

AN AGUADA TEXTILE IN AN ATACAMENIAN CONTEXT

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INTRODUCTION

Thousands of ancient burials surround the Chilean town of San Pedro de Atacama and make a mute statement about its ancient importance. Atacama, the name of the altiplanic desert, seems to be a word that occurs in the Kunza language (Mostny 1954:139-140; Lehnert 1994:18-19) spoken by the people who inhabited this portion of the northern Chilean and Argentinean highlands and who formed what Wendell Bennett (1946) and Max Uhle (1913a, 1913b) called the once extensive Atacama culture. Perhaps the word culture in this case requires some consideration for the desert itself, although apparently uninhabited, has traces of nomadism with rock art along apparent valley routes. The word culture refers then, in this case, to the network of oasis-focused villages with their extensive connecting trails.

The burials discussed in this paper are found in distinct cemeteries outside of, but adjacent to, the *ayllus* or ethnic neighborhoods that constitute the town of San Pedro de Atacama. Although both Max Uhle (1913a) and Wendell Bennett (1934) and others had previously explored in the vicinity of San Pedro, the discovery of the pattern of these edge-of town burials and their naming based on their *ayllu* adjacency was the work of R.P. Gustavo Le Paige, S.J., a priest and self-taught archaeologist and founder of the town's museum (Lanzarotti

1961). Stylistic analysis of the artifacts in these burials suggested to Le Paige that the burials indicated the characteristics of the early inhabitants of the adjacent neighborhoods. Le Paige once told these authors (personal communication 1976) that he believed the San Pedro inhabitants represented by the burials with Tiwanaku artifacts had not only been influenced by Tiwanaku but had actually assisted the people of Tiwanaku in the development of their iconography—that the relationship between San Pedro and Tiwanaku was a two-way street. Subsequent scholars, understandably, have been much less certain of those connections.

Nevertheless, the extent and richness of the data in the San Pedro burials exceed that of any other cemetery in South America. Each burial characteristically contains a clothing-covered body that had been placed in a seated position within a pit. The burials often have evidence of the use of hallucinogens (Torres 1995). Occasionally the burials contain textiles or other artifacts that by their iconography or structure seem alien to the local traditions and seem to have been designed and constructed far from their burial location. This paper is concerned not with a characteristic inhumation, but with one of these apparently unique burials. It explores the implications emanating from the burial contents.

HYPOTHESES ON THE FUNCTION OF SAN PEDRO DE ATACAMA

Probably the most widely-accepted explanation for the seemingly anomalous textiles or other artifacts occasionally found at San Pedro is the following: the cluster of oasis-based *ayllus* that make up the present town of San Pedro de Atacama formed, in ancient times, a populous desert trading post. Surrounded as it is by the vast Atacama desert, but being itself a well-watered oasis at 2463 meters in elevation, San Pedro was a crossing point of the many desert trails (Bowman 1924, Browman 1974) of the vast Andean altiplano used by caravans of people and camelids carrying products (Figure 1). San Pedro is, however, totally without any architectural statement of centralized power, having no palaces, pilgrimage centers, monuments, or ancient plazas. The sporadic distribution and variety of foreign textiles and other artifacts in San Pedro burials tends, we believe, to support the concept of San Pedro as a nexus of what we could properly call the Atacama network. This network was without a peripheral boundary and without a hierarchical social structure that could impose its own style or beliefs. Yet, it was more than a series of simple trading posts. It was a web that permitted a far-reaching, two-way exchange of ideas and products.

Foreign textiles found in various San Pedro burial grounds include textiles representative of the Tiwanaku culture and many alien, and as yet culturally unidentified textiles. These foreign textiles and other foreign artifacts found in the burials have been used by the first author (Conklin 1998) to depict the apparent wide-ranging contacts of the various buried individuals. Such contacts support the network nexus interpretation of San Pedro's role. Yet, the presence of Tiwanaku textiles in graves has caused other scholars to interpret San Pedro as a village occupied by colonizers (Rodman 1992).

Although Tiwanaku certainly had cultural influence on both local textile and ceramic traditions, there is no physical architectural evidence, *i.e.*, no Tiwanaku stone carvings, buildings or palaces, to support the sovereignty claim. These exist in known Tiwanaku colonies, such as the one in Peru's Moquegua Valley (Goldstein 1993) and in other Tiwanaku colonies.

To better understand the different interpretations of San Pedro grave goods, the reader can consider a parallel between ancient San Pedro and the even-more ancient city of Petra, the carved-in-stone Nabatean city whose ruins are in present-day Jordan. Neither Petra nor San Pedro de Atacama had much surrounding agricultural land, nor did either have valuable exportable natural resources. However, both were on very important trade routes and both, in their time, were flourishing settlements. We can compare what we know about their locational characteristics and some of their characteristic products. San Pedro was a focal point of altiplanic caravans. Petra was an important stop on the Silk Road. In the case of San Pedro and the Tiwanaku culture, hallucinogenic materials were important. This is confirmed by their extensive presence in San Pedro graves. However, the source of hallucinogens was far to the east of the altiplano (Torres 1986:49). This suggests that hallucinogenic materials could well have been one of the valuable items exchanged in San Pedro. Petra caravans carried, among other products, "frankincense and myrrh and the most valuable kinds of spices" from far eastern sources. From Petra they were shipped on to Greece and Italy, "where they were highly valued for a range of uses, including religious rituals, medicines, beauty products, and cooking" (Augé and Dentzer 2000:39).

However, even the presence of foreign-styled architecture in an archaeological site does not prove the presence of an occupying power.

In the case of Petra, the predominant and fabulous Greco-Roman architecture was not there because the city was part of the Roman Empire, but because the Greco-Roman style of architecture was widely popular and respected at the time. Stylistic archaeological evidence can be the result of many causes: both formal causes, such as an occupying power, but also informal ones, such as style diffusion and popularity, confusing as that may be to the archaeologist seeking an understanding of cultural relations through the study of artifact styles.

The primary artifactual evidence supporting this paper is from a San Pedro burial. Its textiles seem unmistakably to have come from the ancient Aguada culture of what is now north-western Argentina.¹ Nevertheless we must use care in discussing its meaning both for San Pedro culture and for its own home culture.

MUMMY QUITOR 2, 1983:15

In the course of our research, we examined mummies housed in the storerooms of the Museo Arqueológico R.P. Padre Gustavo Le Paige S. J., at the Universidad Católica del Norte, in San Pedro de Atacama. Our broad goal was to investigate textile typologies present in San Pedro. We noted the presence of tie-dyed textile material (Figure 2) on a mummy with a museum tag marked "Quitor 2, 1983:15". Quitor 2 is the name of one of the ancient burial grounds surrounding San Pedro.² With the approval and cooperation of Agustín Llagostera, director of the museum, the Quitor 2 mummy (Figure 3) was disassembled by our textile conservation team in August, 1990. The mummy had apparently been excavated and placed in the museum between 1961 and 1963 by Padre

Le Paige, the founder of the museum, but re-numbered in 1983.

The textiles surrounding and worn by this mummy were in excellent condition, still strong and durable. In terms of preservation, they are among the best ever recovered from burials in San Pedro. The textiles covering the head showed limited deterioration, suggesting infiltration of only small amounts of moisture from the soil above. This, in turn, suggests that the mummy had been buried in topography that did not permit the accumulation of surface water. The Quitor burial grounds are on a generally well-drained hillside.

The mummy, stored in a museum storeroom, was in the seated position that is characteristic of all San Pedro mummies. This posture has been imaginatively referred to as the fetal position by many archaeologists because of its resemblance to the position of an unborn child in the womb. A far more probable explanation has recently been developed by the physical anthropologist, María Antonietta Costa (personal communication 1990). She has noted that the burial position of the mummies in San Pedro should be called the sleeping position, because of physical anthropological evidence of bone wear and tear indicating that people in ancient San Pedro slept in a seated position. They probably slept sitting, leaning their backs against a wall with their knees brought up. In this position the heavy tunics characteristically found associated with both male and female burials in San Pedro could, during cold nights, form a body-enclosing tent for environmental protection. During warm nights, such a heavy outer tunic may have been folded to form a floor pad for the seated sleeping position. It seems possible then, that death was conceptually related to sleep. Perhaps death was the "long sleep". Max Uhle many years ago suggested that for the mummies of Pachacamac, "... the sitting posture . . . was to simulate a position of rest,

¹ For preliminary discussions in Spanish of the textile discussed in this article see Llagostera (1995) and Conklin and Conklin (1996).

² See Lindberg (1963) for a discussion of typical textiles found in Quitor burials.

identical in fact with that assumed by the local Indians today when sitting by the fire, or resting by the roadside" (Fleming *et al.* 1983:146).

Although the burial orientation of the thousands of mummies excavated by Padre Le Paige was generally not recorded, his workmen who survived him and are still associated with the museum, report (Santiago Ramos and Timoteo Cruz, personal communications, 1990) that most San Pedro burials are oriented within their burial pit to face Mt. Licancabur, a highly visible nearby volcano still considered sacred by local residents. The Quitor burial grounds occupy a hillside that directly faces Mt. Licancabur. However, because exact burial data concerning Q2, 1983:15 is not available, the orientation of the mummy in its grave is not known. Nevertheless, the knees-up posture of the well-preserved body was exactly like all other San Pedro mummies (Le Paige 1964). It is interesting to note that the presence of foreign artifacts within a burial does not seem to cause a change in the burial position or orientation, suggesting that the broad religious beliefs of the deceased person accompanied by foreign objects was the same as those buried without foreign objects.

MUMMY DISASSEMBLY

After preliminary perusal, the mummy, Q2, 1983:15, was transferred to the textile conservation laboratory in the Museo Arqueológico R.P. Gustavo Le Paige, S.J. and a process was outlined for its disassembly. Because San Pedro mummies are clothed and not wrapped, as Paracas mummies are wrapped, the process of separating the textiles and other artifacts from the body is properly called disassembly rather than unwrapping. A careful process for disassembly in the environment and conditions of San Pedro de Atacama had been developed and refined by the present researchers in the course of several field seasons of work on other mummies.

Although the textile preservation associated with the mummies found in San Pedro is often remarkably good, the process of deriving museum data and displayable artifacts is enormously complicated by the extreme aridity of the local climate. In addition to temperature control, humidity control is critical for long-term textile preservation and conservation, and especially for all forms of textile manipulation. The process of mummy textile disassembly inevitably involves extensive textile manipulation, which can only be safely performed at a high relative humidity. The normal outside air humidity in San Pedro hovers well below 10%. It is possible to bring the textile conservation laboratory humidity up to 30% or 40%, but still higher humidity is required for safe mummy disassembly. To address this problem, we constructed a humidification control chamber (Figure 4). This chamber permitted the insertion of a complete mummy on a sliding tray (Figure 5) and the installation of internal water for evaporation, as well as a hygrothermograph and thermometer to monitor the relative humidity and temperature. The process involves humidification of the outer layers of the textiles of a mummy, withdrawal of the mummy from the chamber and removal of these temporarily pliable layers, reinsertion of the mummy into the humidification chamber and subsequent removal of additional layers until completion.

The humidification chamber permitted the disassembly of the mummy and the conservation and storage of all of its associated materials. Technical records for each textile associated with Q2, 1983:15 are presented in the Appendix. The first step in the disassembly process was the removal of the plain outer tunic (No. C1). This tunic (Figure 6) which we call the "exterior" tunic, was a plain, natural tan alpaca warp-faced garment with no stripes, but with side seam stitching and other details created with black alpaca thread. This adult-size tunic showed evidence of wear and limited repairs in

ancient times with a needle and a doubled thread whose color matched the color of the tunic. This outer tunic was not put on the mummy as it would have been worn in life, but was simply laid as a rectangular tunic over the mummy in its approximate real life location. Because of the excellent preservation of the entire mummy, this textile, after its humidification, was easily removed and conserved.

