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"Revisiting the Ocucaje Opened Tunic from the Textile Museum; Washington, D.C.: Textile Models and the Process of Imitation"

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The opened tunic from the Textile Museum in Washington D. C. (fig. 1) is a beautiful object the colors and design of which are well known since a part of it was used 22 years ago on the cover of *The Junius B. Bird Conference On Andean Textiles.*[1] The tunic has no archaeological context, but its characteristics place it among Early Horizon Epoch 9 woven fabrics from Ocucaje.

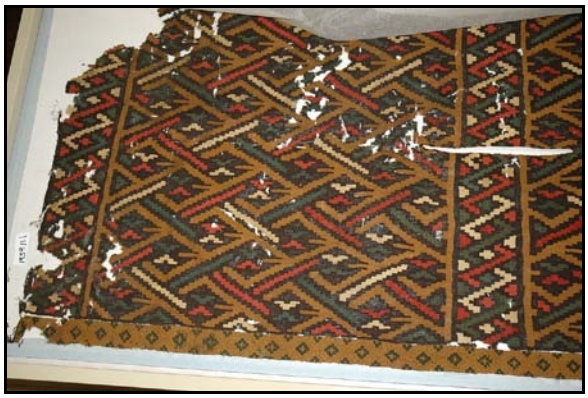

Figure 1. *Opened tunic. 2,04m x 1m, camelid hairs.*
The Textile Museum, Washington D.C., 1959.11.1. Museum Purchase.

Mary Elizabeth King has described the piece in her doctoral thesis.[2] It is made of four widths: two main panels in balanced plain-weave with discontinuous warp-and-weft, and two borders in triple cloth – all in camelid hairs. The central panels show interlocked snakes and three bands of guilloche in five colors (red, gold, green, cream, dark brown), while the borders show another type of guilloche in green, gold and brown, with the brown almost completely missing. [3]

Mary Frame has demonstrated how this design was influenced by fabric structures. [4] Isolated from the whole, the snake design might be looked at as a three-strand braid, and the guilloche motifs as twisted strands – either three-strand plied yarns or three-strand twining (fig. 2ab). And a third reference to textiles is possibly hidden in the composition of the whole piece which can be looked at as "the perfect image of a sprang fabric [in oblique interlacing], with the two halves in reflective symmetry, twined headings at either end and a hold-line in the middle" (fig.2c). [5] According to Frame, this hidden sprang image suggested to her by Martha Stanley is hypothetical as this precise group of features is not found in the archaeological sprang sample from Early Horizon 9 which formed the basis of her research.

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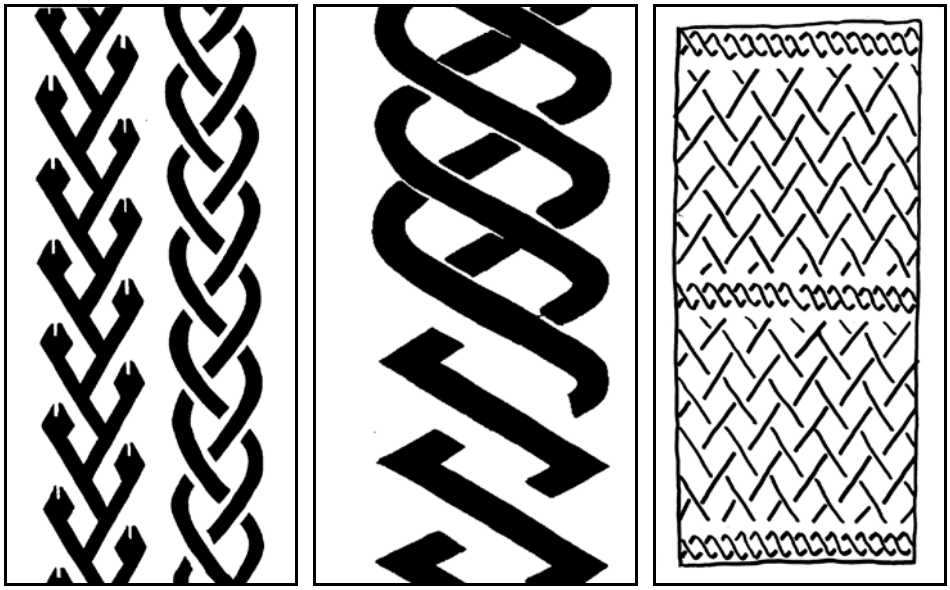
[1] Rowe 1986.
[2] King 1965, 152-153, fig. 18, 518-520. I have retained here only the main features of her description.
[3] The term "guilloche" was used by John Rowe (1967) dealing with the frequent appearance of twisted threads in Chavin art.
[4] Frame 1986, 49-50 and fig. 11.
[5] Frame 1986, 49-50.



