DESIGN CONVENTIONS OF WARI OFFICIAL GARMENTS

by

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ABSTRACT

The people of ancient Peru produced textiles four thousand years before the Spanish Conquest in 1532 A.D.. They used almost every known technique and created some of the world's most outstanding handwoven textiles. One of the most visually exciting groups are the finely woven interlocking tapestry tunics that served as the official garments of the Wari (Huari) culture (c.700-1000 A.D.).

The Wari maintained a highly organized social and economic state and its rigidity is manifested in the formal iconography and artistic conventions of their textiles. With sophisticated design principles and the masterful use of colour, however, the Wari counteracted the problems of monotony and repetition inherent in the strictly prescribed design of the garments.

Few of the existing Wari tunics have accompanying scientific provenience or grave associations and therefore little is known of their cultural role. An art historical approach, however, utilizing stylistic analysis breaks the barrier created by the sparse scientific documentation and facilitates the deciphering of design conventions.

Very little has been written specifically on Wari textiles. To date, the most important work is a brief article by Alan Sawyer. (Sawyer, 1963:27-38) In it he examines some of the complex design conventions and suggests a methodology for establishing a relative chronology. His methodology will be used in this study.

This thesis begins with an examination of the Wari culture based on well documented ceramic evidence and continues with a discussion of

provenience (when known), distribution, technology and iconography of the textiles. The focus of this study is the use of design conventions. Examination of three major design conventions - lateral distortion, symmetry and colour usage - is followed by a comparative analysis and a discussion of relevant ceramic evidence.

Sawyer has divided Wari official garments into the following three types:

1. Type 1 - Paired elements
2. Type 2 - Composite motifs
3. Type 3 - Staff bearing anthropomorphic figures.

This thesis is primarily concerned with the first type. The sample for this study consists of 47 representative examples ranging from fragments to complete tunics of Type 1.

Through the examination of lateral distortion and the comparative analysis of relevant ceramic evidence and known textile provenience, a relative chronology can be proposed. It will be shown that it is possible to evaluate the design conventions of symmetry and colour usage to determine the rules governing their application. This in turn permits the identification of regional and temporal traits.

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CHAPTER 1. HISTORY OF THE WARI CULTURE

A. Introduction to Peruvian Civilization

The German archaeologist Max Uhle, often considered the father of Peruvian archaeology, was the first, beginning in 1895, to apply the systematic scientific method of registration and interpretation of data based on stratigraphic position. He recognized and defined two chronological horizon styles: The Inca and Tiahuanaco Horizons (Rowe, 1962:6), and identified their temporal relation to one another. Uhle's work was primarily concerned with coastal ceremonial sites, notably Pachacamac on the Central Coast and the Ica Valley on the South Coast, and based his chronological interpretations on stylistic analysis. (Menzel, 1977:1). While Uhle's identification of the two Horizons is still applicable, John Rowe has proposed a more useful framework for the study of Peruvian civilization which considers both temporal and spatial relations. Rowe's framework is based on the idea that

> ...a sequence of style changes in one small area form a master sequence, and that we discuss events in the culture history of other areas by cross-dating them with particular events and styles in the area of the master sequence. (Menzel, 1977:2)

The area Rowe selected as the standard was the Ica Valley on the South Coast since the archaeologic data necessary for establishing a chronology was most complete for this area. (Rowe, 1962:49) Rowe

defined six temporal groups which this thesis will follow, based on the sequence at Ica. These are, from early to late:

1. **Initial Period**
2. **Early Horizon**
3. **Early Intermediate Period**
4. **Middle Horizon**
5. **Late Intermediate Period**
6. **Late Horizon**

In addition to these six groups, many authors also include a Preceramic period and the Colonial period.

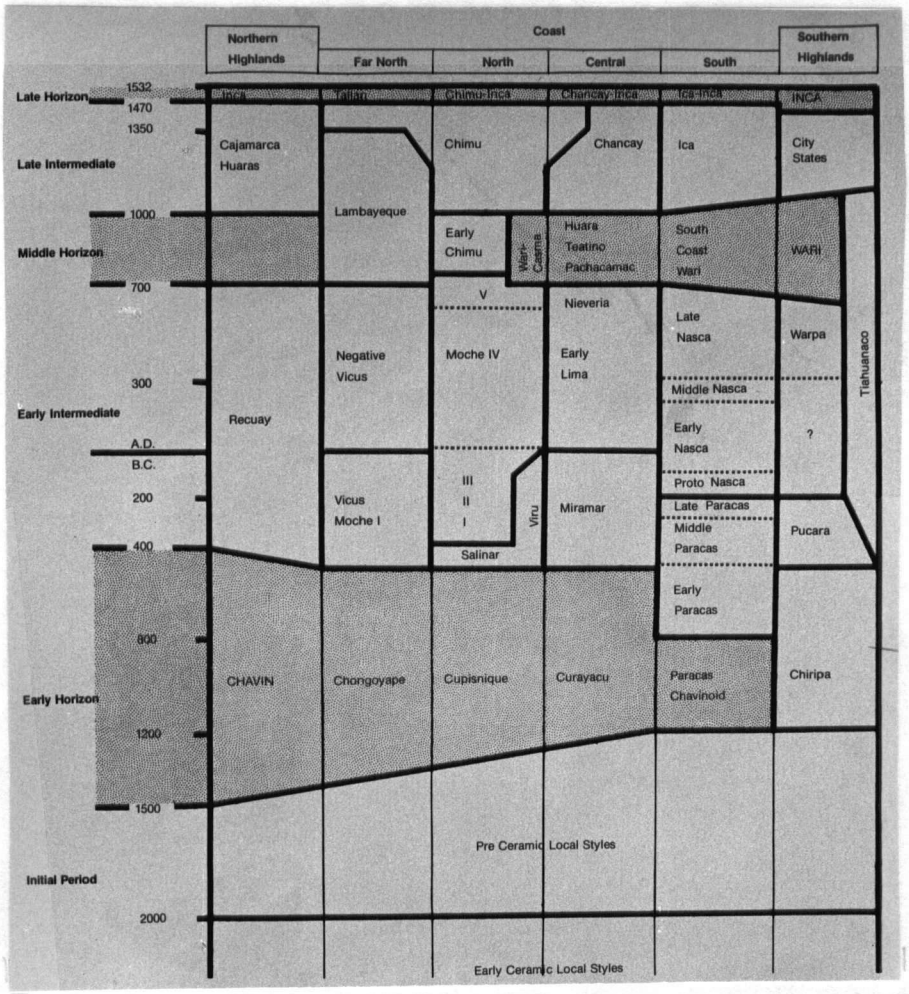
Periods can be considered as units of time where there is "relatively greater regional isolation", while Horizons show "a much wider spread of similar traits". (Menzel, 1977:3-4)

The three Horizons defined by Rowe indicate the widespread distribution of the following three major Peruvian civilizations:

1. **Chavin (Early Horizon)**
2. **Tiahuanaco or Wari (Middle Horizon)**
3. **Inca (Late Horizon)**

The three Horizons can be seen in the chronology chart in figure 1 as shaded horizontal bands, while the unshaded areas represent the Initial, Early Intermediate and Late Intermediate Periods, when widespread cultural unity was not apparent.

Figure 1. Peruvian Chronology. (after Sawyer, 1975:vii)



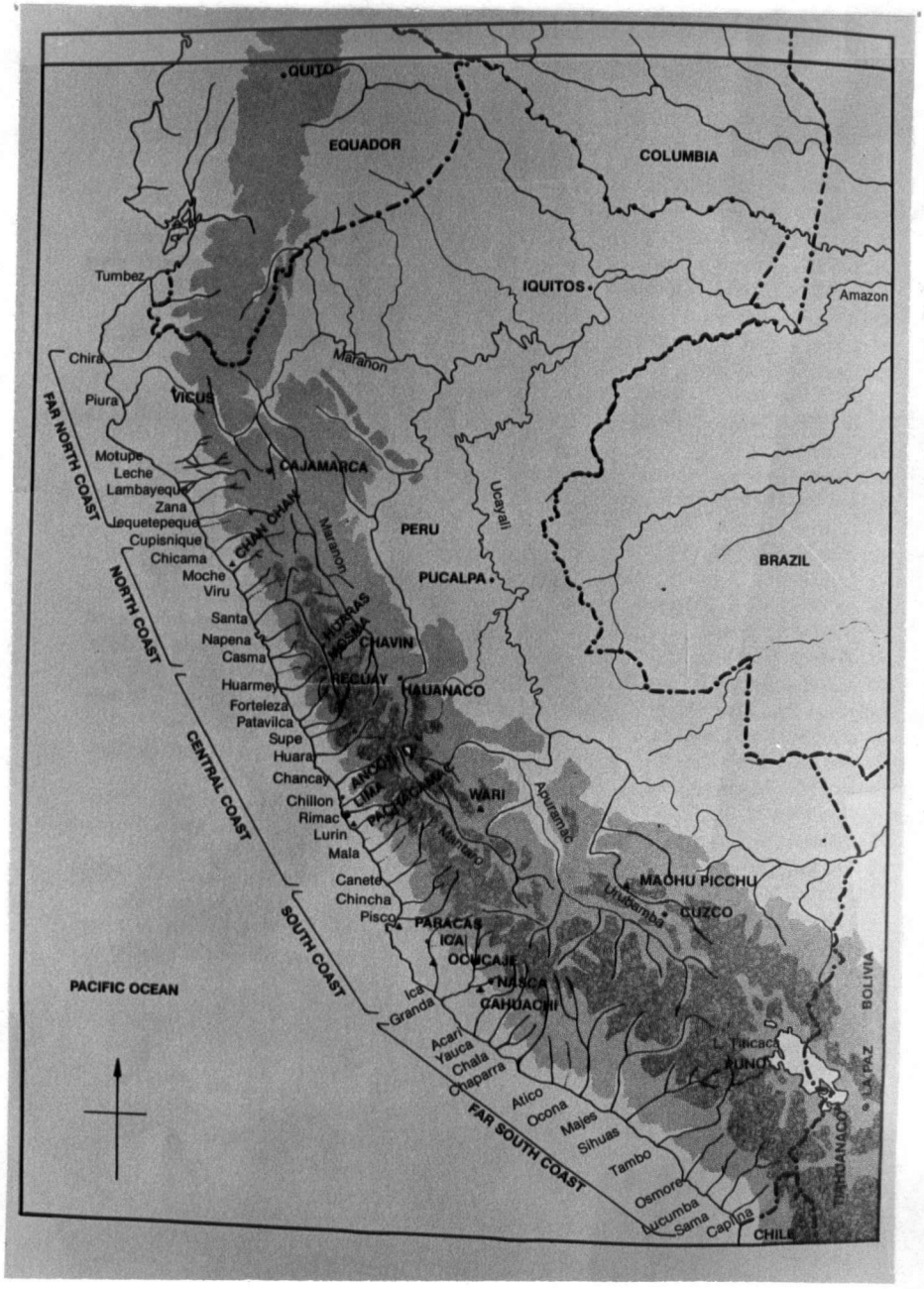
This study follows the chronology (fig.1) presented by Alan Sawyer in his discussion of the Peruvian collection of the Krannert Art Museum (Sawyer, 1975:vii). In addition to Horizons and Periods, Sawyer has divided the chronology into geographic areas. This division differentiates between two primary regions, the coast and the highlands and subdivides them further into specific groups, based on examples in the Krannert collection. These include the Northern and Southern Highlands and the Far North, North, Central and South Coast. The map (fig.2) shows these coastal divisions and includes the Far South Coast. For the purpose of this study the Far North Coast and the North Coast will be considered as the North Coast, while the South Coast and Far South Coast will be referred to as the South Coast. The three coastal regions are defined below.

1. **The North Coast** includes the Chira Valley south to the Casma Valley.
2. **The Central Coast** includes the Huarmey Valley south to the Cañete Valley.
3. **The South Coast** includes the Chincha Valley south to the contemporary border of Peru and Chile.

In addition, the highlands can be separated into similar regions that parallel the coastal regions. These are:

1. **The Northern Highlands** to the east of the North Coast which are drained by the Marañon River, a major tributary of the Amazon.

Figure 2. Map of Peru. (after Sawyer, 1975:vi)



> **The Central Highlands** to the east of the Central Coast which are drained by another tributary of the Amazon, the Huallaga River, and also the Mantaro River, particularly in the southern portion of the Central Highlands.
>
> **The Southern Highlands** to the east of the South Coast which are drained by the Urubamba River. This area also includes the regions surrounding Lake Titicaca situated on the contemporary border of Peru and Bolivia.

The chronology chart (fig.1) separates the highlands into Northern and Southern, with this division placing Wari in the Southern Highlands. Since the site of Wari is located in the southernmost portion of the Central Highlands as defined above, this north and south division is sufficient for this study.

This thesis is therefore concerned temporally with the Middle Horizon and spatially with the Central and South Coast, and the Southern Highlands.

Some terminology problems should be noted which "reflect important differences or changes in research methods, knowledge of the subject, or interpretation of the evidence". (Rowe and Menzel, 1967:iv).

> Max Uhle many years ago was impressed by the similarity between the Huari Style group of Peru and the Tiahuanaco style of Bolivia and treated them as a single style, applying the term "Tiahuanaco" to both. (Rowe and Menzel, 1967:vi)

While Wendell C. Bennett first proposed the distinction between Wari and Tiahuanaco, this study will follow the work of Dorothy Menzel who

has made a clear distinction between the two styles. In addition to confusion between the Tiahuanaco and Wari styles, two alternate spellings of Wari (Huari) exist in the literature. This thesis will follow the first unless it appears as the alternate in direct quotations.

B. Geography

The rugged geography of Peru must have seemed inhospitable to the many great cultures that flourished there. The scarcity of water and lack of land suitable for cultivation made it necessary for the people of ancient Peru to live in relatively isolated groups.

Peru can be divided into a number of geographical zones. This study is concerned with two major zones:

1. **The coastal desert**
2. **The highlands or altiplano**

While the Central and South Coast and Southern Highlands are the primary regions that concern the Wari, there is also evidence that the Wari had connections with the eastern slopes of the Andes or the selva. (Browman, 1978:334)

Textile preservation in the highlands is poor due to the area's abundant rainfall, and few examples have been found there. Of these, all were preserved in dry caves such as those found in 1967 at Huanca-Santos, south of Wari in the Department of Ayacucho, by Dr. R.T. Zuidema of the University of Illinois. Most of the existing textiles

have been found on the arid coastal deserts of Peru, where conditions are more favourable for preservation. The richest area was the South Coast, specifically the Ica and Nasca Valleys, where most of the textiles discussed in this thesis were reportedly found in burials. Here, as throughout Peru, huaquero, or grave robber activity has been so intense that few pieces have any archaeological provenience or grave associations.

C. The Site

The site of Wari is located in the Southern Highlands near the modern town of Ayacucho. Wari is situated in the drainage of the Mantaro River "which drains the long area from Cerro de Pasco above the Huara and Chancay Valleys southeastward to the region of Ayacucho which lies inland from the Ica and Nasca drainage". (Sawyer, 1975:10)

D. The Wari Culture

Since most known Wari textiles have dubious archaeological provenience, a relative chronology for the textiles can only be based on stylistic evidence. Most of the information published on the Wari culture is derived from archaeological excavations and studies of ceramics. An examination of the ceramic evidence is therefore necessary to the understanding of the development and organization of the Wari state. As well, the established ceramic chronology can be compared to a tentative textile chronology to help refine the latter.

Of the researchers who have investigated the Middle Horizon, the work of Dorothy Menzel and Luis Lumbreras is outstanding. The following is a summary of some of their conclusions. The end of the Early Intermediate Period was marked by the development of strong regional states. Agricultural production was greatly increased due to better irrigation and terracing systems. Populations also increased probably because of the improved agricultural production. The religious unity of the Chavin culture of the Early Horizon had disappeared.

> These regional states were also in competition with each other for land and food resources; and their leaders must have vied for power and prestige. In brief, the time was ripe for an imperial attempt. Such an attempt, or attempts, characterize the Middle Horizon. (Willey, 1971:157)

One of these regional states was the Huarpa (Warpa), centered in the Southern Highlands in the Mantaro basin near Ayacucho. The Wari culture had its roots in this regional state and can be seen as a derivative of the local Huarpa culture, but also influenced by the Tiahuanaco culture of the Titicaca basin. This derivation is quite complex with many unanswered questions requiring further research.

The long established culture of Tiahuanaco, located in the Bolivian highlands within the Titicaca basin, holds the key to the major developments in the transition from the Early Intermediate Period to the Middle Horizon. While the exact nature of the influence of Tiahuanaco is not completely understood, likely relationships have been

identified by Menzel and Lumbreras. The area around Ayacucho and its regional styles must similarly be understood to understand how the Middle Horizon began. Menzel has proposed the chronology shown in figure 3 for the Middle Horizon.

E. Wari Ceramics

Chakipampa A (fig.4), "the native pottery style in ordinary use at this time in the area of Ayacucho and Huari" (Menzel, 1964:66) was a "blend of Huarpa and Nazcoid influences". (Willey, 1971:160) In Ayacucho during Epoch 1A of the Middle Horizon, a new ceremonial style of oversize pottery with no local antecedents appeared. Menzel has called this style Conchopata A. The style is represented by oversize ceremonial vessels with "painted depictions of mythical themes". (Menzel, 1964:66) (fig. 5) Menzel goes on to state that:

> The association of the Conchopata A style with a special repertory of new mythical themes and its isolation in a ceremonial context suggest that it implies the introduction of a new set of religious ideas and practices.

These new mythical themes so closely resemble the iconography of the major stone monuments and particularly the Gateway of the Sun at Tiahuanaco, that a close relation is obvious. (fig.6)

Menzel believes that this new set of religious ideas and principles originated in the south at the site of Tiahuanaco or a currently unknown center, and spread to the Ayacucho area.