Largely covered by this exterior tunic, however, was the tie-dyed textile that had been glimpsed in the mummy storeroom. Often in San Pedro burials, the most colorful and elaborate textile was placed over the head of the mummy, and this was clearly the case with Q2, 1983:15. What was revealed was a blue and red, child-size, resist-patterned tunic (No. C8). It had been placed over the head and then tied in position, together with a group of small bags (Figures 7 and 3). The presumed Tiwanaku or Wari provenience of the resist-patterned tunic seemed initially to be reinforced when we first saw that the tunic had not only been tie-dyed but also had been constructed of red panels and blue panels that had been dyed, disassembled, then reassembled with alternating colors using a dovetail join over a common warp, a complex technique used in both Wari and Tiwanaku resist-patterned textiles. However, upon reviewing the revealed iconography, a feline with projecting jaws in the upper red panel and a double-headed, crested snake-like figure in the blue panel below (Figure 8), we began to realize that the designs could not be included within the art of either Wari or Tiwanaku. The figures are repeated on the back side of the tunic, but the blue and red background colors are interchanged. We removed the tunic and began initial conservation, but postponed further analysis of this remarkable textile until after the complete disassembly of the mummy.

Wrapped around the lower part of the body was a rectangular textile (Figure 9) with sections

in black, brown and beige. This textile (No. C2), one meter by almost two meters in size, would appear to have been a mantle, although it was used in the burial simply as a wrapping for the lower portion of the mummy and did not cover the shoulders. If the textile were indeed a mantle, then the color bands, when it was worn, would have been vertical, as they are characteristically in male altiplanic garments, and as they were in their wrapped position on this mummy.

Eight small textile bags were associated with the mummy, six of which (Nos. C3, C3a, C3b, C3c, C4, and C5) were located on the right shoulder of the mummy (Figure 3). Another bag (No. C16) was placed near the neck, and one (No. C17) was pulled down over the head and face (Figure 10). This style of bag-over-the-head covering in burials was noted by Padre Le Paige and by Lindberg (1963:201) as a characteristic of other Quito inhumations.

Technically the most interesting and the most colorful bag (No. C3) was one of those found on the right shoulder. This bag (Figure 11) is of warp-faced plain weave construction whose warps are both transposed and twined. The two sides of this bag with warp patterning in this sprang-like construction are symmetrical about the bottom fold of the bag. Another highly unusual feature is an attached set of loops around the top edge of the bag with an interlaced drawstring that was obviously intended to permit closure. The technical characteristics of this close-able bag have not previously been noted amongst the hundreds of bags recovered from San Pedro, and thus it may well be an imported bag, with nearby Argentinian territory a possible provenience.

Beneath the tie-dyed child's tunic that had covered the head and shoulders of the mummy, was another plain beige-yellow tunic that had been put on the mummy as in life. This tunic (No. C9), which we call the interior tunic, had

construction similar to the exterior tunic except that it did not have the black edge details. All sewing and binding had been done in matching natural tan alpaca. This tunic was in good condition.

Beneath this interior tunic was a tunic that had been inverted and then pulled up over the feet from the bottom up and thus enclosed the lower portions of the mummy. This upside-down tunic (No. C10) also was a plain tunic, but darker in color than either the exterior or the interior tunic.

Removal of these covering tunics revealed a striped bag (No. C17) over the head, and a complex set of wrappings around the neck (Figure 10) that were apparently used as a form of neck support (Nos. C14, 15). The purpose of the neck supports that occur characteristically on San Pedro mummies is uncertain. However, because they seem to be unique to San Pedro burials, as is their body/volcano orientation, a potential linkage between the two can be considered. If the purpose of the burial orientation was to create a face-to-face relation between the deceased and the mountain or mountain deity during the "long sleep", then it could be argued that these neck supports also assist in orienting the head and face of the deceased toward the expressive top of the mountain.

The textiles that made up this complex neck wrapping were heavily worn, used textiles. One of these (Figure 12) was a complete tunic that had been repeatedly mended with a variety of techniques and materials. It seems likely that this lightweight tunic could only have been used as an under-tunic in life. So extensive were the repairs that the quantity of materials used as darning yarns vastly exceeded the quantity of original material remaining. Why then, from a cost/benefit point of view, did the owner not simply create a new tunic rather than spend such time and material repairing an old one?

Perhaps only limited amounts of material were available at a given time, but the burials in San Pedro contain vast quantities of camelid fiber textiles (this burial had a total of six alpaca tunics), and the burials never create the impression of a shortage of such materials. Cost/benefit analysis does not seem to provide an explanation. Much more probably, repaired under-tunics had special values and associated meaning, such as familiarity, provenance, or ownership history that a new under tunic could not equal.

The tunic that had been put on the mummy after the neck supports had been installed but just before the bag had been placed over the head, was an extraordinarily thick, heavy tunic (No. C18) in like-new condition (Figures 13 and 5). The weight of the material in this tunic resembles the weight of materials used in the creation of heavy winter overcoats or rugs. Tunics or mantles of a similar weight have often been encountered in San Pedro burials, but previously they have always been found folded and placed beneath the mummy in the bottom of the pit, apparently as a rug or pad for the seated burial.

The construction of the heavy material used in the tunic is of great interest. Although the weave itself is a simple over-and-under plain weave, the construction of the thread used for the warp is highly specialized. The manufacture of this heavy thread involves a process which we can call "co-directional wrapping" in which a two-ply thread is used as the core for a much larger thread that is created by wrapping the core with unspun camelid fiber. The direction of the wrapping of the loose material on the outside of the core thread is the same as the direction of the plying of the core thread and hence the two constructions, the inner core and the outer wrapping, tend to merge and bond together (Figure 14). The resulting thread is about the thickness of a human thumb or finger, and

the material made from it, which is of a comparable thickness, would have had great insulation value. If used as a sleeping tent with the seated sleeping position as described above, with the bottom edge of the tunic touching the floor and with the arms pulled in to the body through the arm slots, a remarkably warm environment would have been created, virtually independent of outside temperature.

Beneath this thick, blanket-like tunic were only two additional textiles. One was a loincloth (No. C19), and a second was an elaborate tapestry belt (No. C21). This tapestry belt (Figure 15) was constructed with paired warps running the length of the belt with the vertical weft forming interlocked tapestry over two sets of the paired warps. The patterning was repetitive, apparently non-representational, geometric color patterning. Both the patterning and the nature of the interlocking closely resemble the appearance of a textile found in Argentina and previously recorded (Rolandi and Nardi 1978: 29, 37). Interlock tapestry is characteristic of both Wari and Tiwanaku textiles, and the specific manner of pairing the warps of the belt is found in Pucará textiles and in some early Tiwanaku cloth (Conklin 1983). As judged by their representation in stone sculpture, belts were a very important part of Tiwanaku costume, but no actual Tiwanaku belt has ever been found. Later belts, such as Inka ones, are always warp patterned although Inka slings, somewhat belt-like constructions, have multiple warps that are patterned with interlocked wefts. Given the many similarities in Huari, Tiwanaku, and Aguada textiles, it is probable that Tiwanaku weavers created belts like this one, with horizontal warps and vertical patterned interlocked wefts, thus fundamentally using the same weaving structure that they used to create their garments.

Physical anthropological analysis of the body proved the mummy to be that of a male (María

Antonieta Costa, personal communication, 1990), a sexual attribution consistent with the vertical stripes of the mantle. He was perhaps 40 years old at the time of death, elderly for a San Pedro inhabitant.

ANALYSIS OF THE TIE-DYED TUNIC

With the disassembly of the mummy complete, we began study of the resist-patterned and tie-dyed tunic. In discussing the possible identification of the textile, a member of the museum staff, Francisco Tellez, who was very familiar with the foreign ceramics in San Pedro, suggested that we consider an Aguada affiliation. A review of published images of Aguada ceramics (Serrano 1958 and González 1964, 1972) revealed several which seemed remarkably consonant with the images on the textile (Figure 16). Further analysis of these ceramic representations revealed that many of the feline images actually had spots which, because of their square shape and diagonal orientation, looked much more like tie-dyed spots than like actual feline spots, suggesting a textile/ceramic design commonality in the art of the Aguada culture.

In the process of cleaning and straightening the resist-patterned tunic, we re-humidified the textile and noticed a remarkable effect (Figure 17). The textile, under humidification, recalled from its textile memory two sets of textile deformations or wrinkles, actually a familiar effect, like that of curly hair becoming curlier in the rain. These are;

a) The broad wrinkles that were created when the textile was folded and tied around the top of the mummy, and

b) The smaller detailed wrinkles that had been formed during the resist patterning process and then set when the textile was im-

mersed in hot liquid dyes, and then dried and untied.

The re-humidification process, performed at room temperatures but at 80% humidity, seemed to completely relax the wrinkles that had been put in at the time of burial, as we expected. These burial wrinkles, which rapidly disappeared, had presumably been created during typical San Pedro climatic conditions of 5% humidity and at temperatures probably well below 38° Centigrade. The re-humidification process had the opposite effect on the hot-set wrinkles that had been put in at the time of the resist-patterning process which probably used temperatures approaching 100° Centigrade. A humidification process that used temperatures approaching those employed in the original resist-patterning process would no doubt have relaxed the hot-set wrinkles as well as the burial wrinkles. The result, astonishingly, was an excellent record of the exact pattern of wrinkles or textile deformations created during the resist patterning which occurred some 1200 or 1300 years ago.

There are two distinct forms of resist-patterning evident in the textile:

a) Hollow square forms that are free of dye that were no doubt created by the tents formed by the traditional tie-dye methods of resist-patterning; and

b) White undyed linear forms such as those that outline the feline and define the facial features of the figures, that show both stitching holes and small gathers along their edges (Figure 18).

This resist-patterning occurs on both faces of the textile with seemingly equal clarity. These undyed linear patterns are remarkably sharply defined, with the color change occurring between adjacent parallel threads of the textile

that are either colored or white, not mixed, and with their cross-axial partner thread also having its color change at exactly the right point. These linear forms of undyed material might have been created by stitching a moisture resistant material, such as leather strips, cut out in the required linear shapes to resist the hot liquid dye penetration, to both sides of the textile to create the desired pattern. We can call this special form of resist-patterning, area resist-patterning. Such a procedure seems very difficult, although cost/benefit analysis is generally irrelevant in the analysis of Andean textile creations. Although just this explanation for the effect is offered, it must be considered as only a *possible* explanation.

Such large scale linear resist patterns do not occur in the Tiwanaku textiles which have been recovered so far, and also they do not *regularly* occur in known Wari tie-dyed textiles. Amongst the textiles Uhle excavated from beneath the temple at Pachacamac were tie-dyed fragments that can probably be attributed to Wari (Uhle 1991 [1903]: 32; VanStan 1961). Occasionally, short straight-line resist patterns occur in these tie-dyed textiles. Such short lines were probably made by wrapping the textile onto a stick and binding it with strings to create lines across the axis of the roll. The bands and lines in the tie-dyed tunic of San Pedro's Q2, 1983:15 occur outside the areas of tie-dyeing, are sometimes curvilinear as in the case of the double-headed snake, and vary in their width. These textile lines, therefore, were not created by the simple process used to create the short lines found in some Wari tie-dyed textiles.

RESIST PATTERNING IN OTHER HIGHLAND ANDEAN TEXTILES

An undyed squared donut shape set on the diagonal within a dyed background is the visual evidence of tie-dyeing, the resist-patterned technique in which small "tents" are formed in

the fabric with each tent being tightly tied together after its formation. After tying is complete, the entire fabric, ties and all, is dyed, but the portions of the fabric that are tightly bound by the ties do not absorb dye. After dyeing, setting with a mordant, and drying, the ties are removed and the characteristic pattern of undyed squarish shapes appear as undyed areas against a dyed background. These shapes are always set on the diagonal to the x-y coordinate system established by the loom. The tents created by the tie-dyer form taut ridge lines in the warp and weft (x and y) directions, but the areas of the tent surface that are on the bias are stretched out less tightly and form the four sides of the typical tie-dyed pattern.

