

TEXTILES FROM THE LOWER OSMORE VALLEY, SOUTHERN PERU: A CULTURAL INTERPRETATION

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Introduction

During the terminal stages of the Tiwanaku state, the peripheral regions were the first to feel the impact of the state's collapse. The middle Osmore Valley, around the modern city of Moquegua in Southern Peru, was one of these places (Figure 1). The site of Omo, which had served as the Tiwanaku center in the middle valley for several centuries, was abandoned during the tenth century A.D. at the beginning of the Tumulaca phase (Bermann *et al.* 1989:282; Goldstein 1989). Around this time, some of the local population moved into the coastal segment of the Osmore Valley, which had not previously been inhabited by Tiwanaku-related people (Owen 1991a:1).

These new, complex societies in the coastal Osmore Valley were based on irrigation agriculture and constructed a long canal to increase agricultural production. They were also camelid herders (Owen 1991b). Perhaps the most striking aspect of this intrusive society is that it was clearly divided into two distinct, contemporaneous groups, archaeologically identified as the Ilo-Tumulaca/Cabuza culture and the Chiribaya culture.¹ Both cultures left extensive archaeological remains, including habitation sites, cemeteries, canals, and field systems, which can often be unambiguously assigned to one culture or the other. This dual occupation of the coastal Osmore Valley lasted from around A.D. 950 to A.D. 1250, while the Chiribaya culture persisted to perhaps as late as A.D. 1375 (Owen 1992).

The lower Osmore Valley has been the focus of various projects. Some are completed, while others are still not published. This research analyzes the textiles from one

such project, the Proyecto Colonias Costeras de Tiwanaku (PCCT) (Owen 1991a, 1991b, 1993). Specifically, it analyzes the textiles from burials at the site of El Algodonal, which is located in the lower third of the coastal valley (Figure 1) and was excavated by PCCT in 1989-1990. The focus of the research is to compare the textiles from Ilo-Tumulaca/Cabuza burials and Chiribaya burials, which can be clearly distinguished by the distinct style of ceramic vessels associated with each. Additional specimens from the sites of Chiribaya Alta and Yaral (Figure 1) were examined in order to increase the size of the Chiribaya sample and to evaluate the site level variability in Chiribaya material. The samples from these two sites were selected randomly from burials with associated ceramics in the Algorobal phase (early Chiribaya) style (Jessup 1991). Only a small fraction of the textiles from these sites were analyzed, however, and future analyses of the complete textile collections from these sites will certainly increase our understanding of the coastal valley peoples and cultures.

The initial problem that this research addresses is the definition of the Ilo-Tumulaca/Cabuza and Chiribaya textile styles. Though the two cultures are clearly differentiated by their ceramics (Jessup 1991; Owen 1991a; Goldstein 1989), this is the first attempt to correlate these ceramic differences with the textile products of these two cultures. However, the scope of this research is broader.

Based on the definition of each culture's textile repertoire, the textiles of each group are analyzed independently to address specific problems. The first is the problem of the origins of the two cultures. The second problem is to assess the relationships of both cultures with the Tiwanaku culture in terms of the processes that occurred during the collapse of the Tiwanaku state, and the overall influence of

¹ For extensive discussion of the differences between the two cultures see Owen (1993).

this collapse on the remote middle and coastal valley. Third, the social and political structure both between and within the two coastal valley cultures will be addressed. Differences of quality, decoration, and motifs in textiles were recorded for each culture, and were analyzed in order to suggest individual status differences, as well as cultural identities. Finally, the apparent lack of gender differences in the textile record of both cultures will be discussed.

The majority of the textiles analyzed, 395 fragments, came from the site of El Algodonal (Tables 1 and 2). All of the textiles recovered from the cemetery of El Algodonal are considered to be Ilo-Tumilaca/Cabuza textiles. Every diagnostic ceramic vessel and sherd from this cemetery pertains to the Ilo-Tumilaca/Cabuza tradition; not one single Chiribaya sherd was found there (Owen 1991b). The cultural affiliation of this material is quite secure. Textiles from burials in the El Algodonal habitation area were assigned to one or the other culture according to intact ceramic vessels found *in situ* in the same burials.

Many of the textiles came from mummy bundles excavated from intact burials. A large number of textiles from El Algodonal, however, were isolated pieces in various conditions of preservation collected from disturbed burials or severely looted surface areas at this site. The intact mummy bundles were unwrapped by Juana Lazo (Universidad Católica "Santa María", Arequipa), Niki Clark (University of Chicago), and their associates prior to this project. The present research deals only with the textiles themselves, not the ways in which they were used to prepare mummy bundles.²

Other textiles came from the site of Chiribaya Alta (54 pieces) and Yarál (12 pieces) (Tables 1 and 2). The cultural affiliations of these textiles were based on the intact ceramic vessels found in the same burials as the textiles. All of these ceramics were examined

and identified by Owen and myself, using Jesup's (1991) seriation of Chiribaya ceramics.

Methodology

Each piece of textile was laid flat on a plastic supporting screen and mechanically cleaned with a soft brush. Each was photographed and then recorded on forms adopted from an earlier version that was used by Niki Clark for her research on the textiles from the middle Osmore site of Estuquiña (Clark 1988). Many pieces were illustrated with colored drawings. These drawings are not to scale, but a scale was included in the photos. Data recording emphasized types of patterns and decorations, using both drawings and written descriptions. Measurements of width and length of the complete article were taken when present or reconstructible, as were yarn thickness and color, spin and ply directions (where evident), yarn count, weaving and decorative techniques, and character of decoration and form (tunic or shirt, bag, etc.). After being recorded, each textile was wrapped in acid free paper and stored in a box containing all the textiles from the same provenience. To reduce curatorial problems, some extra large textiles were stored separately in a special large box.

The data were coded and entered into dBase III+ directly from the original recording forms, and data on the age and sex of associated human remains were added. Ages and sexes were provided by Shelly Burgess (also see Burgess n.d.). The computer database includes variables selected for their relevance to specific research questions. These variables and research questions include:

1. Presence or absence of mending was recorded as one possible measure of raw material availability, and as a possible indicator of economic and social status differences within and between different sites and cultures.
2. Textile area and density were measured as possible indicators of status, assuming that larger as well as denser pieces of cloth may indicate higher status (Roach and Eicher 1965; Murra 1989; Weiner and Schneider 1989).

² Research addressing the issue of mummy bundle construction will be carried out by Clark and Lazo.

One density measure used is "crossing count", calculated as the number of warp/weft crossings per square centimeter. In practice this figure is the product of warps per centimeter times wefts per centimeter. Taken together, crossing and yarn thickness give a general measure of the density of the cloth. In the majority of cases, the measurement of the total original area was impossible to achieve because not enough of the textile was preserved to allow the extrapolation of the original size of the item.

3. Direction of spinning and plying (where evident) was recorded in order to detect possible cultural differences. It quickly became clear that no spinning differences between the two cultures could be observed.

4. Type of weaving technique was recorded for the main weaving surface (as distinguished from weaving used for finishing or decoration). In rare cases where a variety of weaving techniques were used on one single textile, each individual technique was recorded. These data were collected in order to indicate possible cultural differences.

5. Finishing techniques were recorded by types and the specific location on the piece. Finishing techniques included technical and decorative aspects of salvages and seams. Locations on the piece included seams on the sides of tunics and bags, bottom edges of tunics and top edges of bags, edges of necks and arm openings, and other edges of other types of textiles such as *pañuelos* (handkerchiefs), *mantas* (blankets), etc. These variables were examined not only for cultural differences, but also for differences by sex, age, and site (Tables 7, 8, 9, and 10) within and between each culture.

6. Wherever decoration was present, its appearance was recorded. The techniques used, the location on the piece, and the design pattern were all noted. A series of 17 categories (Tables 12 and 13) was developed to code these data, and certain categories were further analyzed as described below.

7. For decorations that contained geometric or naturalistic motifs, as opposed to simple color stripes, individual types of designs and motifs were defined and recorded (Tables 12 and 13).

8. This category was primarily used for the Ilo-Tumilaca/Cabuza textiles, because the Chiribaya textiles from El Algodonal were usually decorated only with color stripes. In the Chiribaya sample from Chiribaya Alta, on the other hand, many of the motifs were much more elaborate. Because the sample was small, no typology was established for these motifs, which were coded simply as "elaborated forms".

A Comparison between Ilo-Tumilaca/Cabuza and Chiribaya Textiles

The initial research problem was to identify differences between the Ilo-Tumilaca/Cabuza and Chiribaya textiles. This analysis emphasizes variables that might have been intended to indicate cultural differences, that is, traits that are easily visible on the textiles' surface. Shape, main weaving technique, finishing, and decoration are the primary variables considered. These components are the visible parts that are the end results of the intention and labor invested in the creation of each textile by the weavers of each specific culture.

Most of the analysis focuses on tunics and bags because other forms are represented by very few examples. Tunics were the most prevalent type of textile among those that were identifiable (Figures 2, 5, 6, and 12; Table 1). The shape of tunics is consistent among the Ilo-Tumilaca/Cabuza and Chiribaya tunics from El Algodonal, Yará, and Chiribaya Alta. The tunics are all sleeveless, with a slit neck, and range from square to trapezoidal in comparable frequencies in both cultures (Figures 2 and 3). Tunic size varies from 54 by 57 cm to as large as 120 by 107 cm. No specific tunic size could be associated with each culture. All but one tunic were single web products, folded and sewn along the warps, leaving holes for the arms. A neck slit was left unwoven and when the structure of the tunic was trapezoidal, warps were added in

the shoulder area. Warps run length-wise on all tunics investigated.

Bags were the second most abundant type of textiles identified (Figures 3 and 9, Table 1). Many individuals had a bag full of coca leaves buried with them (Owen 1991b), and some had two such bags. Bags were rectangular or trapezoidal in shape and had similar average sizes in both cultures. The same weaving technique utilized for tunics was used in bags. The pouch portions of bags are single web products; warps run vertically and are sewn on the sides leaving one end open as the mouth of the bag. When bags are trapezoidal, warps have been added to the lower section, making the bottom wider than the top (Figure 9).

