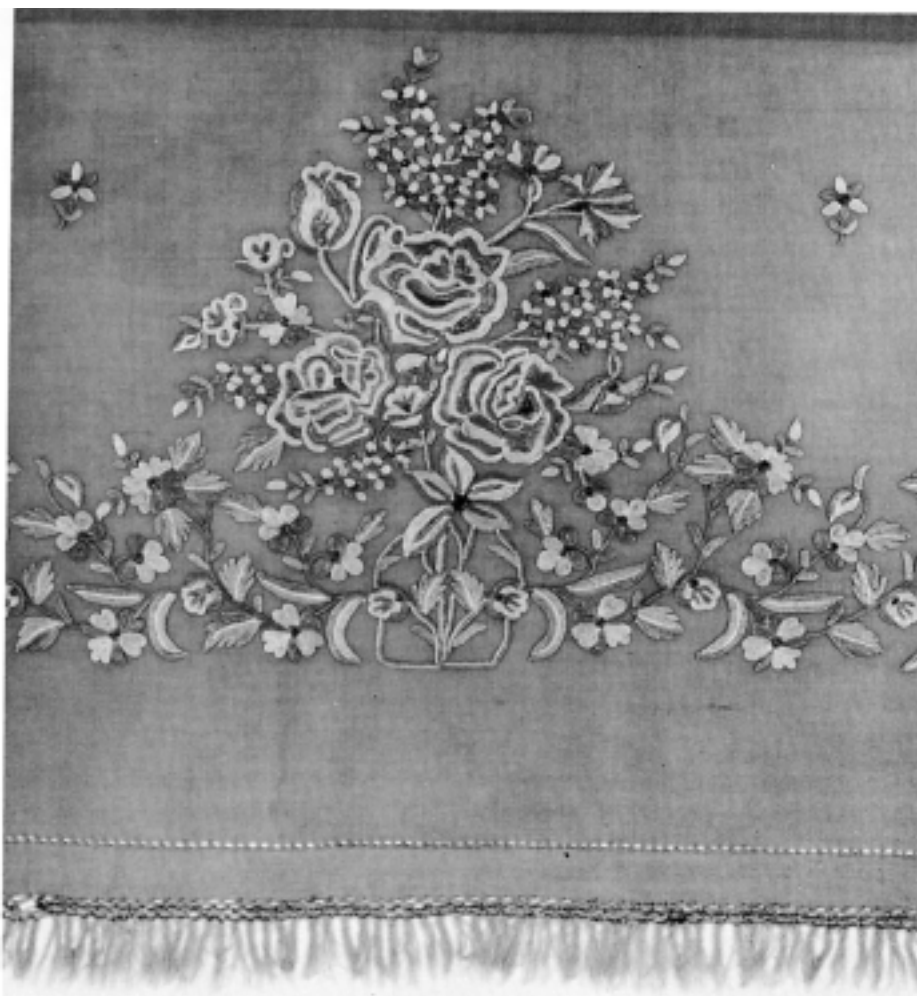


PLATE VII

Shawl, hand-woven and embroidered. Kashmir, India, 1963.

Size: length 2 m. width 85 cm.

Fibers: warp—fine merino fleece, 1z, 2s; set 40 per 2.5 cm., dyed turquoise.

weft—fine merino fleece, 1z, soft twist; count 75 per 2.5 cm., dyed turquoise.

Weave: evensided twill (2 by 2) (see fig. 1 a).

Embroidery fibers: silk floss, 1z, 2s; very light twist. Colors—three tints of dusty rose, beige, two tints of apple green in floral motifs; pale grey (fine worsted yarn, 1z, 2s) in hemstitching and wrapped fringe work.

Embroidery stitches and techniques: fine chain stitch, hemstitch, and decorative wrapped fringe work.

Embroidery pattern: small floral sprays flanking arrangement of large roses, carnations, tulips, lilies, and daisy types combined with stems and several forms of leaves; all parts worked in flat or linear manner, no shading. Same reversed at opposite end of shawl. 29.5 cm. at greatest height; set 16 cm. from lower edge of weaving and extending from selvage to selvage.

Selvages: slightly heavier warps used for 1 cm. along edges.