Chavín Tie-dye

The tie-dye process first appeared in the Andean textile record in textiles created by the Chavín culture (Figure 19; Conklin n.d.). The technique reappears in the surviving textiles of the highland cultures of Tiwanaku and Wari, cultures that also show extensive iconographic influence from Chavín art. Tie-dye technology is also used in the textile arts of other parts of the world, most notably in Japan where it is referred to as *shibori*, but the Chavín textiles are the earliest ones known to have been decorated with this technique.

Pucará Tie-dye

Midway between Chavín and Aguada, both chronologically and geographically, and located along the north-south altiplanic highway (Figure 1) was the Pucará culture. It is known to have influenced the development of Tiwanaku art and culture. One textile attributed to Pucará has been published (Conklin 1983). It is a tapestry-woven sash like those worn by the minor figures carved on Tiwanaku's stone Gate of the Sun. The tapestry sash has representations of several faces and trophy heads, but the

major decorative pattern is a display of white, squared donut shapes set on the diagonal (Figure 20). This pattern occurs frequently on Pucará ceramics and characteristically indicates the spotted coat of the puma. Here this special pattern, executed in tapestry weave, but without any associated feline attributes, seems to represent tie-dyeing, which, in turn, probably represented the spots of a feline. The initial Chavín tie-dyed image represented the markings of a feline, and subsequent Peruvian tie-dyeing no doubt carried that feline association for hundreds of years. The pattern on the Pucará textile that is apparently a representation of a tie-dyed pattern implies the existence of real tie-dyed textiles in the Pucará culture. This suggestion fills a gap along the altiplanic transmission route from Chavín to Aguada. The geometry of the representation is precisely that of later real Andean tie-dyeing, but the colors seem to be reversed, as we shall see, from those in post-Pucará multi-colored tie-dyed examples, as for example, in the Tiwanaku dyed textile from Ilo (Figure 21; and see below) that has yellow patterns on a red background, rather than the predominately red patterns on yellow of the Pucará textile.

Tiwanaku Tie-dye

Prior to the analysis of this Aguada textile, tie-dyeing had been noted in a few other fabrics in the Museo Arqueológico R.P. Gustavo Le Paige, S.J. collections. All of these previously known examples had been attributed to the Tiwanaku culture. Two of these textiles have been briefly recorded in the rare published records of Tiwanaku tie-dyeing.

Four examples of Tiwanaku tie-dye can be examined. The first is a textile fragment (Figure 21) collected by the archaeologist Gary Vescelius in 1964. This tie-dyed fragment was associated with a fine scale interlocked tapestry fragment that had elaborate Tiwanaku iconography.

Both fragments were found in a looted tomb near Ilo, Peru. Vescelius made an extensive collection of textile fragments from southern Peruvian coastal areas. All of these, although lacking extensive associations, do have site proveniences. These fragments are now in the American Museum of Natural History. The Ilo/Tiwanaku tie-dyed fragment numbered 874 by Vescelius has a regular pattern of squared forms set on the diagonal. The squared forms are light yellow against an all-over red background, indicating that the textile was dyed yellow before the tying occurred, and before its subsequent red dye bath. The textile, a weft-faced plain weave, is constructed entirely of camelid fiber with S-ply and Z-spun warps and wefts spaced at about 5 warps per cm with 8 wefts per cm.

The second example of a Tiwanaku tie-dyed textile is from a San Pedro grave, and is part of the grave goods of mummy 2788, from the Quitor 6 burial ground excavated by Padre Le Paige in 1962. Shortly after its excavation, Ingeborg Lindberg, who was then doing textile research at the museum, gave a paper in Santiago on the textiles from that grave, and published her talk as a brief article (Lindberg 1963). She describes the extensive evidence for the Tiwanaku attribution, including the presence of several Tiwanaku-style carved wooden pieces of snuffing equipment. Her paper includes a diagram of a rectangular textile (Figure 22) associated with the mummy but whose location on the mummy and role as clothing is undisclosed. The textile is constructed with a central horizontal section of patterned tapestry but with eight upper and eight lower alternating red and blue conjoined tie-dyed textile sections. Figure 23 is a photograph of a portion of one of the tie-dyed sections of that textile. The tie-dyed squarish forms are set on the diagonal as they inherently are in the tie-dye process, and are arranged along diagonal lines as well. The red and blue sections, each 50 x 42 cm, were presumably

created as parts of color-coherent textiles; that is, joined squares were dyed either red or blue, then taken apart and rejoined to form a red and blue color checkerboard. Their rejoining, however, differs technically from similar Huari rejoining in that the adjacent warp selvages are sewn together with a figure-eight whipping stitch rather than having been de-warped and then re-warped. The tie-dyed textile from mummy 2788 is constructed entirely of camelid fiber with about 14 wefts per cm and 6 wefts per cm in the tie-dyed sections and thus it is somewhat finer construction than the Tiwanaku tie-dyed piece from Ilo.

A third Tiwanaku tie-dyed textile was found in a grave in the Quitor 7 cemetery excavated by Padre Le Paige and labeled Quitor 7, Tomb 3137 (Figure 24). The cemetery is one of the San Pedro burial grounds whose foreign materials are believed to have predominately Tiwanaku associations. The tie-dyed pattern and colors seem almost identical to the fragment recovered from Ilo by Gary Vescelius. The hollow square pattern is set on the diagonal to the matrix of the warp and weft, a placement typical of all Andean tie-dye. Of great interest is the fact that the square form is also light yellow against a red background, like that of the textile shown in Figure 21. This implies a pre-dyeing of yellow with a final dyeing, after tying, with red. The Ilo, Peru and San Pedro de Atacama, Chile locations of these two complex, but seemingly technically identical Tiwanaku textiles says something remarkable about the distribution of the products, or the technology and know-how, of the Tiwanaku culture.

The fourth Tiwanaku tie-dyed textile is one from Tomb 3937 located in another San Pedro burial ground, Coyo Oriente (Figure 25). This textile was previously cited in a paper essentially concerned with the concept of ethnicity (Rodman 1992). The most complete of all of the Tiwanaku tie-dyed textiles herein described, it

is also technically the most sophisticated. It was a complete tie-dyed tunic, the only other apart from the Aguada tunic, that has been archaeologically recorded in the Andes. It is constructed of weft-faced plain weave, with the warp running horizontally, as in all highland Middle Horizon tunics. Each face is constructed of four textile panels arranged in a checkerboard of red and blue. It seems likely that the panels were originally fastened and dyed together, blue with blue, red with red, and then later separated and sewn together into a checkerboard. The vertical center join has a diagonally patterned seaming stitch, while the horizontal seam was probably de-warped and then re-warped, that is, held together by the insertion of a new warp that replaced the terminal warp of each adjacent textile.

The most interesting aspect of the textile, however, lies in the design of the individual tie-dyed patterns. They share with other Andean tie-dyeing, the rounded-corner square pattern set on the diagonal, but it is not a simple hollow square as are the previously described textiles. Portions of each are patterned with alternating undyed and dyed forms to create a pattern resembling tree rings, but other portions are patterned with radial segments of un-dyed material (Figure 26). Most astonishing however, is the fact that these complex patterns were created independently but identically on the red and on the blue textiles so that when the two were joined in a checkerboard, the patterns, most improbably, matched exactly. A partial processual explanation might suggest the use of multiple rings of tie-dye strings. It is undoubtedly the most complex tie-dyed pattern known from Andean materials. It embodies the technical know-how of the Tiwanaku weavers and attests to their wide-spread influence.

Tiwanaku Representations of Tie-dyeing on Stone Sculpture

A general similarity can be noted between typical tie-dyed patterns and the patterned squares carved in stone on the lower portions of several of the stele in Tiwanaku such as those carved on the Stela Bennett that seems to represent clothing (Figure 27). The upper portions of the stone statues have textile representations that closely resemble Tiwanaku textiles found in burials (Conklin 2004). These lower patterns differ on the various stelae but all seem to be representing a form of clothing, perhaps an item like a priest's skirt or a kilt, not found in the archaeological record, and not found in either preceding or subsequent Andean cultures.

Huari Tie-dye

The tie-dyeing associated with the Huari culture of ancient Peru sometimes used a complex version of the tying-and-dyeing process employing multiple colors and creating multiple shapes of cloth. Several individually woven sections were subsequently woven together, using common warps, and were then tie-dyed in a given color. When the tie-dyeing was complete, the common warps that joined the separate pieces of cloth were removed, the pieces were separated and re-combined with other pieces that had been tied and then dyed in other colors, by inserting new warps, together forming a multicolor patchwork of tie-dyeing. Weft selvages were also then usually stitched together. For one example of this technique see Figure 28.

CONCLUSIONS

The "Aguada" tunic discussed in this article incorporates the Chavín-inspired tie-dyeing and area resist-patterning techniques found in Tiwanaku and Wari textiles, but is apparently

technically more complex and advanced in one respect than typical Wari and Tiwanaku examples. The special Aguada technique of linear resist could produce images and complete designs, not just patterns. The Aguada culture, according to González (1998), is approximately coterminous with Wari and Tiwanaku. The radiocarbon date for the Q2, 1983:15 burial is approximately 660AD,³ placing it within the time frame of both Wari and Tiwanaku (Beren-guer 1997). It seems reasonable to think that the use and popularity of such a specialized textile design technique in three highland Andean cultures at the same time constitutes evidence of cross-cultural communication with technology crossing boundaries as readily as iconography. The Aguada resist-patterning technique, although not yet fully understood, appears to be technically sophisticated in that it permits outline representation and not just spots. However, the dyeing of separate patterned and colored textiles that are then separated and rejoined, as well as the use of the basic tie-dyeing technique common to all three of these contemporaneous cultures, are such specialized textile patterning techniques that communication rather than independent invention is clearly implied.

Discussions of altiplanic communication have focused on trade routes and caravans (Núñez and Dillehay 1995) and these were no doubt the important mode of transport of products, but specialized weaving ideas can really only be carried by weavers to other weavers, with mother-to-daughter perhaps being the prototypic form of such technical transmission. Weaving the complex iconic images of any of these cultures involves not only the techniques required to bring the image into its full being, but also intimate perceptions of the meanings associated with iconic details. Andean textiles seem never to be mere copies of each other, but

always appear to be fresh creations. This implies that the transportation of the idea of resist-patterning and tie-dyeing must have involved the actual transportation of weavers, not just their products. The altiplano of the north/south Andes, perhaps like the Silk Road of ancient Asia, must have been as much a highway for living ideas carried by people in their heads as much as it was a highway for products.

Although the technique and concept of tie-dyeing was an invention of Chavín weavers, with Chavín ideas somehow permeating that mountainous route to all subsequent Andean highland cultures, it seems reasonable to think that some time after the sowing of those initial idea seeds, there was a “tie-dye horizon”, a period in the ancient Andes when a new way of creating designs on textiles, a method distinct from the common structural patterning methods such as tapestry, came into popularity and gradually spread from culture to culture with each developing distinct styles. Additional exact creation dates for individual tie-dyed textiles from each culture would certainly be of interest, but the broad pattern of evidence seems to indicate a widespread resonating exchange of ideas between these three very advanced and venturesome weaving cultures (Torres and Conklin 1995). This concept of a resonating horizon, with cross-cultural ideas, adds a communicative role to the exchange of alien artifacts and frees us from seeing them only within the prestige-related framework of the concept of *exotica* (Goldstein 2000).