a b c

Figure 2. *Fabric structures identified in the tunic design; 2a: (left) three-strand braid; 2b: (center) three-twisted strands; 2c: (right) hypothetical image of sprang fabric in oblique interlacing (edges not represented, as their design is not completely clear from the photographs). (a and b: from Frame 1986, fig. 6 and 12b)*

Frame's reading underlines the presence of various structure images in this single object, but images of woven structures themselves are missing. She recalls weaving in which, she writes, following Dawson's observations, "the stepped outlines […] appear to be a stylistic feature developed out of the rectilinear grid of woven fabrics and then transferred to other media."[6] But such a comparison deals with the impact of the orthogonal warp and weft disposition on the motif shapes; it does not suggest the presence of a specific woven structure image.

The aim of this article is three-fold: first to fill in the gap between the visual impact and the structural technique by making legible the specific woven structure which has also been the model for the design of the tunic; second to show how the imitation of structure to design proceeds; and third to understand where the model came from and its implication for the history of textile art on the South Coast of Peru at the end of the Early Horizon. The basis of my work remains the study of Andean weaving which I began in 1979 in several communities of Bolivia and (as with Mary Frame with sprang techniques), the obsessive detailed and systematic drawing and replication of pre-Columbian woven fabrics.[7]

The two motifs of the main panels are characterized by narrow diagonal areas woven with four colors: red, gold, green, and cream. The fifth color, a dark brown, plays a special part that consists in drawing the motifs while separating each of the four bright colors from the others. These features are characteristic of some compounded complementary-warp weaves described by Ann Rowe in her outstanding work on the *Warp-Patterned Weaves of the Andes*.[8] Among the earliest examples of this type of weave published by Ann in her book, is a band found in Ocucaje with a design of snakes that are very close to that of the tunic (fig. 3a). [9] Its design includes two halves of the three-strand braid motif described previously but

[6] Frame 1986, 49; Dawson 1979, 101.
[7] For a systematic study of woven designs see Desrosiers and Pulini 1992.
[8] Rowe 1977, chapter 11.
[9] Rowe 1977, 81, fig. 99; the band is attributed to Early Horizon Epochs 9-10, but it is more likely contemporary to the tunic in Epoch 9. Its technique was not described accurately by King (1965, n°527, fig. 23).

delimited in another way (fig. 3b). The dark color defines the areas filled in with the other three colors: white, red and green. In terms of the weaving process, this means that the dark color is complementary to the bright ones forming a group, and these three colors substitute for each other to fill in the motifs. The substitution operates along diagonal sequences of snakes and follows a color rule: green snakes on a red ground, then red snakes on a white ground, then white snakes on a green ground, and so on.[10] Shapes and fillings are all made through narrow diagonals built with 2-span floats.

