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## **Wrap the Dead : The funerary textile tradition from the Osmore Valley, South Peru, and its social-political implications**

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#### 4.1 Anthropological fieldwork in the community of Cuyo Cuyo

In order to acquire a better understanding of the archaeological textile assemblage from the Osmore valley, ethnographic fieldwork was undertaken by the author in the Quechua community of Cuyo Cuyo in the department of Puno in the year 2000. The aim of that research was to obtain insight in the procurement of alpaca fibre, techniques of spinning, plying, dyeing, warping the loom and weaving. These observations led to a better understanding of the functioning of traditional weavings in indigenous societies, and all allowed taking measurements of the time and material needed for the production of certain fabrics. For these purposes, one old-style poncho and manta were woven according to local standards under the author's supervision. The poncho was chosen because its size, warp-faced plain woven structure, and warp and weft density are similar to those of the camisas found in the Osmore valley. In addition, Cuyo Cuyo ponchos are made of two trapezoidal shaped fabrics, a shape also found in the Osmore textile tradition. The manta was chosen because of its stripes with hand-picked patterning of two sets of complementary warps in a warp-faced plain woven background, a technique used by the Chiribaya people to produce their motifs in camisas, pañuelos, and ch'uspas.

Cuyo Cuyo is one of the five *ayllus* (indigenous societies) of the province of Sandia in the department of Puno (see fig. 1.1). In this area, Quechua is spoken mixed with Aymara words, as this province lies at the linguistic border. The Sandia province is located at the western flanks of the Cordillera de los Andes and is characterised by rapid descent from snow capped mountains to tropical forests. The community of Cuyo Cuyo consists of eleven communities ('minor *ayllus*'), most of them clustered on the steep mountain slopes surrounding Cuyo Cuyo Pueblo lying at the narrow valley bottom. Pueblo itself lies at an altitude of 3,300 masl, but its *anexos* (functional hamlets) can be found between the tundra-like plateau at 4,500 masl to 2,300 masl. In the highest

regions, people make a living of grazing herds of alpacas and seasonal gold mining, while in the lowest regions maize and coca are grown. However, the community's main products are tubers, especially potatoes. The tubers are sown at the advent of the rainy season in August and harvested in February and March. The rainy season is the lean season, and therefore considered the best time to weave. The actual amount of time each weaver can devote to textile production, will depend on other responsibilities such as child care and agricultural and domestic tasks.

The fieldwork was carried out in Rotojoni, one of Cuyo Cuyo's eleven minor *ayllus*. This hamlet is located on the steep mountain slope to the south of the central village, at about 3,700 masl. It can only be reached on foot, and the other hamlets located on the western slopes are reached by climbing down to the central Pueblo and then up the opposite slope. The central Pueblo and the western hamlets are located on the road from Juliaca to Sandia and San Juan del Oro. Rotojoni was recognized as "Comunidad Campesina" in 1995 (Cojene Rotojoni, nr. 24657). Its communal territory measures 37.47 km<sup>2</sup>, half of it are grazing grounds, and the other half agricultural terraces. Rotojoni has one *anexo*, Qeyo, located at a four hour walk to the south of Rotojoni, beyond the valley of Cuyo Cuyo and at about 4,500 masl, at the foot of snow capped mountains. Few families live there permanently, making a living of herding alpacas, few llamas and European sheep, and by trading their meat and fleece.

#### 4.2 Procurement of alpaca fibre

For this research, an alpaca was shorn in order to learn about the technique and the produce of the shaving. The alpaca was shorn in the *anexo* Qeyo, just prior to Todos Santos (November 1st and 2nd).<sup>[1]</sup> This is the normal time to shave alpacas, as the climate gets slightly milder and cash from selling the fleece may be needed to pay for



Fig. 4.1 Shearing of alpaca in Qeyo

the commemoration at the Todos Santos celebration of a deceased family member.

The alpaca had to be shorn at daybreak under freezing conditions, although no explanation for this time setting was given. An alpaca was chosen that had not been shaven for two years, which is the maximum amount of time the owners allow the fleece to grow. The shearing took place amidst the herd of about thirty animals (fig. 4.1). The selected animal was closed in by three men and forced to the ground and quickly had its four legs bound together. Two persons shorn one side first, using shearing scissors. With their left hand they grabbed a handful of fleece and cut it with the scissors held in the right hand. One man worked on the hind part from the groin towards its belly and back and finishing with the buttocks, while the other man worked around the throat and chest. Then the head was lifted up to shear the whole neck and throat, after which the animal was turned to the other side and the procedure

was repeated. Finally the legs were shorn all the way down to the hooves, despite the poor quality of the fleece, and after releasing the legs, the remaining patches of the belly were shorn. A tag of wool was left on both flanks and at both sides of the chin to serve as the owner's marking.

It took 45 minutes to shave the animal, but the men complained about blunt scissors and said that they could have shorn twice as fast. The fibres had a length up to ten centimetres, and about two centimetres of fleece were left on the animal to protect it from night frosts and rain. The total amount of wool shorn weighted 7.5 pounds, which is about three times as much as a European sheep would yield. In 2000, alpaca fleece was sold for nine *soles* (approximately \$2.50) per pound.

In the prehistoric tombs from the Osmore valley, a considerable quantity of individuals was found buried with quantities of raw camelid fibre. Usually these wads



Fig. 4.2 Spinning technique in Rotojoni

were placed at the throat or chest of the flexed and seated individual. They are though to have been imbued with ritual significance. Although it is difficult to identify the exact species, the softness of the fibres suggest that these wads originated from good quality alpaca fleece.