In addition to the child's tunic with the Aguada designs and the specialized tie-dyeing, two other textiles in the Q2, 1983:15 mummy bundle seem alien to San Pedro. These are the richly-patterned bag with the unprecedented drawstring (Figure 11) and the interlocked tapestry belt (Figure 15). Both have possible Aguada affiliations. If the buried person had access to one Argentine textile through trade or

³ Beta Analytics (C14) 1190±50 BP, (C13) adjusted 1290 ±50BP.

exchange, he could logically have had access to others as well.

San Pedro de Atacama appears to have been a nexus in a trading and exchange network for a range of highland Andean cultures and became a recipient of textiles from two of the three chronologically concurrent, tie-dye producing cultures: Tiwanaku, Aguada and Huari. None of these cultures, however, had in its homeland the desert conditions of San Pedro de Atacama which preserve textiles so well and thus provide opportunities for understanding altiplanic inter-cultural relations.

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APPENDIX

MATERIALS RECOVERED IN DISASSEMBLY OF MUMMY QUITOR 2, 1983:15. The individual objects in the burial are herein given object numbers (such as Obj. No: C 1; Obj. No: C 2). These numbers coincide with the conservation numbers assigned during the disassembly of the mummy.

Order of Description

Object number

1. Type of object
2. Dimensions (cm)
3. Material & colors (warp and weft, stitching)
4. Structure and designs
5. Condition
6. Position on mummy

No:	C 1
1	Tunic "exterior tunic"
2	L: 64 cm; W: 70 cm
3	Camelid • Warp: Z-spun, 2S-ply, tan; selvage: black chain stitch binding • Weft: Z-spun, 2S-ply, tan; selvage: tan chain stitch embroidery, black stitching
4	Warp-face, plain weave.
5	One side complete; other fragmentary. Darning repair at armhole area. Neck slot sewn closed.
6	Exterior – not worn as a tunic, but placed over front of head and upper part of the mummy.

No:	C 2
1	Mantle
2	L: 1.75 m, W: 1.06 m
3	Camelid • Warp: Z-spun, 2S-ply, black, brown, beige. Selvage: black chain stitch embroidery over 8-10 warps • Weft: Z-spun, 2S-ply: beige
4	Warp-face, plain weave, warp stripe pattern. Brown mantle, 13cm beige stripe and 35cm black stripe at end of mantle.
5	Incomplete and fragmented at one end.
6	Wrapped lower part of mummy, then folded under mummy.

No:	C 3
1	<i>Bolsa</i>
2	L: 16 cm, plus 3cm loop closure; W: 13 cm
3	Camelid • Warp: Z-spun, 2S-ply: red, yellow, black, brown • Weft: Z-spun, 2S-ply: brown • Loops for closure and drawstring: Z-spun, 2S-ply: brown
4	Warp-face transposed twining. 2 sets of paired warps of a given color move diagonally to create a pattern with warp ends fixed and twining symmetrical. • Left side (6.5 cm): red rectangles on brown ground. • Right side (6.5 cm): red and black diagonal zig-zag lines on yellow ground. • Side seams stitched . • Brown loops attached to heading cords hold a drawstring to close bag..
5	Excellent condition.
6	Front of right shoulder of mummy, with <i>Bolsas</i> Nos. C4 and C5 (<i>Bolsa</i> C3 contained objects C3A through C3G).

No:	C 3A
1	<i>Bolsa</i> (contained algarrobo & other seeds)
2	Diam: approx. 11 cm. Ht: approx 11cm
3	Camelid • Z-spun, 2S-ply: beige
4	Single-element construction, looping, spiral weave?
5	A reused piece of textile, tied at about 6cm to form a small bag.
6	Front of right shoulder, inside <i>Bolsa</i> C 3.

No:	C 3B
1	<i>Bolsa</i> (not opened: hard packed, probably filled with seeds)
2	Diameter 3 cm; height approximately 8 cm
3	Camelid • Z-spun, 2S-ply: beige
4	Plain weave.
5	A reused fragment of textile with small piece of edge binding. Tied at 2cm to form a small bag.
6	Front of right shoulder, inside <i>Bolsa</i> C 3.

No:	C 3C
1	<i>Bolsa</i> (not opened; possibly filled with small rocks)
2	Diameter 3 cm; height approximately 4 cm
3	Camelid • Z-spun, 2S-ply; beige
4	Plain weave.
5	Fragment of old textile, tied with plied cord at approximately 2.5cm to form a small bag.
6	Front of right shoulder, inside <i>Bolsa</i> C 3.
No:	C 3D
1	Bracelet of lapis, inside <i>Bolsa</i> C 3
No:	C3E
1	Quartz scraper; 2 pieces of obsidian; 7 broken points with debitage, inside <i>Bolsa</i> C 3
No:	C3F
1	Organic substance (potato?), inside <i>Bolsa</i> C 3
No:	C3G
1	Small leather bag, inside <i>Bolsa</i> C 3
No:	C 4
1	<i>Bolsa</i>
2	Diameter 7 cm; height approximately 9 cm
3	Camelid • Z-spun, 2S-ply; beige
4	Plain weave.
5	Reused fragment, tied at approximately 4cm to form bag.
6	Placed at front of right shoulder, with <i>Bolsas</i> C3 and C5.
No:	C 5
1	<i>Bolsa</i> (not opened; packed with soft leaves?)
2	Diameter 6 cm; height approximately 9 cm
3	Camelid • Z-spun, 2S-ply; beige
4	Plain weave.
5	Reused fragment, tied at 4cm to form bag.
6	Placed at front of right shoulder, with <i>Bolsas</i> C3 and C4.
No:	C 6
1	See No. C8

No:	C 7A & C 7B
1	Cords on exterior of mummy
2	C 7A diameter 0.8 cm; C 7B diameter 0.4 cm
3	Vegetable fibers: brown
4	Z-spun, 2S-ply, Z re-ply – 3 sets of 2-ply.
5	Broken and brittle, many knots.
6	On exterior of mummy bundle.

No:	C 8
1	Tunic
2	L: 71 cm; W: 54 cm
3	Camelid • Warp and weft: Z-spun, 2S-ply; beige with red and blue resist patterning
4	Warp-face plain weave A child's tunic consisting of 2 joined textiles on both the front and back. Each panel had resist-patterning, had been dyed separately, and then joined with a dovetail join; shoulders also were joined with dovetail. • Upper Panel: reclining feline with recurved tail; Side 1: Red; Side 2: Blue. • Lower Panel: double-headed snake with/serrated body; Side 1: Blue; Side 2: Red. • Sleeve Binding: weft selvedge: chain stitch embroidery over 3-4 wefts; red and beige on red panel; blue and beige on blue panel. • Neck Slot: very well made; not bound, not reinforced. • Bottom of tunic: warp selvedge. • Red Panel: Chain stitch embroidery over a doubled heading cord with occasional 4cm sections, using tan thread to create a patterned selvedge, alternating 3 tan with 3 red stitches.. • Blue Panel: Bound in same manner, alternating 3 tan with 3 blue stitches.
5	Fragile: one side quite complete: other side is partially destroyed, blue panel has some repair, and a fragment of blue panel is detached.
6	Folded and placed over the head of the mummy and secured around the neck.

Note: Textile fragment originally assigned No. C6 was determined to be a small piece from No. C8. Both parts were then assigned No. C8.

No:	C 9
1	Tunic "interior tunic"
2	L: 85 cm; W: 90 cm
3	Camelid • Warp & Weft: Z-spun 2S-ply: beige-yellow
4	Warp-face, plain weave • Neck slot: 10cm brown embroidery reinforcement at each end . • Bottom selvedge and sleeve openings: Beige-yellow binding, straight whipping stitch. • Side seams and neck opening: crudely closed with tan thread.
5	Fair condition.
6	Pulled over the face and head of the mummy; below Tunic C 8.

No: C 10	
1	Tunic
2	L: 78 cm; W: 78 cm
3	Camelid • Warp & Weft: Z-spun, 2S-ply: brown.
4	Warp-face, plain weave.
5	Deteriorated; very worn, much repaired. Side seams, sleeve openings and neck slot were all closed with crude stitching.
6	Tunic was turned upside down and pulled up over the feet of the mummy. Bottom edge of tunic extended just below the shoulders and covered the knees.

No: C 11, C 12 and C 13	
1	Cactus spines • C 11: On right side of face, securing Tunic C 14 • C 12: On left side of face, -----“-----”----- • C 13: On forehead area, -----“-----”-----

No: C 14	
1	Tunic
2	L: 80 cm; W: 75 cm
3	Camelid • Warp and Weft: Z-spun, 2S-ply, brown
4	Warp-face, plain weave.
5	Reused textile – very worn, full of holes and many repairs.
6	Textile crudely folded under the chin, over <i>Bolsa</i> C 17, as a support for the head of the mummy (textiles Nos. C15 and C16 were inside the folds of Textile No. C14).

No: C 15	
1	Textile Fragment
2	L: 50 cm; W: 50 cm
3	Camelid • Warp: Z spun, 2S-ply, black & beige • Weft: Z-spun, 2S-ply, beige
4	Warp-face, plain weave. Warp stripe pattern, similar to Mantle C2.
5	Reused textile, very deteriorated.
6	Inside textile C14, part of neck support for mummy.

No: C 16	
1	<i>Bolsa</i> (not opened; hard-packed and associated with a piece of copper ore).
2	Diameter approximately 3 cm; height approximately 5 cm.
3	Camelid.
4	Single element construction, spiral looping; similar to <i>Bolsa</i> C3A.
5	Reused fragment of textile, tied to form small bag.
6	Inside textile C14, part of neck support for mummy.

No:	C 17
1	<i>Bolsa.</i>
2	L: approximately 30 cm; W: approximately 36 cm
3	Camelid • Warp: Z-spun, 2S ply, black, beige, brown • Weft: Z-spun, 2S-ply
4	Warp-face, plain weave; warp stripe pattern. Weft selvage: chain stitch embroidery, black.
5	Very deteriorated and much repaired.
6	Over the head of the mummy – under tunic C 9 and neck support C 14.

No:	C 18
1	Tunic with attached “strap”
2	L: 95 cm; W: 80 cm; Neck slot: L: 32 cm; Strap: L: 70 cm, W: 3 cm
3	Camelid <i>Tunic:</i> Warp: Z-spun, 2S-ply, wrapped: bi-chrome core of beige and brown; wrapped with loose brown or black camelid fiber in S direction (same direction as ply of core). Weft: Z-spun, 2S-ply: Bi-chrome, beige and brown <i>Strap:</i> Warp and weft: Z-spun, 2S-ply: beige <i>Sewing cords:</i> Multiple ply: beige
4	<i>Tunic:</i> Co-directional wrapping, warp-faced; black warp stripe at sides. <i>Strap:</i> Warp-face, plain weave; Flat strong strap attached to one side of tunic, near center of bottom.
5	Excellent condition. Very heavy textile, weighs approximately 20 lbs.
6	Next to body–Bottom of tunic is sewn shut.

No:	C 19
1	Loin Cloth
2	L: 56 cm; W: 36 cm
3	Camelid • Warp & Weft: Z-spun, 2S-ply, beige
4	Warp-face, plain weave: 2 warp selvages on narrow dimension; weft selvages are torn. Heading cords have added strings, probably attached to hold up the loin cloth.
5	Disintegrating, stiff and very wrinkled.
6	In bottom of Tunic C18.

No:	C 20
1	Cords
2	2 pieces: (1) 10m x 30 cm; (2) 7m x 85cm
3	Camelid • 2 Z-spun, S-ply: 8 Z-reply; Z8 S2Z • 8 strands of 2 ply, Z re-plyed
4	
5	Very good condition, pliable and soft.
6	Cordage used directly around the body.