No cultural or gender differences in bag size or shape could be observed in the sample. It seems that the shape and size of bags were individual choices. Unfortunately, due to logistical problems, bag samples were available only from Algodonal and Chiribaya Alta. There is, however, no reason to believe that the bags from Yaral would differ significantly.

The most common technique used for the main weaving of the textiles is a plain weave 1/1 warp-faced technique (Table 6). In this technique, the warp yarns of the textile are the ones that are seen on the surface (VanStan 1958a; D'Harcourt 1962; Albers 1963; Collingwood 1987). The warp-face technique predominates in both the Ilo-Tumilaca/Cabuza and the Chiribaya textiles.

Some of the textiles were woven with a combination of weaving techniques including the warp-faced and simple plain weave techniques, among others. These textiles have low crossing counts (13-15 crossings per square centimeter, c.p.s.c.) and show a disorganized mixture of weaving techniques. These textiles apparently represent pieces made for purposes that did not require standard quality cloth, or by people who did not have access to material and/or labor resources available to other members of their society.

Only seven of the textiles were woven completely in techniques other than warp face. These pieces are too few to indicate any intra-valley cultural patterns, and they might equally represent exotic objects or unique individual preferences.

Based on both yarn diameter and crossing count (density), bags are generally woven finer than tunics, a characteristic found in both cultures. Ilo-Tumilaca/Cabuza bags have wefts 0.8-1.0 mm in diameter, and warps from 0.6 to 1.0 mm in diameter, while Chiribaya bags have wefts between 0.8 and 2.0 mm in diameter, and warps 1.0 mm in diameter (only two Chiribaya bags were analyzed from El Algodonal).

Ilo-Tumilaca/Cabuza tunics at El Algodonal have about the same weft thickness as bags (0.96-1 mm.), but have 20% smaller warps (0.66-0.74 mm.), with an accompanying reduction in yarn crossing (108-156 c.p.s.c. in bags, 91-101 c.p.s.c. in tunics) (Tables 3-4). The same phenomenon is evident among Chiribaya tunics from El Algodonal. Although only a small sample is available, there is little significant difference between the two cultures (Tables 3-4).

Finishing techniques were sometimes used for decorative purposes in both the Ilo-Tumilaca/Cabuza and Chiribaya traditions. Many tunics have elaborated finishing at the neck and the arm hole. These places were evidently the most stressed parts of the garment and tended to be the first to break down. For this reason, tunics were often reinforced at these points, and often this reinforcement also served as decoration. Even in many simple tunics, some extra weaving or embroidery was done at these points in more sophisticated ways than the main weaving itself. Less fragile parts of the tunic, however, such as the bottom or the sides, were decorated only if other parts of the tunics were decorated. Finishing was used occasionally for decoration at the sides of the tunics. In tunics of this type, the side seam is sewn together below the arm hole with one or more colored yarns, and often with unusually fine yarns. The bottom edges of tunics vary little and were generally only

reinforced for functional reasons. However, in a few cases the bottom edges of tunics were not only reinforced but were also embroidered to further increase this part's durability. The sides and the top part of bags were almost always done with decorated finishing, which formed an integral component of the overall decoration of these objects (for range of finishing techniques and frequency of use see Tables 7-10).

Cultural differences in finishing types are not clear. Ilo-Tumilaca/Cabuza and Chiribaya people from the different sites used all the various finishing techniques, and weavers of each culture applied each technique to some location on their textiles (Tables 7-10). There were preferences for using specific techniques on specific locations on textiles in each culture at each site (Tables 7-10). I attribute these differences, however, to the small sample of Chiribaya textiles from El Algodonal, and the even smaller sample of Ilo-Tumilaca/Cabuza textiles at Chiribaya Alta and Yaral (Tables 1 and 2). A clearer idea of patterns in decorative finishing techniques will be available only when the full analysis of the Chiribaya Alta, Chiribaya Baja, and Yaral textiles is completed. The important point is that no specific finishing type or technique can be exclusively identified with one or the other culture.

Cultural differences in the textiles are evident only in the most obvious and intentional of their features: their decoration. It is difficult to identify differences in any of the other categories examined. However, cultural distinctions are very clear in the types, locations, and techniques of decoration on the textiles.

Ilo-Tumilaca/Cabuza tunics are typically decorated with an embroidery technique that creates geometric designs in two different locations on the tunic. The most visible and common is a narrow horizontal stripe directly under the neck (Figure 4, Table 11). This stripe is composed of five to seven adjacent loop-stitch embroidered lines usually no more than 10 centimeters long. The yarns compos-

ing each line vary in color³ to create geometric designs. The most dominant color is red, a color that during the Late Horizon was commonly used among the Inca to indicate high status (VanStan 1958b:53-54; Murra 1962:719; Uhle 1903). The lines also contain blue, green, and yellow. The geometric designs are always presented in a "double feature" format, with each side decorated with modified "M" motifs, solid triangles, elaborated S shapes, or combinations of these (Figure 4). Usually this "double feature" format was laid out in an almost, but not quite, symmetrical pattern. Minor but discernable differences make each side distinct from the other, creating a "pseudo-symmetrical" design. The designs consist of both vertical reflection and 180° rotation or *pm11* and *p112* respectively according to Ascher (1991:160). Adding the color scheme, a design both vertically reflects itself in different colors, or *pm'11*, of the main body, and also has vertical rotation, or *p'112* of the added triangles (*ibid.*:164-165).

The other major location for decoration on Ilo-Tumilaca/Cabuza tunics was done on the sides, starting under the arm hole and ending at the bottom, covering the seam that joins the front and back panels of the tunic. This stripe usually comprises 5 to 11 loop-stitch embroidered lines done in the same range of colors as the ones used for the under-the-neck stripe. These side stripes are typically 20 to 100 centimeters long, depending on the length of the tunic. The geometric designs include ones similar to those used under the neck, plus additional motifs found only on side stripes (Figure 11). In this case, because the stripe is much longer, the design pattern is allowed to repeat. Unlike the two sides of the neck stripe, the side stripes on a given tunic appear to be identical to each other, or vertical reflection *pm11* (Ascher 1991:160). This may be because the stripes are long, narrow, and placed widely apart from each other, so that even if they were different, the observer might not notice the asymmetry. All the tunics that

³ For analysis of dyestuff from this textile collection, see Boytner and Wallert 1993; Wallert and Boytner 1996.

have side decorations also have neck stripes, but some tunics have neck stripes only.

Another way that the Ilo-Tumilaca/Cabuza people decorated their tunics was to place series of divided stripes along the two vertical exterior sides of the tunic (Figure 5). Each of these divided stripes is comprised of a wide stripe with a narrow line of a contrasting color running down the center. A wide series of these divided stripes, in different color combinations, is placed on the two sides of the tunic. This decoration usually occupies about 2/7 of each side of the tunic, leaving the center area plain. The stripes are not done in the embroidery technique, but rather by weaving dyed warp yarns to create the lines as part of the primary structure of the fabric. At El Algodonal, this kind of decoration was found only in Ilo-Tumilaca/Cabuza contexts. However, this decoration was also found in Chiribaya contexts at Chiribaya Alta and I suspect that it was associated with high status and prestige privileges.

Chiribaya tunics were decorated differently from Ilo-Tumilaca/Cabuza ones. Based on associated ceramics, four Chiribaya tunics were recovered for El Algodonal (Table 1). One of these tunics is undecorated and plain. The other three, however, are decorated in a distinct and similar style, unlike the one seen on the Ilo-Tumilaca/Cabuza textiles. The limited number of tunics from Chiribaya Alta investigated here (20 tunics) are similar to the Chiribaya tunics found at El Algodonal, which suggests that the El Algodonal sample is a reasonable representation of Chiribaya material.

The only decorative technique commonly used on Chiribaya tunics at El Algodonal was done with colored warp yarns that form stripes in the primary structure of the cloth. This decoration results in long colored stripes on the sides of the tunic, starting at the shoulder and ending at the bottom edge. On each side of the tunic, there is a narrow line in one color, usually 1-2 centimeters wide, and a wide line of a different color, usually 3-7 centimeters in width (Figure 6). On a few tunics, this pair of stripes is delimited on each side by a narrow

line (2-4 millimeters) composed of two to three colored warp yarns. The symmetry of the design is completely different from those on the Ilo-Tumilaca/Chiribaya. It is done in glide reflect, or *plal* (Ascher 1991:1960), which presents a completely different concept of spatial organization of the design.

Bags were more elaborately decorated than tunics. Unlike the tunics, there is little variation in bag colors; they are either brown or red. Brown bags were always made of what seems to be natural brown wool with a few narrow vertical colored bands. Red bags are usually red overall with the same type of vertical colored bands.

Typically, each bag is decorated with three vertical, wide bands containing various designs (Figure 9). The designs are done with supplementary warps in red, blue, green, white, brown, and yellow. The motifs used on the stripes are geometric and repeat along the vertical axis (Figure 8). The stripes are symmetrical and each stripe is similar in its decoration to the others. Also, the back and front of the bag are identical (although differences in the front and back decoration of bags have been noted in many bags scattered on the looted surface of Chiribaya Alta).

The differences between Ilo-Tumilaca/Cabuza and Chiribaya bags at El Algodonal are slight. All bags from Ilo-Tumilaca/Cabuza contexts have linear patterning (Figure 8 left), and only one bag from a Chiribaya context had different, triangular patterning (Figure 8 right). Both cultures used the same supplementary warp technique to create the band motifs. Because only one example of the triangular pattern was found, it is unclear if it reflects a real cultural difference. Many such bags can be seen on the looted surface of Chiribaya Alta; only future research will be able to assess these differences.