#### 4.3 Techniques of spinning

The research took place between May and November 2000 when no alpaca fibre could be obtained in Cuyo Cuyo. As alpaca wool is quite expensive at the market, sheep wool was bought at the market of Juliaca for the project. All spinning, plying and weaving was done by women. Four women from Cuyo Cuyo's central village and all 19 women from Rotojoni participated in the project. The spinning and plying techniques were observed and the amount of yarn produced in time units of ten minute was measured.

Prior to the spinning, dirt and the matted tips (*'pichu'* in Quechua) were removed from the fleece. The fibres were loosened to facilitate the pulling of the fibres into a long roving of about 10 cm wide, which were wound around the spinner's left wrist. All spinning was done seated. The spindle is called *'pushka'* in Quechua, and is made from a wooden stick of about 20 cm long, with a wooden whorl close to the bottom to stabilize the spinning motion. By quickly moving the thumb of the right hand in opposite direction of the index and middle fingers, the spindle was set in motion, in clockwise direction. The spindle rotated in a shallow ceramic bowl or sherd to enhance its balance and the control of the spinner to prevent the spun yarn from breaking. Simultaneously, the left hand moved outwards to pull the strip of wool into ever finer yarn (fig. 4.2). The resulting yarn was Z spun, coded as /.

When the yarn had become longer than the arm could stretch, it was wound in figure '8' movement



Fig. 4.3 Spindle whorl found in archaeological context in Osmore Valley (Clark 1993, 394)

around the thumb and three fingers of the left hand. Then the yarn was wound under tension onto the base of the spindle. This procedure was repeated until the cone of spun yarn on the spindle was as wide as the whorl. Finally, the yarn of two *pushkas* was jointly wound up onto a tight ball ('cabeza' in Spanish and 'uma' in Quechua, both meaning 'head'), to prevent the yarn from curling up. This job was preferably done standing up, while the two spindles danced freely on the floor or in a container. All weavers managed to produce four *pushkas* per day (about seven hours of work), yielding

more or less 250 grams. On average, the women spun 17.4 metres per ten minutes, that is, 104.4 metres/hour, rounded off here as 104 m/h.

In Osmore's archaeological context, spindles and whorls are found that are strikingly similar to the spindles from Cuyo Cuyo. Most archaeological specimens are more slender in order to produce finer yarn. The whorls are made of wood, bone, or stone (fig. 4.3).

#### 4.4 Dyeing procedure

Though camelid fibres can be dyed at various stages of the textile production, ranging from unprocessed raw fibre to the state of woven fabric, the general procedure is to dye the yarn once it is spun or plied. The functional reason for this is that the grease of the fleece is helpful for spinning the yarn. In Cuyo Cuyo, the women dyed the fibre after the spinning but prior to the plying procedure, whereas in several Tiwanaku tombs from Chen Chen (1988 and 1995), small wads of dyed raw camelid fibre have been found. These dyed wads seem suggestive of a preference of dyeing the fibre prior to spinning, but a symbolic significance of raw wool dyed for some specific celebration cannot be excluded.

Prior to the dying itself, the spun yarn needed to be washed to extract the grease from the fibres, to allow a thorough and even penetration of the dye. The balls of paired spun yarns were unreeled to form a loose bundle of yarn, a process called '*juñir*'. These bundles were left to soak in the hot springs of Phutina at the southern end of the valley. Plastic sheets were weighted down by stones into the hot water, in which the wool bundles were left to soak with detergent for at least 20 minutes. The yarns were not allowed to be rubbed clean to prevent the yarn to become fluffy and tangled. The yarn was rinsed in the river after which the procedure was repeated. The result was bright white yarn. Finally, the yarn was hung up to dry for at least 24 hours.

Once the yarn was washed, it was dyed. In Cuyo Cuyo, all dyeing was done with synthetic dyes ('analina') bought at the market. Outside the house a fire was made of local eucalyptus wood (imported species in the 1980's) in a ceramic oven ('oncha', about 40 cm x 20 cm and 25 cm high)

with two round openings on top for two pots. The large pots were ceramic or metal and were not used for any other purpose, since the dye stains the inside. The pots were filled with ample water to make sure all wool was completely soaked. For each dyeing procedure, one teaspoon of lemon salt, one table spoon of kitchen salt, and two table spoons of alcohol were put into the pot with boiling water, together with about one ounce of dye powder and one pound of wool yarns. The salts and alcohol functioned as mordants, which allowed the dye to penetrate into the fibre and thus making the colour permanent. The yarn was left boiling with the dye for two to ten minutes. A constant stirring was required to give the wool an even colour and allow the dyes to penetrate deeply into the fibres. The bundles were hung up to dry in a sunny and windy spot. In total, three persons needed ten hours (one day and a half) to dye 81 bundles of wool yarn.

It is not known to the author whether yarn was dyed locally by the ancient Osmore population, or whether yarn was imported in dyed state from higher regions where the alpaca herds would have been concentrated. Chemical analysis of cooking pots would be indispensable to answer this question. Wallert and Boytner (1996) analysed several dyestuffs of Ilo-Tumilaca/Cabuza and Chiribaya fabrics and concluded that all dyestuffs for red, yellow, green, blue, orange and purple colour could have been obtained locally. Most dyestuffs had been obtained from mixing various plant dyes and/or using various metal salts as mordants (Al, Cr, Cu, and Fe) (Wallert and Boytner 1996, 854–860). Colour variation was also obtained by using different hues of camelid wool. For instance, a Chiribaya purple colour ('89) was dyed over a dark brown fibre, whereas a red colour was dyed over a light brown colour.

Today, little knowledge of dyeing fibres with vegetable or animal dyes or mineral pigments (*makhnu*) remains among the indigenous population. Girault (1969, 27–30) compiled a list of the herbs used for dyeing yarn and the colours they yield, together with their Quechua, Aymara and Latin names.