Figure 3. Middle Horizon Chronology. (after Menzel, 1964: plate 1)

PERIODS		STYLES						
		Nasca Drainage	Ica Valley	South-central Coast	Central Coast	North Coast	Northern Highlands	Central Highlands
ca. 1100 a.d.								
MIDDLE HORIZON	Epoch 4	Nasca Epigonal	Ica Epigonal					
	Epoch 3	Soisongo	Pinilla				? ↑ Cajamarca IV	
	Epoch 2B	Atarco B	Ica-Pachacamac		Pachacamac B	Huari Norteño A	Cajamarca III	Viñaque
	Epoch 2A	Atarco A			Pachacamac A			
	Epoch 1B	Robles Moqo Nasca 9	Nasca 9	Cerro del Oro	Nievería	Moche V	[Cajamarca II?]	Robles Moqo Chakipampa B
	Epoch 1A	Nasca 9			Lima			Conchopata Chakipampa A
ca. 800 a.d.								
EARLY INTERMEDIATE PERIOD	Epoch 8	Nasca 8	Nasca 8	Lima (Interlocking)	Lima (Interlocking)	↑		Huarpa
	Epoch 7	Nasca 7	Nasca 7			Moche IV		

Figure 4. Pottery Vessel of the Chakipampa A style.
(after Lumbreras, 1974: 153, fig. 163)

Figure 5. Drawing of figure from an oversize vessel of the Conchopata A style. (after Menzel, 1977: 112, fig. 67)

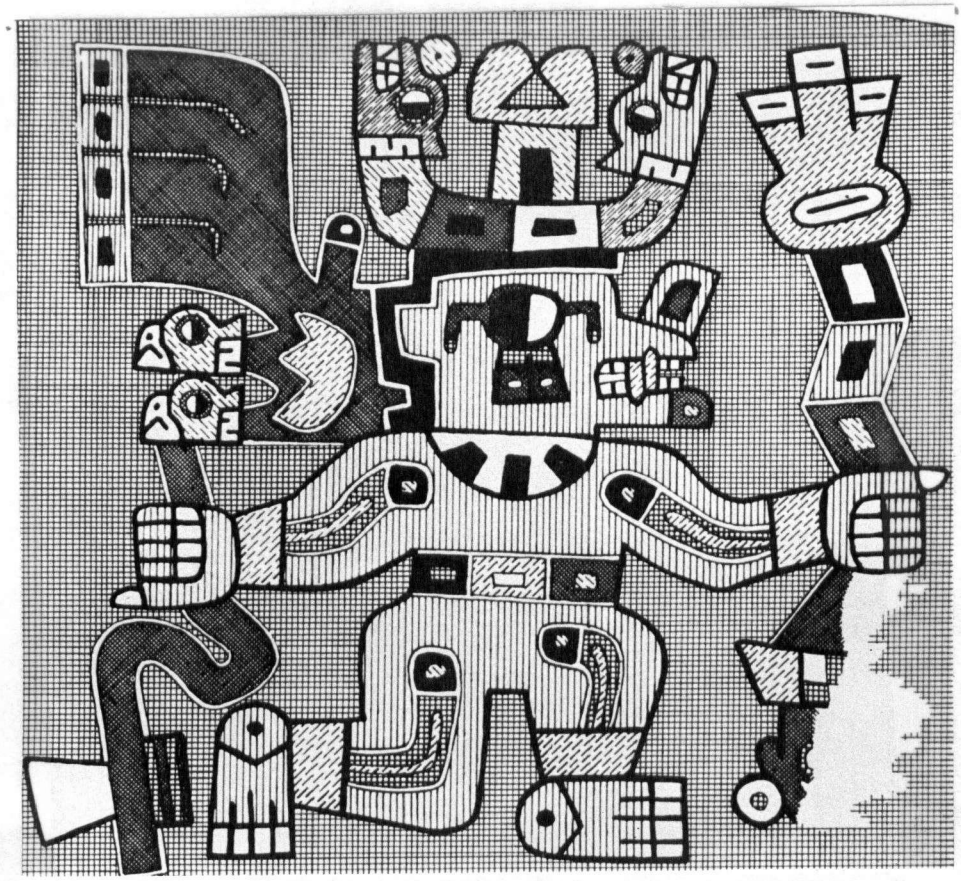


Figure 6. The Gateway of the Sun at Tiahuanaco. (Courtesy Alan Sawyer)

Since no examples of ordinary size.....

> Tiahuanaco pottery have ever been found in Peru north or west of the Departments of Arequipa and Puno, and no Peruvian specimens have been found in Bolivia...it therefore seems unlikely that any military conquest was involved in the introduction of the new religious ideas into Peru ...as...military conquest could be expected to leave some secular traces..., and nothing of the sort has been found. (Menzel, 1964:67)

This evidence implies active contact between the two regions.

The ceremonial center of Tiahuanaco was occupied long before the Middle Horizon (Lumbreras, 1974:18), but the classic phase as defined by Wendell C. Bennett (Bennett, 1934:453-456), represented by the monumental stonework such as the Gateway of the Sun, is probably contemporaneous with the late Early Intermediate Period and the early Middle Horizon.

At this time it is not possible to determine exactly how Tiahuanaco influence spread to Wari, however, two important ways have been suggested. The first is via religious pilgrimages which have historical precedence in Peru.

> The people of the Ayacucho region may have behaved this way toward Tiahuanaco, whose imposing ceremonial center seems to have achieved considerable pan-Andean renown. If so, this would explain why only Tiahuanaco elements that occur in the Ayacucho area are copies from stone sculpture, which were the principle ritual objects. (Lumbreras, 1974:152)

The second way, which is more pertinent to this study, is the transfer of ideas and iconography by textiles, which was suggested by Bennett (Bennett, 1934:488) Textiles provide an easy means of transporting

iconography because they are light, whether worn or carried, and are less fragile than ceramics. At this time little is known about Tiahuanaco textiles, another possible source of iconography. William Conklin (p.c.) is currently working on Tiahuanaco textiles to clarify this problem.

Menzel feels that "the distinctive character of the ceremonial pottery in the Conchopata offering deposit" supports the idea of "men travelling from the area of Ayacucho and Huari" who "learned the new religion abroad and brought it home". (Menzel, 1964:67) It therefore seems likely that religious pilgrimages provided the communication link between Tiahuanaco and Wari, while textiles may have served as the means of transport of the iconography.

Communication between the Ayacucho area and the South Coast also existed at this time. As noted, Chakipampa A is a blend of Huarpa and Nasca styles. Trade routes between the highlands and the coast were already well established as proven by the early use of llama and alpaca wool in coastal textiles, from animals that can only live in the highlands (Bennett, 1934:491), as well as by the appearance of coastal cotton in highland textiles.

In the Ayacucho region at the beginning of the Middle Horizon (Epoch 1A) we have seen a blending of Huarpa and Nasca styles resulting in Chakipampa A, the local regional style. At the same time, Tiahuanaco influence spread producing the oversize Conchopata ceremonial ceramics with their new mythical themes. As yet no Wari empire existed, but the seeds had begun to sprout. When the influence from Tiahuanaco became stronger, the Huarpa culture of the Southern

Highlands, which already displayed expansionist tendencies, transformed into the militant Wari. (Sawyer, p.c.) Epoch 1B marked the first major expansion of the new Wari state. Three main types of ceramics appeared during this time:

1. **Oversized Robles Moqo**
2. **Regular sized Robles Moqo**
3. **Chakipampa B**

According to Menzel, oversized Robles Moqo (fig.7) "continued the tradition of oversize ceremonial pottery represented by the Conchopata style in Epoch 1A." Oversize Robles Moqo ceramics were found at Wari, Chakipampa and Pacheco, and their "restricted distribution" at these sites indicates a "ceremonial context". Only slight stylistic differences exist between these sites. (Menzel, 1964:67)

Ordinary size Robles Moqo pottery has "precedents in the fanciest Tiahuanaco style pottery" and "may reflect new Tiahuanaco influence." From the associations of these ceramics Menzel feels that they were "a high prestige ware associated in some way with the new religion, but less exclusively ceremonial than the oversize vessels." These regular sized ceramics appeared at Wari, Pacheco, Nasca, Lima and Cerro del Oro in the Cañete Valley, but not at Chakipampa or in the Ayacucho region other than at Wari. Their occurrence only at Wari suggests that Wari was the center of expansion during Epoch 1B of the Middle Horizon. (Menzel, 1964:68)

The third pottery type from Epoch 1B is called Chakipampa B which is considered the secular or native pottery used in the Ayacucho area. It is found throughout the Wari domain and is fairly

Figure 7. Oversize Vessels of the Robles Moqo style.
a. (after Batres, 1975; 148, fig. 135)
b. (after Lumbreras, 1974: 153, fig. 164)

a.

b.

homogeneous. The style continues from Chakipampa A and reflects new influence from Nasca. (Menzel, 1964:68) As there are no full mythical figures, this may represent a separate expansion from Wari that did not involve Tiahuanaco influence. (Lanning, 1967:133) Nasca influence appears on the coast as well as in the Ayacucho area suggesting that Nasca "enjoyed a special privileged position in the new empire, sharing its prestige in the provinces." (Menzel, 1964:68) By the end of Epoch 1B the sites of Chakipampa and Pacheco were abandoned allowing the emergence of Wari as the exclusive capital of the new empire at the beginning of Epoch 2A. (Lanning,1967:133) Wari and Wari-related pottery appeared throughout the empire and local styles lost importance.

Three closely related pottery styles, all incorporating Tiahuanaco features appeared during Epoch 2 forming the Wari group. They are:

1. **Viñaque,** native to the Ayacucho area (fig.8)
2. **Atarco,** native to Nasca (fig.9)
3. **Pachacamac,** native to Pachacamac on the Central Coast (fig.10).

> All three represent combinations of features derived from the ceremonial pottery of Epoch 1 with features belonging to the secular traditions of their respective home areas... Mythical themes began to appear on secular pottery in somewhat abbreviated forms, indicating that the new religion had permeated Wari society and become popularized. (Menzel,1964:69)

Less is known about Epoch 2A than about Epoch 2B. As noted, during Epoch 2A, Wari emerged as the capital of the new empire. Epoch 2B marked a period of great expansion, and in fact the empire expanded

Figure 8. Pottery Vessel of the Viñaque style.
(after Menzel, 1964: plate 2)

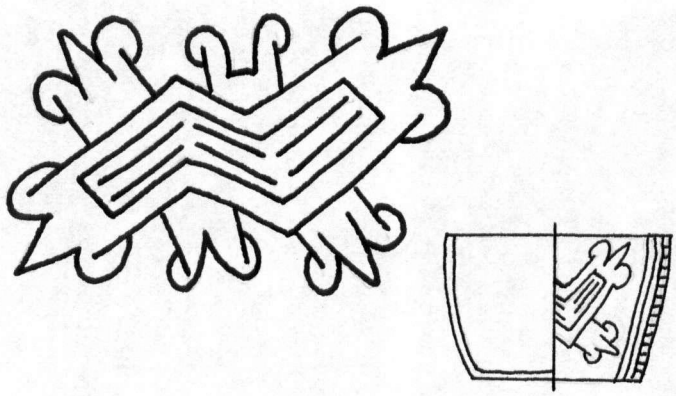


Figure 9. Pottery Vessel of the Atarco style.
(after Menzel, 1964: plate 4)

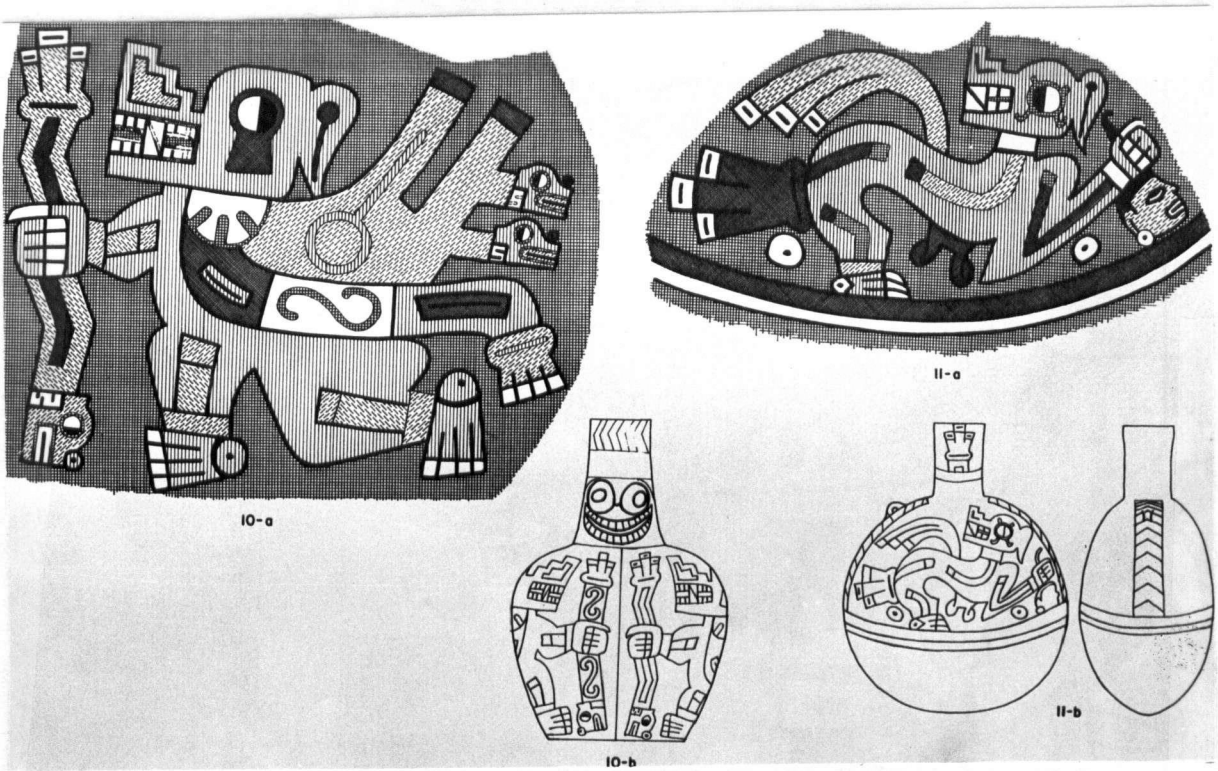


Figure 10. Pottery Vessel of the Pachacamac style.
(after Lumbreras, 1974: 156, fig. 169)

to its furthest reach during this time. (Menzel, 1964:68) The influence of the empire was felt in the north, to Cajamarca in the Northern Highlands and the Chicama Valley on the North Coast. In the Southern Highlands the influence reached almost to the Titicaca basin, while on the South Coast it stretched to the Ocoña Valley. (Menzel,1964:69) A distinction should be made between control and influence. Strong Wari influence has been found at scattered ceremonial centers on the North Coast but it is evident that the Wari did not control the Coast north of the Nepeña River. (p.c. Sawyer)

During this time Pachacamac eclipsed Nasca in its special status within the empire and spread southward to develop a new pottery style named Ica-Pachacamac.

Most of this expansion was accomplished through military means.

> That the ...expansion was made possible through strong military support is implied from the evidence of strong disruption of the local cultures... .(Bennett,1953:117)

Lumbreras and Menzel feel that "conquest was envisioned as the mechanism of dissemination"..."while a proselytizing religious doctrine" was the "basic stimulus." (Lumbreras, 1974:152) This idea of conquest is supported by the fact that secular ware was found throughout the empire in addition to ceremonial vessels found in prestige sites.

The influence of Tiahuanaco caused the disruption of local states in the highlands such as the Huarpa who were rural in nature. After

Tiahuanaco contact the southern sierra became urbanized. These new cities also appeared on the Coast throughout the Wari domain. At the end of Epoch 2B the Wari empire fell and the City of Wari was abandoned. (Menzel, 1964:72) The urbanization and unification of much of Peru was not seen again until the Inca empire.

***

CHAPTER 2. WARI OFFICIAL GARMENTS

A. Definition

This study is restricted to the examination of Wari finely woven interlocking tapestry tunics. Sawyer has proposed that these textiles served as the official garments of the Wari culture.

> It seems probable in view of known Inca practise that each distinctive design in the rigid Tiahuanaco [Wari] iconography ...was the property of a specific rank of governmental or religious functionary. The simpler and more common of these motifs would appear to have been the emblems of the more numerous officials of lower rank, while the elaborate and more rarely encountered designs signified officials of high status. (Sawyer, 1963:29)

Many of the elements found in Wari official garments were not found on the coast prior to the Wari empire; (Sawyer, 1963:27) and the tunics, both in iconography and technique reflect a highland tradition. Stains, mending and alterations suggest a functional use as well as a funerary one. The rigidity of design and the extreme fineness of the tunics reflect the highly organized political structure of the Wari.

These official garments differ markedly in appearance and technique from other textiles found in the same graves which Sawyer referred to as "Coastal Tiahuanaco". The Coastal Tiahuanaco (Wari) textiles do not display interlocking tapestry technique and are normally less fine than the official garments. This study will therefore use the term Wari textiles synonomously with official garments.

B. Provenience and Distribution

As noted, few examples of Wari textiles have been scientifically excavated. Most of the examples in museums and private collections are reputedly from the arid coastal deserts of the South Coast of Peru, specifically from the Nasca and Ica Valleys, where conditions for textile preservation are ideal. Much of this information has come from huaqueros who have been responsible for the recovery of most of the textiles from these areas. While such information should be received with caution, much is plausible given the demonstrated relation between the Ayacucho area and the Nasca and Ica areas, shown through the ceramic evidence. Fortunately some archaeological data does exist to support the claims of the huaqueros. Specific provenience for textiles discussed in this study will be included when available.

While the South Coast seems to be the primary region where Wari tunics have been found, examples have also been found at Pachacamac, Huara and Ancon on the Central Coast and at Wari in the Southern Highlands. (p.c. Sawyer)

It is not surprising that the tunics found throughout the Wari empire display little regional variation because the textiles were official garments and reflect standards set at Wari. Sawyer states that some regional variations exist, but feels the principle differences are "temporal, reflecting stages in several centuries of an evolving art tradition." (Sawyer, 1963:27)

C. Technology

1. Weaving Techniques

Wari textiles are composed of two elements, the warp and the weft, which are woven (interlaced) together. Irene Emery, an authority on textile terminology defines these terms as follows:

1. **Warp:** essentially parallel elements that run longitudinally in a loom or fabric crossed at more or less right angles and interworked by transverse elements. (Emery, 1966:74)

2. **Weft:** the transverse elements in a fabric ...which cross and interwork with the warp elements at more or less right angles. (Emery, 1966:74)

3. **Interlaced:** the most straightforward way of interworking elements inasmuch as each element simply passes under or over elements that cross its path. (Emery, 1966:62)

Interlacing is considered a simple weave because only two elements (the warp and the weft) are involved. The weft elements in Wari official garments completely cover the warp elements. This form of interlacing is called weft-faced plain weave or tapestry weave. Emery distinguishes between the two terms in the following way:

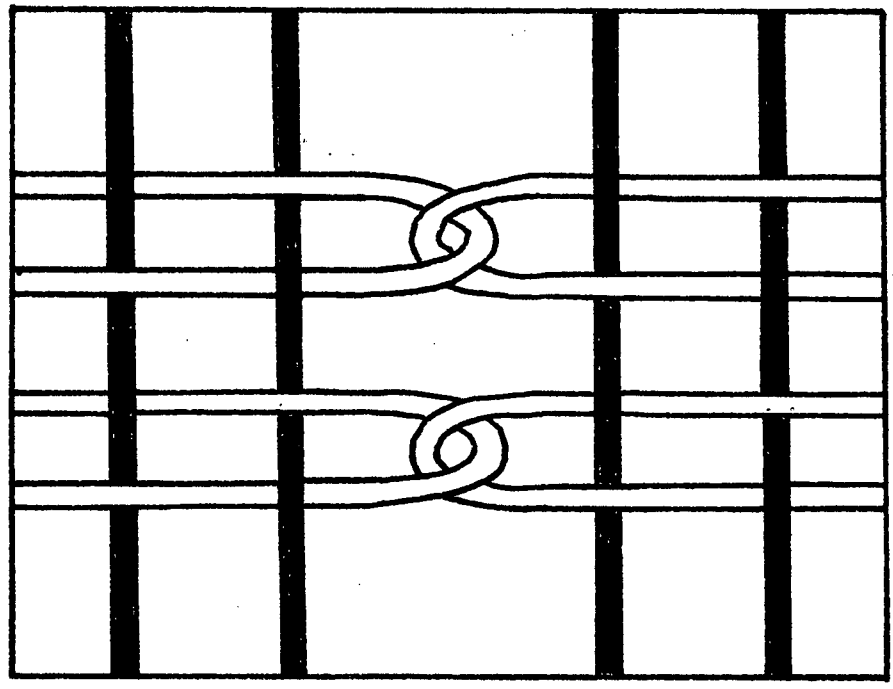
1. **Weft-Faced Plain Weave:** indicates a greater proportion of weft elements to warp elements that are "sufficiently compacted to completely cover the warps." (Emery, 1966:77)

2. **Tapestry Weave:** usually refers specifically to mosaic-like patterning with discontinous wefts in a weft-faced plain weave. (Emery, 1966:78)

The employment of discontinuous wefts, that is weft elements that do not run continuously from selvage to selvage (the finished woven edges), is the distinguishing feature between weft-faced plain weave and tapestry weave. Wari official garments are technically of the latter type. Discontinuous wefts facilitate the production of small areas of different colour. The use of discontinuous wefts also necessitated some sort of joining technique to avoid the production of holes or slits. The technique employed was single interlocking between warps, or in other words the linking of "wefts of adjacent areas with each other each time they meet." This interlocking is called single interlocking between warps because "wefts link once each time as they pass back and forth." (Emery, 1966:80)(Fig. 11) In some portions of the textiles the wefts, notably in diagonal motifs, "simply turn about adjacent warps without interlocking" (Bird and Skinner, 1974:6); however, interlocking is the predominate technique used. The precise term for the weaving technique employed by the Wari is therefore tapestry weave with single interlocking between warps.