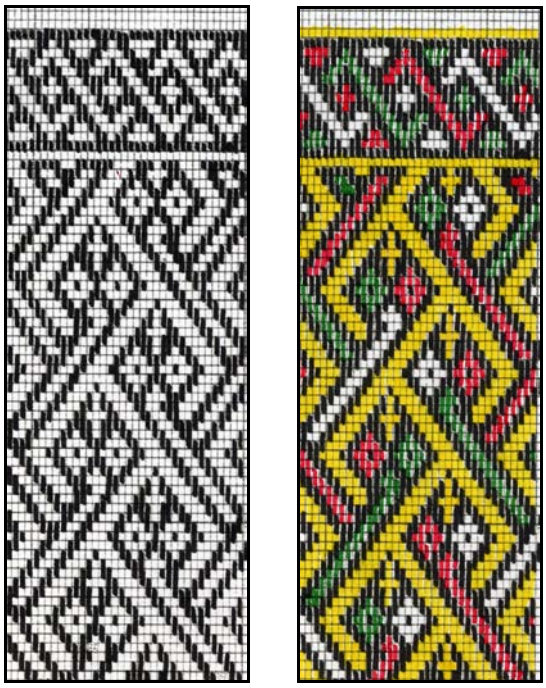
a **b**

Figure 3a (left). *Detail of snake band in complementary-warp weave with warp substitution and diagonals in 2-span floats; 64.5 x 3.5 cm, camelid hairs. Photo Jennifer Heimbecker.*
The Textile Museum, Washington D.C., 91.1060. Acquired by George Hewitt Myers in 1957.
Figure 3b (right). *Portion of the tunic snake design woven in the band; approximate width of the frame: 18 cm.*

The main difference between the designs forming the band and that of the tunic is neither in the number of colors and their shades, nor in design variations, which are limited, but, rather, in their comparative sizes. The band is 3.5 cm wide, while the discontinuous warp-and-weft design unit of the tunic is more or less 18 cm wide – more than five times the warp-patterned example. It is very fortunate to be able to compare these two pieces from the same culture showing almost the same design woven with different techniques because the comparison highlights instantly the imitation process at work: the tunic snake motif is a magnified version of a warp-patterned woven design and its stepped outlines render the magnified individual warp threads of the model. The two drafts on figure 4 show how the snake and the twisted strand motifs might have been woven with a complementary-warp weave opposing the black warps – drawn first with a length and a disposition evaluated according to the steps of the tunic design – to the red-gold-green-cream warps which substitute each other in filling

[10] This is regular in the length of the band except at the beginning and in two sequences where snakes are red instead of white.

the areas defined by the dark lines. The diagonals were obtained, as in the Ocucaje band, through 2-span floats in diagonal alignment – except for the gold color with 3-span floats.[11]



a **b**

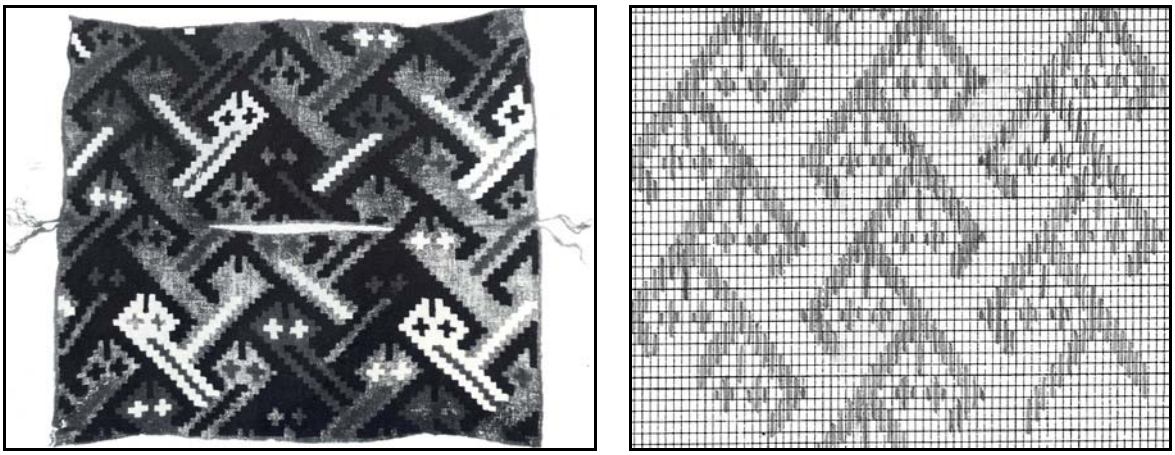
Figure 4. *Drafts of the design woven in complementary-warp weave with warp substitution used as model for the tunic design.* ***4a, (left),*** *first, the dark threads, the lengths of which are determined by the steps;* ***4b, (right),*** *second, adding the bright colored threads complementary to the dark ones.*