#### 4.5 Techniques of plying

The next procedure observed was the winding up of the dyed bundles of paired spun yarns into firm balls, a

process called *kiwiy*. The bundle was held around both lower arms in circular or in figure 8 form, leaving the hands free to unwind the yarn. If the bundle of yarn had not become too fluffy by the washing, the yarn came off easily, allowing the job to be done by one person in twenty minutes time. Usually the job was done by two persons: often a child was asked to hold the yarn around the arms. One person could wind up about 18 balls in one day's work.

To make a yarn stronger and prevent it from curling up, two (or more) spun yarns were plied together. The plying procedure is called '*k'antiy*' (Quechua, '*torcer*' in Spanish). The procedure resembled the spinning process, but a larger and heavier spindle whorl was used, called '*k'antiy pushka*'. The ball of wool was pinned to the left side of the chest with a big safety pin, or put into the pocket of an apron or in a plastic bag tucked under the waistband of the skirt. The spindle is set into motion between two flat hands, by pushing the right hand away and the left hand towards the body. The spindle was allowed to drop without touching the ground, holding the yarn in the right hand while the left hand pulled out yarn from the ball. In contrast to spinning, the whorl made a counterclock movement, resulting in a two-plied S yarn, abbreviated as  $/2\backslash$ . The yarn destined for warp elements was given an extra twist for extra strength to withstand the powerful beatings of the sword and the *wichuña* (bone pick) during the weaving process. The degree of twist was checked by allowing a  $\pm 60$  cm long plied yarn to hang loose. Then the yarn should spontaneously twist into three curls.

Plying was done sitting, standing and walking. The standing position allowed the longest yarn per action, about two metres. Then the plied yarn was wound around the spindle shaft as during the spinning procedure, until the spindle was full or too heavy. On average, the women plied 21.8 metres per ten minutes, that is, 130.8 metres/hour, rounded as 131 m/h.

#### 4.6 Warping the loom

In the Cuyo Cuyo communities, most weaving was done in the rainy months, after the agricultural terraces were sown in September and October

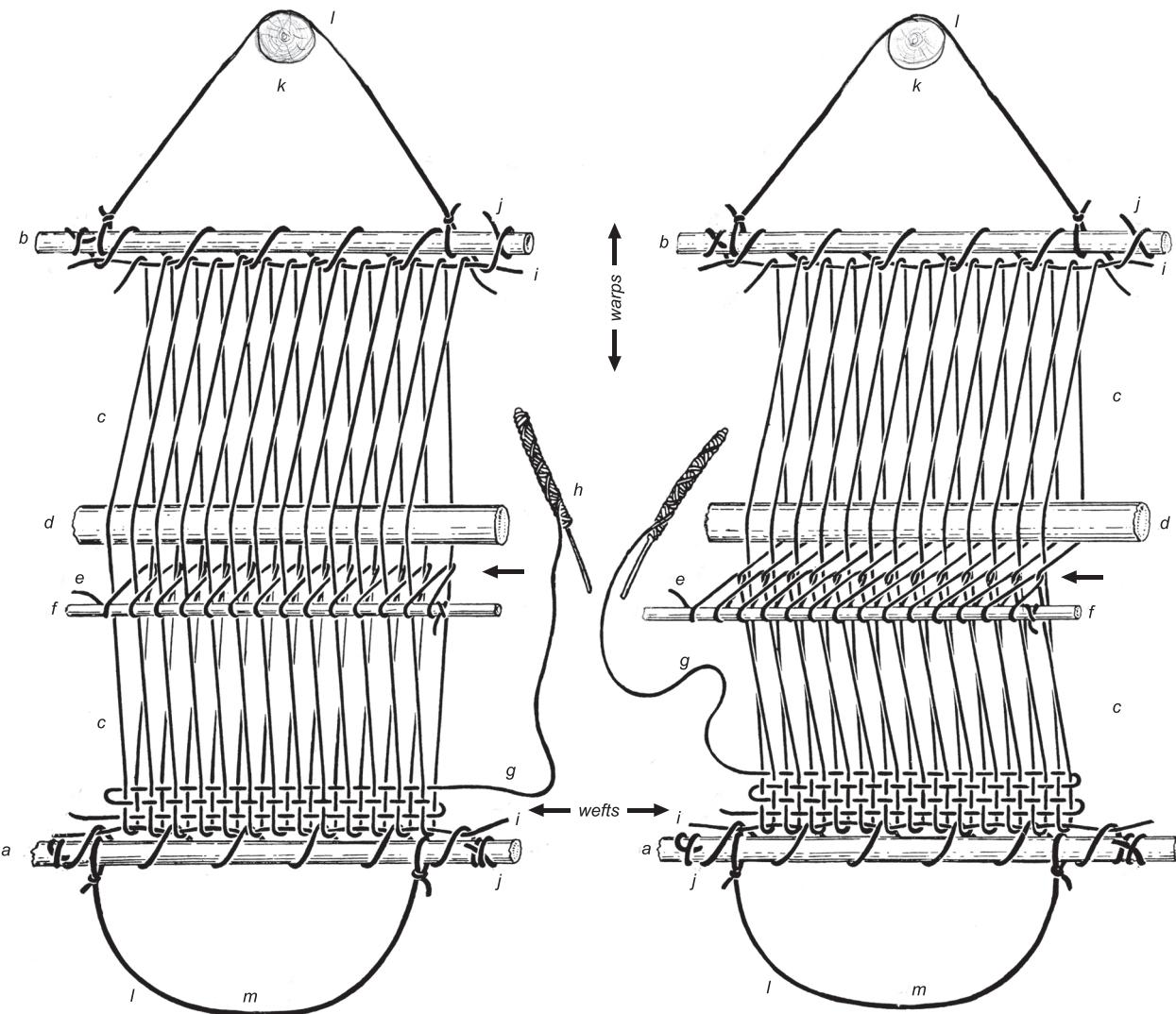


Fig. 4.4 Andean back strap loom and its constituent parts (d'Harcourt 1987, fig. 3)

and before the festivities of Carnaval in February. Because of the rain, most weaving was done inside the house, close to the open door for the light. Peak of weaving activity fell in the months of December and January. Women were expected to weave at least one manta or faja that they or their husbands would wear at the Carnaval dances. Simultaneously, newly woven cloth was considered a demonstration of a woman's skills and her dedication to the family, and thus served as an important status object. During this period, husbands often went away to work for cash money.