The differences in decoration on Ilo-Tumilaca/Cabuza and Chiribaya tunics might be attributed to one of two possibilities. The first possibility is that there was a chronological difference between the two cultures. In that case, the distinct decorations would be

because the two cultures never met. However, recent radiocarbon dates from sites in the valley indicate a substantial length of time during which Ilo-Tumilaca/Cabuza and Chiribaya people coexisted in the valley (Owen 1992). Moreover, Ilo-Tumilaca/Cabuza and Chiribaya burials were found in the same habitation area at El Algodonal (Owen 1991b), in the same cemeteries in Yaral with no stratigraphic differences between them (Lozada 1991; Lozada *et al.* 1991), and probably also in the same cemeteries in Chiribaya Alta, although these data are still preliminary. Also, there are 5 textile pieces from Chiribaya Alta, 3 from looted surface contexts and 2 from tomb excavations, all of which have Ilo-Tumilaca/Cabuza and Chiribaya style decorations on the same piece. This mixing of decorative techniques might be expected among contemporary cultures. The technical similarity in textiles, including weaving technique, yarn thickness, yarn density, spin, and size and shape of tunics, bags, and other forms also suggests that the two cultures coexisted, at least for a limited time, in the lower valley.

Another possible explanation for the differences in the tunics of the two cultures is that they were used to mark ethnic differences. As the largest single piece of cloth worn by these people, and possibly the one mostly commonly worn, tunics were well suited to use as cultural identity markers. Ethnohistoric material suggests that clothes were important tools for marking cultural identity, status, and roles in Andean societies. Textiles were so important that a naked enemy was considered to be powerless and not a threat (Murra 1962; Murra 1989:280; Clark 1988:1). Moreover, "no political, military, social, or religious event was completed without textile volunteered or bestowed, burned, exchanged, or sacrificed" (Murra 1989:293).

Although the Ilo-Tumilaca/Cabuza and Chiribaya tunics share many similar traits, it is easy to distinguish between them because the differences are found in obvious, visible traits that were easily manipulated to serve explicit message functions. Wobst (1977:333) suggested the importance of size and location of symbols used to transmit cultural messages.

The large size of the Chiribaya stripe motifs and the location of the Ilo-Tumilaca/Cabuza neck stripe on the high central part of the tunic makes them both easy for an observer to distinguish, and fit well with Wobst's observations concerning stylistic elements that are used to communicate ethnic affiliations. These two cultures must have interacted continually, and because no evidence of warfare was found in the valley, they evidently interacted in a peaceful manner (Owen 1992). Nevertheless, the two groups probably competed for control over resources, mainly water, which were severely limited in the narrow valley.

Hodder (1979:450) suggests that in times of economic stress, cultural differences between groups are often highlighted. These differences are manifested as a stronger emphasis on characteristic material culture symbols, making the boundaries between cultures particularly distinctive. At the same time, one possible response to difficult times is to increase cooperation between the groups in order to enhance the total efficiency of resource use from a given area. While the level of cooperation is increasing, each participant will expand his or her presentation of, and emphasis on, symbols of cultural identity. He or she will try to exaggerate these symbols in order to make them as distinct as possible from those of the other culture.

The situation in the Osmore Valley seems to have worked in a similar way. The two cultures coexisted in the narrow valley, where resources were limited and the environment was not similar to the areas from which they had come (probably the middle Osmore Valley). Coping with limited means for survival, cooperation formed between the two cultures, probably with each developing its own technical or economical specialization. Parallel to, and because of, this situation, distinct cultural identities were highly emphasized, and so the use of individual cultural markers was important.

The size of the designs that comprise the textile differentiation, especially the Ilo-Tumilaca/Cabuza markers, suggests another

important aspect of the two cultures' interaction. An observer could identify the cultural affiliation of an individual only from a distance of a few meters or less. The implication is that in general there was no need for early reconnaissance when individuals from the two cultures approached one another. Individuals could approach one another without threatening or being threatened. Wobst (1977:322) has suggested that ethnic markers visible only at such short range imply interaction, rather than aggressive conflict, between the groups. In this sense, the textile data support the conclusion that the relationship between the Ilo-Tumilaca/Cabuza and Chiribaya cultures in the valley was one of cooperation and peaceful coexistence.

Evidence for Highland Origins

Andean textiles typically embody great ideological power, and in order to preserve this power, textile manufacturing methods and decoration designs tend to be conservative (Conklin 1983:20; Frame 1986:52; Murra 1962:713,721). Hence, textiles can be efficient tools to assist in determining geographical origins. Comparing textiles of suspected immigrants with textiles from areas where they are thought to have resided for long periods of time may indicate cultural relationships or place of origins.

As the Ilo-Tumilaca/Cabuza and Chiribaya people were cooperating in the valley, the need for clear and immediate distinction was evident. Tunic decorations were highly emphasized as the primary medium for exhibiting cultural identity. Once the goal of distinctiveness was achieved, further distinctions were unnecessary, and the other textile traits remained the same. Clear status differences within each culture probably existed, but cannot be observed in the investigation of the textiles from El Algodonal. The brief analysis of the textiles from Chiribaya Alta clearly indicates intra-cultural social differences (see below), but only a complete analysis of this site's textile assemblage will identify the textiles characteristic of each social class. Bag decoration techniques and forms, main weaving techniques, and other textile characteristics

were the same in both cultures, which may indicate that they have a common origin.

Camelids and camelid wool were clearly of great importance to both the Ilo-Tumilaca/Cabuza and Chiribaya people of the coastal Osmore Valley. Masses of raw camelid wool were found in some burials, sometimes on the bottom surface of the tomb, and sometimes inside the mummy bundle. Many of the burials contained camelid bones, most often the cranium, mandible, and/or the foot bones (Owen 1991b; Lozada 1991; Lozada *et al.* 1991). Although all the textiles examined from burial contexts were made of wool, excavations in the habitation areas of El Algodonal and other coastal Osmore sites frequently encountered bolls, seeds, yarns, and textile fragments made of cotton in midden contexts, so cotton was clearly available and used by the people of El Algodonal (Owen 1992: personal communication). Their exclusive use of wool textiles in burial contexts is unusual among Andean coastal cultures, where cotton yarns were often incorporated with wool yarns for ceremonial, as well as utilitarian textiles (Murra 1989:153; Rowe 1986:153). The fact that the vast majority of yarns used were single yarns S-spun is difficult to explain. S-spun yarns typical of the North Coast tradition are usually cotton warps (Rowe 1984:89). Moreover, this type of yarn construction is different from Tiwanaku textiles and other Late Intermediate textiles found in the region, which are typically Z-spun 2S-plied (Conklin 1983; Lothrop and Mahler 1957; Oakland 1986). Is it possible that the Ilo-Tumilaca/Cabuza and Chiribaya cultures both adopted North Coast yarn preparation technology? The answer for this question is still far from clear and this investigation suggests no explanation for the phenomenon.

This unusual emphasis on wool, and the similarities between the textiles of the two cultures, suggest that both Ilo-Tumilaca/Cabuza and the Chiribaya traditions derived not from the coast, but rather from the highlands, where camelids traditionally played a more central role in the economy and ideology. The similarities in textiles suggest a close relationship between the two cultures,

perhaps even a common origin. It is clear, however, that at the time when the two cultures are first archaeologically recognizable in the valley they were already distinct from each other. Based on the textiles alone, it is impossible to select a precise point of origin in the highlands, but the textiles are certainly consistent with other archaeological data that suggest that at least the Ilo-Tumilaca/Cabuza culture derives directly from the terminal Tiwanaku tradition of the middle Osmore, near Moquegua.

Ilo-Tumilaca/Cabuza, Chiribaya, and the Tiwanaku State Ideology

Our understanding of the nature of relationships between the Chiribaya and Tiwanaku cultures is still vague. A distinctive tunic that casts some light on the ideological relationships of the Ilo-Tumilaca/Cabuza people and the Tiwanaku state was recovered from a looted burial at El Algodonal. This tunic is unique in its decoration, and is the only piece examined that has depictions of an anthropomorphic figure. The figure is done with supplementary warps on stripes vertically decorating the plain weave, 1/1, warp-faced tunic. The image of the figure alternates with an image of a square within a square done in the same technique. Between two figure/square stripes, there is another color stripe similar to the one used for decorated bags done with supplementary warps without any apparent design (Figure 13). This figure is different from any other Ilo-Tumilaca/Cabuza or Chiribaya motif encountered. Although this figure lacks the usual staves and the lines radiating from its head, its face is depicted in a frontal view and not in profile. Its general appearance and temporal context suggest that it represents a simplification of a Tiwanaku deity figure found on earlier Tiwanaku textiles from the region (see Conklin 1983, especially T7 on p.15).

The weaving technique used to depict the deity on this tunic is similar to the supplementary yarn technique used in decorated bands of Ilo-Tumilaca/Cabuza and Chiribaya bags. In addition, parallel to the stripes bearing the depiction of this deity are other stripes

with decorated bands identical both in technique and color to those used on bags. This tunic, together with the general similarities in ceramic motifs, suggests that the people of the coastal Osmore Valley knew the Tiwanaku ideology and were familiar with the former Tiwanaku center in the middle Osmore valley at the site of Omo. Although the presence of the Tiwanaku culture in the middle valley is clear (Goldstein 1989), the relationship between the ideology of Tiwanaku and those of the Ilo-Tumilaca/Cabuza and Chiribaya cultures is still unknown. Clarifying these relationships will increase our understanding not only of political and social processes in the valley's history, but also of the processes and consequences of the collapse of the Tiwanaku state.