One could object that this example demonstrates how woven motifs and not woven structures have been imitated. This is true, but the woven motifs relate so strongly to the structure used to weave them that one can identify all of the structure's characteristics. First, the tight angle of the diagonals building the motifs and the dark drawing opposed to the colored fillings means that this structure belongs to the category of complementary-warp weaves with substitution (I would discount the hypothesis of complementary-weft weaves – on one hand because of the vertically elongated shape of the motifs which fits with warp-patterning, and on the other because no complementary-weft weaves seem to have existed on the South Coast during the Early Horizon). Second, the steps help in identifying the length of the woven modeled warp floats, and therefore their diagonal arrangement in 2 and 3-span floats. This configuration is another very important feature of Andean structures because it strongly influences the shapes of the design. Third, the way the colored threads which substitute each other are bound by the weft when they are not used on the front can be deduced from the Textile Museum band model: they probably float on the back. Finally, in the case of textiles with an archaeological provenance and, therefore, a precise attribution in the history of woven structures, this group of design features allows a complete identification of the weave used to produce it. One may suspect that at least some Ocucaje people were able to identify at first sight both the woven textile on which the design is based and the process of magnification of its individual threads in the stepped outlines. The fact that structure images have been magnified when used as design models has already been noted by Frame. [12] But

[11] Simplified drafts of fig. 4 and 6b have been published in a first attempt to explain the snake design of the tunic in Desrosiers1994.
[12] Frame 1986, 48.

the special process of magnifying each individual thread from the model and, by doing so, of creating stepped outlines is proposed here for the first time.

This process does not mean that it is possible to reconstruct easily a precise woven model for all the motifs with stepped outlines. In some cases, as for an Ocucaje neck poncho of the American Museum of Natural History showing a snake design similar to the one of the tunic, the colors of the woven model have been changed so that the threads usually of a dark color complementary to the bright ones show a polychrome variation and are therefore difficult to identify. Nevertheless, the drafts made according to the steps show finally that the model of the poncho design has been created with a compounded complementary warp-patterned weave with two- and three-span floats (fig. 5).[13]



a b

Figure 5. *Drafts of the design woven in complementary-warp weave with warp substitution used as model for the poncho design.* ***5a, (left),*** *first, the polychrome threads – in place of the dark ones - defining the areas filled with the other colors.* ***5b, (right),*** *second, adding the bright-colored threads complementary to the first ones.*

Another transformation of the poncho design regards the square proportion of the steps and of the whole design that does not fit with a usually elongated warp-patterned model. But various other Ocucaje tunics, knotted and not woven, with the same design of twisted strands with stepped outlines similar to the three transverse bands of the first tunic show that the same design might be interpreted either with square or with elongated proportions.[14] An earlier brocaded double-cloth and several triple-cloth examples with the same design in both proportions exist in various collections.[15] Their small steps are made by a number of warps and wefts changing level together and not by single threads. Nevertheless the possibility that a warp-patterned example existed cannot be precluded, as the color organization of these double and triple cloths follows the same complementary logic as that of the guilloche in figure 4.

The process of magnifying each individual thread from a woven model has been used in pre-Columbian Peru at various periods of time and outside of the south coast. I do not have space here to attempt an inventory of such pieces, but a few examples can clearly demonstrate the principle. The most illustrative examples come from the Chimu culture, for instance three

[13] Frame 1986, fig. 8: AMNH 41.2/5398.

[14] TM.91.489 illustrated by Frame 1986, fig. 29, Kajitani 1992, fig. 23, and Kauffmann Doig 1999, fig. 10; Mayman collection inv. 201, 202, 226, in Makowski *et al*. 2006, vol. 1, Cat. 2-4.