No:	C 21
1	Belt with continuous ties
2	Belt: L: 154 cm; W: 6 cm; ties: approximately 43cm at each end of belt
3	Camelid • Warp: Z-spun, 2S-ply, black • Weft: Z-spun, 2S-ply, multi-colors, tan, red, green, brown
4	Interlock tapestry: geometric pattern of squares.
5	Very worn and dirty, much used.
6	Wrapped around body directly, 2-3 times. May have supported loincloth.

Radio carbon date
Beta Analytic Inc.

Organic material C-14 Age Years BP 1190 ± 50
C-13 Adjusted age 1290 ± 50

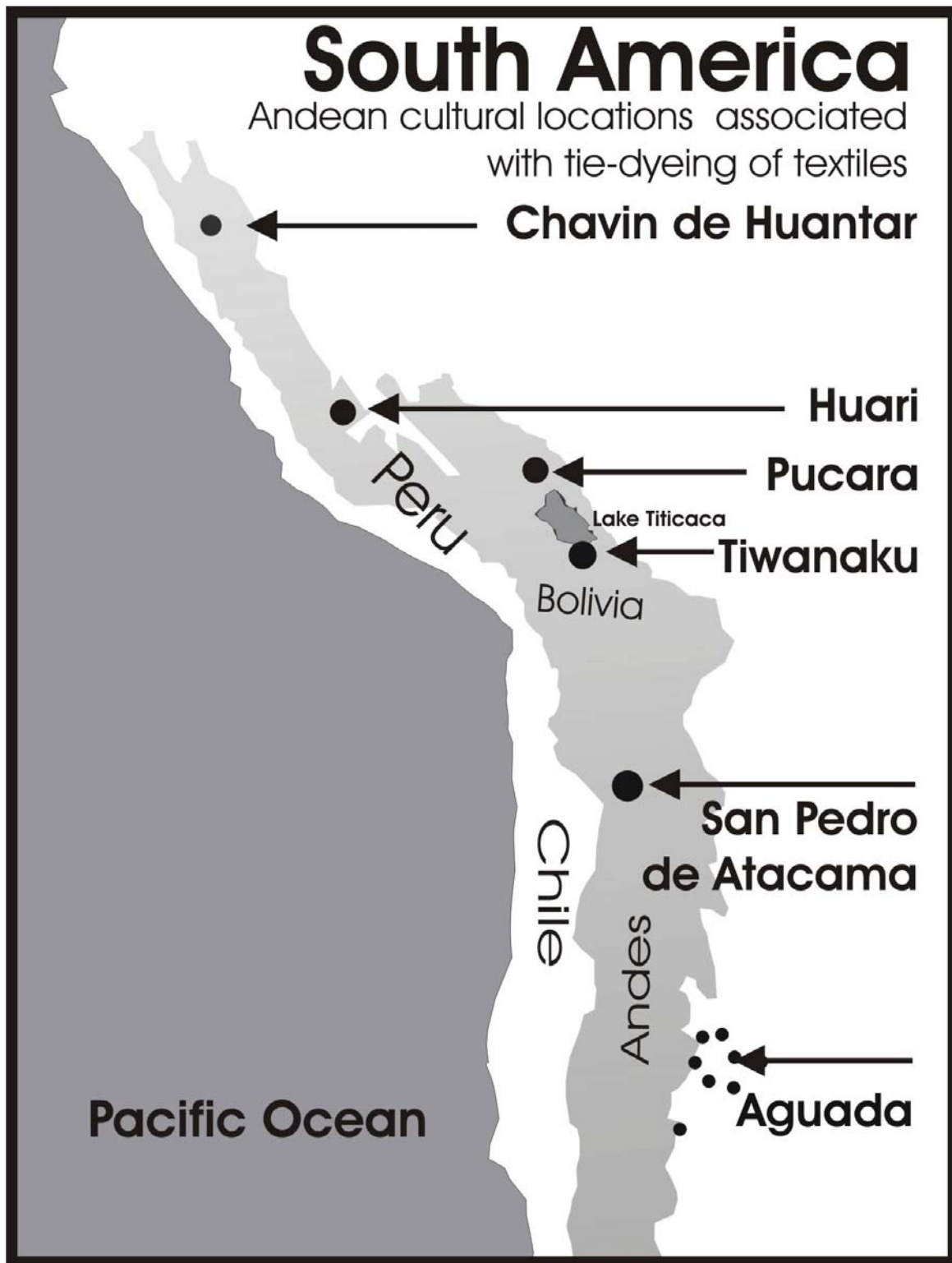


Figure 1. Map showing the locations of the Andean highland sites that can be associated with the creation of tie-dye textiles.



Figure 2. A close-up view of the tie-dye pattern distinguished by the authors on a San Pedro de Atacama mummy.



Figure 3. The fully clothed mummy (Quitor 2.1983:15) as first seen in the Museo Arqueológico R. P. Gustavo Le Paige S. J., in San Pedro de Atacama, showing the tie-dye textile over the head. Note the seated burial position, also the group of bags on the right shoulder.

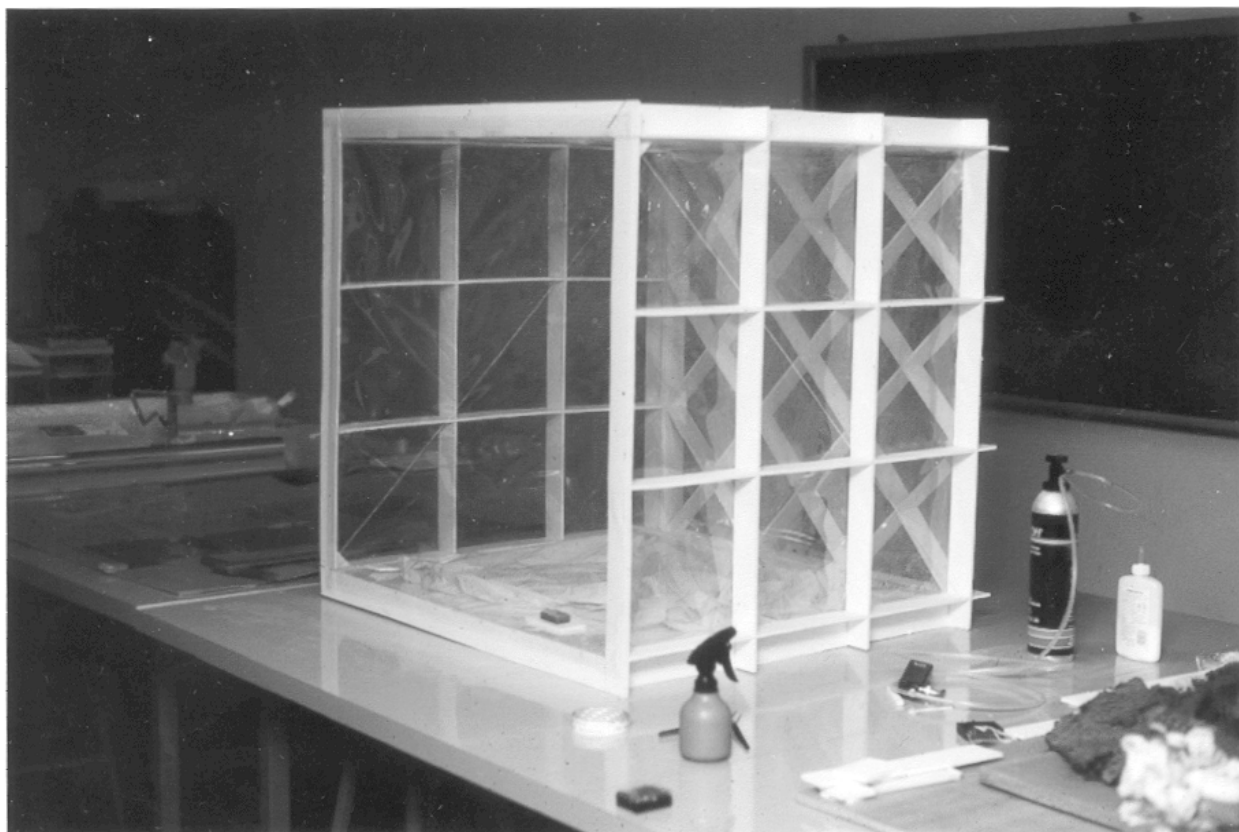


Figure 4. The Humidification Chamber. After the mummy, securely seated on a tray, was positioned inside, moisture was introduced and a hygrothermograph and thermometer were installed. The transparent chamber was then sealed, and the changes in internal humidity and temperature could be monitored and recorded.



Figure 5. The mummy seated on the sliding tray-support. The mummy at this stage of disassembly remains inside the very heavy tunic of co-directional weaving (No. C18), and the striped bag (No. C17) is over the head.

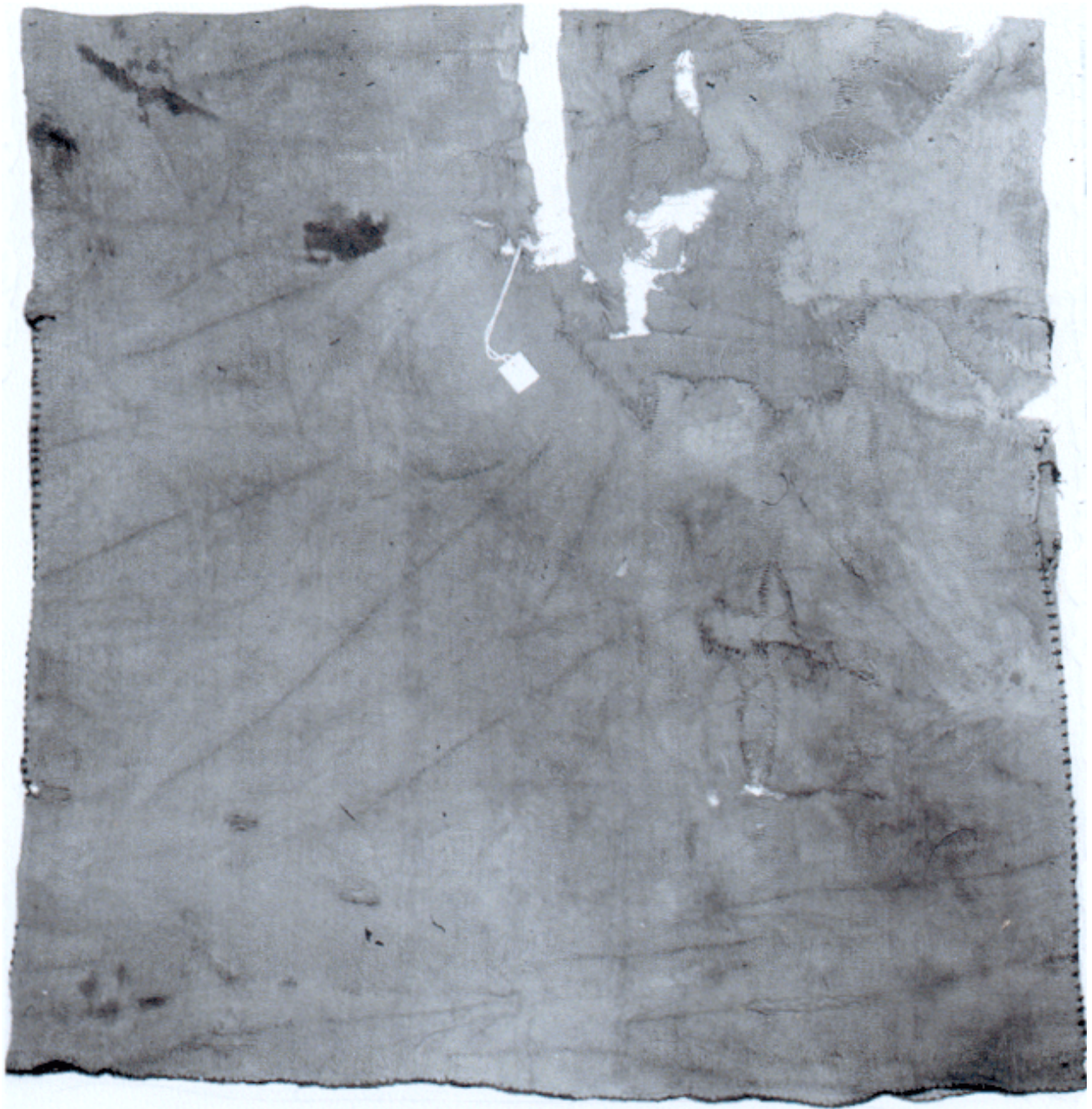


Figure 6. The exterior tunic (No. C1) is a tan, warp-faced plain weave. Chain stitching of black camelid fiber is used along the bottom selvage.