The warp direction in the tunics is horizontal (as worn) while the weft direction is vertical. The weft is approximately twice the length of the warp.

Figure 11. Single Interlocking Between Warps.



Junius Bird and Milica Skinner examined one Wari tunic in great detail. (fig. 35) (Bird and Skinner, 1974:5-13) Much of the information they learned is relevant to the textiles discussed in this paper and will be summarized in the following sections.

2. Construction and Dimensions

Wari tunics consist of two virtually identical, separately loomed pieces measuring approximately 80 inches in the weft direction and 22 inches in the warp direction. (Sawyer, 1963:27) These pieces are doubled in the weft direction and bound together with openings left for the arms and head. A roughly square shirt, measuring approximately 40 inches square is thereby produced. Dimensions, warp and weft direction and method of construction are shown in figure 12.

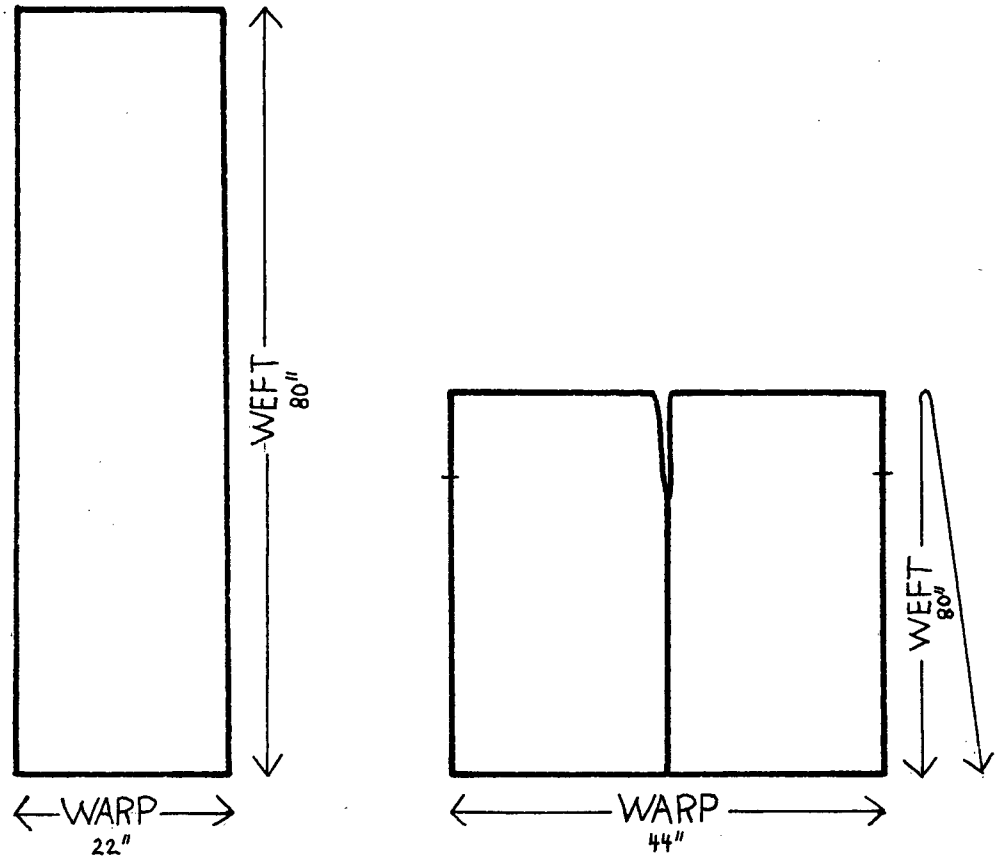
3. Finishes

Due to the frequent colour changes inherent in the interlocked tapestry weave, many weft ends are produced and need to be finished in order to complete the garment. The most common practise in both Wari and contemporary tapestry weaving is to leave the ends until the weaving is complete, then stitch each one back into the woven piece. In the specimen studied by Bird and Skinner, the ends were invisible without magnification, an indication of the quality of craftsmanship.

Each loomed piece has two warp selvages, each produced in a different way. The first selvage is produced by the

> ...use of continuous warp yarns which turn about yarn or cord headings lashed against the loom bars

Figure 12. Dimensions and Construction of Wari Official Garments.



> or which turn alternately about a single common cord in another warping system. The weft is laid or beaten in against the heading which may or may not be withdrawn on completion of the work. (Bird and Skinner, 1974:8)

The second selvage is formed by cutting each warp and then diagonally interlacing these with four other warps, to produce a strong edge. (fig.13)

4. Looms

In the areas of unpatterned solid colour stripes, Bird and Skinner noticed that the weft was discontinous and turned at irregular intervals producing virtually invisible diagonal lines, or 'lazy lines'. These diagonal lines were produced by weaving around successive warps, rather than by interlocking. Given this fact and the width of the weft, Bird and Skinner have suggested that two weavers worked simultaneously on each piece, a common custom still found throughout the world. This is done to eliminate having to constantly shift position, which would be necessary if one person had to span the eighty inch weft.

Bird and Skinner noted that each loomed piece (80" by 22") was warped and woven separately. The evidence that supports this, differing fiber content in each loomed piece, lead them to suggest a probable loom type (fig.14): a simple frame loom made by lashing sticks together. The warp is lashed to a cord that is then lashed to the loom sticks. The raising of alternate warps produces an opening or shed that allows the placement of the weft. Shed rods are used to

Figure 13. Warp Selvage Finish. (after Bird and Skinner, 1974: 9, fig. 4)

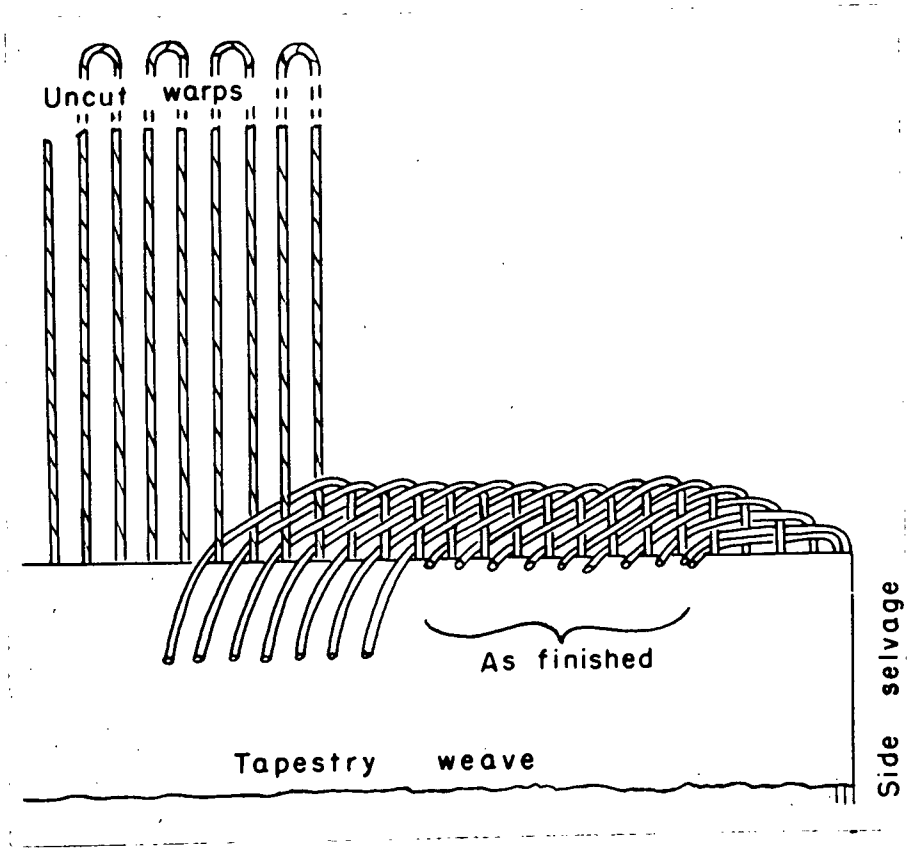
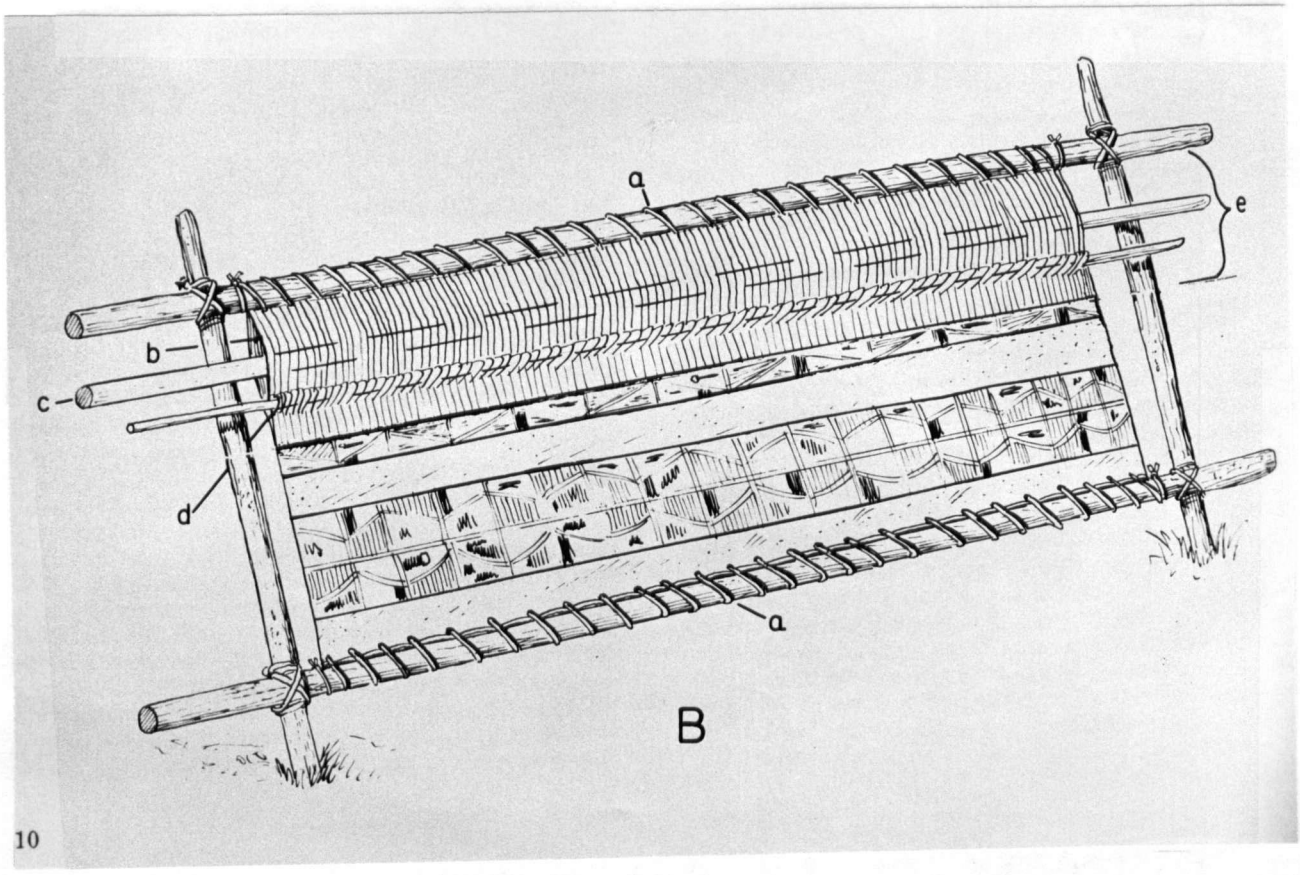


Figure 14. Suggested Loom Type. (after Bird and Skinner, 1974: 10, fig. 5)



10

retain this opening and heddles or yarns tied around the warps are used to lift the alternate warps. The frame loom that Bird and Skinner suggest was used is shown with heddles and shed rods "because such rods are normal parts of most archaeological and modern native looms in Peru, not because of any internal evidence in the fabrics." (Bird and Skinner, 1974:9) They go on to state:

> More effective would have been the use of a heddle made only of cord or yarn such as is still used by some people in South America. These flexible heddles permit the weaver to raise any portion of the warp independently of the rest but will not automatically open the entire shed. (Bird and Skinner, 1974:9)

Sawyer notes that "the official garments of the later Inca empire...were woven on similar wide looms, the chief difference being that the later Inca shirts were woven in one piece with the neck slit accomplished by means of scaffolding wefts." (Sawyer, 1963:2)

5. Materials

In Wari tunics the weft material is predominately alpaca wool while the warp is usually cotton, although some variation occurs. Cotton, a common trade item, was used for the warp because of its strength. The slipperyness of alpaca wool makes it a less strong yarn for warp.

The yarns used were first spun separately and then twisted or plied together. The direction of plying and spinning can be described

as either 'S' or 'Z', referring to the angle of the central bar of each letter. The yarns in Wari official garments are composed of two 'Z' spun yarns, plied in an 'S' direction for both the warp and the weft. The thread count in the tunic examined by Bird and Skinner was one hundred ends per inch for the weft and twenty-six ends per inch for the warp. The greater number of wefts to warps is necessary to achieve a weft-faced tapestry weave. This fineness is about the average of the sample examined in this thesis, but much finer pieces do exist.

Whether weavers produced these textiles from mental images, models or samplers is currently unknown, but the fact that they varied so little from area to area supports the hypothesis that standards were set at Wari.

6. Dyes and Mordants

While it would be interesting to examine the use of dyes and mordants as an aspect of technology, without chemical and spectroscopic analysis, few conclusive statements can be made about their specific identity. The Alpaca, a member of the cameloid family, supplied the principal weft fiber. Alpaca wool exists in a wide variety of natural colours ranging from pure white to black, with the majority falling between tan and brown. The wool accepts dyes readily making it possible for the Wari to produce a broad palette of colours using only three or four dyestuffs. By dying the range of natural colours of alpaca with a variety of dyes, a large number of colours were possible. A second method was by overdying, or dying yarns first one colour and then re-dying them another colour.

The Wari used mordants, usually metallic salts, to chemically fix the colour. Without mordants, the fabric would not be colour-fast. One of the easiest mordants to identify is iron. Iron darkens colours and is important for the production of black, one of the most difficult colours to produce. Iron as a mordant has some drawbacks. It is a tri-valence metal and over time it undergoes an ion change (oxidation) resulting in a less stable compound. This oxidation leads to deterioration of the fiber. (Col. James Rice p.c. to Alan Sawyer) This is evident in otherwise well preserved specimens as seen in figure 15, where most of the black areas have disintegrated leaving only traces of black. Areas where black remains intact may indicate the use of natural black alpaca wool. White also shows some deterioration caused by bleaching.

Another mordant that has been identified is alum (Bennett and Bird, 1964:197), the metallic salt aluminum sulphate which occurs commonly in Peru. (Fester, 1954:241) Alum characteristically produces clear bright colours and does not result in the deterioration of fibers.

Less is known about other mordants in use at this time, although common mordants used throughout the world are tin, chrome, soda ash (from burnt plant matter) and urine. The extent of use of these mordants is unclear at this time.

The three primary colours are found in Wari textiles: yellow, red and blue in order of the frequency of their occurrence. As a group they form the three primary colours, which in combination with the range of natural alpaca hues and different mordants made virtually any colour available to the Wari.

Figure 15. Detail of Figure 51 showing deterioration of fibers caused by the use of an iron mordant.

Yellow and related colours, ranging from tan to greenish brown, are the easiest to produce because of the proliferation of plants that create such colours. Without specific botanical evidence, however, it may be impossible to isolate the source or sources of yellow dyestuffs used in the Middle Horizon.

While several red dyestuffs have been identified in Peru, it is likely that cochineal was a main source for the Wari. Cochineal is produced from female insects of the genus Dactylopius "which belongs to the scale insect family Coccidae." (Gade, 1972:58) These insects live on the "Opuntia" or prickly pear cactus which grows in the Ayacucho area. The dyestuffs has also been isolated in Paracas and Nasca textiles. (Fester,1954:241) In the same study, Fester noted the occurrence of a red dye derived from the roots of a coastal plant called Relbunium. It is possible the Wari also had access to this dye through their trade routes with the coast.

There is little dispute that the principal source of blue was indigo (or indigofera). Fester states that indigo was the main source of blue dye native to Peru. Indigo dye is produced by the "more or less prolonged immersion and reduction by fermentation of the leaves of various shrubs which contained colouring matter." (D'Harcourt, 1962:6) Fibers to be dyed are immersed in the indigo vat and are yellowish upon removal, but turn blue through oxidation when exposed to air.

D. Iconography

Wari official garments are composed of repetitions of motifs with a surprisingly limited range of iconography. As noted earlier, the range of motifs has been grouped by Sawyer into three main types. These are:

1. **Type 1** - Paired Elements
2. **Type 2** - Composite Motifs
3. **Type 3** - Staff Bearing Anthropomorphic Figures.

Each of these three types are further subdivided by Sawyer into two or three more categories which will be discussed below. The order reflects the frequency of their appearance, with Type 1 textiles representing the greatest number of examples and the focus of this study. The order, in view of known Inca practise, may relate to the importance of the official or functionary they belonged to, and therefore may represent hierarchical status.