The Andean heddle loom is characterized by having a continuous warp with applied shedding devices.<sup>[2]</sup> In Cuyo Cuyo, a horizontal loom was preferred, although back strap looms were used for smaller fabrics such as belts and bags. A 'back strap loom' (fig. 4.4) was kept under tension by the weight of the weaver, securing the far end bar (b), also called 'awa', to a fixed point (k) and strapping the nearest bar (a) around her hips (m) with a rope or a band (l). The traditional horizontal loom is fixed by four wooden or iron pegs in the ground to which two cross bars (a and b) are tied, which will form the horizontal extremities of the loom.<sup>[3]</sup> Recently, a fixed framework has been



Fig. 4.5 Warping procedure on modern loom with fixed framework in Cuyo Cuyo

introduced in Cuyo Cuyo as horizontal loom (fig. 4.5). It consists of two square cut poles, measuring 270 cm x 5 cm x 6.5 cm, with drilled holes at a regular interval of 20 cm. The crossbars (*a* and *b*) are placed perpendicularly on top of the two poles at the required length and are tied to the poles by pulling thick wool ropes (*wasqa*, made by alpaca and sheep herders from *anexo Qeyo*) through the drilled holes. Thus the square poles take over the role of the pegs. The weaving loom itself is identical: the distance between the two cross bars (*a* and *b*) of both types of horizontal looms is measured by a wool string (*'topuña'*), which corresponds to the required length of the fabric plus some extra length (about 6%) that will be lost due to the taking up of the weft insertion. Two women needed 12 minutes to construct the frame.

The warping procedure for both looms is the same. Warping in Cuyo Cuyo was done by two persons, usually two related women. Before starting the warping, three

coca leaves (*'k'intu'*) were torn up and thrown over the loom with silent prayers to invoke success for the warping and weaving process. This ritual was called '*allwiy'*. Another *k'intu* was placed under the ropes of the loom.

Two women took place at the narrow ends of the frame behind the crossbars. Underneath the loom, a plastic sheet and wool blanket were spread on the ground, and the desired fabric was spread out on top, between the two loom beams as an example for the warping. As the woven fabric was warp-faced, its patterning had to be determined in the warping phase. Before starting, the colour sequence was sorted out and placed in warping order next to the loom. During the warping, the women constantly discussed the shade of colour and the number of warps. Every time the colour was changed, the yarn was broken off and its end tied in an easily removable loop to the new colour yarn, preferably on one side of the loom.

One woman threw a small ball of wool from above the loom bar to the person opposite of her, letting the ball hit the floor just in front of the far bar (*b*), so that it rolled under the bar into the hand of the other woman (see *fig. 4.5*). This person picked up the ball and threw it back in the same manner, thus forming the figure-8 alignment of the warps (*c*). This procedure results in a lower and an upper group of warps, also referred to as 'uneven' and 'even' warps, respectively.

The width of the cloth's warps was measured with the hand: each web of the poncho should be four hands wide. One hand is the size between thumb and middle finger of a stretched hand, more or less 16 cm.<sup>[4]</sup> The women estimated that the true width of this web would be some six centimetres wider, as the warps would spread a little during the weaving procedure. The width of the fabric did not exceed the space within which the weaver can pass the shuttle with weft yarn from side to side. Fabrics wider than one metre, especially tapestry weaves, were apparently made on vertical looms, allowing two or more weavers to sit side by side and jointly pass a shuttle from selvage to selvage or to work on particular sections of the fabric.

The warping of one poncho web took two hours and ten minutes, which included about twenty minutes of discussion time.

When the warping was finished, a third bar (*awa, d*) known as shed rod was inserted behind the warp cross in the middle of the loom, to ensure the separation of the upper and lower warps. Once this bar was inserted, a flat wooden sword or batten (*luk'a*) (not in drawing) (about 120 cm long and 3 cm thick) was placed in the warp shed between the shed rod and the weaver's side of the loom. The sword helps opening the warp shed, beating down of the wefts, and inserting the weft shuttle.

The even and uneven warps were permanently separated by looping each individual upper warp with a strong cotton yarn (*e*). This yarn was first pulled through the shed between the sword and the warp cross in the middle. Working from the right to the left, the cotton yarn was picked up after each upper warp by the left hand's fingers, thus forming loops (also known as heddles or '*illawa*' in Quechua) of about 3 cm long. These loops were held by the middle finger of the right hand until the finger got full, when the loops were

moved onto the heddle rod ('*soqosa*'). The heddle rod was a very strong, but flexible twig (*f*) of about 1 cm diameter and 1.40 metre long. In order to prevent the loops from sliding off this twig, a synthetic yarn was tightly fastened to the right and left of the loops. This heddle rod was pulled up in one movement, creating a shed through which the weft (*g*), wound on a narrow stick called shuttle (*h*), was moved. The looping process was called '*awata illaway*' and lasted 28 minutes.

