

DENVER ART MUSEUM

1300 LOGAN STREET, DENVER, COLORADO

DEPARTMENT OF INDIAN ART

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INDIAN CLOTH-MAKING

Looms, Technics, and kinds of Fabrics

LEAFLETS 59 AND 60

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1. INTRODUCTORY. "Cloth-making" is used in the title of this leaflet because "Textiles" involves basketry and beadwork, and "Weaving" brings in fabrics made of vegetal fibres which are not cloth in our sense of the word. This leaflet attempts to describe the kinds of cloth which Indians have made, or still make, to correct the false notion that all Indians were cloth-makers. Only wool and cotton fabrics are described, cotton being a wool, though of vegetal origin.

2. CLOTH is fabric made by the weaving of spun or twisted wool or cotton fibres with the aid of mechanical devices constructed to simplify the manipulation of the fibres. It differs from basketry because the latter is made without specialized mechanical aids, the basket maker's awl not being so considered because of its many uses in other fields.

Indian cloth is not made in long bolts which can be cut in any desired length. Each blanket, belt or bag is a complete unit when finished.

3. WEAVING MACHINES. Five have been developed by the Indian in America north of Mexico. Arranged in order of complexity they are: one point warp suspension; warp suspension from cords strung between upright stakes; warp suspension from a wooden cross-piece upheld by posts; warp wrapped around a pair of parallel, horizontal round bars set in slots in upright posts and capable of being turned; and the true loom, which has the warp made rigid by being fastened at both ends and manipulated by heddles, slim rods tied to the warp in several ways.

On the first three varieties weaving proceeds downwards on warps fastened at the top only, with but one or two warps manipulated at a time. In the fourth variety the warp is tight, but weaving still proceeds downward one warp at a time. On the true loom, the fifth variety, weaving proceeds upward on warps tied at both ends and worked by heddles, so that a considerable number of warps are enclosed by the weft at once.

4. WARP is the foundation of a fabric. The word is applied to all the cords of this type or to one alone.

5. WEFT OR WOOF is the part of a fabric which encloses the warp, filling in the openings between the warps and fastening them together into a solid fabric.

6. CLOTH-MAKING TECHNIQS. Twining is the process of twisting weft around warp. In single twining one weft is wrapped around each warp or small group of warps, and in double twining two or rarely more wefts are manipulated at once by crossing between warps. If the weft encloses pairs of warps so that one member of the pair is enclosed with one member of the next pair on the succeeding weft layer, the weaving proceeds in a diagonal manner and is called twilling or diagonal twining.

In plaiting or checkerwork warp and weft are indistinguishable as they pass over and under each other. Plaiting can also be made diagonal in the manner described for twining.

These two methods, twining and plaiting, are those generally used on all the weaving appliances but the true loom. They are slow methods, as only one warp or group of warps can be enclosed in the weft at a time. Weaving is much faster on the true loom because the heddles make possible the enclosing of many warps at once. On the other types the warps are single strands, or if in groups are treated as single units. But in the true loom the warp is a continuous cord strung in a series of figure-8 loops, which, when pulled very tight, become pairs of warps crossing in the middle. One member of each pair is behind the other, as seen from directly in front, and not beside it. A heddle is tied to the rear unit of each pair. This heddle is pulled toward the weaver and a weft passed behind the rear units and in front of the forward ones. The heddle is then released and by the action of another heddle, called the shed rod, the front warps are pushed forward and the rear ones to the back. A second weft is put in place, which passes in front of the rear warps and behind those in front. Thus with two motions all the warps are enclosed in the weft.

Weaves in which the warp is entirely invisible are called tapestry weaves and allow the making of elaborate patterns in several colors. Weaves which show warp and weft equally are called basketry or open weaves and allow only very simple patterns, because weft color can be changed at will, while warp color remains constant. For further discussion see section 17, on belt weaving.

7. ONE POINT WARP SUSPENSION. A number of warps are tied together at one end and hung from some solid object. The wefts are then twined around the warps one at a time. Only round bags and narrow bands can be made by this method. The best known products of this process are the sandals, bags and head bands of the prehistoric Southwestern Basket-makers. These are made of yucca and Indian hemp (*Apocynum cannabinum*) fibres. These are not wools, it is true, but are mentioned for the sake of continuity. These specimens show complicated weaves and elaborate patterns which are illustrated in references 6 and 7.