There are interesting contrasts between Tiwanaku textiles and coastal Osmore textiles in their treatments of symmetry and perspective. In the Ilo-Tumilaca/Cabuza tunic decorations, as well as on the Chiribaya ones, there is always a slight distortion of symmetry. Dividing the tunic on a vertical axis from the neck down, the two sides are never symmetrical mirror images. On the contrary, they are distinctively different from side to side. In Ilo-Tumilaca/Cabuza decoration, the horizontal decorative stripe below the neck slit is always slightly asymmetrical along its central vertical axis (Figure 4). In Chiribaya decoration, the sequence and width of color stripes on the tunics is always different on each side. Each side has the opposite combination of color and stripe width of the other (Figure 6). This phenomenon might not be immediately obvious to the observer, but the overall impression of the decoration is not balanced. This same idea was executed with more sophistication in tunics from Chiribaya Alta, where changes of color sequence and width did not occur from side to side, but rather from front to back, with the change in stripe patterns occurring at the top of the shoulder (Figure 12). This type of change required a more sophisticated technical mastery of weaving, because the change at the shoulder was done along a single weft yarn. Even if we put the tunic on its side and we look for the "Horizon phenomenon" as one possible way of weaving,

and thus observing,⁴ the tunic (Conklin 1986:125), the symmetry of the design is clearly broken. Neither the characteristic of symmetry nor that of the "Horizon effect", both typical of Tiwanaku textiles (Bird and Skinner 1974; Conklin 1970, 1983, 1986), are evident in either the Ilo-Tumilaca/Cabuza or the Chiribaya textiles. Both of the coastal Osmore groups replaced the most notable Tiwanaku organizational principles with the distinctly different concept of "pseudo-symmetry".

A few Chiribaya tunics found at Chiribaya Alta embody yet another variant of the "pseudo-symmetry" organizational principle, or the glide reflect *plal* (Ascher 1991:160). These tunics have a horizontal band of zigzag decoration under the neck done in continuous zigzag embroidery (Figure 7). This decoration probably originated from the functional need to reinforce this part of the tunic, as described earlier. It is almost the same size as the typical Ilo-Tumilaca/Cabuza loop-stitch embroidery stripe, and shows a comparable "pseudo-symmetrical" organization. The stripe is effectively cut along its vertical center line, and the sequence of colors inverted, so that the top of one side is depicted on the bottom of the other side, and vice versa. Yet, this band is not similar in its shape or size to the Ilo-Tumilaca/Cabuza band, and can be clearly distinguished from it. It had no boundaries, no complicated geometry, and simply utilized the "pseudo-symmetry" rule in its most simplistic way.

The motifs selected for each decoration were not random choices of geometrical de-

signs (Weiner and Schneider 1989:1). Both cultures selected motifs widely used in the Andean region at the time (tenth and eleventh centuries A.D.), including S shapes, triangles, and squares (see Figures 4, 8, 10, and 11) (Frame 1986:55; Rowe 1986:156-157). These motifs were probably part of a pan-Andean ideology common to many cultures in the region at that time. But why did the Ilo-Tumilaca/Cabuza and Chiribaya people choose not to adopt Tiwanaku insignia after the collapse of the Tiwanaku state? Were not the symbols historically recognized as illustrating power and prestige, representing widespread and powerful ideology? Why did the people of the valley simply adapt the symbols of the collapsed entity to their own use, utilizing an already-known set of symbols to indicate social status and economic power?

Goldstein (1989) found evidence that suggests deliberate destruction of many of the structures and burials at the Tiwanaku center at Omo. I suspect, with Bermann *et al.* (1989:162), that the absence of the standing deity and Tiwanaku condor was part of the same process. Both the people in the middle valley and those in the coastal Osmore Valley rejected the Tiwanaku ideology as such. It is possible that the overall structure of the ideology persisted, because many decorative motifs typical of the Tiwanaku repertoire remained in the Ilo-Tumilaca/Cabuza and Chiribaya textiles. The symbols such as the standing god and the eagle that were associated directly with Tiwanaku dominance, however, simply vanished from Ilo-Tumilaca/Cabuza and Chiribaya textiles and ceramics, and the traditional Tiwanaku forms of symmetry were deliberately broken.

⁴ Conklin (1986) suggested that the correct way to look at South Andean Middle Horizon textiles should be sideways because this is the way they were woven. The concept of looking into the horizon, where the wider lines represent areas closer to the observer, and thinner lines represents areas far from the observer is useful here. When a textile was constructed to make a garment, however, instead of presenting the lines in horizontal mode, the garment was constructed to present the lines in vertical mode, making it difficult for the untrained eye to notice the view-to-the-horizon concept depicted on it.

It is currently not completely clear how the populace of the middle Osmore Valley related to the Tiwanaku state around A.D. 950. Their apparent rejection of the explicitly Tiwanaku-related aspects of the ideology, however, may indicate that there was some conflict between them and the representatives of the Tiwanaku state in the valley. Evidence from Omo (Goldstein 1989) suggests that the Tiwanaku temple at the site was deliberately destroyed by the local Ilo-Tumilaca/Cabuza people.

Rejection of Tiwanaku dominance was reflected, then, not only by demolishing power centers, but also by abolishing the symbols of their power. The Tiwanaku icons served not as a source for power among the valley's people, but as reminders of being subject to powers they did not welcome. It seems that the act of rejection was so powerful that it was remembered by the valley people immigrating to lower elevations, who never readopted Tiwanaku design modes.

Intra-Valley Social Stratification

Inter-site differences in the textile assemblages strongly suggest hierarchical status relationships between the sites, and, indirectly, among individuals. For example, there are dramatic differences in the labor and material expended on bags from El Algodonal as compared with those from Chiribaya Alta. The yarns used for bags from Chiribaya Alta are 40-60% thinner than those from El Algodonal (0.8-2 mm. at El Algodonal versus 0.39-0.7 mm at Chiribaya Alta), while the density of the textiles was higher at Chiribaya Alta (108-156 c.p.s.c. at El Algodonal versus 170-194 c.p.s.c. at Chiribaya Alta) (Tables 3-4). Considering that the bags from both sites are similar in size, it appears that people buried at Chiribaya Alta had bags that required significantly more time to weave.

Comparing the tunics from El Algodonal to those from Yaral, it is evident that the tunics from Yaral are coarser and less dense (Tables 3-4). While the shapes of the tunics from Yaral are similar to those from El Algodonal, their crudeness suggests that the people of Yaral could not afford as much weaving time and investment in raw materials. It seems that the Yaral people were poorer than the people of El Algodonal.

As was the case with bags, the tunics from Chiribaya Alta are finer and denser than those from El Algodonal and Yaral. Although there is not much difference in weft thicknesses (0.75-1 mm at El Algodonal, 0.87-2 mm at Yaral versus 0.6-1.98 mm at Chiribaya Alta), Chiribaya Alta tunics have much thinner warps (0.6-0.74 mm at El Algodonal, 0.69-1.7

at Yaral versus 0.3-0.49 mm at Chiribaya Alta), and much higher yarn densities (15-101 c.p.s.c. at Yaral and El Algodonal versus 112-167 c.p.s.c. at Chiribaya Alta). Because of their high density, tunics from Chiribaya Alta required substantially longer periods of time to weave. Unidentified fragments of cloth from El Algodonal have about the same yarn thickness and density as the tunics, suggesting that the general quality differences can be extended to much of the El Algodonal textile assemblage.

The textiles from Chiribaya Alta were also more finely finished than those from El Algodonal and Yaral, and greater amounts of work were invested in finishing. The use of more than one color, particularly what seem to be dyed colors, was much more common at Chiribaya Alta than at El Algodonal or Yaral (Tables 7-10).

Although the finishing of bags from Chiribaya Alta is more elaborate than that of bags from El Algodonal and Yaral, the differences are only slight. Bags of both cultures were evidently important objects in burials. They contained coca for the dead, and they were always highly decorated. Because bags are relatively small, they required comparatively little wool and labor to make. Even poor people could evidently afford to have relatively elaborate bags (sometimes more than one) to accompany them in death. In some cases, bags were mended in various places. Despite being tattered, they were very elaborate in their weaving and decoration. These bags were probably used and repaired by their bearers for a long time because they could not afford to acquire new ones.

At El Algodonal, as well as at Yaral, only a small fraction of the textiles are decorated, and those that are have only minimal amounts of decoration. Some of the decorated textiles were used for a long time, and were mended before the person was buried. This was not the case at Chiribaya Alta. In burials of both cultures at Chiribaya Alta, the decorative techniques were the same as at El Algodonal and Yaral, but the density was higher (Tables 5 and 11). Ilo-Tumilaca/Cabuza tunics from

looted surface contexts at Chiribaya Alta have side stripes up to 25 loop-stitch rows wide, although the neck decoration is about the same as at El Algodonal. The designs in these stripes are more elaborate, and involve complex geometrical forms (Figure 10). Although the range of colors is the same and red is still the dominant color, the greater area of decoration and the use of more colors in any given stripe allowed the tunics to create a stronger impression.

The relative elaboration of decoration at Chiribaya Alta is even greater in Chiribaya textiles. Although the same colors are used, many Chiribaya Alta tunics have the additional complication of color sequences that change at the top of the shoulder, and many have elaborate zoomorphic and abstract motifs, most commonly a lizard figure, but also including serpents, felines, and birds. These motifs are executed in the same supplementary yarn technique that is used on bags. This technique must have increased the cost of the tunic, because it requires not only more colored yarns, but also a completely woven surface below the decoration, and hence larger amounts of wool for the same size tunic. Such sophisticated decoration also implies access to more skilled labor.

Colored yarns were evidently valuable, because in 90% of both bags and tunics, only the warp yarns are colored. These articles look completely colored, even though only some of their yarns were colored. This was an efficient way to minimize costs without sacrificing appearance.

Unfortunately, it is difficult to estimate the time required to make these textiles. As shown by Franquemont in his ethnographic research (1984:322-323), weaving time is highly variable, depending on the loom and spinning technique, the age of the weaver, the time of year when the weaving was done, and the quality of wool. Nevertheless, Franquemont's work suggests that these textiles would have taken hundreds of hours to produce. Whatever the exact time was, the time spent to make the Chiribaya Alta textiles would have been greater than that for equiva-

lent size El Algodonal and Yaral textiles, because the decorated areas are larger and the decorative techniques more complex.