Then the weft heading cord (*i*) was pulled through the warp shed. Cuyo Cuyo weavers preferred to use a triple cotton yarn with a length of three metres as heading cord. A loom bar was placed on top of the warps near the weaver, which replaced the crossbar nearest to the weaver around which the warps were wound, in order to place the crossbar outside the weaving. This fourth bar, plus the cotton heading cord and about eight warp elements were now firmly wrapped together by a very strong synthetic *ch'ukura* yarn (*j*), working from the left to the right, thus looping the new bar tightly to the warps and heading cord (*fig. 4.6*). After finishing this looping procedure called '*ch'ukura illawa*', all loops were once more pulled as tight as possible, after which the synthetic yarn was tightly fastened to the new bar. Then the original crossbar was pulled out so that now all warps were held by the heading cord tied to this crossbar outside the fabric. This process took 32 minutes. The loom bar on the opposite end was replaced by a similar external bar at this stage, but could also be replaced later, just prior to the completion of the fabric.

In order to maintain an even width throughout the weaving process, an enveloping string (not in drawing) may be used.

Finding the heading cord in archaeological fabrics helps identifying the warp direction of a fabric and thus helps identifying the weaving procedure, especially in fragmentary specimens. The composition and functioning of the Andean loom as described above, especially the back strap loom, is identical to small looms found in Chiribaya tombs (*fig. 4.7*). Often these looms contain unfinished fabrics, allowing precise reconstruction of the prehistoric weaving procedure to take place.

#### 4.7 Weaving procedure

When the loom was made ready for use, the warps were aligned and disentangled by the *wichuña*, a bone pick. The sword beat down the heading cord and in the second and third separation of the warp shed, the spare ends of the three metre long cotton heading cord were pulled through as weft element. The ends of the heading cord were left to hang loose and once the fabric was complete and taken off the loom, the ends were hidden in the space left by the removal of the synthetic *ch'ukura* yarn.

If some warps turned out to be too loose, they were now pulled tighter by undoing the knots in their loose ends. These loose warp ends were pulled through the warp shed and kept in place by the next weft insertions.

The weft is called *minin*. The weft yarn was lengthwise wrapped around a 50 cm long shuttle, wooden stick called *qeshwina* or *mini qaspi*. The weft yarn was wound tightly along the length of the stick, and fixed at each end. In total, some fifty wrappings were made, leaving the stick thickly covered. In Cuyo Cuyo, cotton yarn was traditionally used for the weft element, but at present, synthetic yarn is commonly used. Likewise, synthetic yarn had replaced alpaca and sheep fibre for the warp elements. Once the weft was inserted, a new shed was created by pulling up the warps that were in the lower position in the previous separation of the warps. Therefore, the weaving process can be separated into two repetitive actions (see fig. 4.4):

*First action: the looped warps are down (figure-8 alignment of warps seems invisible) (see fig. 4.4a):*

The warps were separated with the aid of the *wichuña* held in the right hand. Once a handful warps had been gathered around the left hand, these warps were passed on to the sword. When the sword was completely inserted, it was beaten down against the woven part. The *wichuña* pulled the warps over the sword to help beating down the wefts, in order to increase the density of the fabric. Then the sword was placed upright to widen the warp shed and facilitate the insertion of the weft, after which the sword was removed. The average time for this procedure is 119 seconds, rounded as 2 minutes.



Fig. 4.6 Procedure of looping external bar to the warped loom

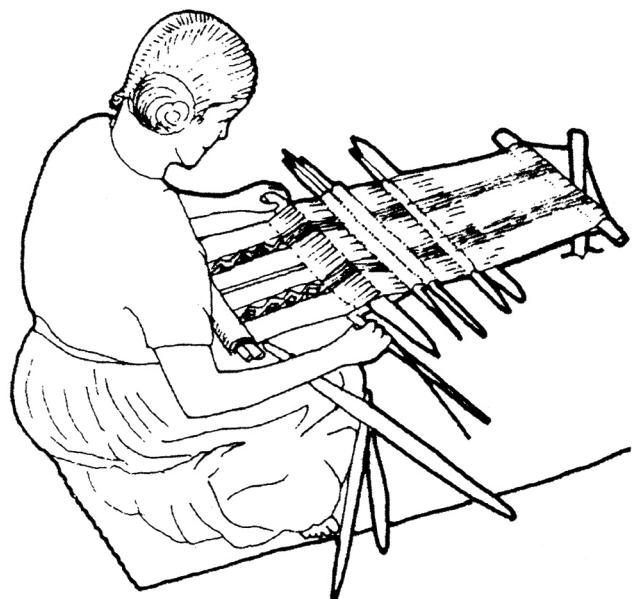


Fig. 4.7 Reconstruction of Chiribaya loom (Umire and Miranda 2001, 52)



Fig. 4.8 Procedure of finishing the weaving with large needle

*Second action: the looped warps are up (figure-8 alignment of warps is visible) (see fig. 4.4b):*

The shed rod placed behind the cross warp was pushed back some 20 cm to create more space for pulling up the looped warps. The heddle with the loops (*soqosa*) was held firmly in the left hand and pulled up vertically towards the weaver. The right hand was clenched into a fist and pushed down the warps behind the *soqosa* to aid the separation of the warps, moving from the right to the left. The looped warps now lie above the fabric (see arrow in fig. 4.4b) and are moved on to the sword. Then the warps behind the *soqosa* were straightened by some bold strokes of the *wichuña* to check if the warp separation was correct, after which the follows: the sword was tightly pulled to the woven fabric while the *wichuña* beat the previous wefts down, and the new weft was inserted in the sword's shed. The average time needed for this action was 185 seconds, rounded as 3 minutes.