8. BRAIDING. While braiding is not weaving, braided cloth products of two kinds are mentioned here because the ends of the cords are suspended from a single point. Braided work is usually round, but can be made flat by fastening the cords to a bit of wood so that they hang side by side and not in a rounded mass. As many as several hundred cords can be braided.

There are two kinds of braided cloth fabrics, the white cotton belts of the Pueblo Indians and the colored wool sashes of many eastern tribes. The former are 4 to 8 inches wide and 4 to 5 feet long. At the ends are quite large knobs from which hang long fringes. These belts are without decoration, though the intricate braiding creates small repeated figures in the cloth. In recent years cotton string has been much used in place of native spun cords. The colored wool sashes are especially characteristic of the northeastern tribes, though also made in the southeast. They are 4 to 12 inches wide and 3 to 5 feet long. The most common form shows a complicated braid which produces a multiple zigzag design.

9. BUFFALO WOOL CLOTH was a specialty of the southern Mississippi valley tribes, though made also generally in the east as far as the buffalo ranged and to some extent on the plains. Round and flat bags, belts, garters and even blankets are mentioned. Articles of this kind are now practically non-existent, only a few specimens being known. References 37 and 38 give the available knowledge, and reference 11 describes the use of buffalo wool for decorating fibre bags. Reference 38a. describes buffalo hair ropes.

10. WARP SUSPENDED FROM AN HORIZONTAL CORD—CENTRAL STATES. Flat bags (A) are made by this method by many tribes around the Great Lakes and in the Mississippi valley. Among them are the Chippewa, Menomini, Potawatomi, Sauk, Fox, Miami, and Kickapoo of the Algonkin stock; and the Winnebago, Iowa, Osage and Santee or eastern Sioux of the Siouan stock.

Two strong but springy rods are set firmly in the ground. Around their tops is stretched a loop of heavy cord. The warps are hung from this cord, evenly spaced and not fastened at the bottom. The warps are enclosed by several varieties of twining with wefts of variously colored wools, the worker twisting a pair of wefts around each warp one at a time. When almost all of the warp has been covered, its loose ends are bent over and wrapped to form the top rim of the bag. The broad, endless band of cloth is lifted off the stakes and the side which was the top when in place on the stakes is sewed together to form the bottom of the bag. Women are the weavers.

The product of this process is a flat, square or oblong bag or wallet, usually about 16 by 20 inches in size, but with a wide dimensional range. Formerly these bags were made of twisted bark or plant fibre, often with patterns of buffalo hair. But since the coming of the whites commercial yarns of a rather large size have been used. The many colored patterns usually consist of rather small repeated geometrical figures arranged in three horizontal bands. Occasionally conventionalized life forms are used. Often the two sides of the bag have different patterns.

11. WARP SUSPENDED FROM AN HORIZONTAL BAR—CHILKAT. The Chilkat blankets (B) of southeastern Alaska are woven on a frame with two wooden uprights and a wooden top cross bar. Loops fastened to the bottom of the bar support a stout cord from which the warp is suspended. Each warp has a core of twisted, shredded cedar bark wrapped in mountain goat wool and is hung doubled over the top cord. The warp lengths are graduated to make a downward curving bottom edge. The loose ends of the warp are gathered in small bunches and placed in bags to keep them from tangling. When the warp is adjusted, the weaver, a woman, squats before it and begins the enclosing of the warp with wefts of mountain goat wool. A number of varieties of twining are used, but the details are too elaborate for inclusion in this leaflet. Reference 15 gives full details. The blanket is woven in sections, each one a part of the whole design field. That is, the weaving does not move across the whole warp one course at a time, but works only on as many warps as are included in one design section until it is done. Each new section is fastened with a special stitch to those already done.