[15] The brocaded double-cloth piece is from Yauca and considered as Early Horizon Epoch 8 (Gayton 1961, fig. 4). The triple-cloth ones are considered as Early Horizon Epoch 9 as the knotted tunic (Wardle 1944; Cahlander 1985, fig. 2-12; Kajitani 1992, fig. 20; Kauffmann Doig 1999, fig. 9).

sets of Chimu garments woven in brocaded double-cloth and five pieces woven in plain-weave with discontinuous warp-and-weft which come from one grave or a series of graves on the north coast[16], and three pieces at the Musei Civici of Modena woven in tapestry. [17] All have designs with stepped outlines which can be translated into warp or weft floats, including the well known bird and snake panel in the collection of the Metropolitan Museum of Art. The size of the steps reveals the importance of the magnification. (fig. 6). The number of colors and their arrangement are not characteristic of a single structure, but the floats are all parallel to each other, and their arrangement appears to indicate a design initially created with a complementary warp- or weft-patterned structure formulated using the white lines and blue-brown details in opposition to the other colors. Chimu artists working in other artistic fields also used this process. The plaster cutwork bird friezes protruding from the walls of the many palaces in the city of Chanchan can be interpreted as supplementary wefts above the plain surface of a textile, each step representing a thread largely magnified (fig. 7).[18] And silver birds from the Dumbarton Oaks collections show stepped bodies reminiscent of such images.[19]