The weaver advances from both loom bars towards the middle. To separate the warps in the narrowing terminal area, ever thinner swords were used. When the shed had become too narrow, the central shed rod had to be removed, as well as the heddle rod holding the looped warps. Instead, two thin sticks were inserted at both sides of the warp cross to maintain the separation of the upper and lower warps, allowing a weft insertion on both sides. When the warp shed had become too narrow for even these sticks, the warps were separated by finger or *wichuña* picking, creating space for a thin stick serving as a sword. The final centimetres were woven with a large needle (fig. 4.8). It took eight hours to finish a terminal section of 20 centimetres.

In Cuyo Cuyo, girls learned to weave and to spin by watching their mothers and other women at work. They did not receive official instruction, although their mothers would help out in difficult areas. Most

**Calculation of total length of plied warp**

(warp length) x (average.. warps/cm) x (total width) =.. metres plied warps

**Calculation of total length of plied weft**

(weft width) x (... avrg. wefts/cm) x (total length) =.. metres plied wefts

**Calculation of total length of spun yarn**

total length of plied yarn x 2 (if 2-plied) x 1.1 (compensation) = ... metres spun yarn

Table 4.1 Calculation of total length of plied and spun yarn

of the girls started weaving when their interest was raised, usually in their puberty. Their wish to become good weavers was stimulated by the fact that up to today, good weaving skills enhance the status of a girl and her chances to find a suitable husband. However, one woman from Cuyo Cuyo Pueblo told that she did not start weaving until after her marriage, urged by her husband who told her that '*if you don't learn how to weave, you are like a man, you cannot show your qualities*'.

#### 4.8 Calculation of time and material needed to produce a fabric

During the ethnographic fieldwork, measurements were made of the material and time required for each of the production steps. All adult women from Rotojoni and four women from Cuyo Cuyo Pueblo participated in these experiments for local wages. After obtaining these data in the field, the production rates of the modern poncho were translated in a calculation of the total quantity of material and length of time that would have been needed to produce one ancient camisa from the Osmore valley. These calculations have been made for the four camisas illustrated in Paragraph 10.4.2, and are rendered in detail in Appendix 5.

*Yarn production*

To calculate the total length of plied yarn, the original warp and weft selvages of archaeological fabrics need to be preserved, so that the total length and width of the fabric are known. An additional 6% has to be added to the warp length to compensate for the shortening of the warps due to the weaving procedure.

The total length of plied warp yarn is calculated by multiplying by the average number of (upper and lower) warps inserted in one centimetre in the fabric, followed by multiplying the outcome by the total width of the fabric. To this total warp length, the total weft length needs to be added. Therefore, the average weft width is multiplied by the average number of wefts inserted per centimetre, which finally is multiplied by the total warp length (for camisas, both back and front need to be included).

For a 2-plied yarn, the total length of spun yarn would have been the total length of plied yarn multiplied by two. This outcome needs to be multiplied by 1.1 to compensate for shortening of length of yarn due to the plying twist, as experiments by Franquemont (1986, 309-329) in Chinchero showed (Table 4.1).

*Time calculation*

By recording the yarn production and the various weaving activities within certain time units, a calculation could be made of the total amount of time required to produce a fabric. Each woman was asked to spin and in a later stage to ply during ten minutes twice. The yarn production of both actions was measured and averaged. Then the average time needed to set up a horizontal loom for one warp-faced fabric was measured, plus the time needed to warp the loom for ten centimetres. Followed the time needed for the looping of the warps, and the replacement of both loom bars by external bars. Finally, it was measured how many wefts were inserted in one hour time and how much time was needed to finish weaving the terminal section with a needle.

These observations showed that Rotojoni's women ( $n = 15$ ) on average plied 131 metres per hour and spun

104 metres per hour. The tasks to prepare a loom as described above are summarized in Table 4.2. Ten centimetres of warping was done in 20.6 minutes on average, allowing reconstruction of the warping time needed for a fabric whose complete width is known.

task	minutes
loom preparation	12
10 cm of warping	20.6
insert heddle looping	28
loop outer loom bar	32
<i>Total</i>	92.6

Table 4.2 Minutes needed to prepare the loom

On average, the weavers of Rotojoni ( $n = 8$ ) inserted 22 wefts in one hour time in a warp-faced plain woven fabric. These 22 wefts on average resulted in 4.5 cm of woven cloth. To finish the final section of 20 cm with a long needle, another 8 hours were needed (Table 4.3).

To reconstruct the complete amount of time to produce a fabric such as a camisa, the time needed for the final construction technique would have to be included. However, as various finishing techniques were used which would have required different amounts of time, some of them no longer en vogue, and as this finishing formed no intrinsic part of textile production itself, this time factor was left out of the calculations.

The total sum of invested time can be expressed in percentages (Table 4.4). These percentages show that the spinning of yarn was by far the most time consuming procedure of the textile production: Appendix 5 shows that 53 to 70% of the total time was spent on spinning, versus 12 to 21% that was spent on plying, and 14 to 25% spent on the actual weaving.

#### 4.9 Manufacturing a trapezoidal fabric

In Cuyo Cuyo, the striped ('lista') ponchos are made of two trapezoidal shaped fabrics, with the warps worn vertically. The selvages on the shortest warp side are

#### Hours needed for plying of warp and weft yarn

meters of plied yarn for all warps: (131 plied metres/hour) = ... hours

#### Hours needed for spinning warp and weft yarn

total metres of spun yarn: (104 spun metres/hour) = ... hours

#### Weaving time

(Fabric length – 20 cm) + 8 hours = ... total weaving hours  
4.5 cm/hour

Table 4.3 Calculation of total amount of hours to produce spun and plied yarn and to weave fabric

#### Total preparation of a fabric

... metres of spun yarn	=	... hours	...%
... metres of plied yarn	=	... hours	...%
time loom preparation and warping	=	... hours	...%
total time for weaving camisa	=	... hours	...%
<i>Total time in all</i>	=	... hours	100%

Table 4.4 Total amount of time to prepare a fabric, in hours and percentages

sewn close to form the central seam, with an opening spared for the head. The corners of the longest warp side are doubled and stitched to form rounded corners.