1. Iconographic Types

Following Sawyer's definition, Type 1 textiles display paired elements. These are divided into three subtypes. The first, Type 1A is composed of a rectangle, usually outlined in white, with paired step spirals of opposing orientation, separated by a diagonal line. (fig.16a) Type 1B is similar, but substitutes a stylized profile head for one of the stepped spirals. (fig.16b) Type 1C introduces a new element consisting of vertical geometric bars ending in stylized heads, paired with either a stepped spiral, as in Type 1A, or a stylized profile head, as in Type 1B. The latter is more common, and in fact only one example of the former appears in our sample as illustrated in figure 16c.

The second group of Wari textiles, Type 2, are composite motifs. This group is divided into two subtypes. Type 2A (fig.17a) is a geometric design with a profile feline head, while Type 2B (fig.17b) has a similar geometric design but with a profile bird or human head.

Figure 16. Type 1 - Paired Elements. (after Sawyer, 1963: 28)

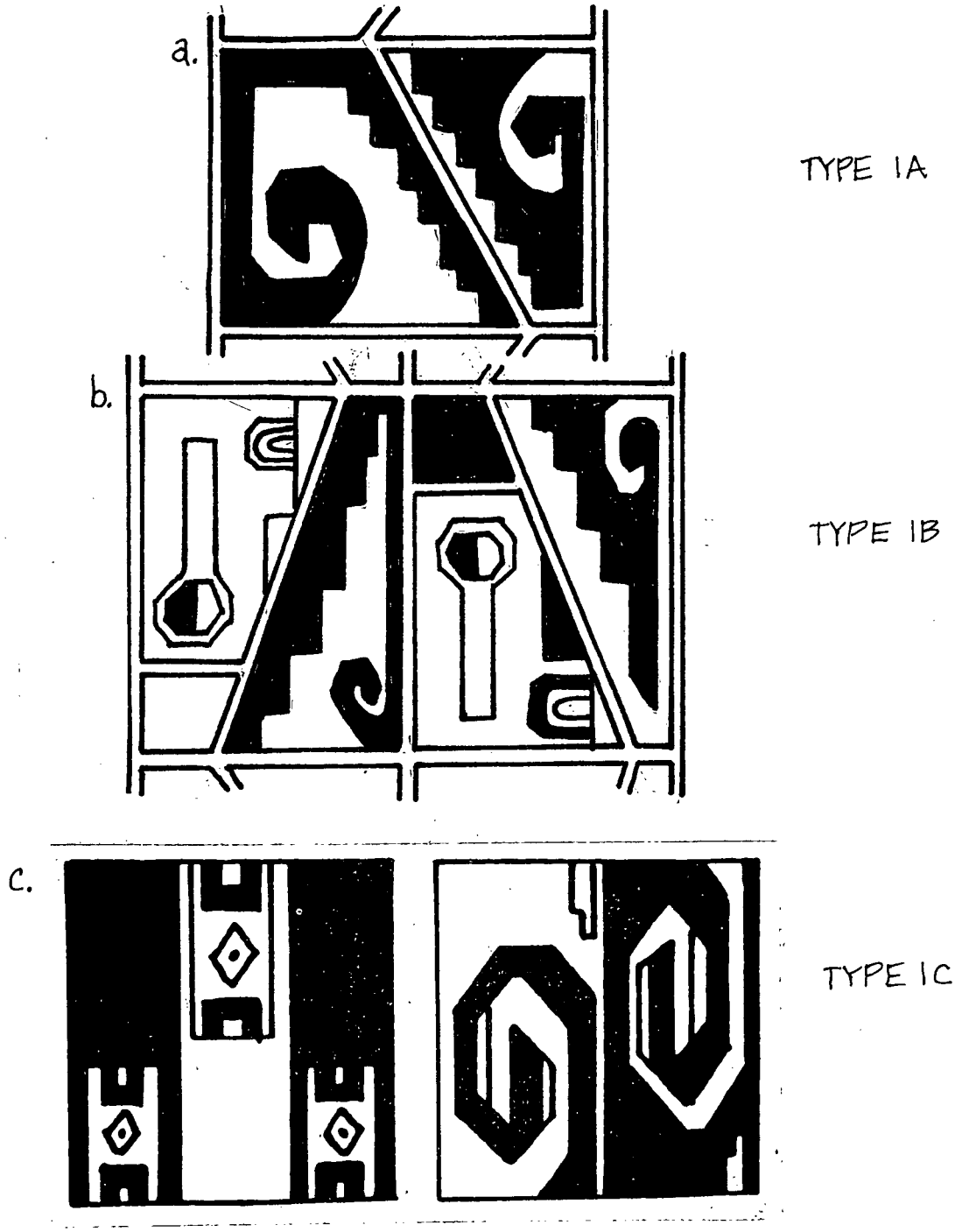
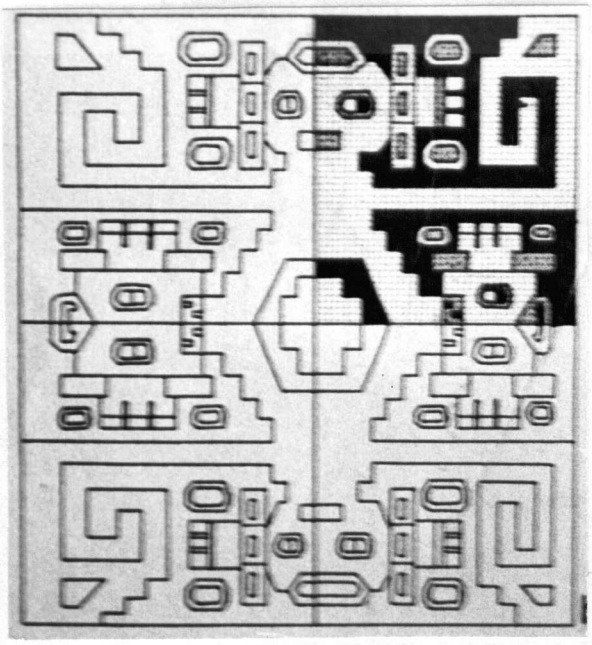


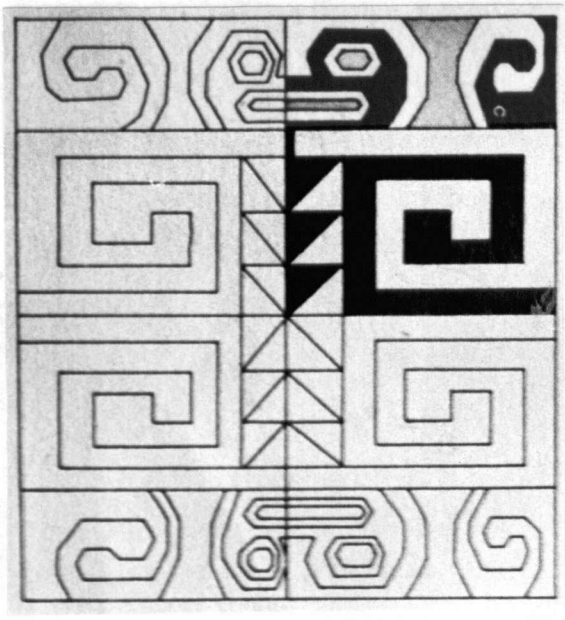
Figure 17. Type 2 - Composite Motifs. (after Sawyer, 1963: 28)

a.



TYPE 2A

b.



TYPE 2B

Each is repeated in varying positions to produce a four-part design. The movement to produce this design can be described as either transverse reflection or bilateral symmetry formed along two separate axis, one horizontal and the other vertical. This symmetry is interesting in that it produces the illusion of frontal faces by the juxtaposition of two profile faces along the axes. Symmetrical movement will be discussed in more detail at a later point.

The third group, Type 3, are staff bearing anthropomorphic figures, which are subdivided into two groups. The first, Type 3A (fig.18a) consists of winged anthropomorphic figures with puma, falcon and human heads. The figures are in profile with legs bent in a running position and holding a staff to the front. Type 3B (fig.18b) is a similar anthropomorphic figure with a second staff substituted for the wings and is usually seen in a standing position. There are also other subtypes (p.c. Sawyer), but these are not important to this study.

2. Iconographic Sources

The relation of Wari and Tiahuanaco has already been demonstrated through the ceramic evidence, and the obvious relation between the iconography of Wari ceramics and of the stone monuments from the classic Tiahuanaco period has also been shown.

Type 3 textiles have a similar, but not always easily recognized iconographic relation with Tiahuanaco. Sawyer has traced the iconographic sources for the designs of Type 3 textiles. (Sawyer,1963) These can be clearly seen in figure 19. Variations are inevitable when one culture adopts religious iconography from another culture and medium. They are partially dictated by the geometricizing

Figure 18. Type 3 - Staff Bearing Anthropomorphic Figures.

a. Winged Figure in a running position.
(after Sawyer, 1963: 30, fig. 1b)
b. Similar Figure with a second staff substituted for the wings, in a standing position.
(after Sawyer, 1963: 23)

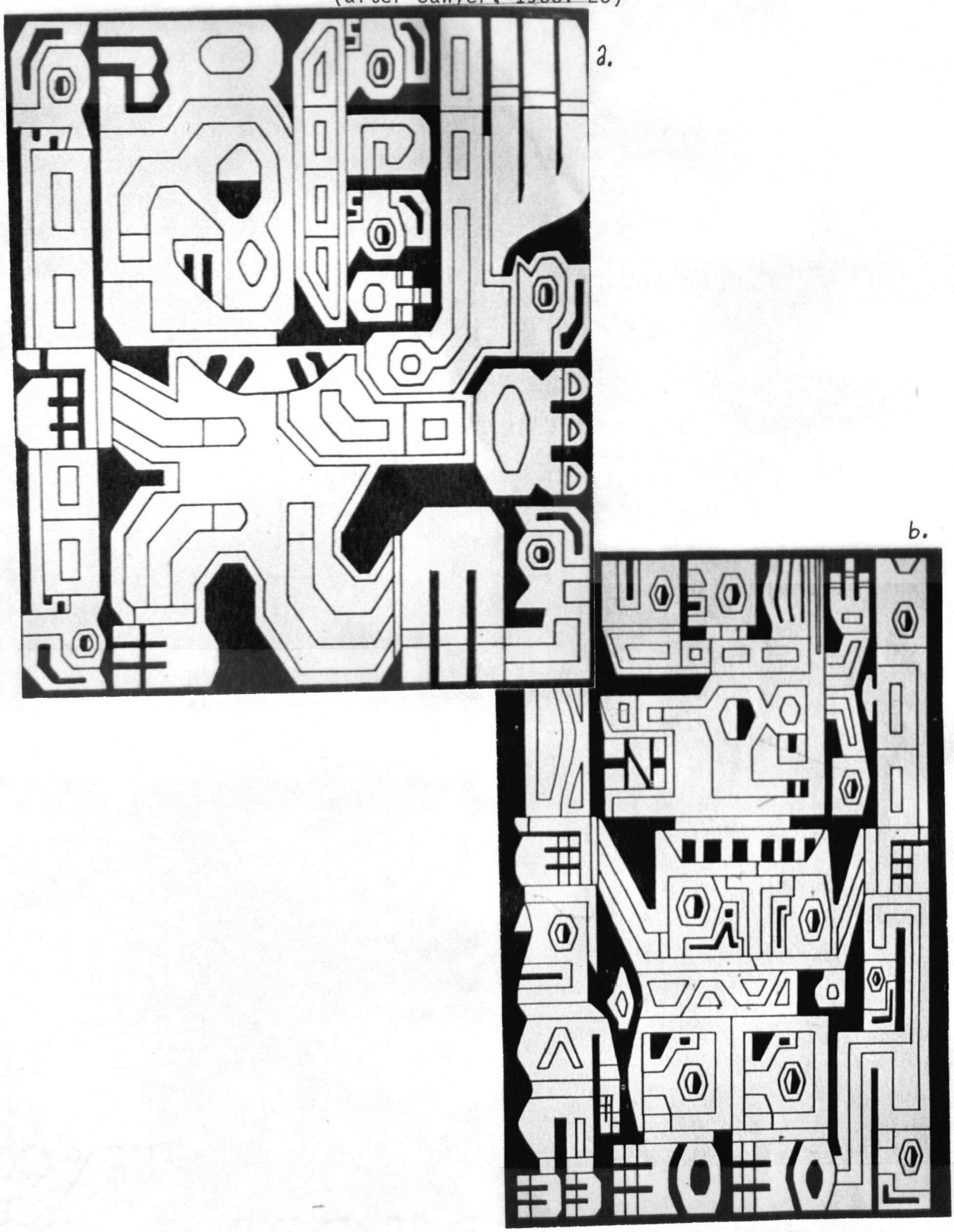
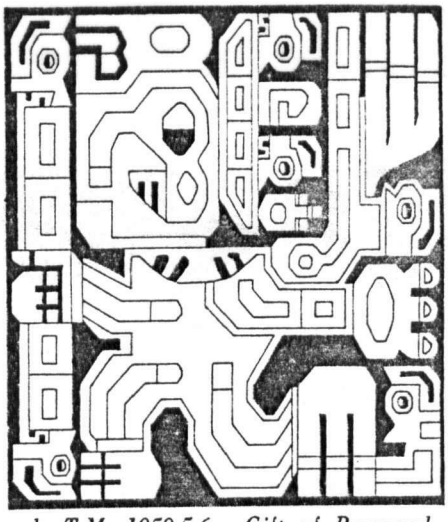
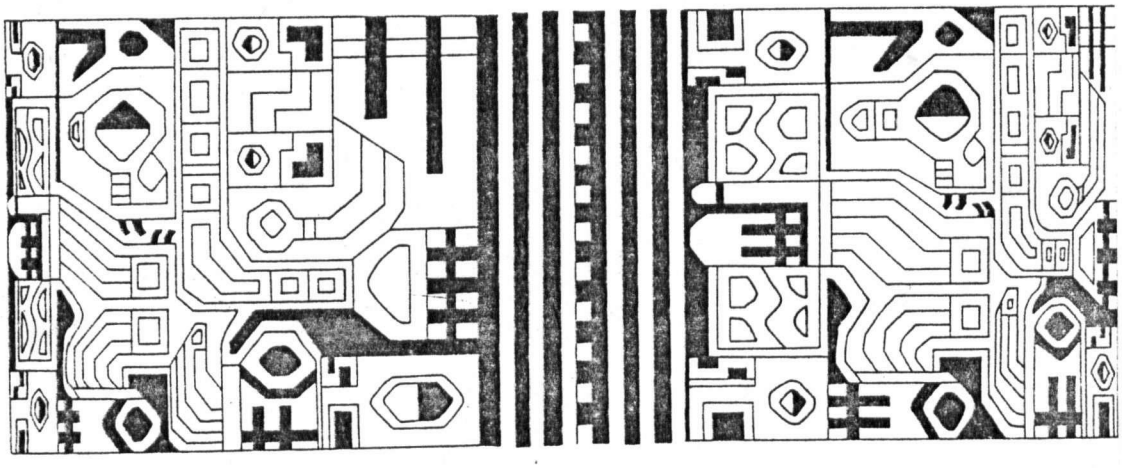


Figure 19. Stages of representation of Type 3 - Staff Bearing Figures. (after Sawyer, 1963: 30, fig. 1)

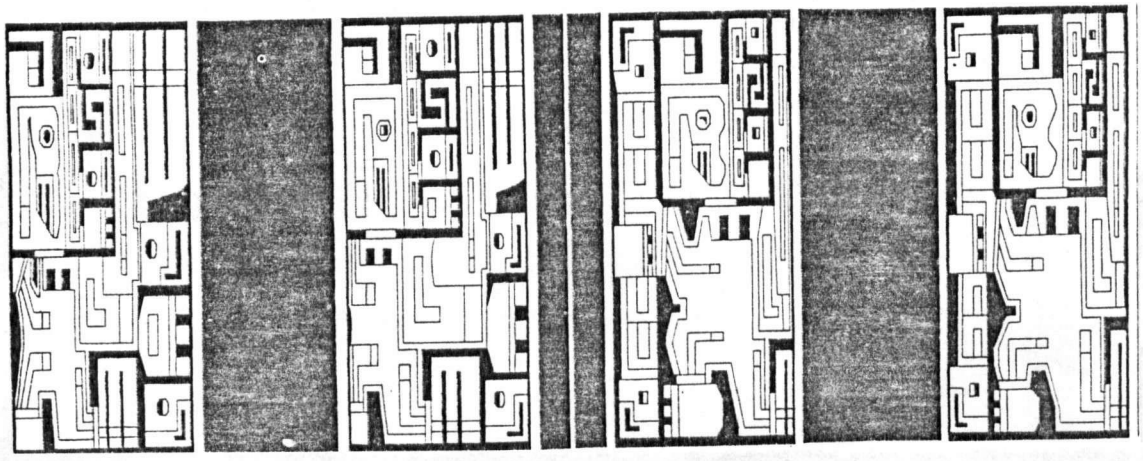
a. From the "Gateway of the Sun" at Tiahuanaco, Bolivia



b. T.M. 1959.5.6. Gift of Raymond Wielgus



c. T.M. 1961.24.1 Gift of John Wise



influence of the warp and weft. Once the transition from culture to culture, and medium to medium occurs, refinements of the iconography are made to reflect the tastes of the culture.