Fringe: warp ends divided into small groups, wrapped and redivided into five rows of ornamental openwork ending in fringe 3.5 cm. long.



PLATE VIII

Handloom cotton textile, embroidered. Kashmir, India, 1963.

Size: length 51.5 cm. width 52 cm.

Fibers: warp—cream-colored cotton, 1z, 2s, medium twist; set 50 per 2.5 cm. (paired).

weft—cream-colored cotton, 1z, medium twist; count 50 per 2.5 cm. (paired).

Weave: basket weave (see fig. 1 b).

Embroidery fibers: fine wool, 1z, 2s, medium twist; colors—five shades of brown, two tints yellow-green, pink, salmon, gold, rose-red, grey. Silk floss—1z, 2s, light twist; colors—grey, four shades of green, two shades of gold, medium blue, three tints of red, two tints dusty pink, two tints of salmon pink, orange, two tones brown, black, beige, two tints of yellow, turquoise, Persian blue, peacock, red-violet.

Embroidery stitches: very fine chain stitch (27 rows wool chain stitch per 2.5 cm. and 26 rows of silk chain stitch per 2.5 cm.).

Embroidery pattern: scene from Hindu mythology.

Selvage: one with no special treatment. Three raw edges are whipped with widely spaced variation of blanket stitch, using double two-ply strand of cotton.

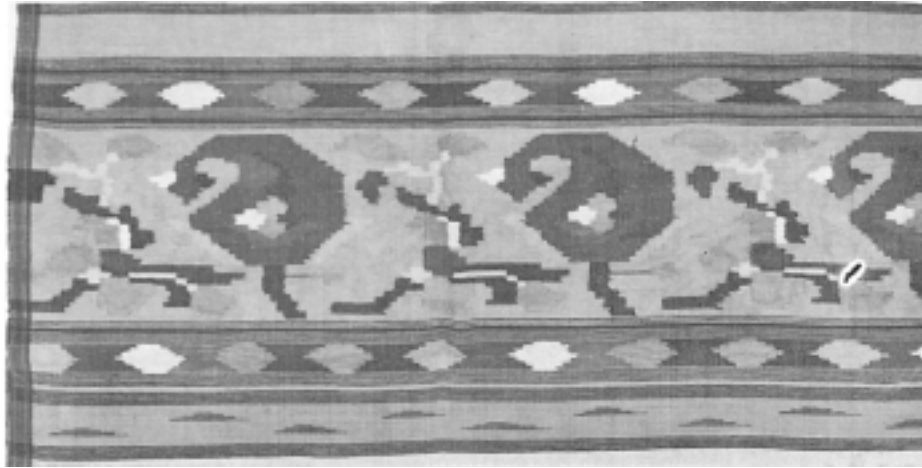


PLATE IX

Sari, loom-patterned (*kanikar*). Kashmir, India, 1963.

Size: length 5.5 m. width 1.10 m.

Fibers: warp—silk (*Bombyx mori*), pink, 1z, 2s, very light twist; set 110 per 2.5 cm.

ground weft—pink silk, same as warp; count 110 per 2.5 cm.

pattern weft—double-strand multiple-filament silk floss; count 35 per 2.5 cm. in decorated end border (*pallav*); single-strand multiple filament silk floss in selvage-to-selvage bands and in laid-in motifs of *pallav*. Colors—turquoise, white, yellow, orange, royal blue, deep pink, green, brown, Persian blue, red.

Weave: plain weave, square count throughout sari except in *pallav*. Plain-weave tapestry with interlocking wefts (see fig. 1 e) in patterned end-border (*pallav*). Plain weave with extra laid-in color wefts (see fig. 1 f) in geometric spot motifs in narrow lower band of *pallav*.

Pattern: large cones (*kalkas*), with pendent tips, alternating with conventionalized floral motifs in broad band (13 cm. wide) across end border (*pallav*). This broad band is bordered top and bottom with narrow weft color bands and simple geometrical shapes in tapestry, with an additional narrow band below with flattened triangular shapes in laid-in color wefts. All color areas are kept perfectly flat, without shading or any attempt at detail such as leaf veins. Edges of all motifs are in stepped patterns or horizontal lines, no curves included.

Selvages: slightly heavier warps used in 1.4 cm. stripe in red and turquoise along both selvages.