The trapezoidal shaped fabric is created on a horizontal loom. Instead of fixating the cross bars parallel to each other, they are placed diagonally according to the required shape (see fig. 4.5). As a result, the warps have different lengths at both weft selvages. The first wefts on both warp ends are inserted parallel to the loom bar, but soon discontinuous wefts are inserted to even out the longer warp lengths. Eventually, the wefts are inserted perpendicularly to the warp elements.

In the Osmore archaeological collection, two trapezoidal fabrics are found. One specimen is a taparrabo (loin cloth) from La Cruz made of two trapezoidal webs. In contrast to the modern poncho, this taparrabo has its selvages with longest warp elements sewn together, resulting in hexagonally shaped cloth. The other specimen is the camisa Boca del Río, likewise made of two trapezoidal shaped fabrics. The selvages with longest warp elements have been sewn together as well, forming the horizontal shoulder line. In both specimens, the warps are in horizontal position when worn.

#### *Single-web camisa in warp-faced structures*

A Chiribaya-style camisa is typically made of one web in trapezoidal shape, with the shoulder area as the widest dimension. This implies that the fabric was woven on the loom in hexagonal form. According to Rosa Choque (pers. comm. 2002), an Aymara-speaking weaver from Carumas in the Moquegua Department, the most plausible method of manufacturing such shape in warp-faced plain weave structure, is by inserting supplementary discontinuous warps during the initial warping of the complete camisa, rather than halfway the weaving procedure itself. Though adding the discontinuous warps in a later stage is possible, Choque found that inserting them during the initial warping proved to be an easier and faster procedure, as all discontinuous warps need to be added to the heddle rod, between the looped continuous warps, in order to separate them from the lower warps.

Two loom bars (1st and 4th) are fixated in the ground at a distance of the maximum required length of the cloth.

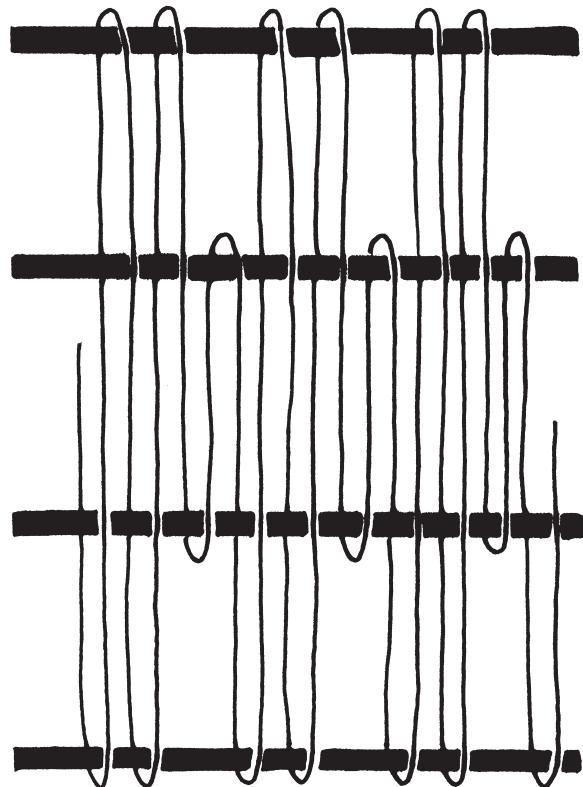


Fig. 4.9 Schematic drawing of warping supplementary discontinuous warps (to create trapezoidal shape in single web fabric)

Two extra loom bars (2nd and 3rd) for the discontinuous warps are placed parallel in the middle. The warping starts normal, passing the continuous warp in a figure-8 movement around the outer two bars. At a regular interval then, depending on how much the centre of the fabric needs to be widened, discontinuous warps are added. Now the warp is returned over the furthest extra bar in the middle (3rd), moving back in a figure-8 movement to the nearest extra bar (2nd), and once passed around this bar it continues on to the furthest bar (4th) (fig. 4.9). Though the warp is discontinuous in the sense that it does not reach from the nearest to the furthest outer loom bar, it is not cut. In both warping procedures, whether normal or while adding the supplementary discontinuous warps, the figure-8 crossing of the warps occurs in the middle section between the 2nd and 3rd bars.

The weaving of a trapezoidal shaped textile is started in the middle section weaving through all continuous

and discontinuous warps. The weaving procedure is comparable to a regular warp-faced plain weave: all upper warps are looped and held by a heddle rod, followed by replacing the extra loom bar closest to the weaver by an external loom bar, lashed to the warps and the inserted heading cord by means of a spiralling cord as described above. The heading cord forms the first weft, around which the discontinuous warps turn, known 'scaffold weft'. Since it are the continuous warps that endure the main tension of weaving, the scaffold first weft does not need to be extra thick. The weaving then starts from this heading cord, working towards the other end of the central section.

As the outer parts of the loom with only continuous warps may be quite long, the weaver needs to roll this section up in order to be able to work on the central section. The outer warp section is rolled up around the closest outer bar (1st) with the aid of an extra rod to maintain the warp tension. Then both bars with the warps wrapped around them are tied to the 2nd loom bar where the weaving starts. Now the loom is ready for use and, if required, the horizontal loom can be turned into a back strap loom, using the furthest pairs of stakes and the weight of the weaver to create tension.