No exact antecedents of Type 2 textiles are found at Tiahuanaco, although certain elements can be shown to have been abstracted from Tiahuanaco sources. Consider the upper right corner of figure 17b. The figure is a bird, probably a falcon, with a spiralled appendage emerging from what appears to be a representation of wings. The tail ends in another falcon head. Both of these depictions of birds are shown with a stylized headdress, an abstracted version of the headdresses that occur on the Gateway of the Sun (fig. 6). Similarly, the split eye is common in Tiahuanaco art. Sawyer suggests that these composite motifs are "figure motifs altered by substitution of symbolic elements such as spirals and stylized heads for some of their natural components." (Sawyer, 1963:166)

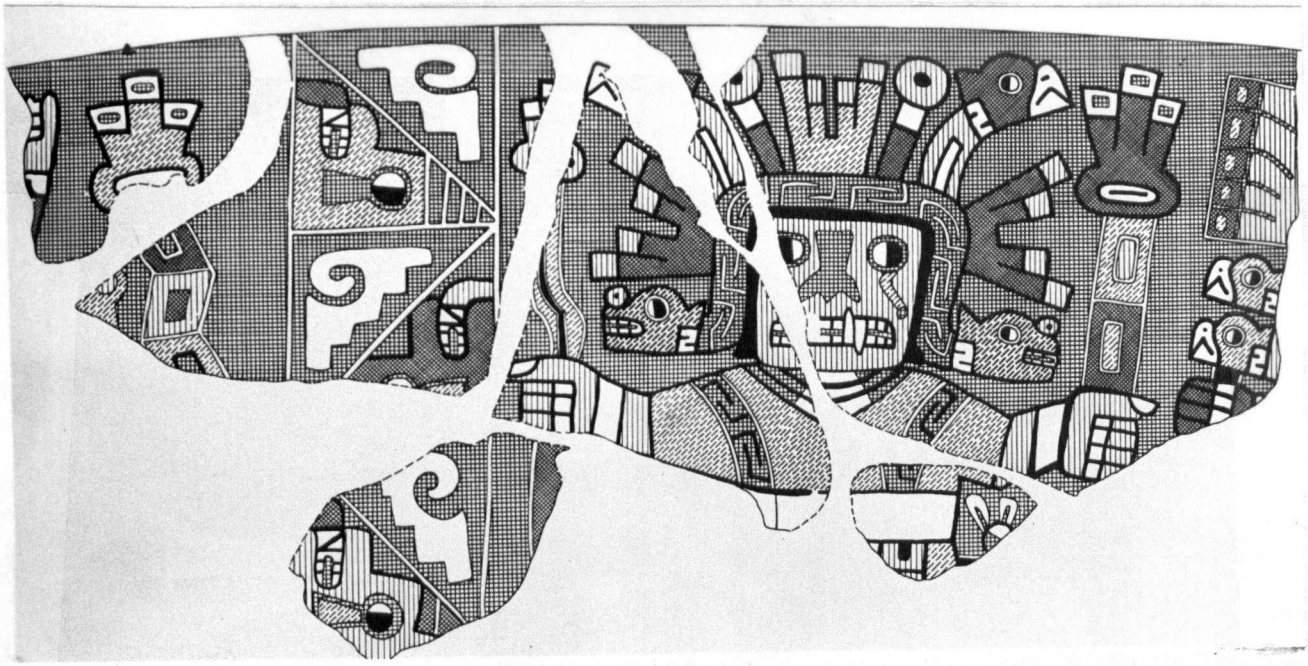
The step spiral design has great antiquity in the indigenous art of the Americas. Many examples exist in North and South America (as well as Africa and Asia) spanning the period from the first millenium B.C. to contemporary times. The antiquity and widespread occurrence of this design may imply universal symbolic importance, but more likely the meaning probably varied both regionally and temporally. The Wari's stepped spiral design has been referred to in the literature (Lothrop, 1964:214) as the tail of a puma. This interpretation has been made partially because of the profile feline head that it is often paired with. The proponents of this argument believe that the paired elements of Type 1B represent an abbreviated form of a feline. While this

interpretation may be correct, there is not enough evidence to prove it conclusively. For that reason it is preferable to describe the designs in literal terms.

As with Type 2 textiles, no exact antecedents can be found for Type 1 designs at Tiahuanaco. However, examples of designs which appear in Type 1 textiles are found on Wari ceramics. Some of these appear on the ceramics in conjunction with designs that do have direct connections with Tiahuanaco iconography. Most of these ceramics are from the beginning of the Middle Horizon, in Epoch 1A and 1B. The earliest example is a fragment of an oversized vessel found near Conchopata by Max Uhle. (Menzel, 1977:109) It dates from Middle Horizon, Epoch 1A and is in the Conchopata style. (fig.20) The central figure is closely related to the central figure on the Gateway of the Sun. (fig. 6) To the left of this figure in a narrow vertical band there are three paired elements, the same as those of Type 1B textiles, except that the orientation of the pairs is shifted 90 degrees. The fragmentary representations that appear to the left of the vertical band and to the right of the central deity, are parts of the same motifs seen on another fragment from Conchopata, also from Epoch 1A. (fig. 5)

While this image is not identical to the running figures on the Gateway of the Sun or other stone monuments at Tiahuanaco, it shares many common traits and it is safe to assume that this iconography was derived from Tiahuanaco. This is a design that can be traced directly back to Tiahuanaco, appearing in conjunction with paired elements that appear to have no close equivalent in Tiahuanaco. This ceramic fragment is one of the earliest known examples illustrating the paired elements that appear on the textiles and shows that the motif, probably a Wari innovation, occurred as early as Epoch 1A.

Figure 20. Drawing of figure from an oversize vessel of the Conchopata style. (after Menzel, 1977: 109, fig. 62)



A ceramic in the Robles Moqo style dating from Epoch 1B of the Middle Horizon (fig.21) is of particular interest because it is one of many in which the paired elements appear in a Type 1B style tunic. The representation of the paired elements is not an exact reproduction of textile patterning. Painted ceramics are not bound by the same restrictions that govern textile structures, which may explain the variations in orientation and design. What is of particular interest however, is the representation of a figure wearing an official garment. This strongly suggests the existence of the official garments during this epoch and may help to date their appearance.

The representation of paired elements on ceramics occurs throughout the period of Wari domination and in all regions of the empire. Whether occurring in the context of an official garment or appearing alone, the representation of paired elements on ceramics did not follow the same rigid design conventions that applied to textiles.

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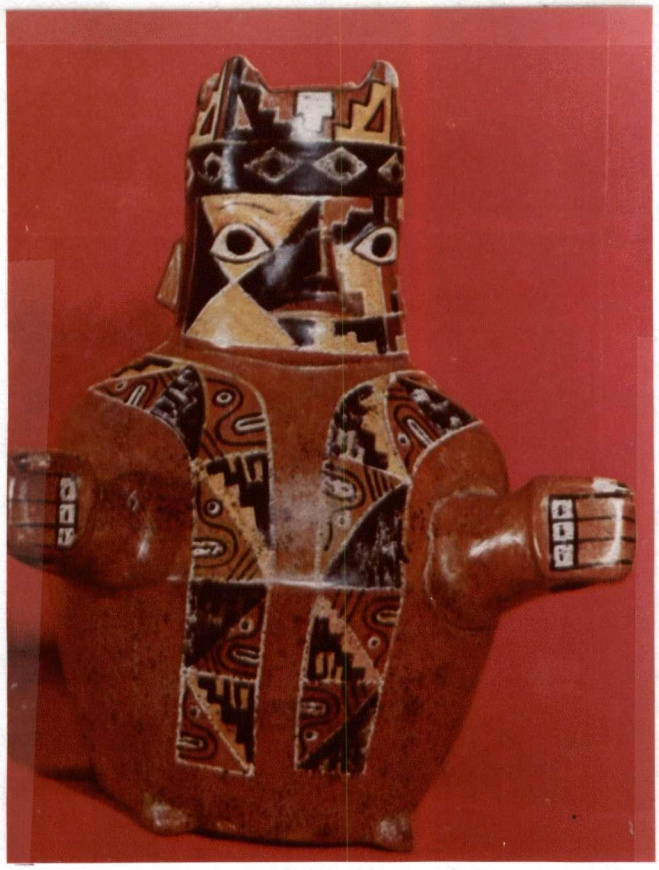
Figure 21. Pottery Vessel of the Robles Moqo style, with a Type 1B tunic. (after Larco Hoyle, 1970: 158, fig. 116)



CHAPTER 3 DESIGN CONVENTIONS AND SAMPLE

A. Introduction to Design Conventions

Four main types of design conventions appear in Wari textiles:

1. Abstraction
2. Distortion
3. Symmetry
4. Colour Patterning

The remainder of this thesis consists of a general discussion of abstraction and distortion for the three types of official garments, and a specific analysis of distortion, symmetry and colour patterning in Type 1A and 1B tunics.

1. Abstraction

Abstraction of the motif is one type of design convention apparent in all Wari official garments. This abstraction involves the selective elimination of the unessential and the reduction of symbols to an abbreviated form. In the previous discussion of iconographic sources it was shown that Type 3 textiles closely resemble their Tiahuanaco antecedents. Abstraction of the motif can be clearly seen for these staff bearing figures. Figure 19 shows the stages of representation beginning with the stone carving from the Gateway of the Sun at Tiahuanaco (the original iconographic source) and demonstrates the progressive use of abstraction in three tunics. Similarly, figure 25 shows the staff bearing figure abstracted to a state that is almost unrecognizable. The curvilinear image seen in the stone carving from the Gateway of the Sun becomes geometricized in the textiles, largely

as a result of the medium transistion from stone to textile. When abstraction is examined in the textiles it is apparent that its use increases over time reflecting changing interpretations and tastes of Wari artists.

Similar progressions in abstraction to those demonstrated for Type 3 tunics, are evident in all other official garments, however the progression in Type 1 and 2 tunics is less striking than in Type 3 tunics. This is undoubtedly due to the fact that the images in Type 1 and 2 tunics are reductive in nature, and as shown earlier, were probably a Wari innovation rather than directly derived from Tiahuanaco. A demonstration of the progressive abstraction of a stepped spiral design of Type 1 is illustrated in figure 22. The first (fig.22a) is a relatively unabstracted stepped spiral, while the second (fig.22b) has been abstracted to such an extent that portions of the stepped spiral almost disappear. In addition, two blocks of colour (indicated by shading) have been added to the stepped spiral. These additions will be discussed later. Similarly, the abstraction of the profile head elements can be seen in figures 23a and 23b, with the first showing less abstraction and the second greater abstraction.

2. Distortion

The most apparent design convention used by the Wari is lateral distortion. This device of

> ...lateral expansion of those elements of the motif which lie towards the center of the garment and compression of those nearest the side hem (Sawyer, 1963:29)...

Figure 22. Abstraction of the Stepped Spiral motif.

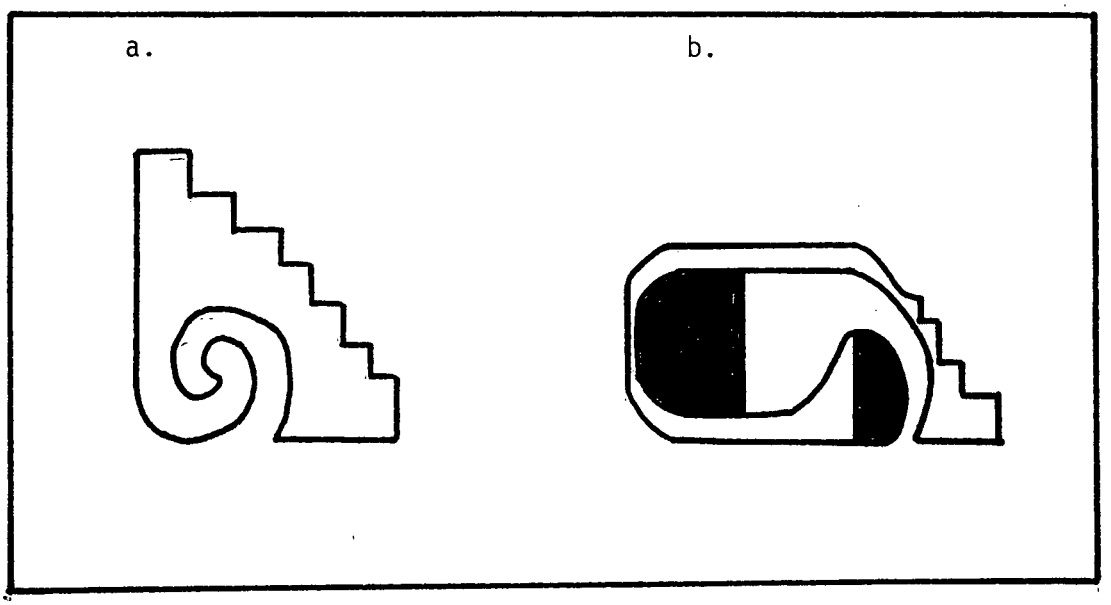
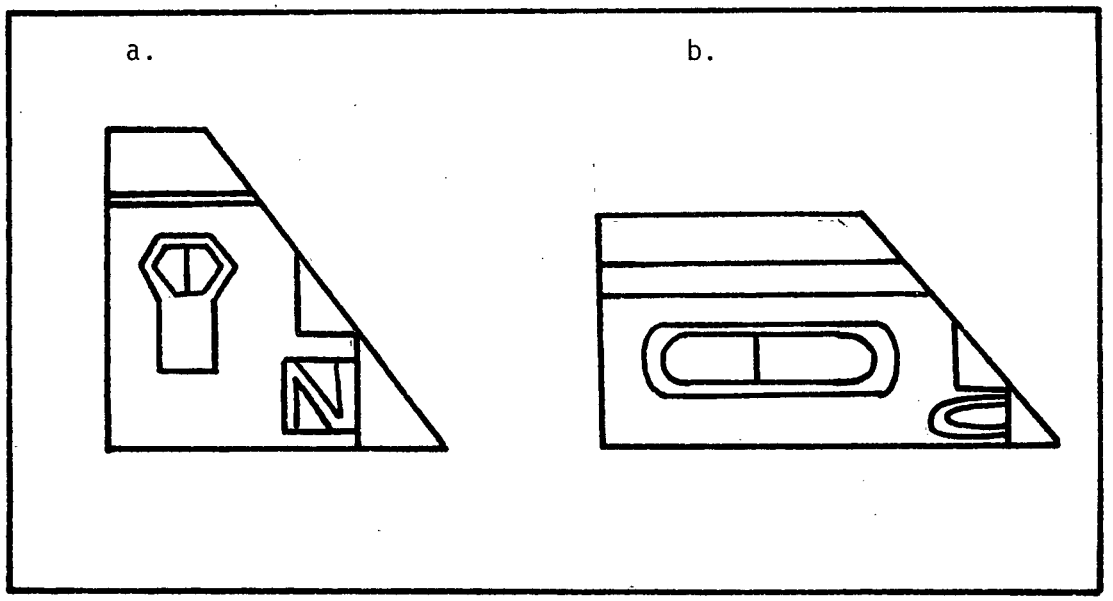


Figure 23. Abstraction of the Profile Head Motif.



is one of the more sophisticated design conventions developed and used by the Wari, and the central theme of an article by Sawyer. In it he states that

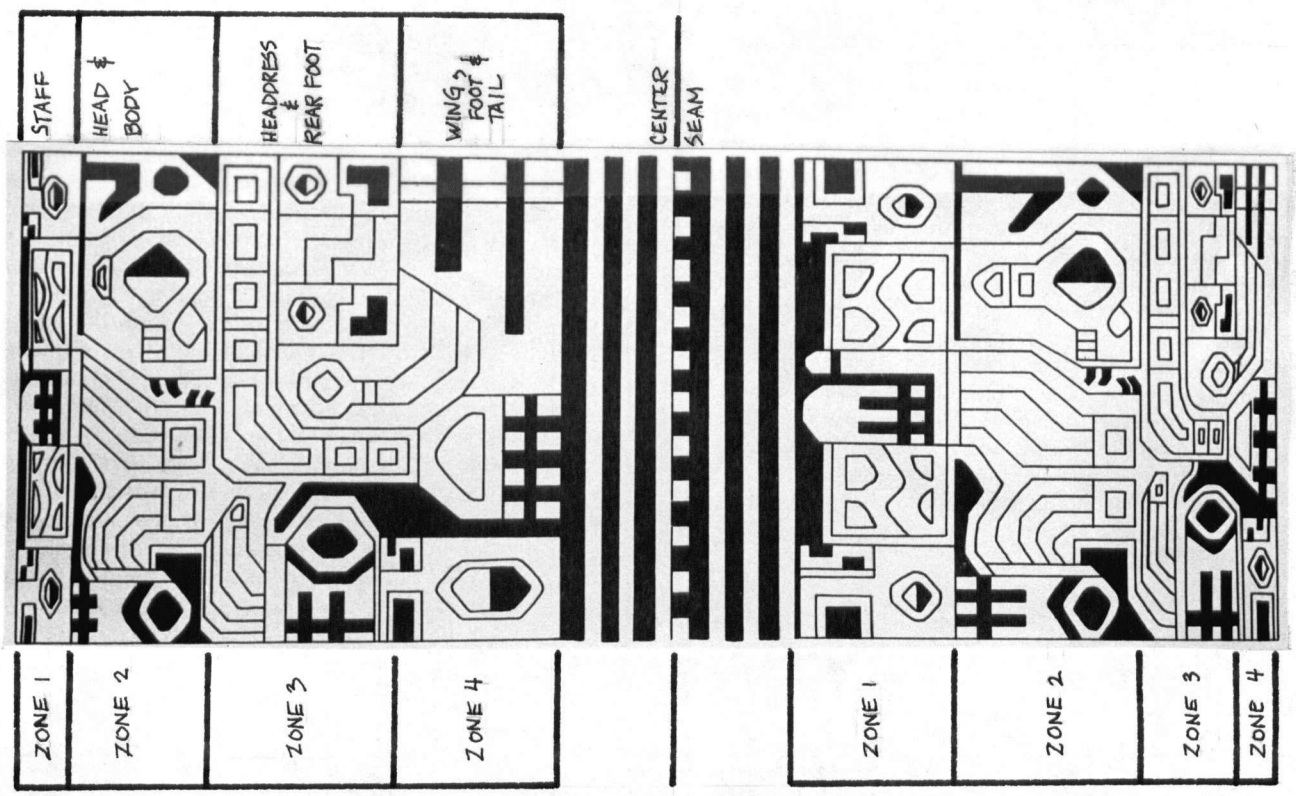
> ...the degree to which this distortion is carried usually becomes more pronounced in direct relationship to the extent to which the motif is stylized. (Sawyer, 1963:29)

Lateral distortion is demonstrated clearly in Type 3 textiles. Its use has some interesting manifestations. As noted, the greatest amount of expansion usually occurs towards the center seam, but in Type 3 tunics another variation occurs. Sawyer has divided the staff bearing figure into four zones (fig.24) from left to right:

1. **The staff**
2. **The head and body**
3. **The headdress**
4. **The wing, foot and tail**

In this figure (fig. 24) we see two staff bearing figures on either side of the center seam facing in the same direction. The application of expansion towards the center seam produces two images that appear very different from one another. Sawyer has noted that expansion and compression" was accomplished by the simple expedient of adding or subtracting from the weft threads used to form the elements in a given zone." (Sawyer, 1963:29) He notes that in the example (fig. 24) the