Figure 7. The tie-dyed textile (No. C8) covered the head and shoulders of the mummy, and was secured around the neck.



Figure 8. The tie-dyed tunic (No. C8) as it appeared when removed from the mummy and after preliminary conservation. In the upper blue quadrant, there is a feline with a recurved tail. In the lower red quadrant, there is a serrated, double-headed serpent. Both icons are similar to the iconography seen on Aguada ceramics.

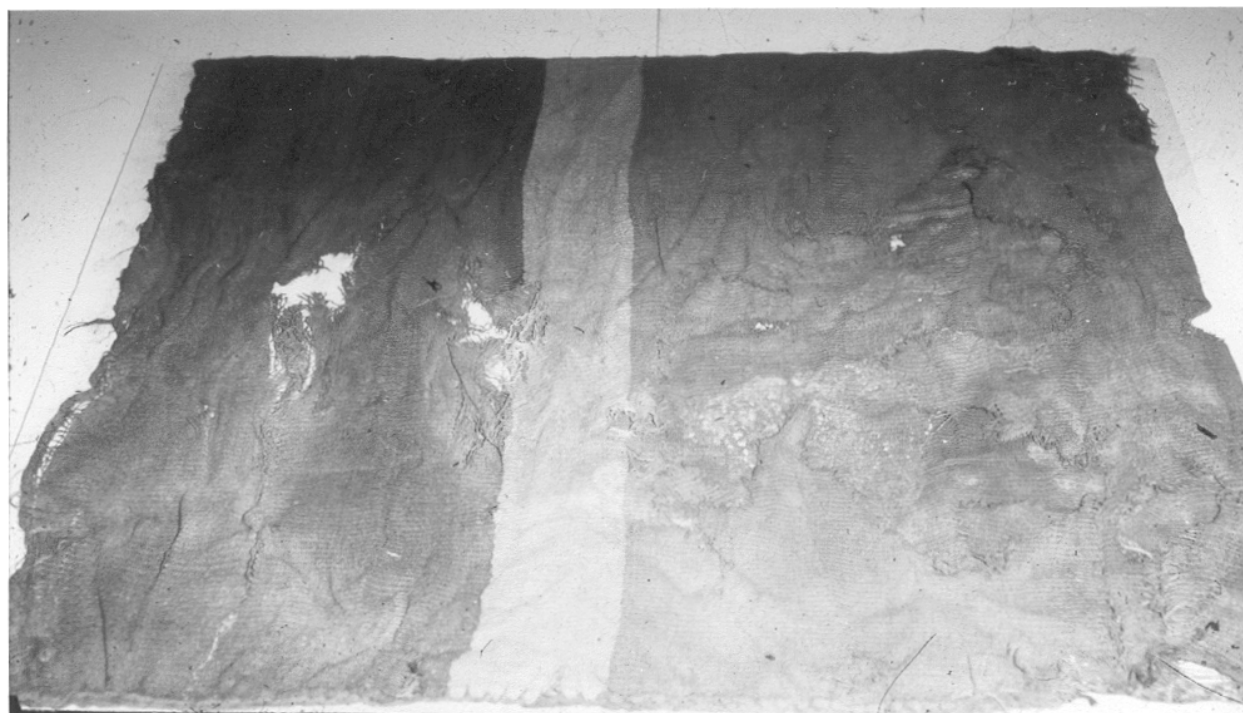


Figure 9. A large striped textile (No. C2), perhaps a mantle, covered the lower part of the mummy. The beige band is bordered by black and brown.



Figure 10. A striped and fragmentary bag (No. C17) had been pulled down over the head and face of the mummy.

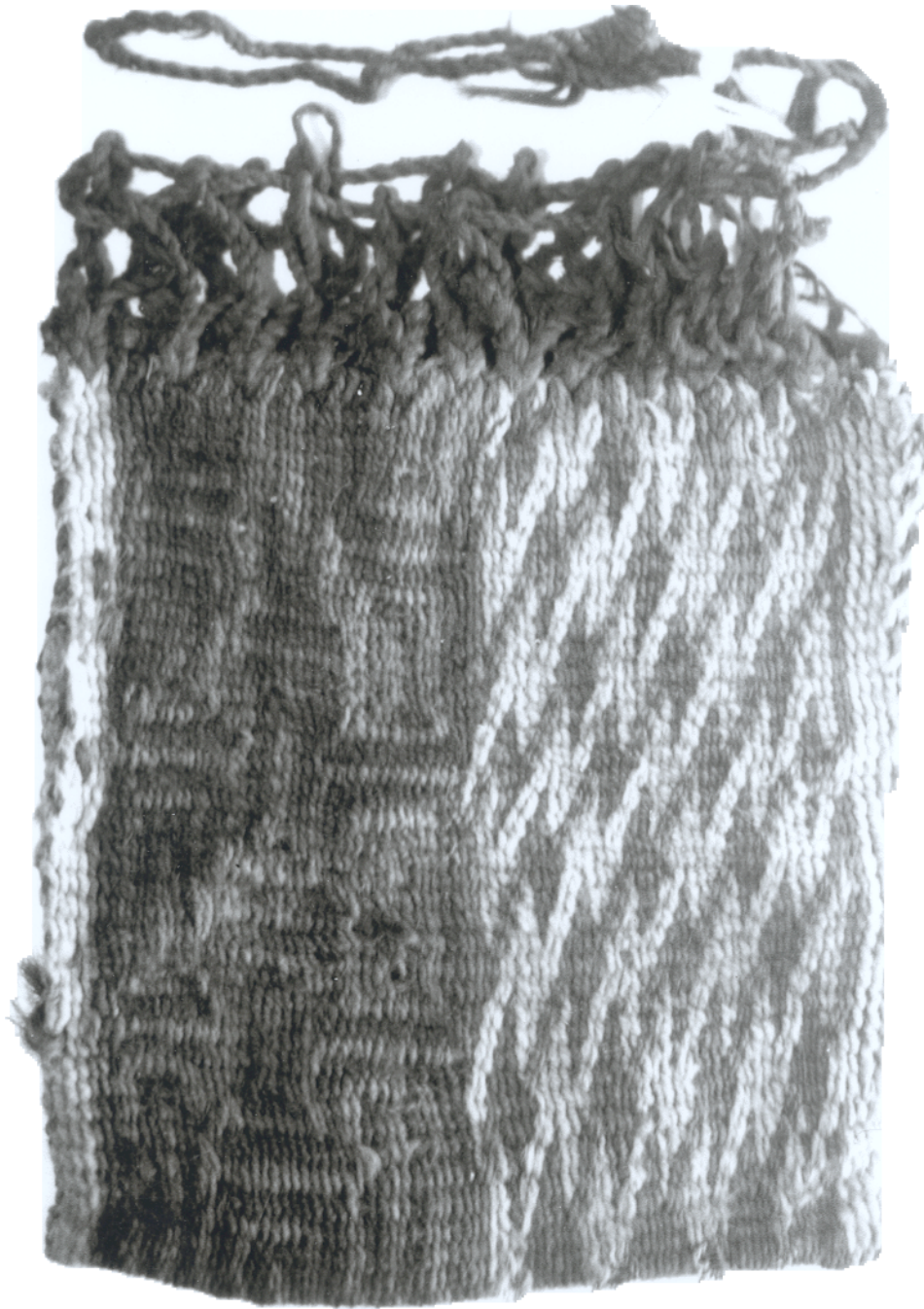


Figure 11. A bag (No. C3) of asymmetric twining with transposed warps. The patterns show rectangles on the left and zigzag lines on the right.

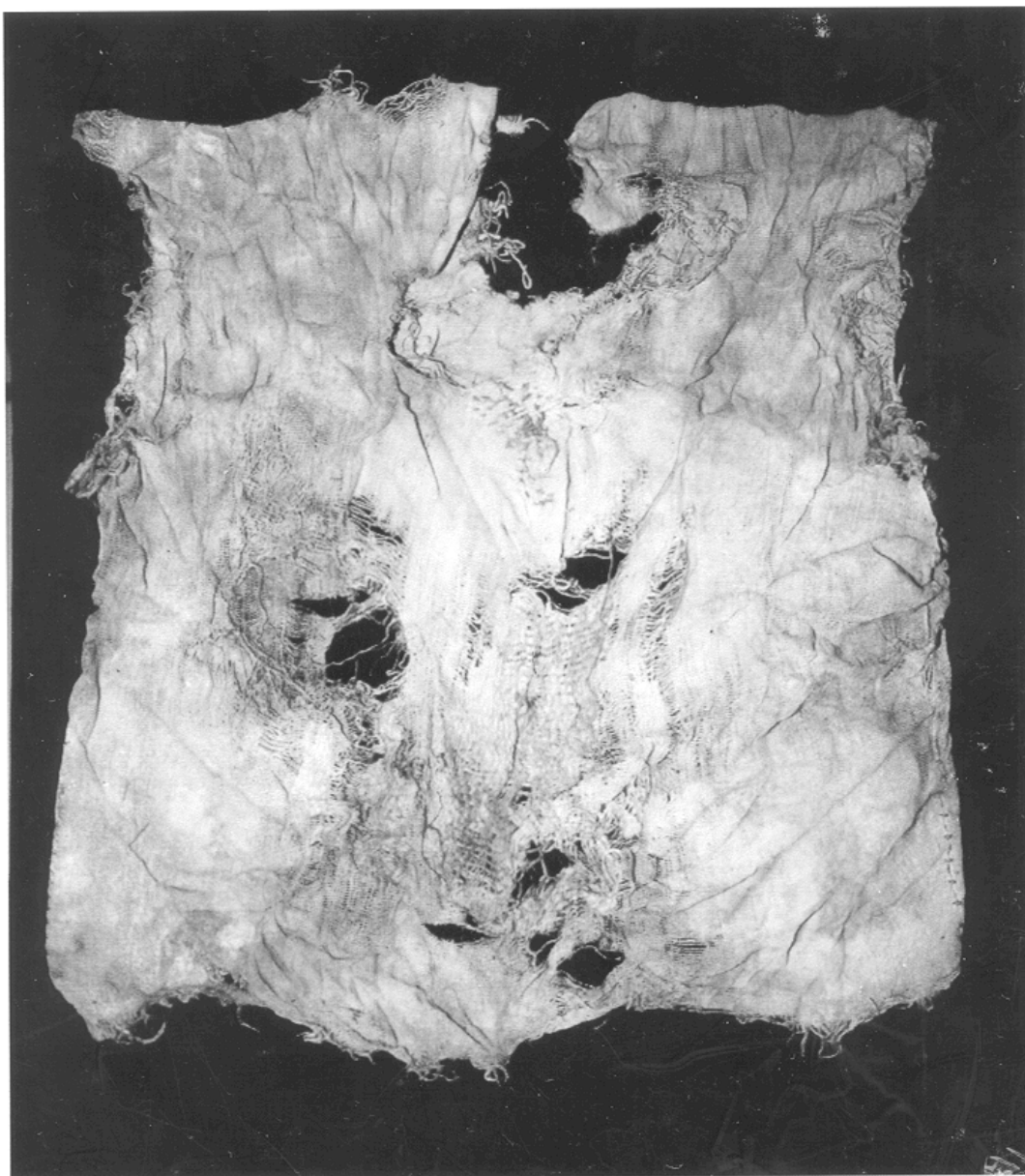


Figure 12. A tunic (No. C14), very worn and repeatedly mended, was used to create neck support for the mummy.