Finish lines: a broad band of brown silk wefts (7.3 cm. wide) divided into four equal parts by three loops of royal blue. The remaining 12 cm. of sari length is crossed at intervals of 2 cm. with one loop of brown silk.

Fringe: both ends of sari left with cut warps in uneven fringes 2.3 cm. long.

FIGURE 1

Reconstructions of Weaving Techniques from Kashmir Textiles Shown on Plates I-IX

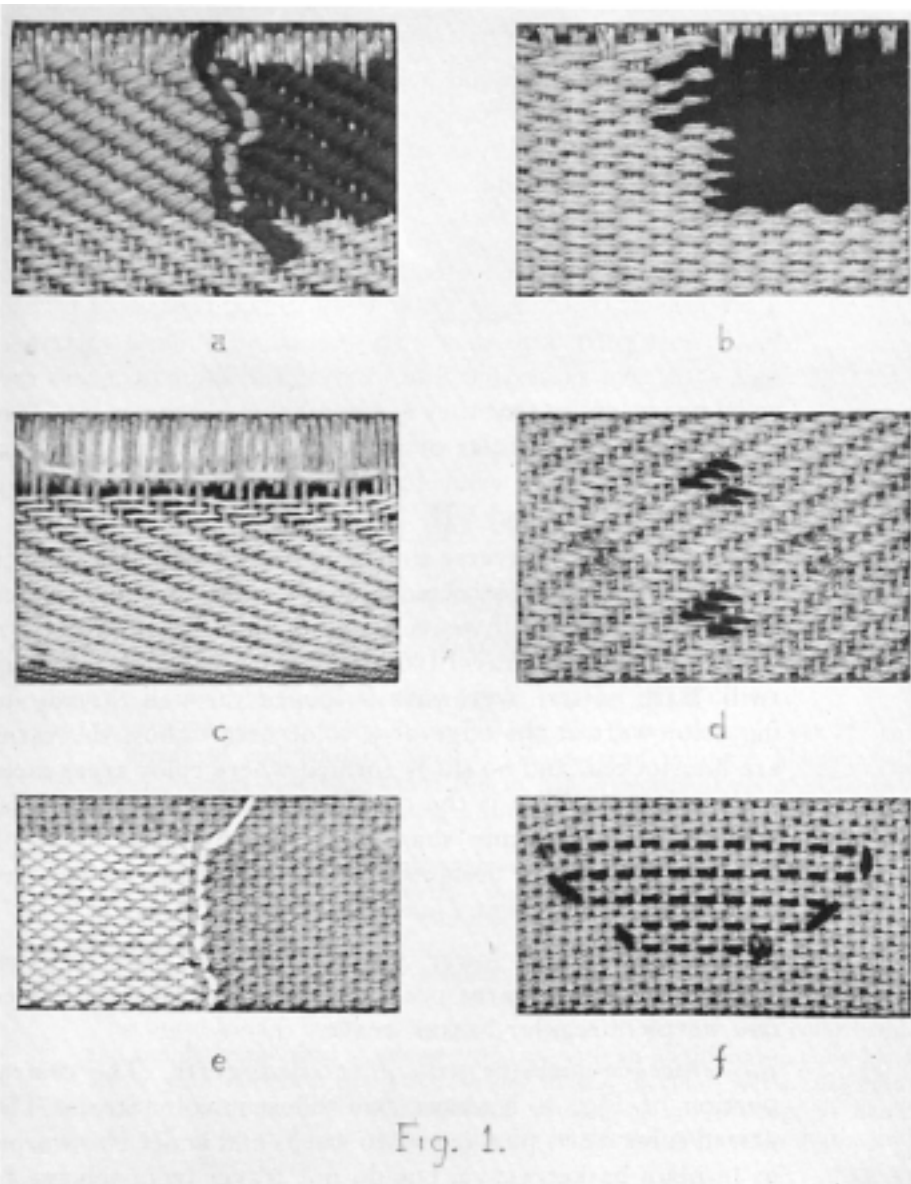
Each reconstructed weave sample has been placed with the warp running in vertical direction and the weft yarns in horizontal position. Likewise, each sample has been placed in the position in which it was woven, with either the face or the reverse side up. An explanation of each reconstructed weave follows.