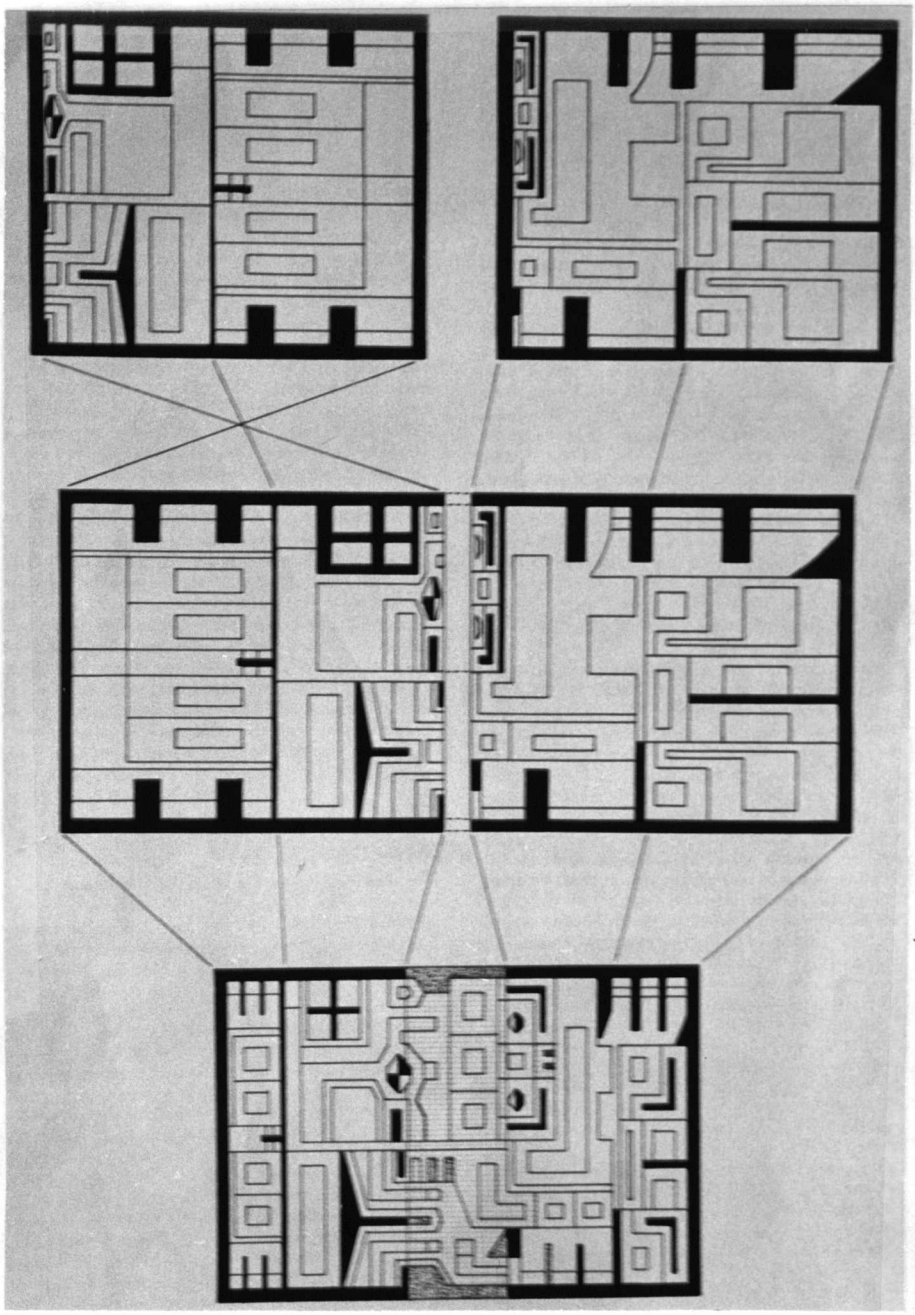
Figure 24. The Four Zones of Type 3 - Staff Bearing Figures.
(after Sawyer, 1963: 34, fig. 4)



two zones closest to the center seam occupy two-thirds of the design area rather than half. Lateral distortion (expansion and compression) is used to different degrees in different textiles. In very abstract examples the compression is often so great that one or more zones are totally eliminated. In another example (fig.25), Sawyer had deciphered a very complex and almost unrecognizable image. Here the motifs contain less than half the complete motif, alternating front and back by register. Briefly, his process of resolution is as follows. The two design units (top of fig.25) appear in alternate registers, one above the other, and are labelled A and B. The middle portion of the diagram shows the design unit A reversed in orientation, while B maintains the same orientation as at the top of the diagram. Without altering the vertical height, Sawyer has eliminated the lateral distortion and filled in the missing areas (shaded portion). It is now recognizable as a staff bearing figure. This demonstrates the sophisticated application of lateral distortion across the tunic and within zones, and attests to the creative skill of the weavers who conceived these textiles.

In Type 1 textiles, similar zones can be identified, although the complete elimination of zones is not seen. Generally, the horizontal width of the spiral portion of the stepped spiral element is equivalent to the horizontal width of the eye in the profile head element in the register directly above or below it. Lateral distortion as applied to Type 1A and B will be discussed further in a later chapter.

Figure 25. Resolution of distorted Type 3 figure. (after Sawyer, 1963: 34, fig. 4)



B. Overall Design Organization

The design conventions of abstraction and distortion demonstrate the Wari artist's adherence to formal design principles. This is also seen in the overall design organization of the tunics.

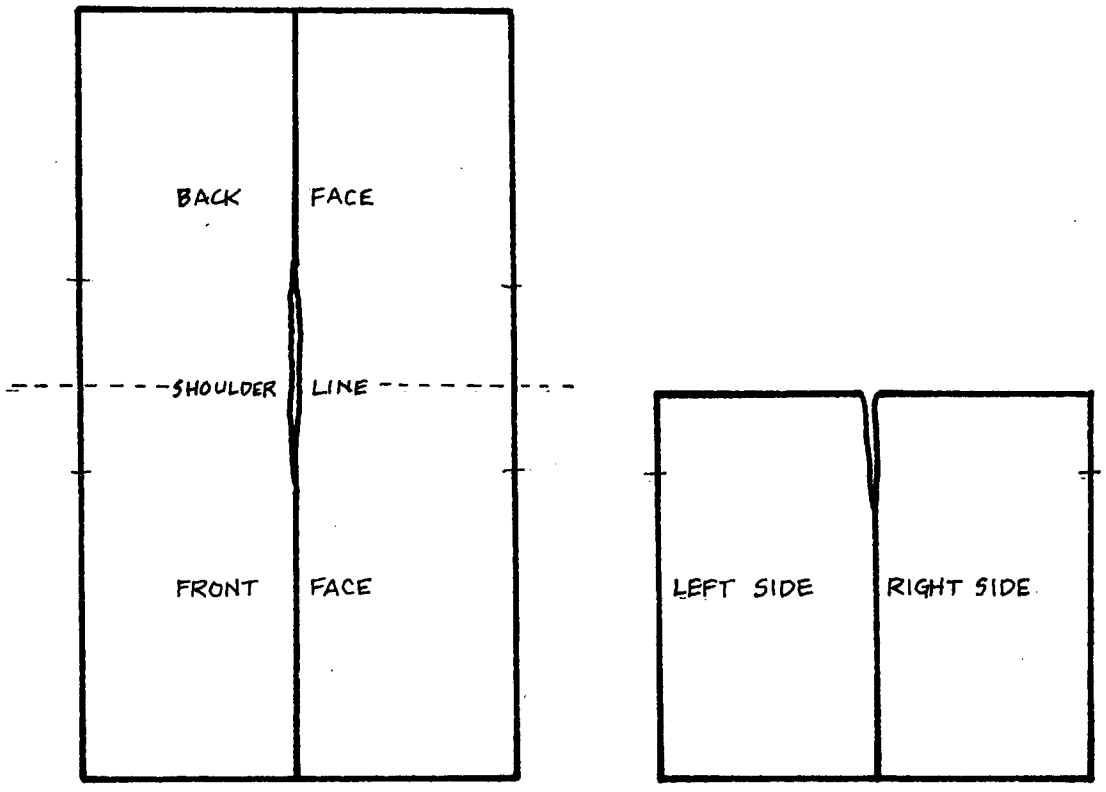
Wari tunics are composed of a series of vertical columns. These columns are either patterned or unpatterned. The unpatterned columns consist of solid colour stripes and will be referred to as **interspaces** or **interspace columns**, while the patterned columns consist of a vertical stack (or set) of design units and will be called **design columns.** A **design unit**, as defined earlier, is one set of paired elements, either two stepped spirals (Type 1A), or a stepped spiral and a profile head (Type 1B).

Wari tunics are constructed with two loomed panels joined at the center and side seams, with openings for the head and arms (fig.12).

For clarity, one **side** (or **half**) refers to the portion of the tunic to the right or left of the center seam as assembled, rather than to the **front or back face** of the tunics (fig.26).

The column organization on the right side of the tunic is simply a mirror reflection of that found on the left side of the tunic. The

Figure 26. Diagram indicating loomed panels, front and back faces and left and right sides.



design organization can therefore be described by the number of interspace and design columns on one side (half) of a tunic. In addition, the columns can be further be described as single, double or triple, etc.. Single unit columns separated by interspace columns will be referred to a **single design column**, while double unit columns (appearing side by side with no interspace column separation) will be called **double design columns.** Multiple unit columns will be discussed as they occur. As well, every example in this study has a single design column at the side seam that will be referred to as a **single compressed edge design column.** The term **adjacent design columns** will be used to describe design columns that are adjacent to one another whether separated by interspace columns or not.

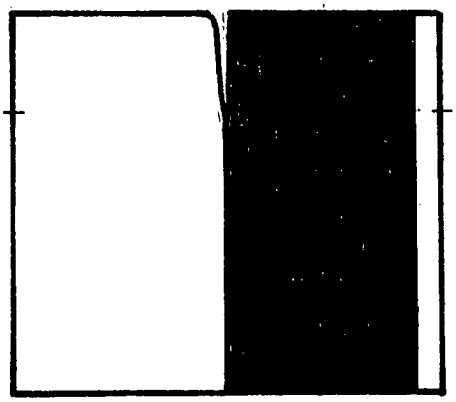
For comparison purposes, the sample has been divided into five groups reflecting the number and relation of interspace and design columns on one side of a tunic (fig. 27).

Group 1 consists of a single compressed edge design column, with the remaining field composed of multiple colour stripes. These stripes, considered as a whole, form the interspace.

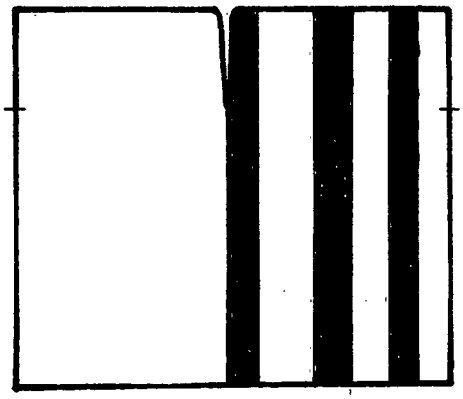
Group 2 consists of one double design column, a single compressed edge design column, and two interspace columns. The interspace columns appear to the right and left of the double design column, with the first interspace column occurring at the center seam.

Group 3 consists of two double design columns, a single compressed edge design column and three interspace columns. The interspace

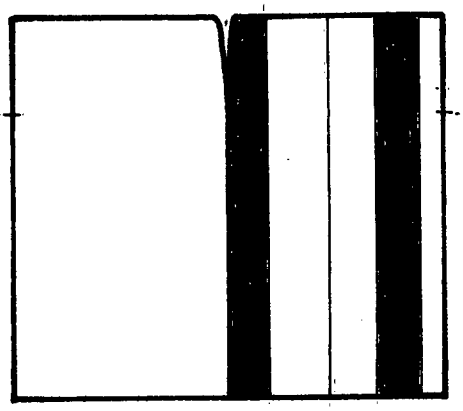
Figure 27. The Five Groups of Type 1 Tunics.



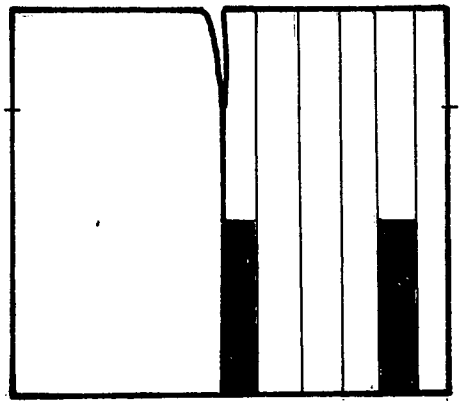
GROUP 1



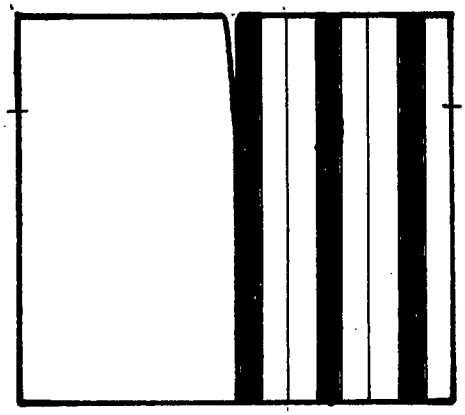
GROUP 4



GROUP 2



GROUP 5



GROUP 3

Shaded areas - Interspaces.

columns appear to the right and left of each double design column, with the first interspace column occurring at the center seam.

Group 4 consists of two single design columns, a single compressed edge design column and three interspace columns. The interspace columns appear to the right and left of each single design column, with the first interspace column occurring at the center seam, as in Groups 1 through 3.

Group 5 differs from Groups 1 through 4 in overall design organization. The front face (and back face) of the tunic is divided approximately in half horizontally, with overall design columns (multiples ranging from five to seven) appearing in the upper portion of the tunic. Some of these design columns continue into the lower portion of the tunic in multiples of two, three and four. In addition, a single compressed edge design column (as in Groups 1 to 4 appears in both the upper and lower portion of the tunic. Interspace columns (two or three) are discontinuous, and appear in only the lower portion of the tunic, with the first appearing at the center seam.

C. The Sample

The sample for this study consists of forty seven examples ranging from complete tunics to fragments. The author has been fortunate to examine and photograph many examples in museums and private collections in Berkeley, New York, Washington, D.C. and Peru. In addition to personal research, the extensive photo and slide archives of Alan Sawyer and existing photographs in the literature have been studied.

A breakdown of the sample into the five groups defined according to column organization can be seen in figure 28.

***

Figure 28. Sample List.

			FIGURE	TYPE	PHOTOS COLOUR	PHOTOS B/W	
GROUP1	1.	SMITH 431116	29	1B	x		
	2.	TM 91.402	30	1B	x	x	
GROUP2	3.	Priv.Col.	31	1B	x		Coyungo, Rio Grande de Nasca
	4.	TM 1960.12.1	32	1B	x		Uyujalla, Ica Valley
	5.	TM 91.1960.12.3	33	1B		x	Ica Valley
	6.	TM 91.1960.12.4	34	1A		x	Ingenio Valley, San Javier
	7.	Priv.Col.	35	1B	x	x	
	8.	Milwaukee P.M.	36	1B		x	
	9.	Priv. Col.	37	1B	x		
GROUP3	10.	AMNH 41.0 3628	38	1B	x		
	11.	Univ. Ill.	39	1A	x		Huanca Santos,near Ayacucho
	12.	Ayacucho Mus.	40	1A	x	x	Ayacucho area
	13.	AIC	41	1B	x		
	14.	TM	42	1B	x		Coyungo,Rio Grande de Nasca
	15.	TM 91.344	43	1B		x	
	16.	AMNH 41.2 766	44	1B	x		
	17.	Mus. de la Plata	45	1B		x	
	18.	DO B.498 PT	46	1B	x	x	
	19.	TM 91.342	47	1A		x	
	20.	TM 91.1966.12.5	48	1B		x	
	21.	Mus. de Lujan	49	1B		x	
	22.	Priv. Col.	50	1B		x	
	23.	AMNH 41.2 768	51	1A	x		
	24.	DO B.499 PT	52	1B	x	x	
	25.	PM 42.12.30.3346	53	1B	x		
	26.	Amano Mus.	54	1B	x		
	27.	AMNH 41.0 1192	55	1A	x		
	28.	Oberlin 61.39	56	1A		x	
	29.	Priv. Col.	57	1A	x		
	30.	Priv. Col.	58	1A	x		
	31.	Priv. Col.	59	1B	x		
	32.	Priv. Col.	60	1B	x		
	33.	Univ. Ill.	61	1B	x		Huanca Santos,near Ayacucho

* KEY TO ABBREVIATIONS ON FOLLOWING PAGE

			FIGURE	TYPE	PHOTOS: COLOUR	PHOTOS: B/W	PROVENIENCE
	34.	PM	62	1B	x		
GROUP 4.	35.	TM 91.471	63	1A		x	
	36.	AMNH 41.2 764	64	1A	x		
	37.	TM 91.3432	65	1B	x	x	
	38.	Priv. Col.	66	1A	x		Callango,
	39.	TM 91.301	67	1A		x	Ica Valley
	40.	Priv. Col.	68	1B	x		
	41.	Mus.de Arte,Lima	69	1B			
GROUP 5.	42.	TM 91.9	70	1B	x	x	Rio Grande de Nasca
	43.	Priv.Col.	71	1B	x		
	44.	AMNH 41.2 763	72	1B	x		
	45.	DO B.497 PT.	73	1B	x	x	
	46.	AIC S.1182.55.1702. M5600	74	1B		x	
	47.	AMNH (no cat.number)	75	1B	x		

AIC	Art Institute of Chicago
AMNH	American Museum of Natural History,New York
DO	Dumbarton Oaks
PM	Peabody Museum, Harvard
SMITH	Museum of Natural History, Smithsonian Institute
TM	Textile Museum, Washington, D.C.