The blankets are about 6 feet long, 2 feet wide on the ends and 3 feet in the center, not including the fringe, which is about 2 feet long. Besides blankets, long sleeveless shirts, small aprons shaped like the blankets, and leggings are made. Photos of these articles appear in reference 16. Shirts with sleeves were also made.

The very striking designs, in soft black, yellow and green, are copied by the women from designs painted on boards by the men. This is unusual, as most Indian designs are made without guiding patterns. These patterns represent the farthest carrying out of the design convention of the Northwest coast tribes, which is that living creatures are the most suitable subjects for design, and that while the creature depicted must be shown head on, all the rest of the body must also appear. To solve this apparently insuperable difficulty the artist

*For some bags a rod is placed across the uprights, or hung from cords fastened above. The warps hang across the rod. Bags made in this way have no seam across the bottom.

cuts the animal up in sections and lays them out on either side of the front of the body in a symmetrical arrangement. The sections are highly conventionalized, so that their interpretation necessitates the help of expert advice. Space does not permit a further description of this strange artistic device, one of the most original in all the fields of either primitive or civilized art. Full details and explanatory charts are given in references 15, 17 and 19.

This type of textile seems to have been invented by the Tsimshian tribes of west central British Columbia, the middle of the Northwest coast culture area. From this central point, it spread up and down the coast. For a long time the Chilkat division of the Tlinkit has been the only producer. The earliest blankets are said to have been plain white. Later came the introduction of stripes bearing geometrical elements, and finally the robes with animal designs described above. The latter style seems to have developed early in the last century. Of the older geometric style blankets, which lack the curved bottom, only a very few remain. A blanket of this type is one of the rarest of all Indian made articles. The weaving of the animal design type is restricted today to 3 or 4 rather inferior weavers, using mostly commercial yarn. Photos of the geometric type are found in reference 18.

12. BAR LOOM WITH TIGHT WARP—SALISH. The Salish tribes of southern British Columbia and the coast and eastern part of Washington used this type of loom. There are two uprights pierced with holes in which the two parallel, horizontal round bars are placed. They fit loosely and are tightened with wedges. Yarn was spun on unusually large spindles from mountain goat wool, the wool of a small dog bred especially for its hair, feathers and various vegetal fibres. A small rod or stout cord was fastened to the loom between the bars, and the warp tied to it. The warp passed over the bars, around the stick, and then reversed. Reference 24 has a drawing of the process. On this warp two kinds of blankets were made. One was in coarse twilled plaiting (C), apparently usually not decorated except with a few bands of red cloth threaded through it.† The color was creamy white. The other type, made in a complicated sort of twining, had elaborate patterns involving bands of small square design elements and sharply angled multiple zigzags. A number of colors are seen in the few remaining examples of the elaborate blankets, but information about them is lacking.

The weaving was done by a seated woman. When the work had progressed downward to a point where labor became difficult, she loosened the bars and turned them and the unfinished blanket upon them to a more convenient position, or else slipped the fabric on the bars without turning them. When the whole warp was enclosed the small rod was pulled out of the blanket, allowing the two ends to separate and the fabric to fall from the bars. Narrow carrying straps were also made by the Salish by the twining method. (D).

Practically nothing is known about the history of this kind of cloth-making. Some have supposed that the Salish spindle and the loom were introduced by the whites, but since the first explorers found these two articles in use everywhere this theory seems very unlikely. The impact of white influence caused the rapid end of most native industries, so that it is a long time since the art was a flourishing one. It is possible that there are a few weavers of the coarse blankets still working, but no definite information is available.

13. TRUE LOOM. The most common form is the vertical blanket loom. This has solid top and bottom cross pieces, either fixed to upright posts as by the Navaho, or fastened to floor and ceiling, the Pueblo practice. The warp, a continuous strand, is wrapped around two slender rods laid on the ground and held apart by temporary side poles. When the warp is strung, it and the two rods are tied to the fixed cross pieces and drawn very tight. Weaving technic details are given in section 6. As before mentioned, weaving proceeds upward on the true loom in distinction to the downward motion on the other weaving frames.