Fig. 1 a *Evensided twill* The lower portion of the illustration shows a plain even twill (2 by 2) which forms a reversible textile. Each weft yarn skips over two warps and under two warps, and with each successive shot of weft the skips progress forward one warp, so that they are in echelon arrangement. This results in diagonal wales or ribs in the textile. Kashmir textiles woven in plain even (2 by 2) twill are illustrated in plates II, III, IV, and VII.

Tapestry twill (Reverse side of textile shown.) The upper portion of the reconstructed textile in Fig. 1, a shows the same two-by-two twill weave, but introduces colored pattern wefts which do not travel from selvage to selvage as in plain twill. Each pattern weft yarn is looped through the adjoining color weft at the edge of a color area. Thus, the yarns are interlocked, and no slit is formed where color areas meet between warps. This is the traditional technique used in the world-famous Kashmir shawls of past centuries. Plate I shows a beautifully designed and woven shawl in tapestry twill technique, all-over (*jamaṭwar*) pattern.

Fig. 1 b *Basket-weave* The lower portion of the reconstruction shows paired weft yarns passing over two warps and under two warps in regular basket weave.

Basket-weave tapestry with dovetailed wefts The central portion of Fig. 1, b shows two different color areas. The paired color wefts pass over two warps and under two warps, as in plain basket-weave, but do not travel from selvage to selvage. At the edge of a color area the wefts of one color and the wefts of the adjoining color *pass alternately around the same pair of warps*, so that the wefts are dovetailed, and no slit is left between the color areas. In Kashmir textiles of



this weave, no attempt is made to compress the wefts to hide the warps. (See plate VI.)

Basket-weave tapestry with dovetailed wefts around multiple warps The upper portion of the reconstructed weave shows two color areas in which adjoining paired color wefts are carried *alternately around more than one pair of common warps*. The number of common warps involved in multiple-warp dovetailing may vary in one decorative motif, producing a diffused feathery line. The wide shawl border of conventionalized floral and geometric motifs shown on plate VI is woven in basket-weave tapestry, with dovetailed wefts around a common pair of warps or around multiple pairs of common warps. These variations of basket-weave tapestry produce reversible textiles.

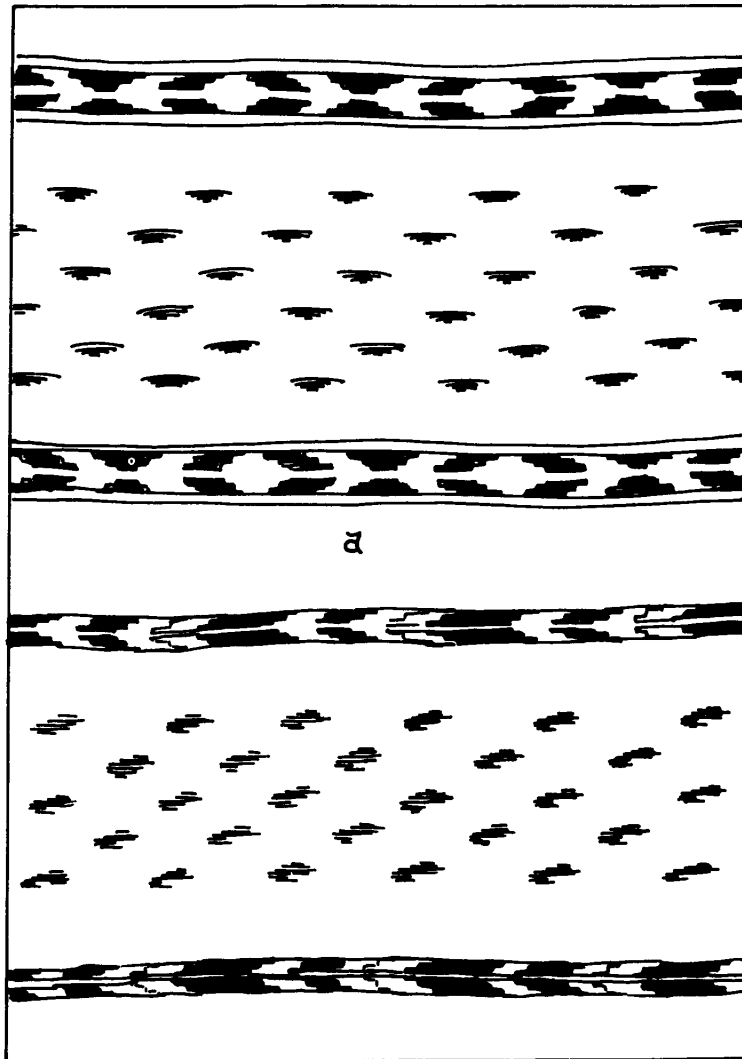
Fig. 1 c *Double-faced twill weave* The reconstruction shows a weave which produces a textile with face of one color and the reverse side of entirely different hue, but both sides in the same twill. This effect results from the use of two separate color wefts carried alternately in twill weave thus: one shot of color (1) weft under one warp and over three warps, followed by one shot of color (2) weft under three warps and over one warp, repeat. The 'over one' portion of weft color (2) must always fall in the center of the 'over three' skip of the previous weft. The upper part of the illustration shows the relationship of the two separate wefts as they are laid in the web, and the lower portion shows the compact color-area of the face of the textile. Plate V shows a corner of a double-faced twill weave shawl, which is reversible, with embroidery which is also reversible (*shuni shawl, duranga aksi*).