Figure 29. Sample number 1. SMITH 431116
Group 1
Type 1B
Collection: Museum of Natural History, Smithsonian Institute, Washington, D. C.
Photograph: Author

Figure 30. Sample number 2. TM 91.402
Group 1
Type 1B
Collection: Textile Museum, Washington D. C.
Photograph: Courtesy Alan Sawyer

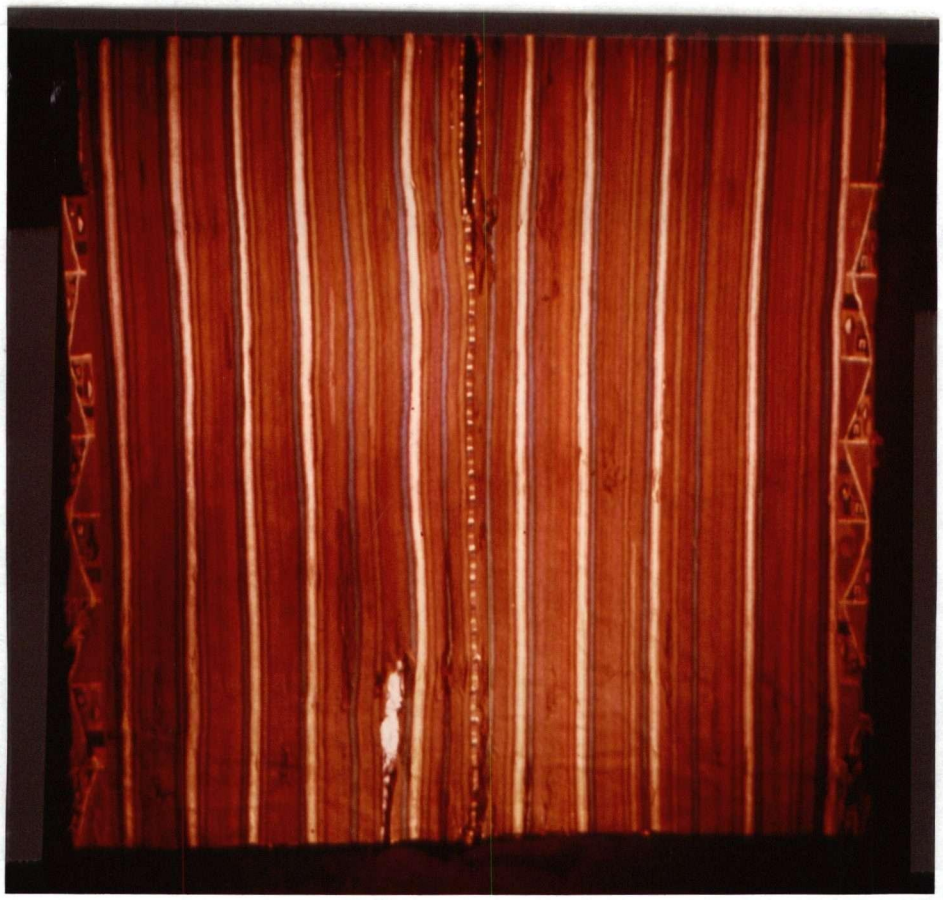


Figure 31. Sample number 3. Private Collection
Group 2
Type 1B
Collection: On loan to Brooklyn Museum
Photograph: Courtesy Alan Sawyer

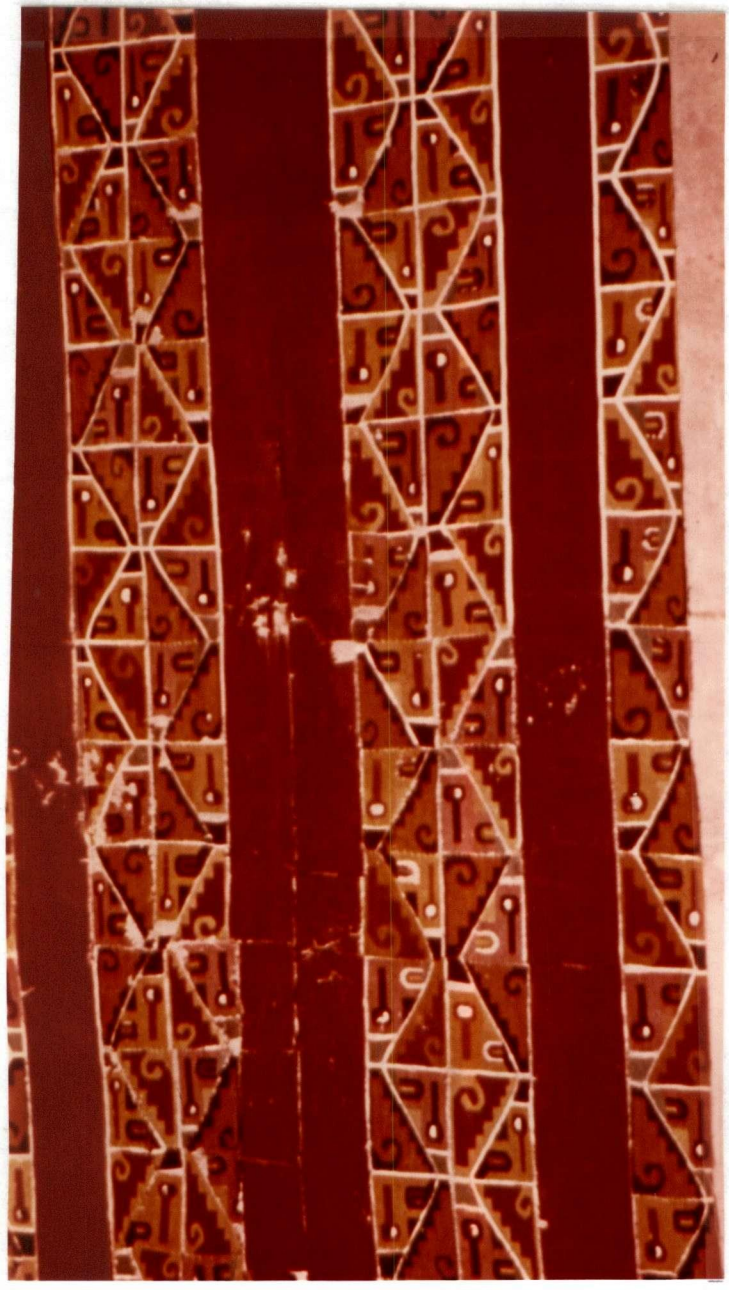


Figure 32. Sample number 4. TM 1960.12.1
Group 2
Type 1B
Collection: Textile Museum, Washington, D. C.
Photograph: Courtesy Alan Sawyer

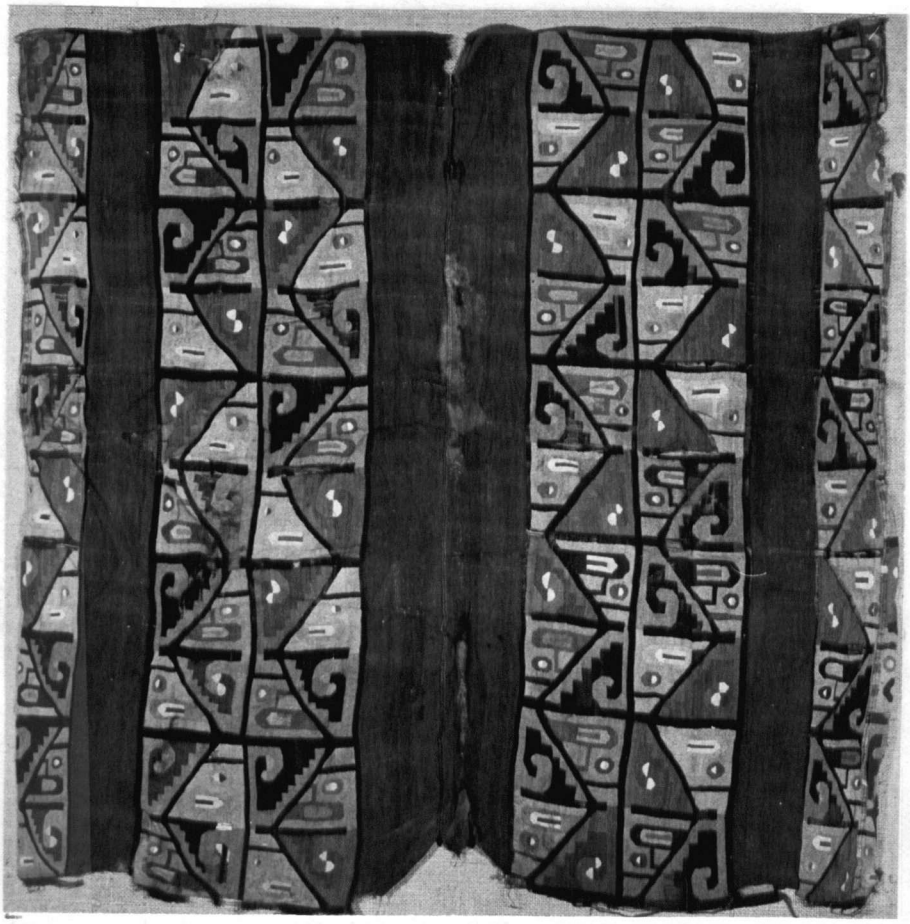


Figure 33. Sample number 5. TM 91.1960.12.3
Group 2
Type 1B
Collection: Textile Museum, Washington, D. C.
Photograph: Courtesy Alan Sawyer

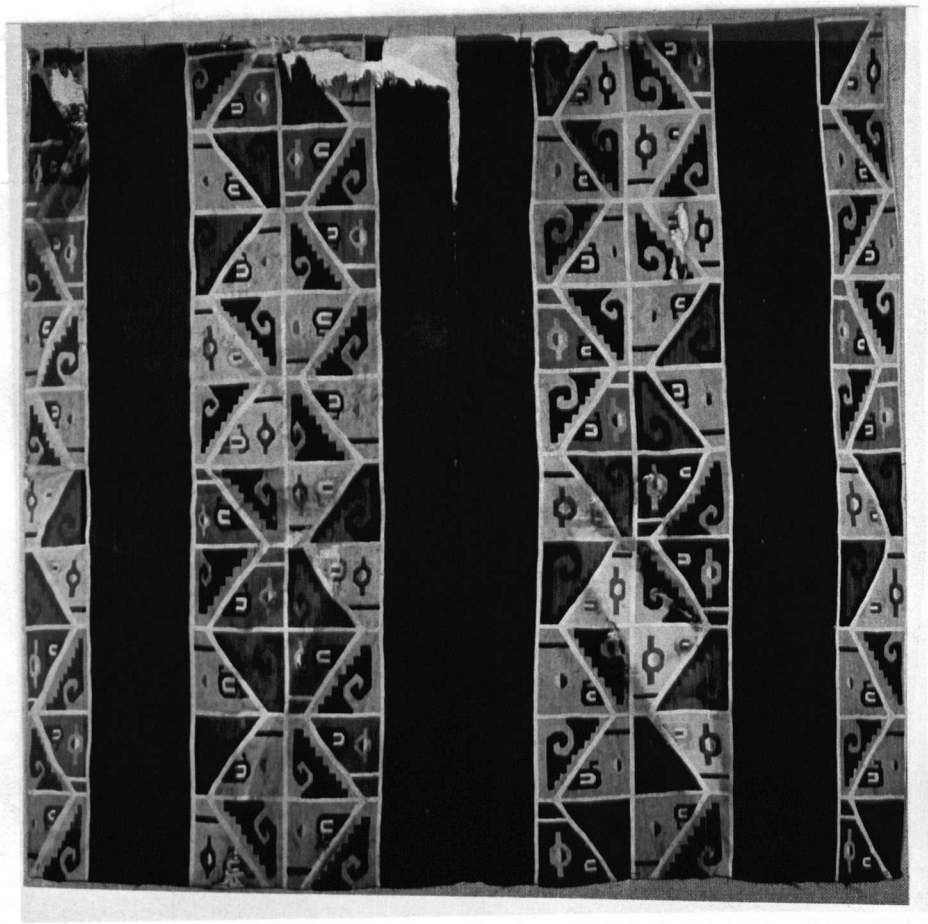


Figure 34. Sample number 6. TM 91.1960.12.4
Group 2
Type 1A
Collection: Textile Museum, Washington, D. C.
Photograph: Courtesy Alan Sawyer

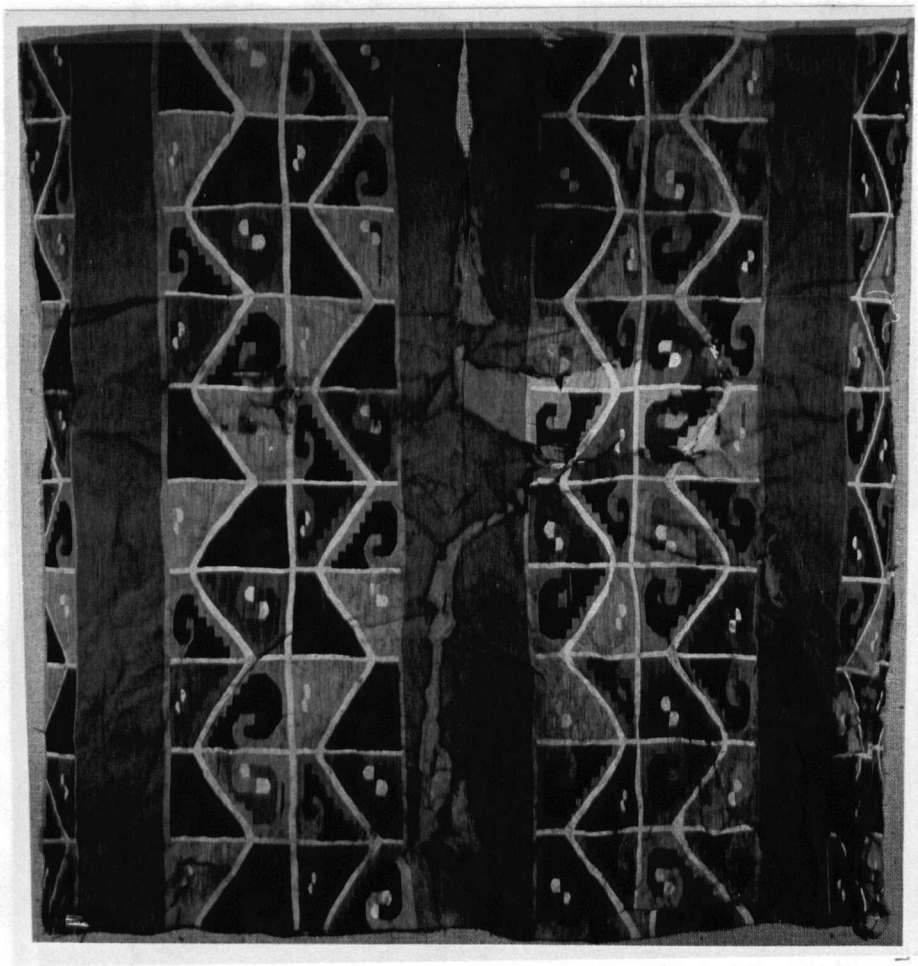
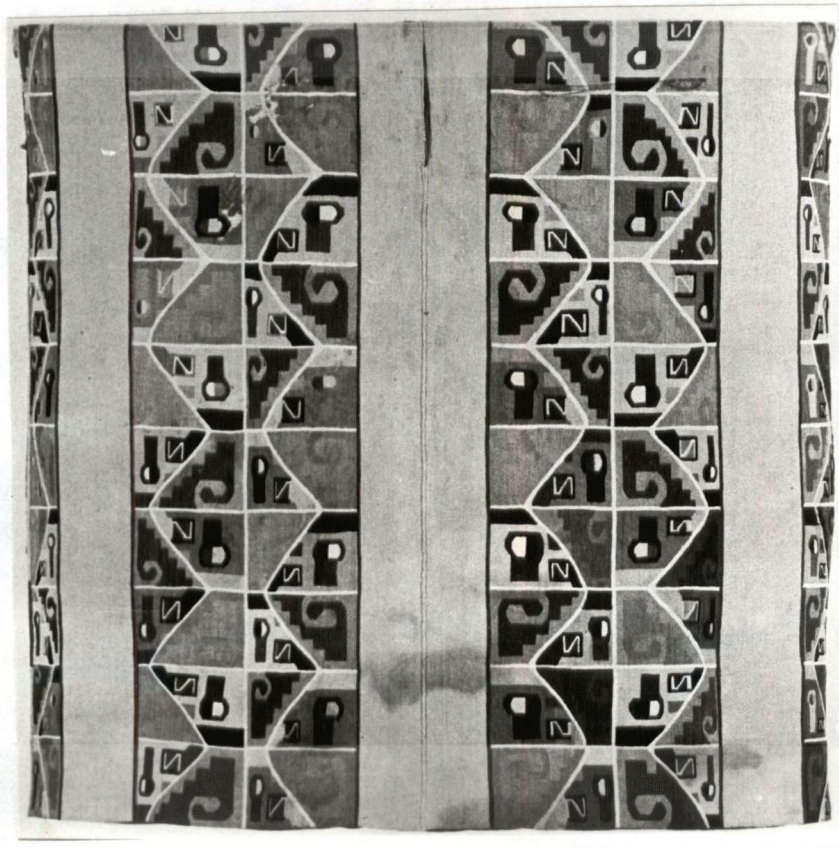


Figure 35. Sample number 7. Private Collection
Group 2
Type 1B
Collection: Private Collection, Houston
Photograph: After Bird and Skinner, 1974: 6, fig. 1 and cover.



FRONT AND BACK FACE OF TUNIC.

Figure 36. Sample number 8. Milwaukee Public Museum
Group 2
Type 1B
Collection: Milwaukee Public Museum
Photograph: Courtesy Alan Sawyer

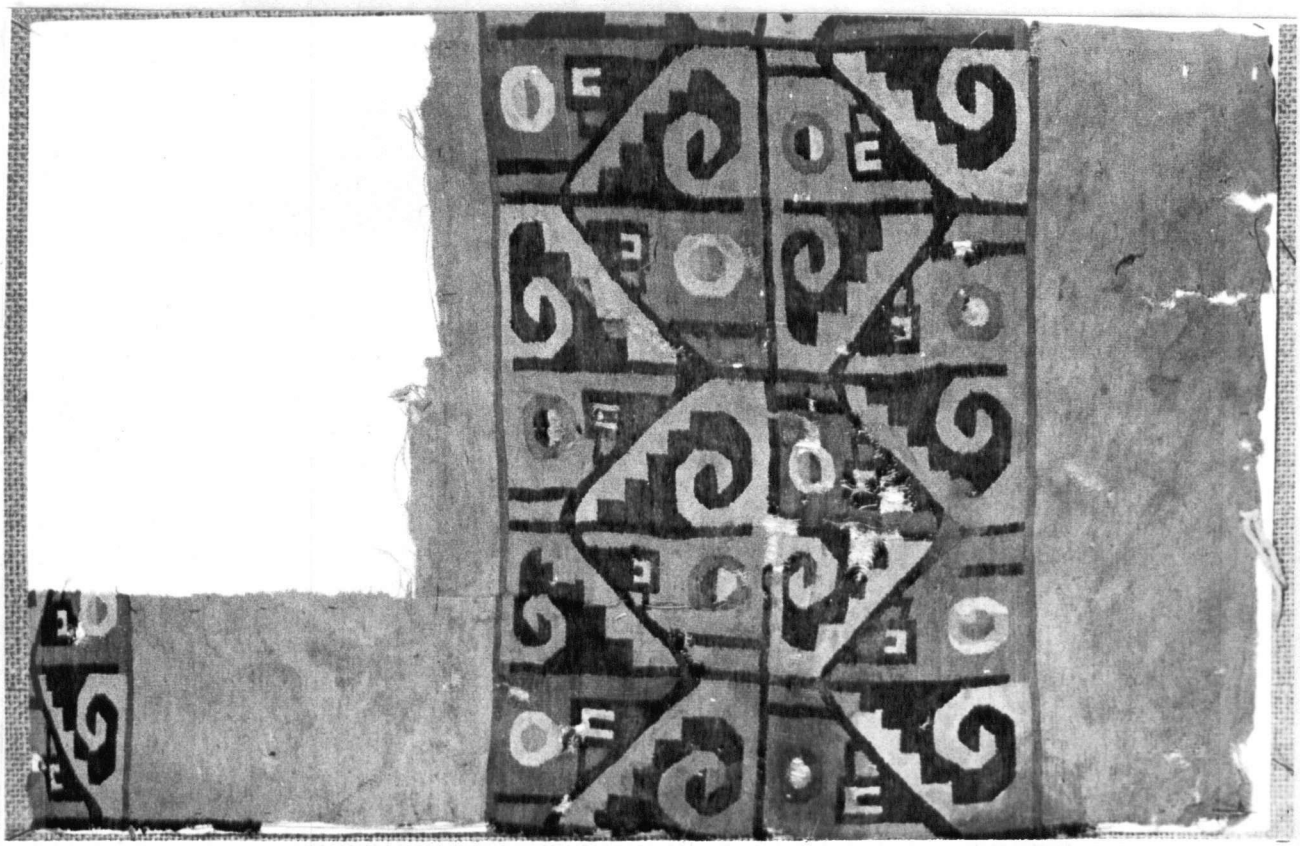


Figure 37. Sample number 9. Private Collection
Group 2
Type 1B
Collection: Private Collection, Osaka
Photograph: Courtesy Joanna Staniszkis

Figure 38. Sample number 10. AMNH 41.0 3628
Group 3
Type 1B
Collection: American Museum of Natural History, New York
Photograph: Author

Figure 39. Sample number 11. University of Illinois
Group 3
Type 1A
Collection: University of Illinois, Urbana
Photograph: Courtesy Alan Sawyer