The next most common form, and probably the most ancient, is the belt loom. This has a long narrow warp, one end of which is fastened to a raised support, while the other is belted around the waist of the weaver or tied to a lower support, thus assuming a sloping position. With the aid of heddles this loom produces long narrow fabrics such as belts, garters and hair ties. Belt heddles are of two types. In the first type the heddles are rods tied to the warp as in the blanket loom, while in the second the heddle looks like a small ladder with very close set rungs, usually made of split reeds. This heddle is set across the warp at right angles, both vertically and horizontally. Part of the warps pass through holes in the rungs. By moving the heddle up and down the warps passing through the holes are alternately behind and before the warps passing between the rungs, thus producing the same effect as is gained by the rod heddles, as outlined in section 6.

The least common form of the true loom, found till recently among the Pima and possibly earlier in the Southeast, is the horizontal type, which is staked out only a few inches above the ground.

The true loom is found in all forms in the Southwest, the Pueblos and Navaho using the vertical and belt types. The Mound Builders of the eastern states probably had some form of the true loom, but exact information is not available.

†Some of these coarse plaited blankets have narrow patterned borders in fairly fine twined weaves.

14. PUEBLO CLOTH-MAKING. The making of blankets and smaller cloth articles has long been carried on by the town-dwelling tribes of the Southwest. Fine cotton fabrics have been dug from prehistoric ruins; the first Spaniards reported on the cloth of the natives, and today the art is carried on vigorously by at least one Pueblo tribe, the Hopi, and to some extent by other groups.

Cotton was the raw material for prehistoric cloth and is still used today. The Hopi men weavers make white sashes, shawls, kilts, and blankets. The latter (E) are usually embroidered on the long edges with wool of many colors, black predominating. They are about 40 by 60 inches. The shawls are smaller and have broad red and blue bands on the long edges. The kilts and sashes have colored embroidery or brocade on the ends.

Hopi wool blankets traditionally have patterns of simple transverse stripes. (F) Often the main body of the blanket shows very narrow black and blue stripes with broader, more colorful bands for the principal decoration. These narrow stripes make the celebrated "Moqui" pattern. Hopi men's wearing blankets often have bold black and white checks. In recent times Navaho figured patterns have been adopted to a slight extent. Probably the best known product of the Hopi loom is the wool dress for women, an oblong rectangle of dark brown or black cloth about 40 by 48 inches, with broad bands of dark blue diamond weave on the long sides. Dark blue men's shirts are woven, as are long narrow belts, (G) garters and hair ties, usually made in combinations of red, green, white, black and blue. Knitting, learned from the Spaniards, produces footless stockings of dark blue wool. For the details of Pueblo weaving, see the last paragraph on page 40.

Weaving at the other Pueblos is very nearly gone. Some is done at Zuñi, where blankets, women's dresses and belts are still made. At some other towns belt weaving alone is done, according to the available scanty information. The Zuñi woman's dress may be distinguished from that of the Hopi by its bands of heavy blue embroidery. The Acoma dress, one of the most beautiful of Indian textiles, but very rare, has embroidered bands in various combinations of red, green, yellow and blue. See notes on page 40.

15. NAVAHO CLOTH-MAKING. The Navaho Indians of Arizona and New Mexico are the most celebrated of Indian blanket makers. There are hundreds of weavers, the vast majority women, in the large tribe of 45,000 members. The Navaho loom, described in sections 6 and 11, can produce the plain, diagonal, diamond and 2-faced fundamental weaves and the quite numerous variant forms of them. Two to four heddles are needed to execute these weaves. Patterns to every degree of elaboration can be and are produced. Curves are difficult to make and are scarce, but are sometimes woven. The native colors were formerly rather limited, but indigo blue, cochineal-red dyed baize or flannel and, in recent years, aniline dyes, all procured from the whites, made every color combination possible. Today many new native colors are being developed.