Finally, there is a greater variety of textile types at Chiribaya Alta than at El Algodonal. Hats, "handkerchiefs" (*pañuelos*), belts, bag-belts (*faja-bolsas*), and other types that are rare at El Algodonal are common at Chiribaya Alta. All in all, the textile evidence seems to reflect the location of Chiribaya Alta above the valley floor, on top of the steep slopes, far from water resources, and surrounded by fortification walls. This apparently was a central site and elite cemetery for the valley.

The clear site-level status differences in the textiles suggest that both cultures were socially stratified. The site of Chiribaya Alta was used by the elite of both cultures, and it is possible that the two cultures shared not only the same site hierarchy and geographical environment, but also the same social structure. The textiles alone do not reveal the specific nature of the social hierarchy, nor the exact relationships between the two cultures. Further research integrating the textile record with other elements of the material culture may clarify this issue.

Gender Differences

The tunics of both cultures come in rectangular and trapezoidal varieties. Clark (1988:14) suggested that rectangular tunics were worn by men and trapezoidal tunics were worn by women at the Late Intermediate period site of Estuquíña in the upper Osmore drainage. At El Algodonal, however, there was no evidence of differentiation in tunic shape by gender at any of the investigated cultures. This may be due to the poor quality of preservation and the small number of complete tunics with individuals of known sex from El Algodonal. Both the Ilo-Tumilaca/Cabuza and the Chiribaya sample suffer from these limitations.

There appear to be no significant differences between bags buried with males and females of the Ilo-Tumilaca/Cabuza culture at El Algodonal. No differences in yarn thick-

ness of wefts or warps were observed (Tables 3-4). Bags buried with males were slightly denser than those buried with females (Table 5), but the 10% difference in density is probably not significant given the large standard deviation of the sample.

No gender preferences were detected in finishing types in either culture. Nor are there any evident gender differences in decorative motifs at El Algodonal (Tables 12-13). The sample of Chiribaya decorative motifs is too small to assess gender differences, but at least among the Ilo-Tumilaca/Cabuza people, there were evidently no specific textile motifs that were strongly associated with either gender.

Overall, the textiles do not suggest any gender preferences in weaving techniques, finishing, or even decoration. It is, however, important to note that the number of individuals of known gender from El Algodonal is small, and it is possible that such preferences simply cannot be detected in this sample. The apparent absence of gender differences is particularly surprising because Jessup (1991) reported that in his excavations in Chiribaya cemeteries, he found different ceramics in burials of males and females. Societies in which males and females share the same status are not unknown in the Andes, but they are not common. Only future investigation of textiles from other coastal Osmore Valley sites would resolve this problem and will either support or contradict the above observation.

Conclusions

The textiles analyzed here comprised only a small segment of the cultural universe of the Ilo-Tumilaca/Cabuza and Chiribaya people. The conclusions offered serve best to bolster other lines of evidence, and to suggest hypotheses for future research. One such conclusion is that textiles point to a common highland origin for both Ilo-Tumilaca/Cabuza and Chiribaya cultures. The absence of Tiwanaku deities in textile decoration is significant, and combined with the evidence of intentional destruction of the Tiwanaku center at Omo, can be interpreted as a rejection of Tiwanaku ideology. The great similarity of the

textiles from the two cultures strongly suggests cooperation and coexistence in the coastal Osmore Valley. Nevertheless, the inherent differences in the symmetrical organization of designs provide clear evidence of the distinctiveness of each cultural identity. Ascher (1991) claims that although there is no necessary functional explanation for the relationships between the spatial design organization and the cultural interpretation of the world, this relationship does exist. Moreover, it reflects distinctive and particular cultural sets of ideas and beliefs. Thus, the differences in the organization of design in the two cultures reflect the differences between them, and provide an indication that each is a distinct and individual cultural system.

Two important issues remain unanswered. First, what is the true nature of the relationship between the Ilo-Tumilaca/Cabuza and Chiribaya cultures? How is it that these two cultures engaged in such close relations, while so strongly maintaining and emphasizing their individual identities? Second, there is the question of how and why the Ilo-Tumilaca/Cabuza culture disappeared from the valley. It is possible that the competition within the symbiotic relationship of the two cultures finally ended the Ilo-Tumilaca/Cabuza people's ability to control resources, forcing them outside the valley. The absence of signs of warfare and the lack of evidence of diffusion or blending suggests that the Ilo-Tumilaca/Cabuza people probably left the valley peacefully, rather than integrating into the Chiribaya society. This is, of course, only one possibility, and should be addressed using the full range of available archaeological data.

Although the main purpose of this research was to define differences between the two coastal valley cultures, it also helped define other questions. It addresses issues regarding Ilo-Tumilaca/Cabuza and Chiribaya ideological and political structures. Furthermore, it examines a process of change in these structures that occurred by the end of the Middle Horizon. By looking at its margins, we may better understand the collapse of the Tiwanaku state and the events that followed the destruction of central authority. Once we understand

these processes in the lower Osmore Valley, we may apply our model to other regions of the Tiwanaku state and examine the results. Eventually, we may be able to achieve a better understanding of the general ideological and political processes of the Andean region.

Acknowledgements

I wish especially to recognize Bruce Owen's assistance in conducting my research and in writing this report. There was no limit to his willingness to share data and experience with me at any time and place. I do, however, bear sole responsibility for the interpretation of these textiles. Thanks go to Timothy Earle and Christopher Donnan for their constructive criticism and helpful advice in the various stages of this research. Thanks are also due to Jane Buikstra for granting access to material from Chiribaya Alta and Yaral, as well as to Shelly Burgess, María Cecilia Lozada, Liliana Ulloa Torres and to the rest of the staff at the Azapa Museum of the University of Tarapacá at Arica, Chile. Niki Clark, Cecilia Quequezana, and Manuel Patcheco deserve thanks for their enthusiasm in sharing data, and for their interest and dedication to the understanding of Andean prehistory. I would especially like to acknowledge Patricia Anawalt and Barbara Sloan of the Center for the Study of Regional Dress at the Fowler Museum (UCLA), and Katherine Spilker of the Los Angeles County Museum. Southern Peru Copper Company (SPCC) provided valuable support for this research. Lastly, I would like to offer my deepest appreciation to Karen Marshik who dedicated long, patient hours to correcting and re-correcting many drafts of this paper. I could never thank her enough.

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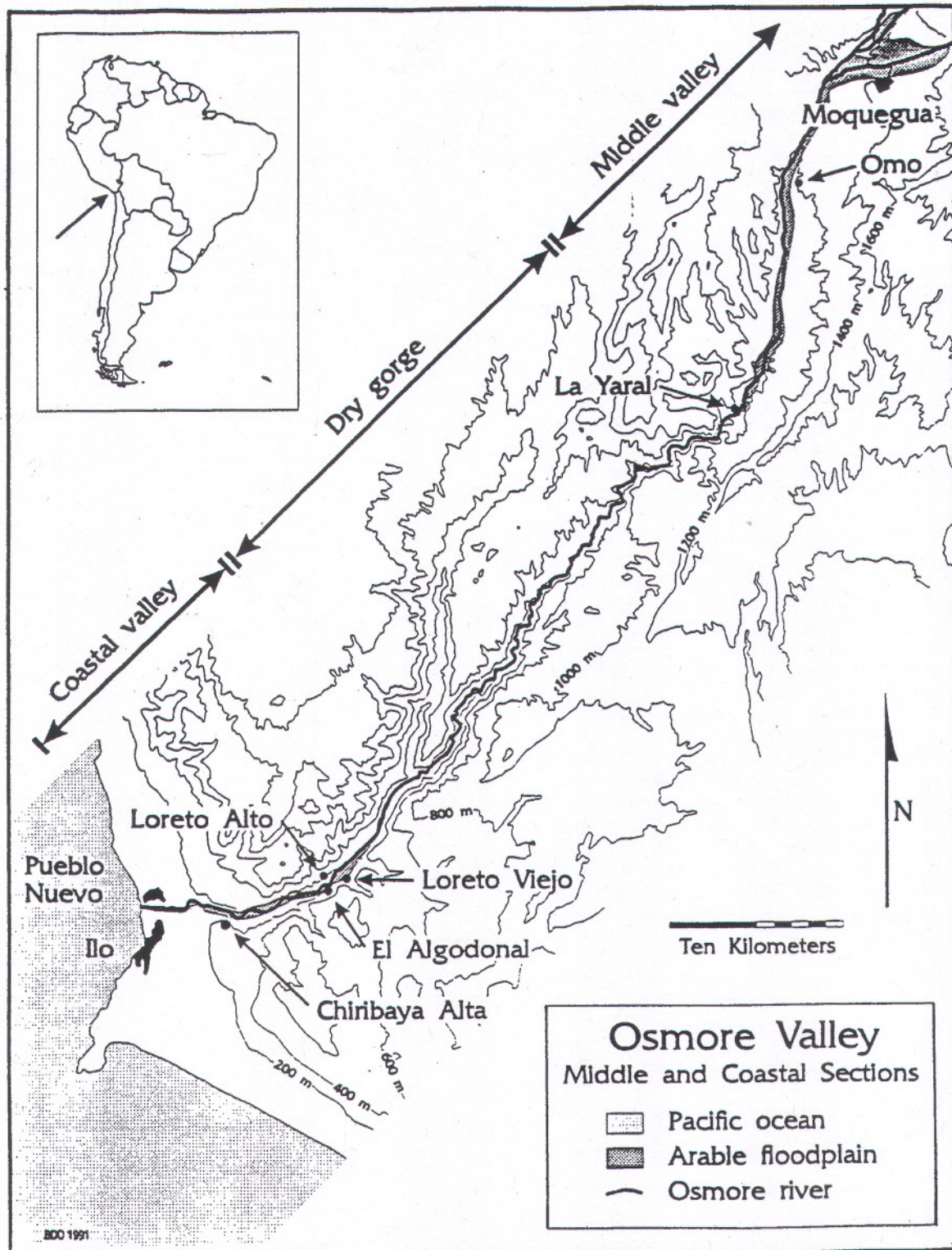


Figure 1. The Osmore valley (from Owen 1991a).