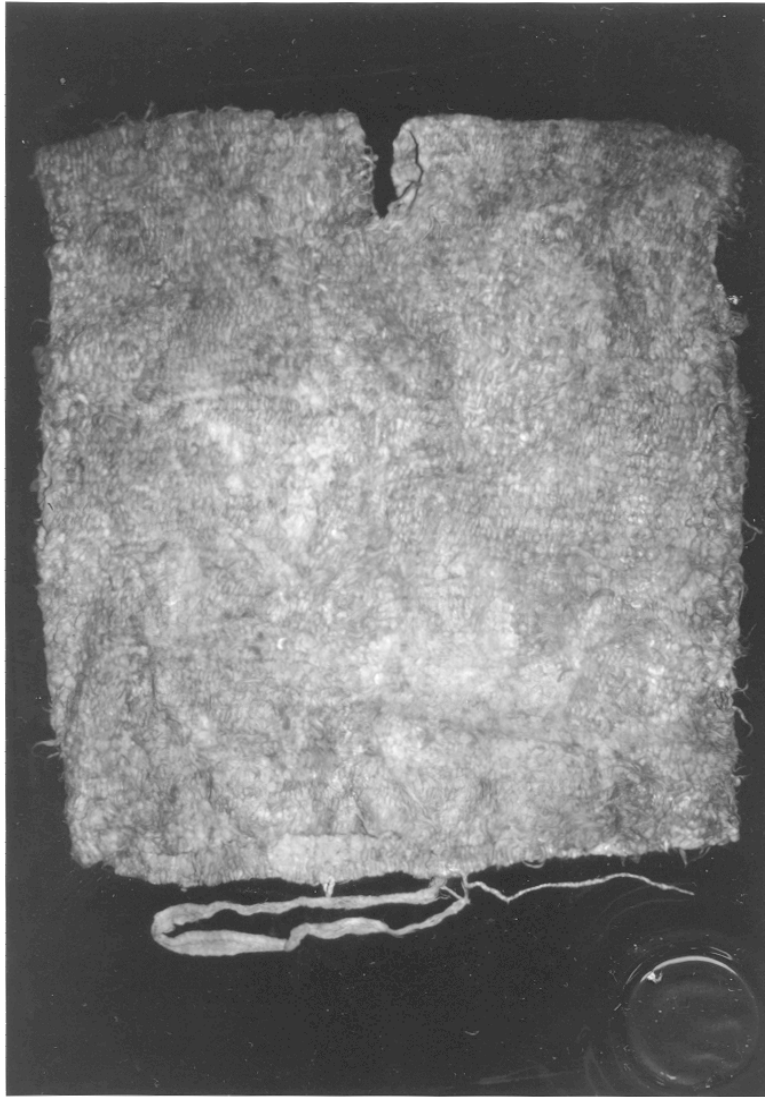


Figure 13. This very coarse and heavy tunic (No. C18) closed with stitching at the bottom, surrounded the body of the mummy. The thick threads of the plain weave were created by co-directional wrapping. A long, flat strap was attached to the front bottom edge.

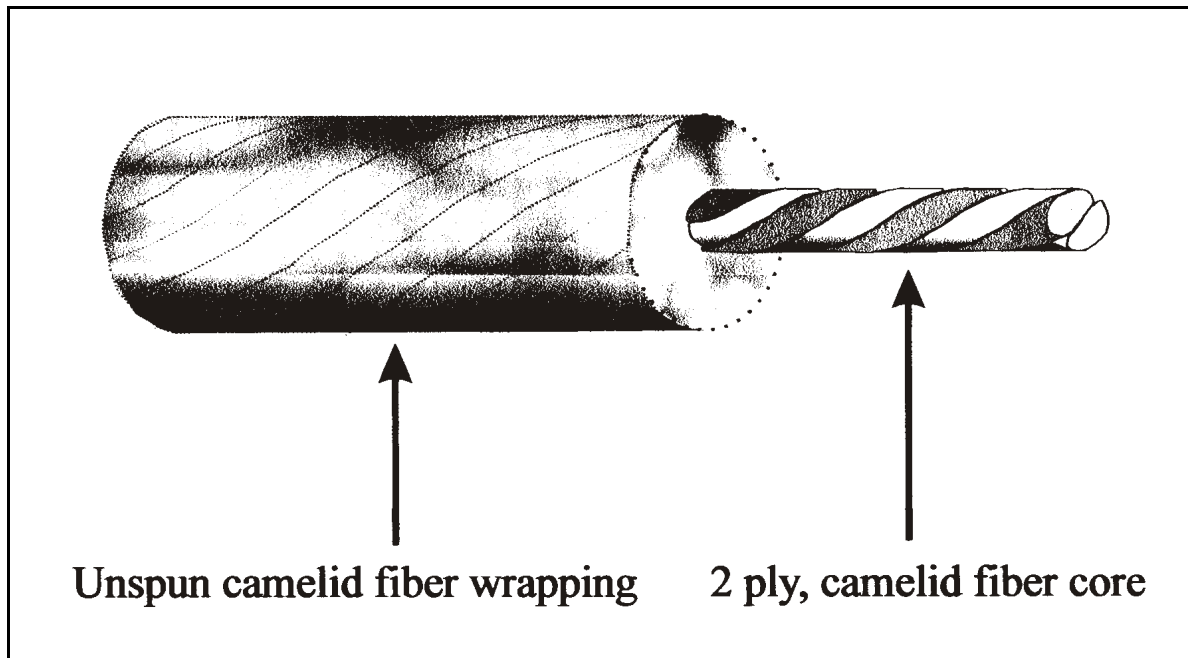


Figure 14. Drawing of co-directional wrapping. To produce a very thick textile, the spinners wrapped un-spun camelid fiber around a two-ply thread with the wrapping co-directional with the plying of the thread.

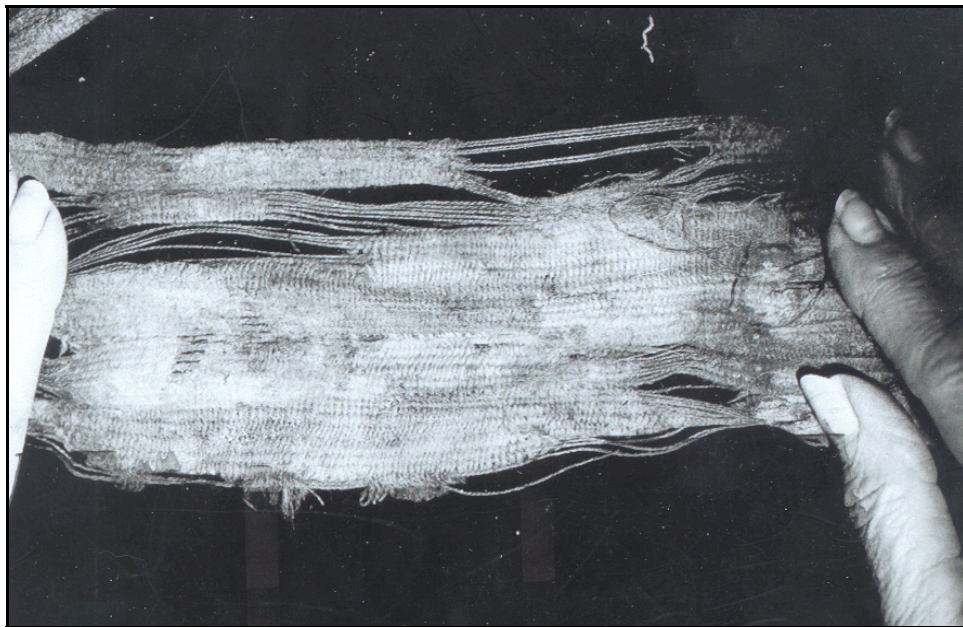


Figure 15. A belt (No. C21) constructed with black warps and multicolor wefts in interlocked tapestry. The weft colors form a linear, undulating geometric pattern in tan, green, brown and red.

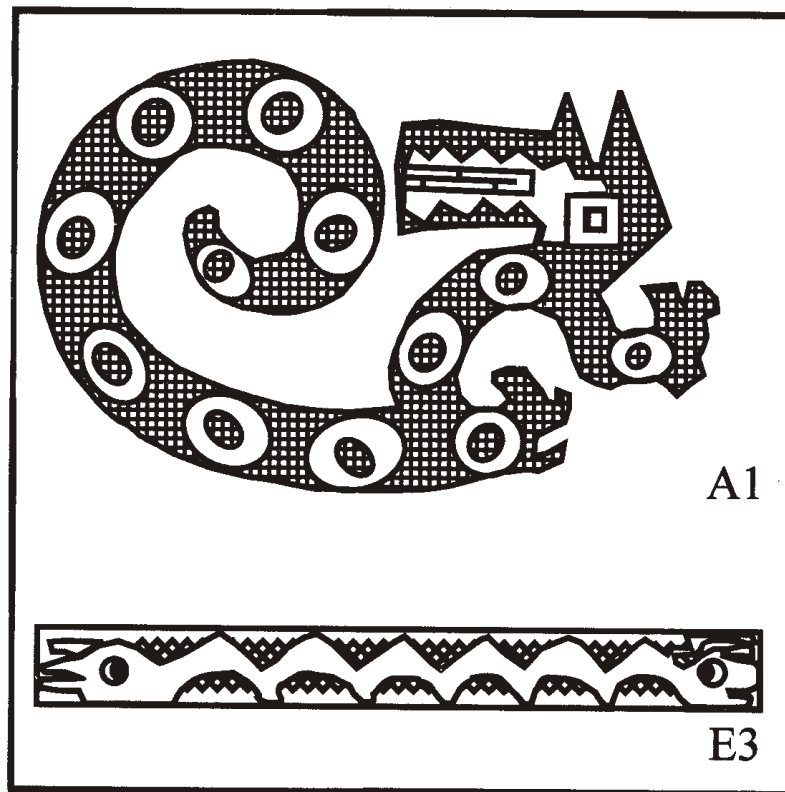


Figure 16. Drawings by Antonio Serrano of a long-jawed, spotted feline figure (A1) and a double-headed snake figure (E3) found on Aguada ceramics (from Serrano 1958: figure 45).



Figure 17. A photograph taken with cross lighting of the tie-dyed tunic (No. C8) after humidification. The creases and folds that had been created during the tying and hot liquid dyeing process reappeared under humidification.

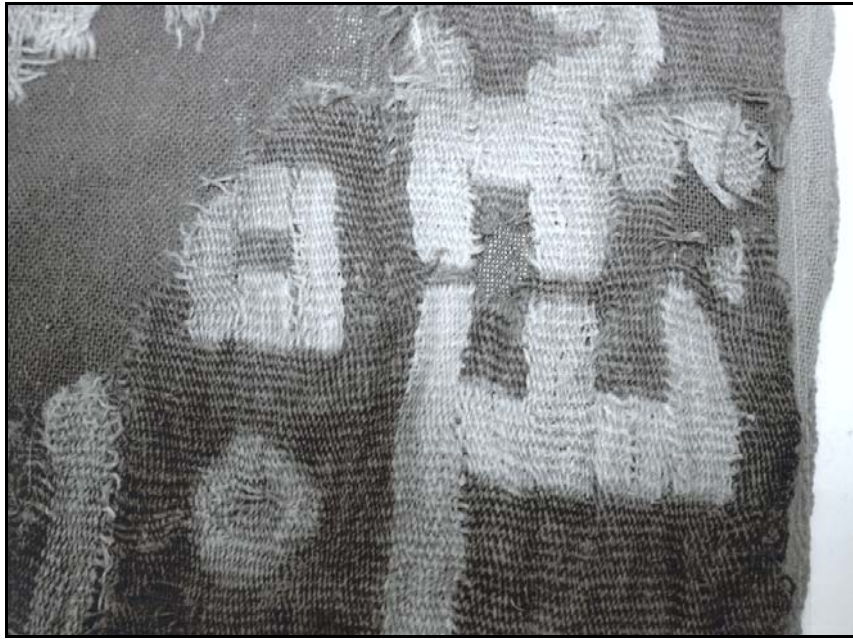


Figure 18. In addition to tie-dyeing, a second form of resist patterning was used (No. C8): area-resist that was apparently created by stitching areas of waterproof material to both sides of the textile before the dye bath.