The textile is now woven as normal: the whole middle section has to be woven and finished with a needle as if it were an independent fabric, before moving on to the two extensions without the discontinuous warps. In these two outer parts, a new figure-8 warp cross has to be created. This is easily done by pulling up and looping the lower warps in a new heddle system, after which a shed rod can be inserted. Then these extensions are ready to be woven as if it were an independent fabric, just like the central part.

The transition between the widened middle section and the narrower ends can be made fluent by adjusting the length of the wefts through the shed: the wefts will be pulled least hard in the centre of the middle part, and ever tighter towards the scaffold weft, and then ever tighter in the outer sections without discontinuous warps, thus creating the trapezoidal shape. Then the addition of discontinuous warps is only visible in the warp density: where the discontinuous warps end, the warps are less densely packed.

#### 4.10 Function of traditional weavings

Despite the world's industrialization and globalisation, the indigenous population of Cuyo Cuyo, like many other parts in the Americas, still wear their traditional clothes. Nonetheless, the native clothing style has changed dramatically since the Spanish conquered the Inca empire.

First changes occurred shortly after the conquest in 1532, when the native dress was chastened to agree with catholic morals. For instance, the lateral split of the female dress had to be closed and underwear had to be worn underneath short tunics. Throughout the colonial era, the common people continued to wear their own homemade clothing, while the elite combined fine woven *cumbi* cloth with Spanish style clothes.

Drastic changes, however, occurred after the rebellion of Tupac Amaru II in 1780-1781, who strived for reinstallation of the Inca empire. Once defeated, all expressions of indigenous identity were forbidden, certainly including the native clothing. Women were forced to wear a pleated skirt with blouse and their hair in two braids, while the men were forbidden to wear their tunic, and instead had to wear long trousers with a jacket, according to the dress code of Spanish farmers of that time. Soon, however, the men added a poncho to this attire, which had been made popular by horsemen, but closely resembled the tunic. Conservative as the Andean dress code is, this attire has been preserved up to present (Adelson and Tracht 1983, 15-39). However, recent textile studies make clear that the Andean clothing tradition in fact is very susceptible to innovation. Or, '*weavers reproduce structures of their culture, not their history*' (Franquemont *et al.* 1992, 50). As a result, modern materials such as synthetic yarn, factory-made fabrics, sewing machines, treadle looms, and metal or plastic beads have found their way into the indigenous clothing production. These innovations always take place gradually, as they need to be accepted by all members as suitable for expression of their ethnic identity, so that drastic changes only become visible by comparing a community's attire made several decades apart. The care people take in their ethnic clothing style becomes clear when one realizes that the garments for special occasions are often worth many months' wages. Usually these garments are combined with more conservative weavings, such as hand-woven mantas, fajas, or

ch'uspas, which have hardly changed their form, structure, or design since pre-Columbian times (see Chapter 1).

On other occasions, ceremonial weavings may be brought out that are truly ancient. Such antique weavings may be used in domestic rituals such as the first cutting of a child's hair, or in fertility rituals such as the earmarking of the animals or the arrival of the sowing or harvesting season. These weavings may be centuries old and are preserved in the family as heirlooms, or they may belong to a certain political or religious cargo and be passed on to each successor. In the southern Andean region, these weavings are kept in a bundle called *q'epi* or *señal q'epi*. Usually they contain mantas, pañuelos, and ch'uspas that are used as *mesa*, that is, the 'table' on which ceremonial items will be displayed.<sup>[5]</sup> The bundles also may include ceremonial outfits (*puruwana*) such as camisas and ponchos, and costales, talegas and ropes.

#### NOTES

1. In Cuyo Cuyo, the sheering of sheep, alpacas and llamas takes place just prior to three main occasions when the cash obtained by selling the fleece is needed most: Todos Santos (November 1st and 2nd); Imaculada Concepción (December 8th); and Carnaval (February).

2. Since the shed rod and heddle rod are applied to the warp after it is wound on the loom bars, the warps do not need to be cut as they are in European style treadle looms in which the warp ends are passed through a fixed apparatus (Rowe 1977, 14).

3. Today, as maybe in the past, the horizontal loom is more common in the highlands of southern Peru and northern Bolivia, whereas the back strap tension is common in Peru and Ecuador, also for larger fabrics. Small sized weavings (faja and bolsa) are produced on back strap looms throughout South and Middle America (Rowe 1977, 14).

4. Comparable measuring devise was used by the Incas, referring to the distance from the tip of the outstretched thumb to the little finger, about 20 to 22.5 cm (Cobo 1990 [1653] Lib. 14, cap. 2, 186).

5. A mesa formed by one pañuelo was laid out in the ritual in Rotojoni at the advent of the weaving project described above. At night time, the pañuelo was placed on a small table, and

folded double with coca leaves inside. Next to this bundle, two spindles were placed referring to the weaving project. Everybody present in the room picked out three intact coca leaves (*k'antu*) that were placed underneath one of the pañuelo's doubled corners and were dedicated to Pachamama. Another *k'antu* was placed under the other corner for Cuyo Cuyo's three Apus (Ch'unchu, Choquechambi and Apuri). Everyone sprinkled alcohol from a cup over the inkuña and the pushkas and more drops were sprinkled at both door posts of the room where most spinning and weaving activities would take place. The remainder of the alcohol plus Pachamama's coca leaves were burned in ashes of the cooking fire in the kitchen. Then the coca leaves for the Apus were torn up in tiny pieces and thrown into a cup with alcohol and thrown outside into the direction of Ch'unchu, the main Apu, which was also the direction of the rising sun. The rest of the evening, all participants chewed coca leaves, and drank and sprinkled a little alcohol, and smoked cigarettes for the Apus, while chatting about the project.