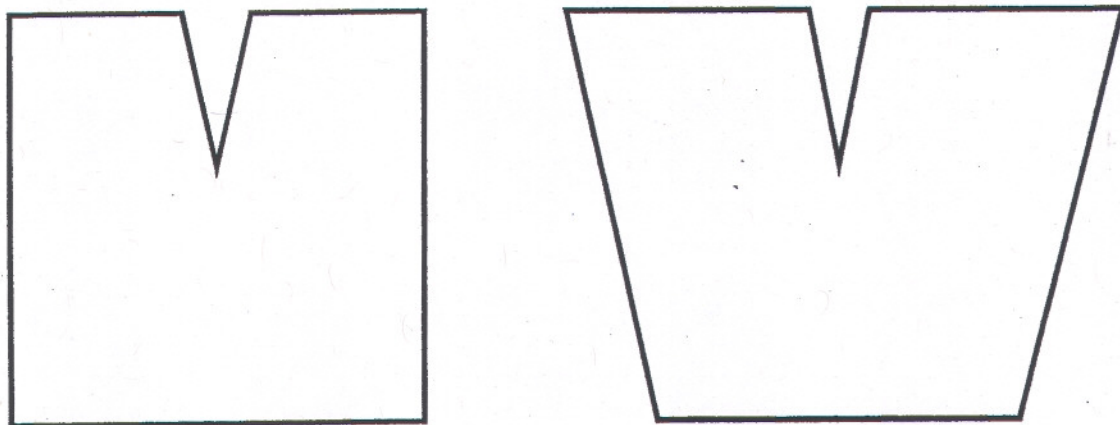


Figure 2. Variation of shapes among tunics.

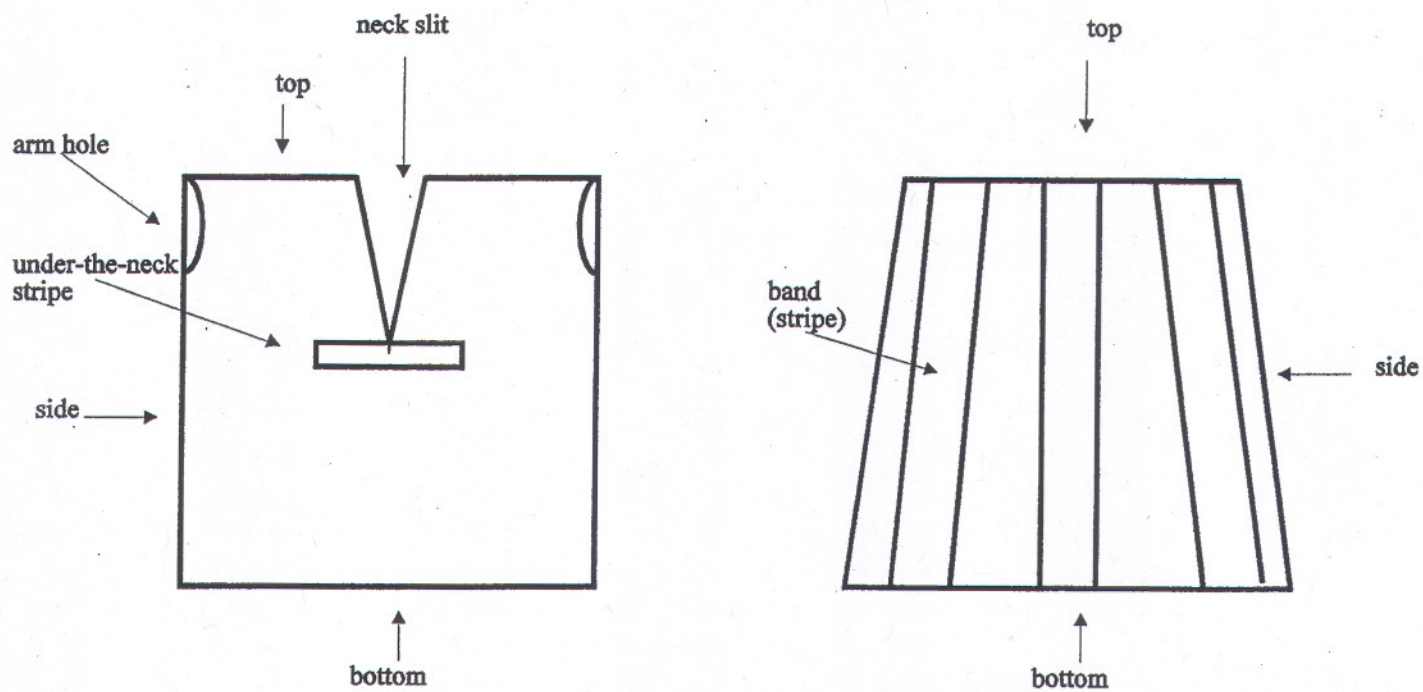


Figure 3. Key to specific area locations and terminology used in the text: left, tunic; right, bag.

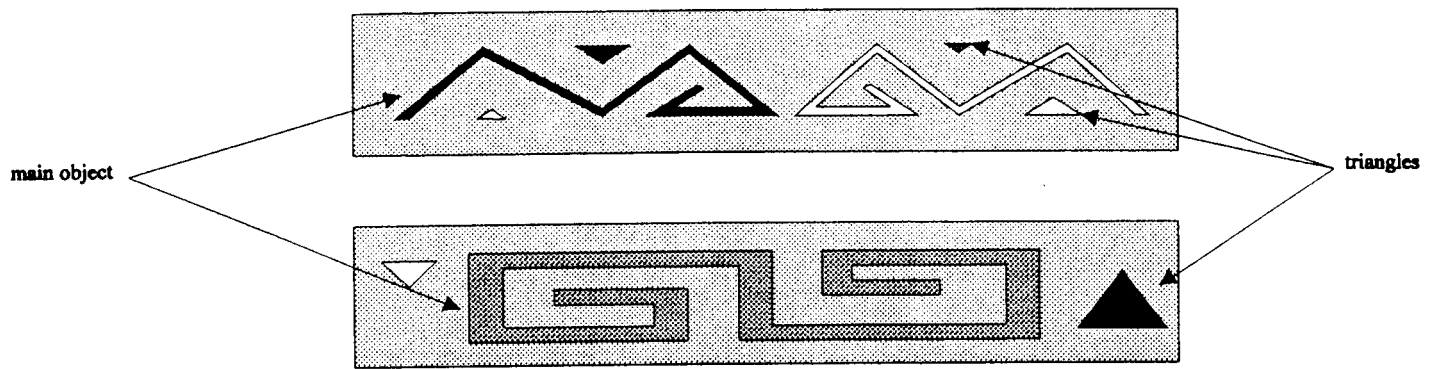
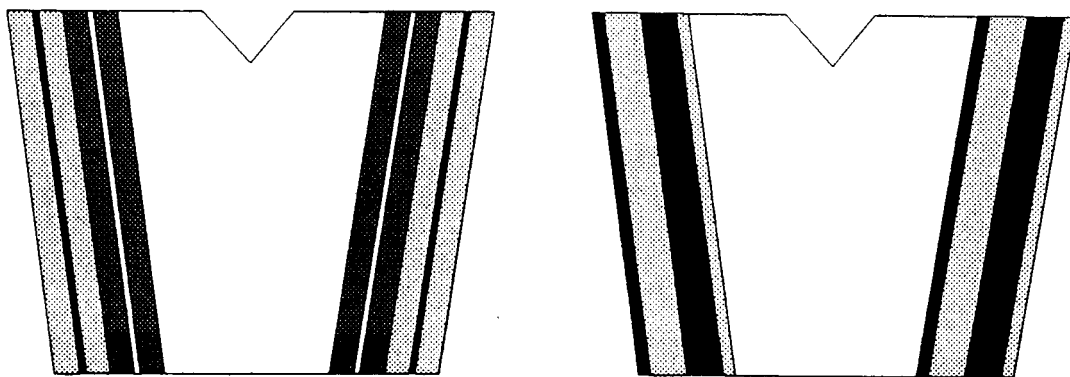


Figure 4. Variations of under-the-neck Ilo-Tumilaca/Cabuza (I-T/C) decoration.



(Left) **Figure 5.** Ilo-Tumilaca/Cabuza divided line decoration on tunic
(Right) **Figure 6.** Chiribaya tunic decoration.

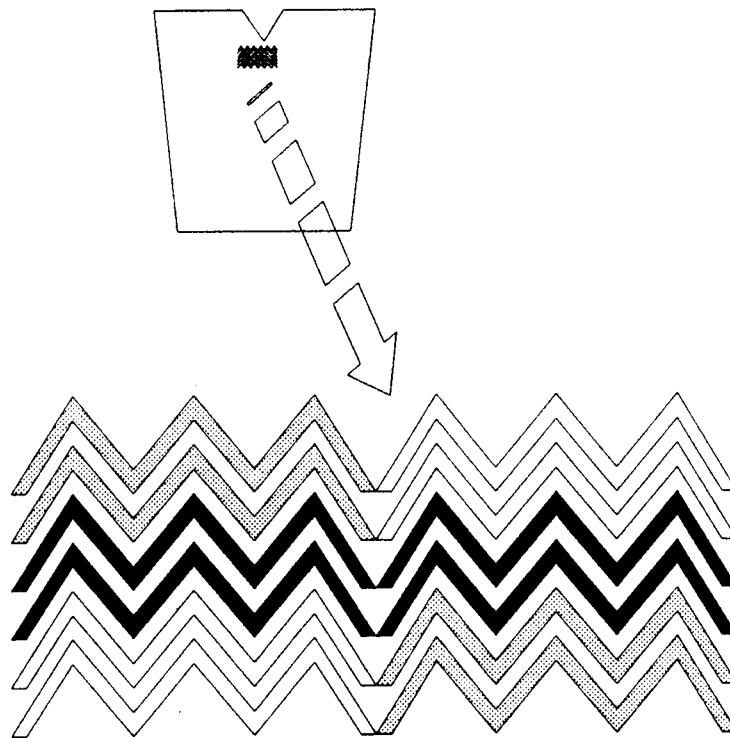


Figure 7. Under-the-neck zigzag decoration.