Navaho blankets are made in so many sizes that it is difficult to give full particulars. The saddle blanket, (H) about 30 by 45 inches, is a very common type. Some of the finest pieces are in this class. The "Chief" blanket with its striking broad black and white stripes and endless variations of the "nine-spot" design, is another celebrated type. Smaller blankets of similar style were also made for women. Another type is the woman's dress, two oblong blankets sewed together along the long sides. Each is about 48 by 30 inches, with black centers and broad red ends. Wearing blankets made to fit persons of every size were woven in the days before American clothes became the style. The very best of these wearing blankets, made in the first half of the last century, rank among the finest of all primitive textiles. Only a few of them are extant today. Persons whose idea of Navaho blankets is based on those offered for sale in curio stores have no conception of the very superior qualities of the best Navaho weaving. Navaho blanket designs are largely combinations of simple geometric elements and are without significance or symbolism. For further information about the making of Navaho blankets see Leaflet 3, preferably the second edition.

The Navahos, who presumably arrived in the Southwest before 1400, learned the art of weaving from the Pueblo tribes. The two types of Indians were thrown in close contact during the Pueblo revolt of 1680-1700, and it seems likely that Navaho weaving began at that time. Once begun, it developed rapidly, until by 1800 Navaho blankets were well known in the Southwest and Mexico. Sometime in this early period it was discovered that a kind of wool trade cloth from England, called baize in English and bayeta in Spanish, could be raveled to produce fine but strong threads. This cloth was dyed in several colors, of which cochineal red of several shades was the most common.

This discovery, coming at a time of great tribal prosperity and power, resulted in the Golden Age of Navaho weaving, from about 1800 to 1865. The tribal captivity in the sixties, soon afterwards followed by the introduction of machine made wool yarn, the so-called Germantown, and aniline dyes, brought forth in the eighties a crop of blankets with highly elaborate designs and many colors, often garish and brilliant. In the nineties and early years of this century rapid popularization, with its tendency to disregard quality, reduced

Navaho weaving to its lowest ebb. Since about 1915 there has been a growing tendency to revive the best in the art, so that today many very good blankets in the older styles are being made.

16. PIMA CLOTH-MAKING. The Pima of southern Arizona and their neighbors the Papago and Maricopa formerly wove blankets and belts of cotton. The art has not been practiced for about 50 years and little is known about the fabrics produced. Reference 39 gives quite full details about the unusual horizontal loom and the method of using it. The blankets were plain white without designs or colors. The belts, of which two are pictured in reference 39, somewhat resembled those of the Pueblos and Navaho. See also reference 41a

17. BELT WEAVING. As is indicated in section 13, paragraph 2, there are two forms of the belt loom, the variation being in the heddle form. On these looms are woven women's sashes 3 to 5 inches wide and 5 to 8 feet long; garters about 2 inches wide and 3 feet long; and hair ties 1 inch wide and about 4 feet long. All have quite long end fringes. The belts, (G) whether made by Pueblo or Navaho, have lengthways stripes of red, white, black, green, and occasionally blue, yellow and purple, and a center section of raised stitches forming small geometric patterns which reverse colors and forms on opposite sides of the belts. The other two articles made are much simpler, the hair ties usually not having the raised stitching. Details of the weaving are too complex for inclusion in this leaflet. Belts differ from blankets in that they show the warp on the surface, the weft being hidden, while in the case of blankets the reverse is true. There is a tubular set-up of warp on some belt looms. See reference 31.

These fabrics have never been thoroughly investigated, so that it is impossible to give detailed information. Some data appear in reference 36. Results of a study now under way will appear in a later leaflet.

Compiled by F. H. Douglas from the following sources:

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Weaving at Zuñi is done by women, except for a few old men who weave in cotton. Elsewhere men wove, though there were some women weavers at Acoma. Belt weaving is quite general in the modern pueblos, and is chiefly, though not always, the work of women. Weaving at Acoma, except belt-making, is almost gone, only about six craftsmen now surviving. The last Laguna weaver is blind and feeble. The Acoma type of embroidered wool shawl was also made at Laguna. In the Rio Grande Valley pueblos, there seems to have been more weaving than was once supposed. But not enough data are yet available on which to base a statement. For Acoma weaving see reference 31a.

Leaflets in this series dealing with Pueblo weaving: Hopi, 18; Acoma, 89; Tewa, 90; Keres, Tewa and Jemez, 91; cotton textiles, 92-93; wool textiles, 94-95; Zuni, 96-97. See also the following:

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