Fig. 1 d *Evensided twill weave with laid-in color wefts in pattern spots* The basic weave is a regular two-by-two twill. After a shot of weft has been laid, short lengths of extra color wefts (usually paired) are placed in the same shed, as desired, with the ends left hanging free. The shed is changed; another basic weft yarn is thrown across, then the free ends of the extra color wefts are laid between the warps as desired, and the process repeated according to the shape and size of the decorative color spot. Due to the diagonal line of

twill weaves, the added weft spots always form assymetrical shapes which are attractive small accents (*buti*) on a plain field. On the reverse side of the textile, the extra color wefts are simply looped from one weft row to the next, and floated from one color spot to another when convenient. This method of patterning does not produce a reversible textile unless the floats and ends are carefully removed. The small spots (*buti*) (each composed of four extra color weft spots) on the shawl shown in plate VI are examples of this type of weaving.

Fig. 1 e *Plain weave tapestry with interlocking wefts* (Reverse side of textile shown.) In this reconstruction two different color areas are clearly visible. The weft yarns pass under one warp and over one warp as in plain cloth, but do not go from selvage to selvage unless a solid color band is desired. The weft is not packed down to cover the warps, as it is in most plain weave tapestry in other parts of the world. At the edge of the color areas the two adjoining color wefts are looped through each other, so that the yarns are interlocked and no slit is left between the color areas. This technique is known as '*kani*' in Kashmir, from the word '*kanikar*' meaning a woven pattern. It is mainly used to create patterned silks, especially the highly decorative end of women's saris known as the *pallav*. Plate IX shows a portion of the *pallav* of a pink silk sari woven in this technique.

Fig. 1 f *Plain cloth weave with laid-in extra color wefts* (Reverse side of textile shown.) In this reconstruction basic wefts run from selvage to selvage, over one warp and under one warp in plain cloth weave. After one shot of basic weft has been laid, an additional weft of a different hue is placed in the same shed wherever desired, with the end left hanging free. The shed is changed. Another basic weft is laid (sometimes several basic wefts are laid) and the extra color weft drawn through as many warps as necessary to shape the intended motif, and the process repeated. Usually very simple shapes form the motifs, and they are placed in horizontal or diagonal scatter arrangement on a plain field, forming *buti*. (See plate IX. The lower band of the sari *pallav* is ornamented with flattened stepped triangles woven in this technique.)



b

FIGURE 2

Two silk sari decorated end-borders (*pallavs*) with woven (*kani*) patterns.

Decorated end-border (*pallav*) of red silk sari patterned with geometric band in interlocking tapestry and field spots (*buti*) of laid-in extra wefts. Colors—red, blue, orange, gold, green, and pink on pink background.

Decorated end-border (*pallav*) of Persian blue silk sari patterned with bands of interlocking tapestry in geometric motifs and field spots (*buti*) in cone or flame form (*kalka*) in laid-in extra wefts. Colors—red, orange, blue, green on aqua background.