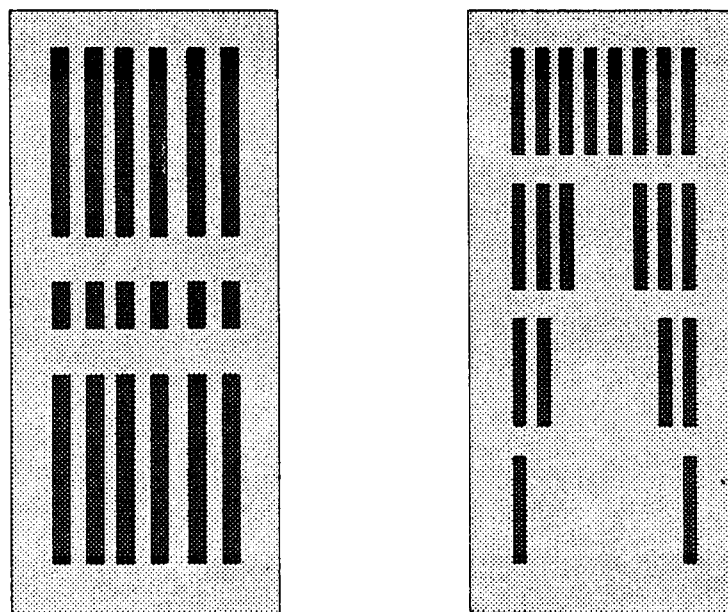


Figure 8. Variations of stripe motifs in decorations of bags: *left* is the I-T/C version, *right* is the Chiribaya version.

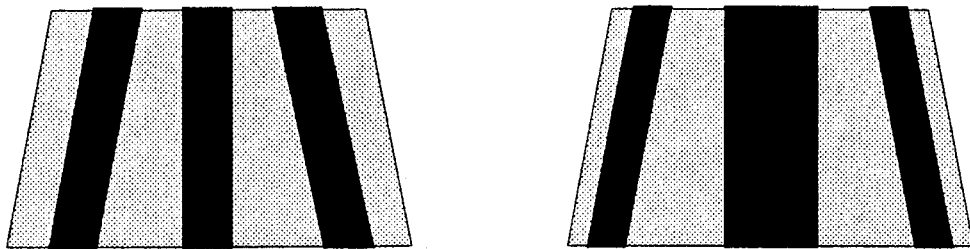


Figure 9. Variations of stripe width in bags.

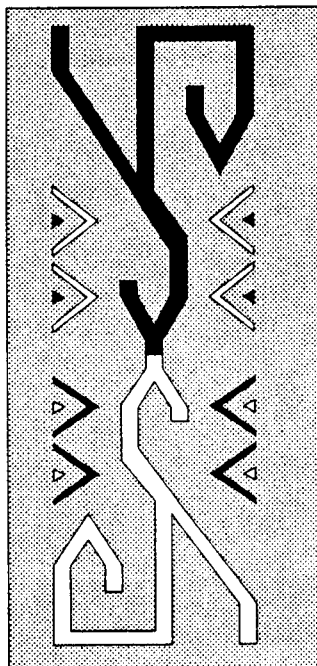


Figure 10. Sample variant of elaborated side decoration of tunics from Chiribaya Alta.

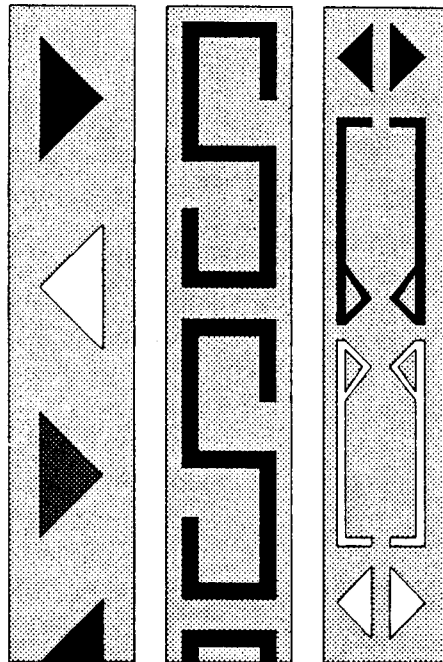


Figure 11. Variations of I-T/C side decoration on tunics.

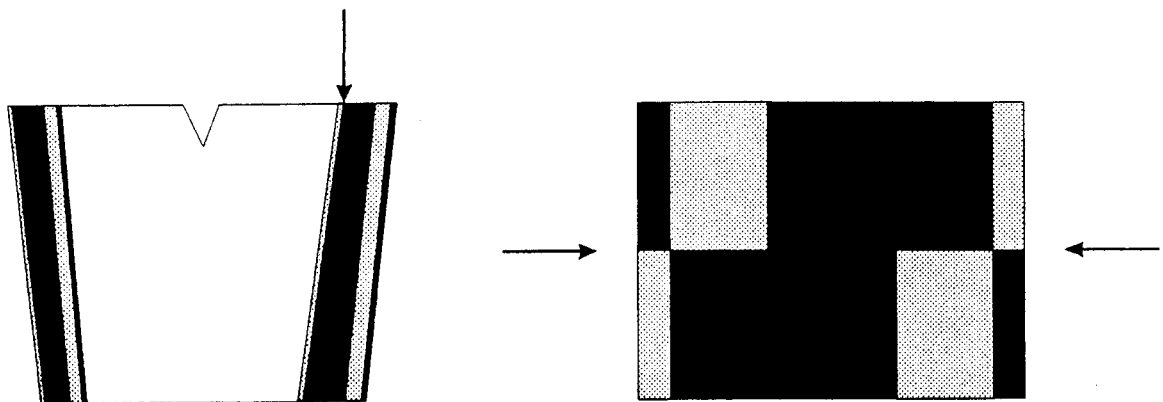


Figure 12. Changes in stripe width on the shoulder in Chiribaya tunic from Chiribaya Alta.

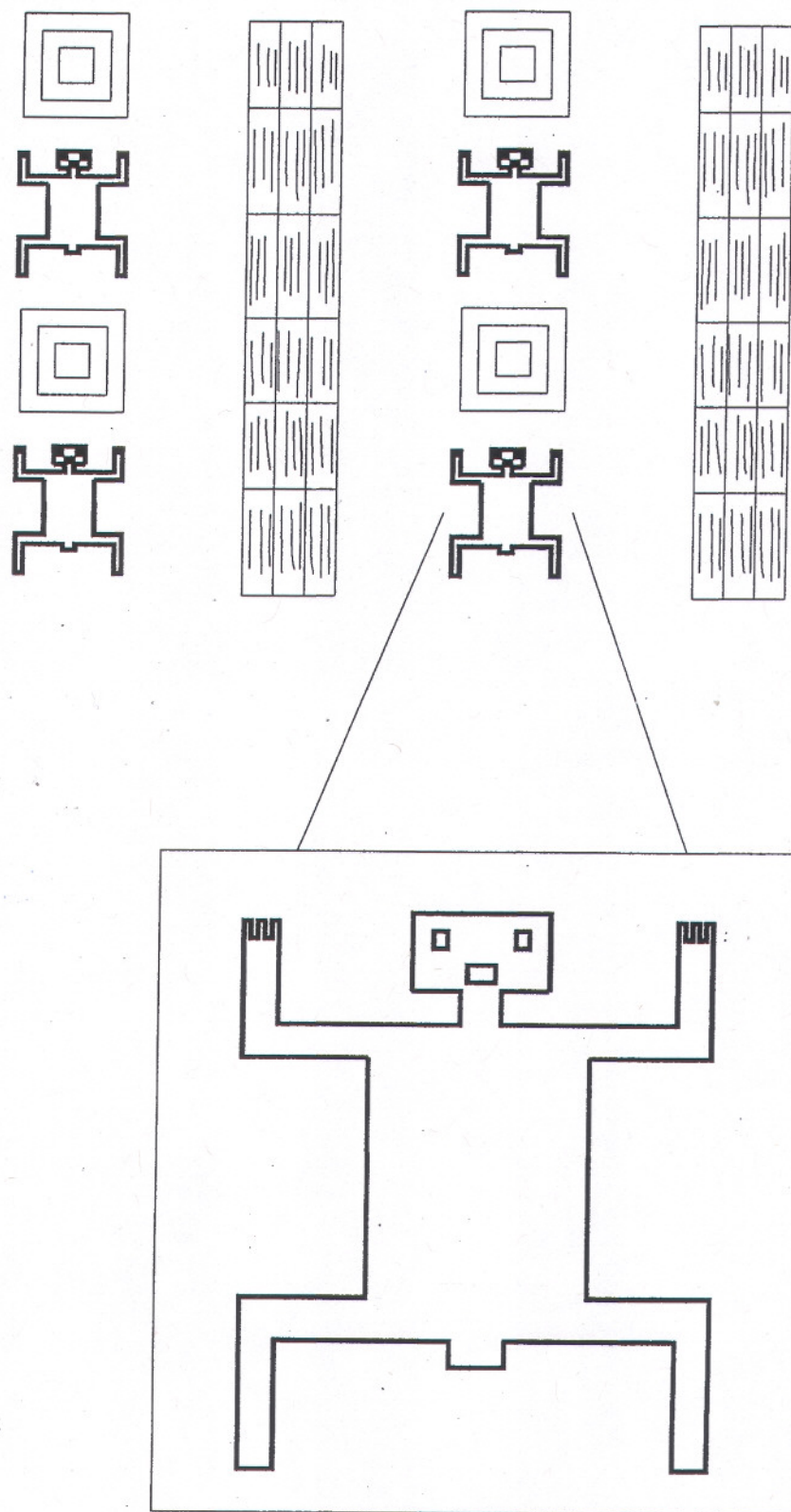


Figure 13. The tunic with the front face deity found on the looted surface at El Algodonal.