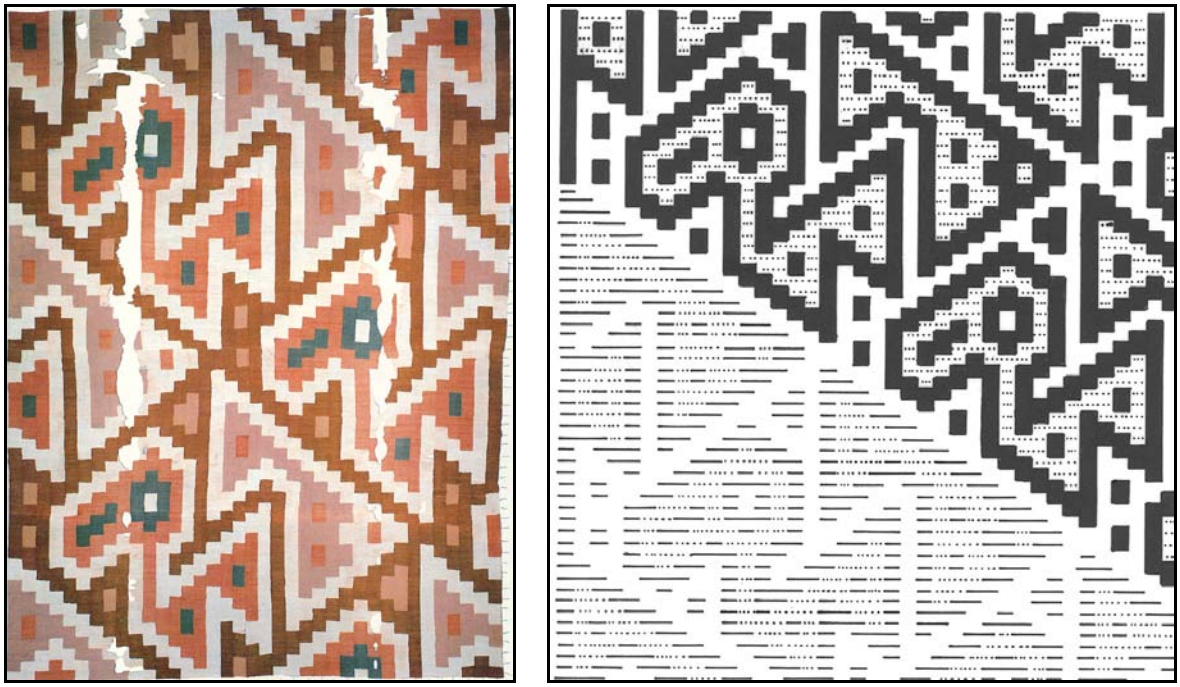


Figure 6a (left). *Panel in plain weave with discontinuous warp-and-weft, each step is approximately 3.5 cm high which would be substantially thicker than the diameter of a thread. Cotton. 208 x 162.5 cm. Warp horizontal. The Metropolitan Museum of Art, The Michael C. Rockefeller Memorial Collection, Bequest of Nelson A. Rockefeller, 1979. (1979.206.601). Image © The Metropolitan Museum.*
Figure 6b (right). *Draft built according to the steps of a possible model woven with a compound complementary warp- or weft-patterned structure.*

[16] Rowe 1984, fig. 2-4, 15-17, 24-30, pl. 4.
[17] Desrosiers and Pulini 1992, n° 104-106.
[18] Campana Delgado 2006. For a brocaded design similar to figure 7, see Desrosiers and Pulini 1992: fig.11.
[19] Cordy-Collins 1996, 265, plate 69.

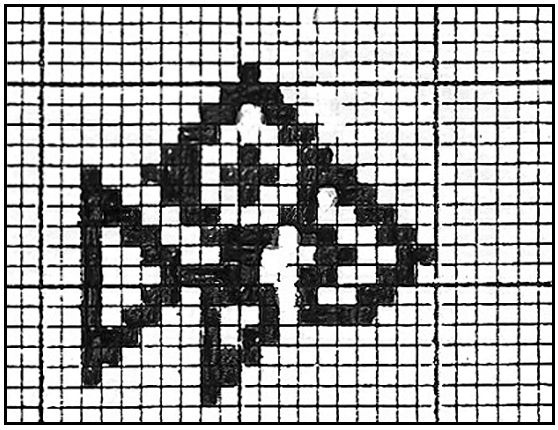
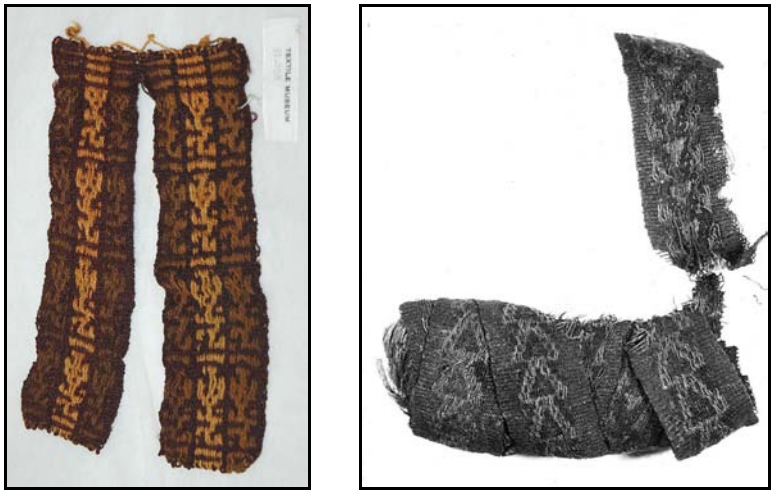


Figure 7a (left). *Plaster cut-work frieze from the Tschudi palace in Chanchan. Photo Ilaria Pulini.*
Figure 7b (right). *Draft of the possible woven model with supplementary weft floats above a flat ground.*

The use of woven textile structure images in architecture is also identifiable in the old world. Simple geometric designs, such as diagonals, chevrons, checkerboards, diamonds and so on, share common mathematical rules of construction with woven textiles and appear in walls, roofs, and pavements built with bricks, tiles, or stones of various colors (examples are the Roman defense walls of Le Mans city, many colored tile roofs in the Burgundy region in France, and many Islamic buildings).[20] When the complexity of the design is high, there is a chance that a real textile might have served as a model. This is probably the case in Venice with the diamonds painted on the Santo Stefano church walls and also those made of white and pink marble decorating the Doge Palace façade. These Venetian examples are reminiscent of the ground weave of "cloth of aresta" silks woven in Spain and Languedoc (maybe also in Italy), and highly fashionable in Europe during the 13th and early 14th centuries.[21] The fact that the church and palace were given their decoration more than a century later may indicate that a similar type of fabric was woven at that time in Northern Italy.