Figure 19. The earliest evidence of Andean tie-dye occurs in this painted feline image on a Chavín textile found at the site of Karwa on the south coast of Peru. The tie-dye is used to represent the spots of the feline. Textile Museum, Washington, D.C., 1991.41.14.

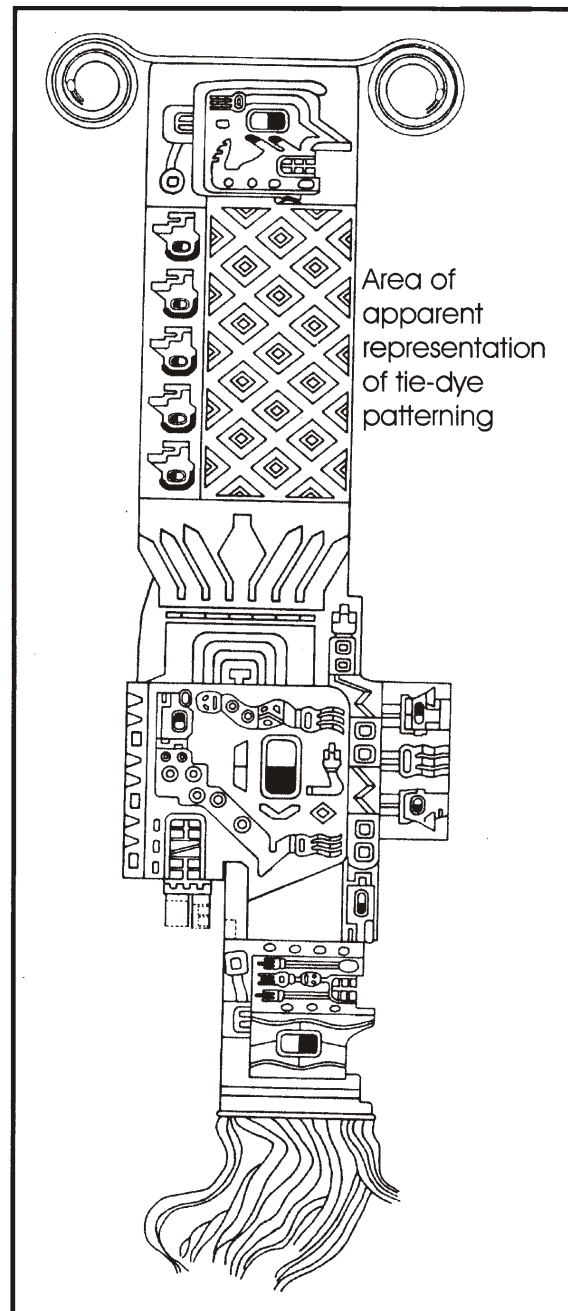


Figure 20. Drawing of a Peruvian tapestry sash that hung down from the neck. The top profile face seems to represent a human. The central profile face with crossed fangs represents a deity and the lowest profile face seems to represent, with its real human hair, the most recently acquired trophy head. Beneath the top face is a vertical column of five small trophy heads and a prominent pattern of diagonal squares that appears to represent designs that are characteristic of tie-dye textiles (see Conklin 1983). Metropolitan Museum of Art, HZTR600-2002.



Figure 21. A fragment of a tie-yed textile, shown with the warp horizontal, with yellow tie-dye patterns and a red background. It was found by Gary Vescelius in 1954 in a looted grave near Ilo, Peru together with a Tiwanaku interlocked tapestry fragment. American Museum of Natural History, Vescelius Collection, No. 874.

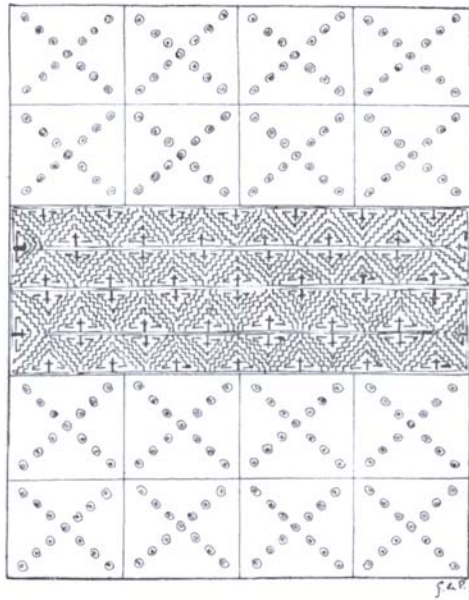


Figure 22. Drawing by G. Le Paige of a textile associated with a San Pedro de Atacama burial, Quitor 6, No. 2788, that he excavated. The central section of the tunic was described by Ingeborg Lindberg (1963) as tapestry. The upper and lower sections of the textile contain tie-dye patterns and have alternating red and blue backgrounds).

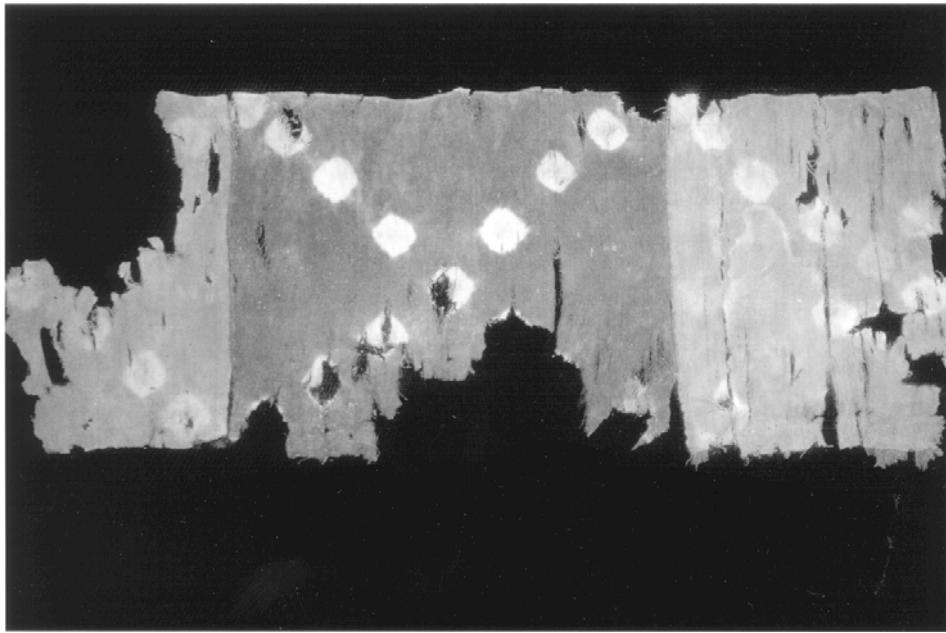


Figure 23. A portion of the Tiwanaku tie-dyed material that formed the upper and lower portions of a textile associated with Quitor 6, No. 2788. The horizontal warp is doubled at the warp selvages (the top and the bottom of the fragment). The weft selvages of adjacent pieces, vertical in the tunic, and here shown vertically, were joined together with a figure eight stitch using blue thread. The tie-dyed patterns are very precisely laid out.



Figure 24. A portion of a Tiwanaku tie-dyed textile from a grave in San Pedro de Atacama, Quitor 7, Tomb 3137. The tie-dyed squarish pattern is a light yellow in color with the background color being red. This seems to match exactly the tie-dyed pattern of the Tiwanaku fragment from Ilo (see Figure 21).

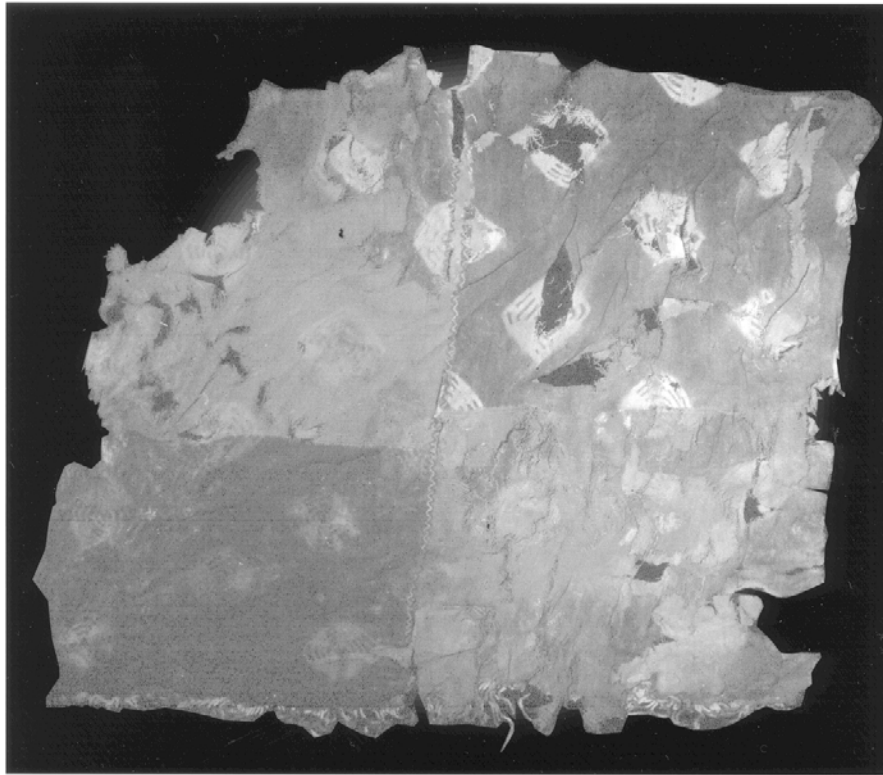


Figure 25. This complete tie-dyed tunic was associated with the San Pedro de Atacama burial labeled Coyo Oriente 3937 and is attributed to Tiwanaku by Rodman (Rodman 1992). Each face of the tunic consists of alternating red and blue tie-dyed panels with resist patterns. The tunic has a bottom tie-dyed fringe very much like that sometimes found on male Inka tunics. This small light-weight tunic, only 88cm wide and 70cm high would extend just slightly below the waist on an adult and thus suggests an association with the small Aguada tunic under consideration.



Figure 26. The individual tie-dyed patterns used on the tunic illustrated in Figure 25 are the most complex Andean tie-dyed patterns yet recorded. They have both radial patterns and circular patterns that have been tied in such a way that they have resisted the dye bath. Half of this textile was made in a red dye bath and half in a blue dye bath before the parts were joined together. The warp is horizontal.



Figure 27. The squared doughnut-shaped carved-in-stone patterns that cover the legs of the Stele Bennett in Tiwanaku seem to be representations of tie-dye patterns on a kilt or leggings. The sculptors have slightly reinterpreted the weaver's typical tie-dyed patterns.



Figure 28. Portion of a Huari tie-dyed textile. Several colors and shapes of pre-constructed and dyed cloth have been rejoined to form a colorful patchwork. Peabody Museum, Harvard University, T630A2, 46-77-30/7720, (Photograph by Hillel Burger).