	EL ALGODONAL								CHIRIBAYA ALTA								YARAL							
	I-T/C				CHIRIBAYA				I-T/C				CHIRIBAYA				I-T/C				CHIRIBAYA			
SEX	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO
BAG	6	2	7	15	2		2	4	1			1	8	3	9	20								
TUNIC	17	18	41	76	4			4					2		18	20	1			1	2		7	9
UNKNOWN	16	19	90	125	2		1	3																
2-PLY YARN	2	4	7	13	3			3																
RE-PLIED YARN	10	9	27	46	2	3	1	6						3	4	7								
ROPE	4	4	4	12	3			3							1	1								
HANDKERCHIEF (PANUELO)		2	3	5											4	4								
OTHERS	12		1	13		1		1						1		1							2	2

	EL ALGODONAL	CHIRIBAYA ALTA	YARAL
EXCAVATION	99	54	24
LOOTED SURFACE	218	0	0

(Top) Table 1. Textile types found on each site.

(Bottom) Table 2. Collection types.

		EL ALGODONAL						CHIRIBAYA ALTA						YARAL					
		I-T/C			CHIRIBAYA			I-T/C			CHIRIBAYA			I-T/C			CHIRIBAYA		
	SEX	M	F	N/A	M	F	N/A	M	F	N/A	M	F	N/A	M	F	N/A	M	F	N/A
BAG	N	6	1	3	1		1				2		8						
	SIZE	0.97	1.0	0.8	0.8		2.0				0.7		0.39						
TUNIC	N	14	15	34	2			1	3		8		18	1			2		7
	SIZE	0.96	0.97	1.0	0.75			1.0	0.6		1.98		0.72	2.0			1.5		0.87
UNKNOWN	N	12	13	62															
	SIZE	1.01	1.11	0.97															

		EL ALGODONAL						CHIRIBAYA ALTA						YARAL					
		I-T/C			CHIRIBAYA			I-T/C			CHIRIBAYA			I-T/C			CHIRIBAYA		
	SEX	M	F	N/A	M	F	N/A	M	F	N/A	M	F	N/A	M	F	N/A	M	F	N/A
BAG	N	6	1	3	2		1				2		8						
	SIZE	0.93	1.0	0.6	1.0		1.0				0.55		0.25						
TUNIC	N	14	15	34	2			1	3		8		18	1			2		7
	SIZE	0.72	0.66	0.74	0.6			0.8	0.3		0.41		0.49	1.7			1.0		0.69
UNKNOWN	N	12	13	62															
	SIZE	0.73	0.97	0.71															

(Top) Table 3. Weft thickness (average thickness in millimeters).

(Bottom) Table 4. Warp thickness (average thickness in millimeters).

		EL ALGODONAL						CHIRIBAYA ALTA						YARAL					
		I-T/C			CHIRIBAYA			I-T/C			CHIRIBAYA			I-T/C			CHIRIBAYA		
	SEX	M	F	N/A	M	F	N/A	M	F	N/A	M	F	N/A	M	F	N/A	M	F	N/A
BAG	N	5	2	7	2		2				3		7						
	SIZE	156.2	108	144	112.5		82.5				170		194						
TUNIC	N	16	17	34	4			1	3		5		17	1			1		7
	SIZE	91.9	101.2	97.9	83.2			112	167.3		127		164	15			15		99.1
UNKNOWN	N	15	16	86	2		1												
	SIZE	86.6	89.5	98.8	71.5		187												

	EL ALGODONAL		CHIRIBAYA ALTA		YARAL	
	I-T/C	CHIRIBAYA	I-T/C	CHIRIBAYA	I-T/C	CHIRIBAYA
WARP FACE	105	9	3	35	1	7
WARP FACE + REINFORCMENT WARP	23	3	1	1		4
MIXED W/ WARP FACE	12		6			
MIXED W/OUT WARP FACE	1					
BASKET (2/2)	1					
SEMI BASKET (2/1)	4					
INTERCOURSING	1					

(Top) Table 5. Yarn count (weft x warp per centimeter).

(Bottom) Table 6. Main weaving techniques.

	EL ALGODONAL								CHIRIBAYA ALTA								YARAL							
	I-T/C				CHIRIBAYA				I-T/C				CHIRIBAYA				I-T/C				CHIRIBAYA			
SEX	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO
NO WEFT FINISH			1	1																				
NO WARP FINISH	6	3	7	16	1			1					5		12	17	1			1	1		3	4
REGULAR EMBROIDERY			1	1																			1	1
DENSE EMBROIDERY	1	5	2	8					1			1	1		5	6					1		2	3
LOOP STITCH: ONE COLOR	2			2									1			1								
LOOP STITCH: MULTI COLOR		1	1	2																				
BOUBLE LOOP STITCH: COLOR IN PATTERN	1	1	1	3						2	2	4		1	2	3								
BOUBLE LOOP STITCH: COLOR IN TRAINGLE																								
LOOP STITCH STRIPE PART OF FINISH																								
EMBROIDED LINES IN SLIVE/NECK					2			2																

Table 7. Sleeve finishing techniques.

	EL ALGODONAL								CHIRIBAYA ALTA								YARAL							
	I-T/C				CHIRIBAYA				I-T/C				I-T/C				I-T/C				CHIRIBAYA			
SEX	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO
NO WARP FINISH	3	3	4	10	2			2		1		1	2		2	4								22
REGULAR EMBROIDERY																								
DENSE EMBROIDERY	1	2	3	6					1			1			3	3	1			1	1		2	3
LOOP STITCH-ONE COLOR	6	8	8	22	1			1	1			1												
LOOP STITCH-MULTI COLOR			2	2																				
DOUBLE LOOP STITCH-COLOR IN PATTERN	3		1	4						2		2	2		3	5								
DOUBLE LOOP STITCH-COLOR IN TRIANGLES																								
LOOP STITCH STRIPE PART OF FINISH			1	1																				
EMBROIDED LINES IN SLEEVE/NECK													2		4	6					1			1

Table 8. Neck finishing techniques.

	EL ALGODONAL								CHIRIBAYA ALTA								YARAL							
	I-T/C				CHIRIBAYA				I-T/C				I-T/C				I-T/C				CHIRIBAYA			
SEX	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO
NO WARP FINISH	4	3	34	41		1		1							4	4							1	1
REGULAR EMBROIDERY	14	19	41	74	6			6	1	1		2	8		17	25	1			1	3		7	10
DENSE EMBROIDERY		3	1	4			1	1					1			1								
LOOP STITCH-ONE COLOR	2		2	4																				
LOOP STITCH-MULTI COLOR																								
DOUBLE LOOP STITCH-COLOR IN PATTERN	3		2	5											3	3								
DOUBLE LOOP STITCH-COLOR IN TRIANGLES															1	1								
LOOP STITCH STRIPE PART OF FINISH		3	7	10						2		2			3	3								

Table 9. Side finishing techniques.

	EL ALGODONAL								CHIRIBAYA ALTA								YARAL							
	I-T/C				CHIRIBAYA				I-T/C				I-T/C				I-T/C				CHIRIBAYA			
SEX	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO
NO WEFT FINISH																							1	1
WEFT REINFORCMENT	18	27	46	91	6	1	1	8		2		2	8	1	19	28	1			1	3		2	5
WEFT REINFORCMENT +LOOP STITCH	3	1	3	7											1	1								
WEFT REINFORCMENT +EMBROIDERY	2	2	15	19					1	1		2	2		5	7							1	1
DENSE EMBROIDERY																							1	1
LOOP STITCH-ONE COLOR		1		1											1	1								
LOOP STITCH-MULTI COLOR															3	3								
DOUBLE LOOP STITCH-COLOR IN PATTERN			4	4																				

Table 10. Shirt bottom and bag top finishing techniques.

	EL ALGODONAL								CHIRIBAYA ALTA								YARAL							
	I-T/C				CHIRIBAYA				I-T/C				CHIRIBAYA				I-T/C				CHIRIBAYA			
SEX	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO
WEAVED COLOR STRIPES	2	3	22	27	5			5	1			1	7		8	15					1		4	5
DIVIDED LINE IN SEQUENCE	4	1	18	23	1			1							3	3								
EMBROIDERY UNDER-THE-NECK ONLY			1	1	1			1																
EMBROIDERY-SIDES+NECK	2	3	8	13											3	3								
EMBROIDERY-NARROW NECK+WIDE SIDES										2		2												
BAG STRIPES-EQUAL WIDTH	1	2	2	5	1			1							2	2								
BAG WITH WIDER CENTRAL STRIPE	4		3	7											2	2								
BROCADE													3		4	7								

Table 11. Decoration techniques and location on cloth.

	NECK								SIDE								STRIPE							
	I-T/C				CHIRIBAYA				I-T/C				CHIRIBAYA				I-T/C				CHIRIBAYA			
SEX	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO
TYPE A 	1	2	1	4																				
TYPE B 									1	1	2	4												
TYPE C 											1	1												
TYPE D 																					1			1
TYPE E 											1	1					1	1	2					
TYPE F 											4	4												
TYPE G 																	5	2	6	13				
TYPE A+B			1	1						1	2	3												
TYPE E+F										1		1												
ELABORATED FORMS									1		1	2												
ZIG ZAG			4	4																				
ZIG ZAG W/ CHANGING COLORS	1			1																				
REINFORCED LINES UNDER NECK	2		2	4	2		1	3																

Table 12. Embroidered motif types by sex and culture at El Algodonal.

	NECK								SIDE								STRIPE							
	I-T/C				CHIRIBAYA				I-T/C				CHIRIBAYA				I-T/C				CHIRIBAYA			
SEX	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO	M	F	N/A	TO
THIN COLOR LINE ON THE SIDE										2	15	17												
WIDE STRIPES-NO CHANGE									2	1	7	10												
WIDE STRIPE- CHANGE BETWEEN SIDES													5			5								
DIVIDED LINE PATTERN SEQUENCE									4	1	18	23	1			1								

Table 13. Woven motif types by sex and culture at El Algodonal.