Coming back to the South Coast of Peru, the band with the thread organization that inspired the makers of the Ocucaje tunic (fig. 3a) calls for additional commentary. As far as I know, complementary warp-patterned structures have been identified in only two other pieces from Ocucaje: a pair of bifurcated panels with two warps, and another band with three warps – both in camelid hairs (fig. 8).[22] The designs of both these pieces are made with 3-span floats aligned in alternate pairs, the first ones showing some additional five- and seven-span floats. And both have been built with complementary structures (although the third warp of the second example adds one more color through warp substitution. The eight other warp-patterned bands from Ocucaje published by King, and additional pieces in other collections, are built with a simpler structure: plain weave with supplementary warps. This structure is far easier to weave than a structure made up of complementary-warps.[23]

[20] See for instance Campbell 2004.
[21] Hills 1999, chapter III, in particular 78-79 and fig. 103, where the author points out the likeness between the façade of the Doge's palace and a woven textile. For the "cloth of aresta", see Desrosiers and Vial 1989, fig. 12, and Desrosiers 1999.
[22] Rowe 1977, 69 and fig. 76, 81 and fig. 98; King 1965, fig. 24a and 1969, fig. 5a.
[23] King 1965, 169-176 and fig. 23, 24a; Rowe 1977, 110 and fig. 128; Kajitani 1992, n° 22ab.



a **b**

Figure 8. *Ocucaje pieces woven with complementary warp-patterned structures.*
8a, (left), *one of a pair of bifurcated panels with two warps. 17 x 9 cm. T.M. 91.858.*
8b, (right), *band with an additional warp working by substitution. Width 3 cm. T.M. 91.880b.*
(both: The Textile Museum, Washington D.C. Acquired by George Hewitt Myers in 1957).

Several observations about these expertly woven complementary warp-patterned pieces found in Ocucaje suggest strongly that they were imported from the highlands along with the camelid hairs abundantly used by the time on the South Coast of Peru. First, camelid hairs was by then newly imported in great quantity from somewhere in the highlands; second, these are among the oldest warp-patterned textiles found on the South Coast; third, there is an important conceptual distance between the complementary and the supplementary weaving techniques; and fourth, complementary warp-patterned weaving was practiced widely in the South Peruvian and Bolivian highlands during the Middle Horizon and the Inca Empire as it is still today.

The present analysis contributes to the consideration of questions asked by archaeologists looking for a better understanding of the transition of cultures during the early period of Andean development. For example, the question posed by Paul Goldstein regarding the "technical and stylistic affinities shared by the Pukara and Paracas-Nasca traditions […] towards the end of the Early Horizon (Ocucaje sequence) and Early Intermediate Period (Nasca sequence)".[24] It shows how the design influence of the highlands could be initiated through imitation of objects imported from that area and not through contacts between weavers (Had the craftsmen been involved, then they would have introduced complementary warp-weaving as well.) As I demonstrate in another article,[25] the highland influence has been much broader than has been showed in the present paper: most of the Paracas bands with supplementary warps or with embroidery in the linear style are probably imitations of other imported warp-patterned bands. My hope is that the examination of the diversity and the individual characteristics of the textiles that can be reconstructed from their imitations enable a discussion of the diversity of the groups who wove them.

Although limited to the study of a few pieces, the present paper establishes the basis for answering important archaeological questions. It shows also how woven structures were present in Andean artistic creations, and how the stepped outlines appearing on various works

[24] Goldstein 2000, 340.
[25] Desrosiers to be published. I presented the main aspects of this research at the TSA symposium in Hawaii, but there is no space here to develop them.

of art might come from the adaptation of an enlargement or magnification in scale based on the threads of woven structures – a transformation that also occurs sometimes in the old world. The fact that fabric images have been used as iconographic models in the Andes underscores once more the importance of such a medium in the region.

Acknowledgments

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