Figure 40. Sample number 12. Ayacucho Museum
Group 3
Type 1A
Collection: Ayacucho Museum, Ayacucho
Photograph: Courtesy Alan Sawyer

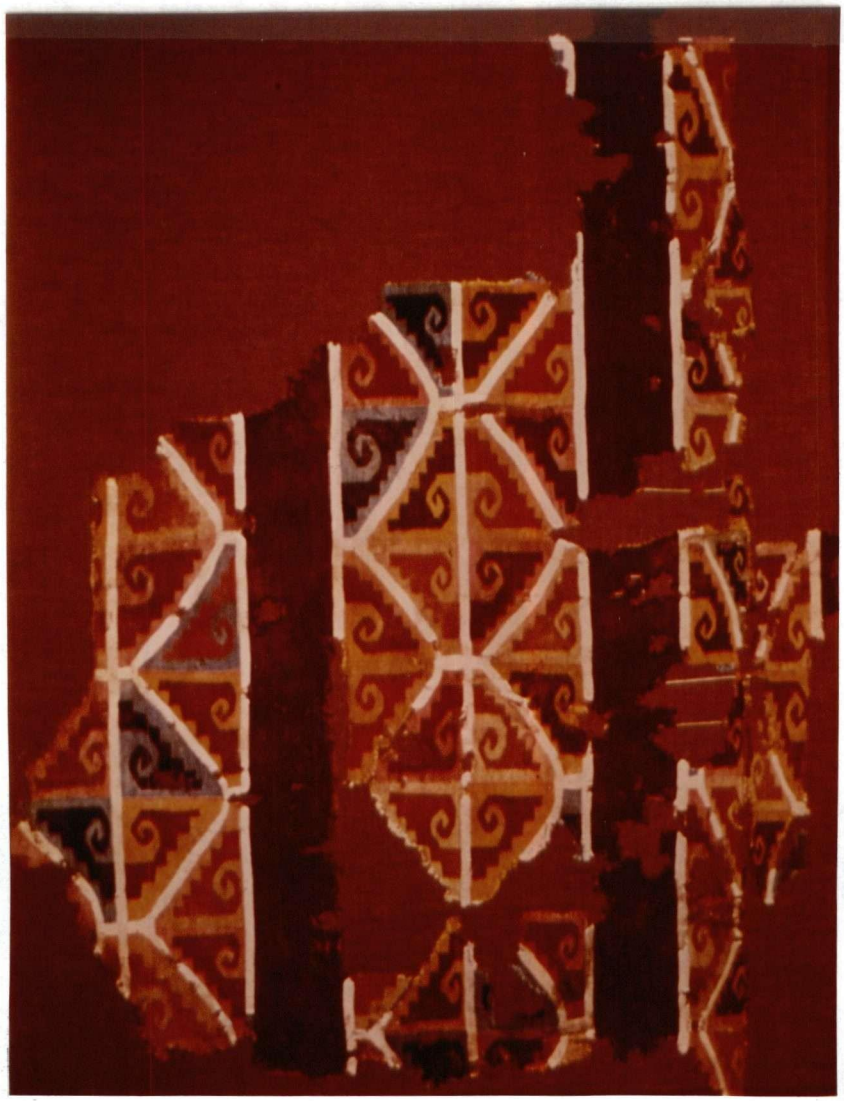


Figure 41. Sample number 13. AIC
Group 3
Type 1B
Collection: Art Institute of Chicago
Photograph: Courtesy Alan Sawyer

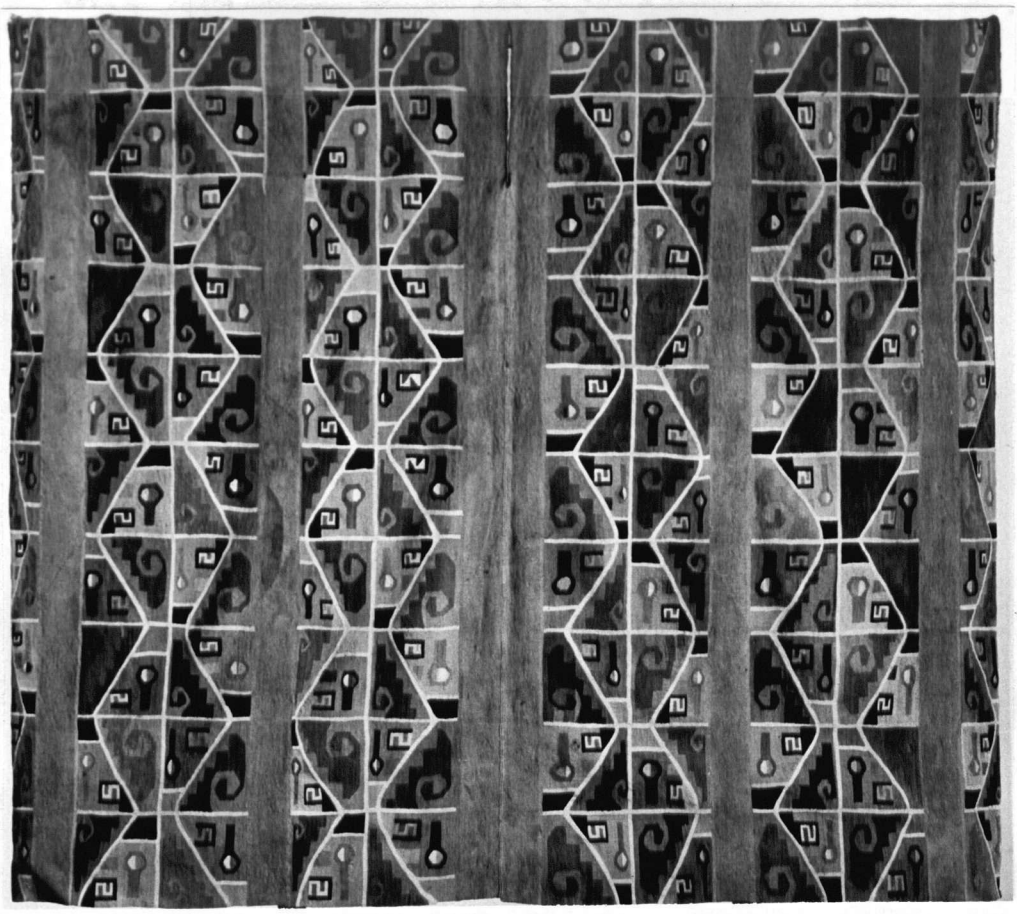


Figure 42. Sample number 14. TM
Group 3
Type 1B
Collection: Textile Museum, Washington, D. C.
Photograph: Courtesy Alan Sawyer

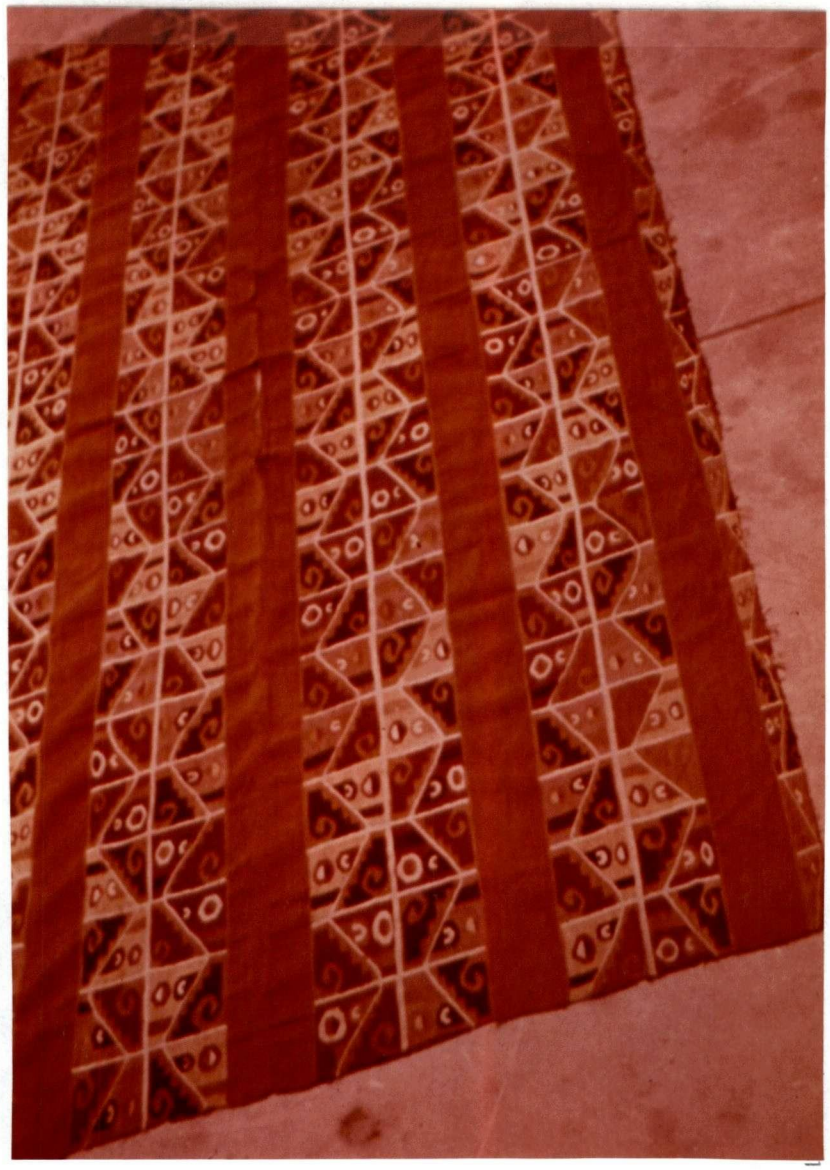


Figure 43. Sample number 15. TM 91.344
Group 3
Type 1B
Collection: Textile Museum, Washington, D. C.
Photograph: Courtesy Alan Sawyer

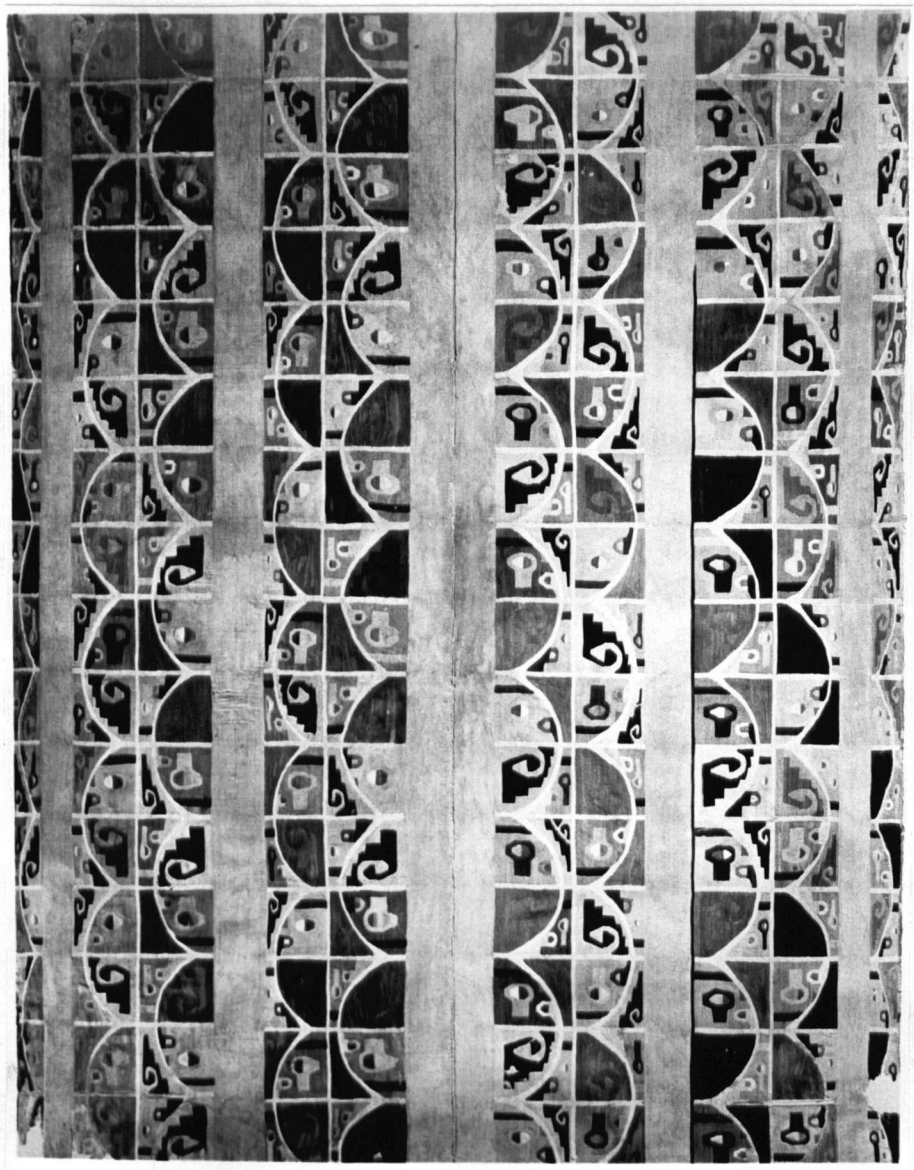


Figure 44. Sample number 16. AMNH 41.2 766
Group 3
Type 1B
Collection: American Museum of Natural History, New York
Photograph: Author

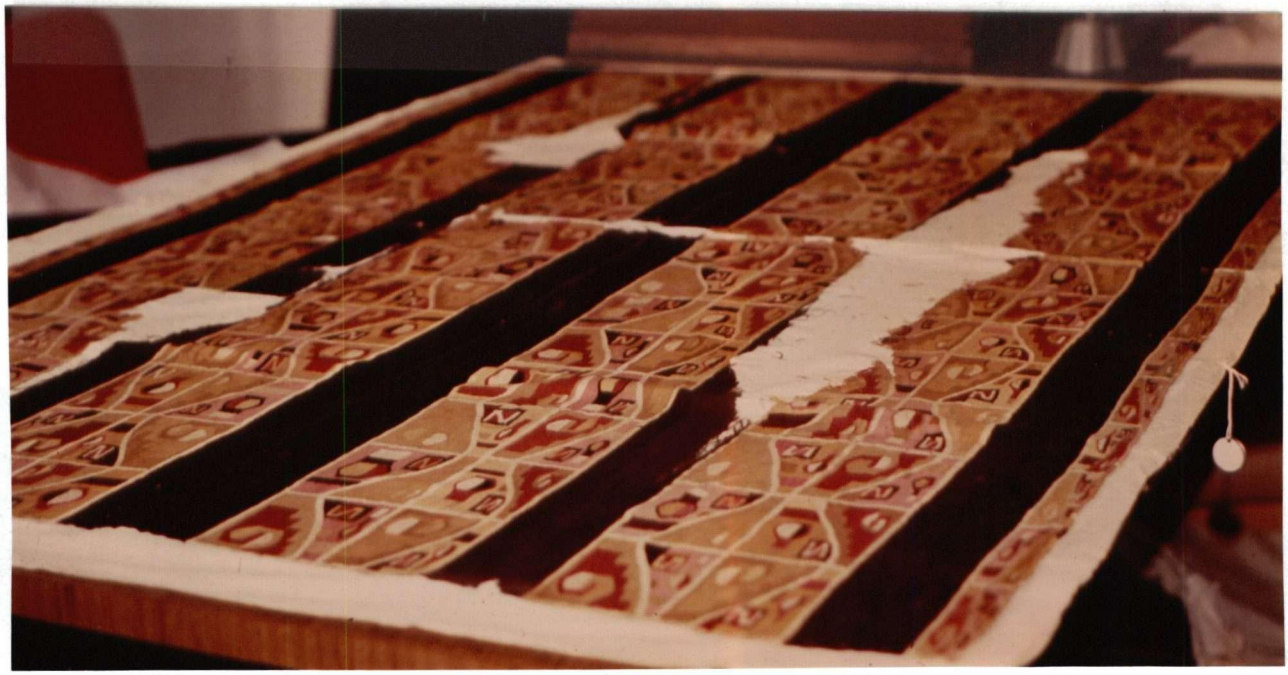


Figure 45. Sample number 17. Museo de La Plata
Group 3
Type 1B
Collection: Museo de La Plata, Argentina
Photograph: After Taullard, 1949: plate 43

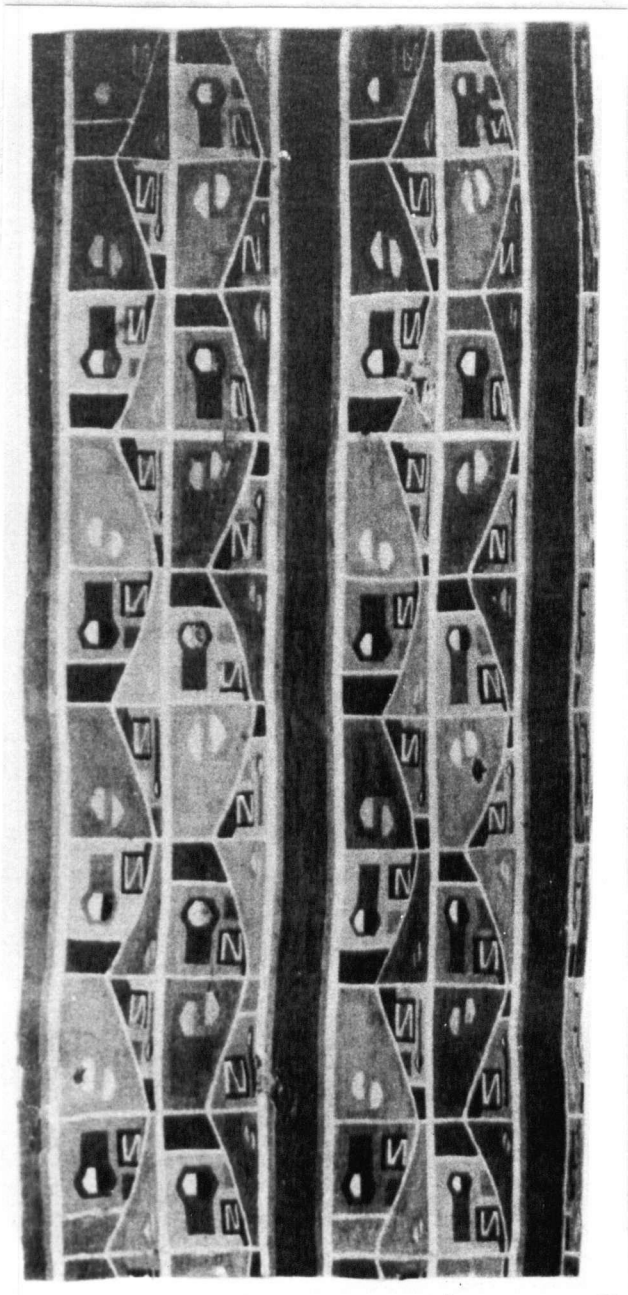


Figure 46. Sample number 18. D.O. B.498 PT
Group 3
Type 1B
Collection: Dumbarton Oaks, Georgetown
Photograph: Courtesy Dumbarton Oaks

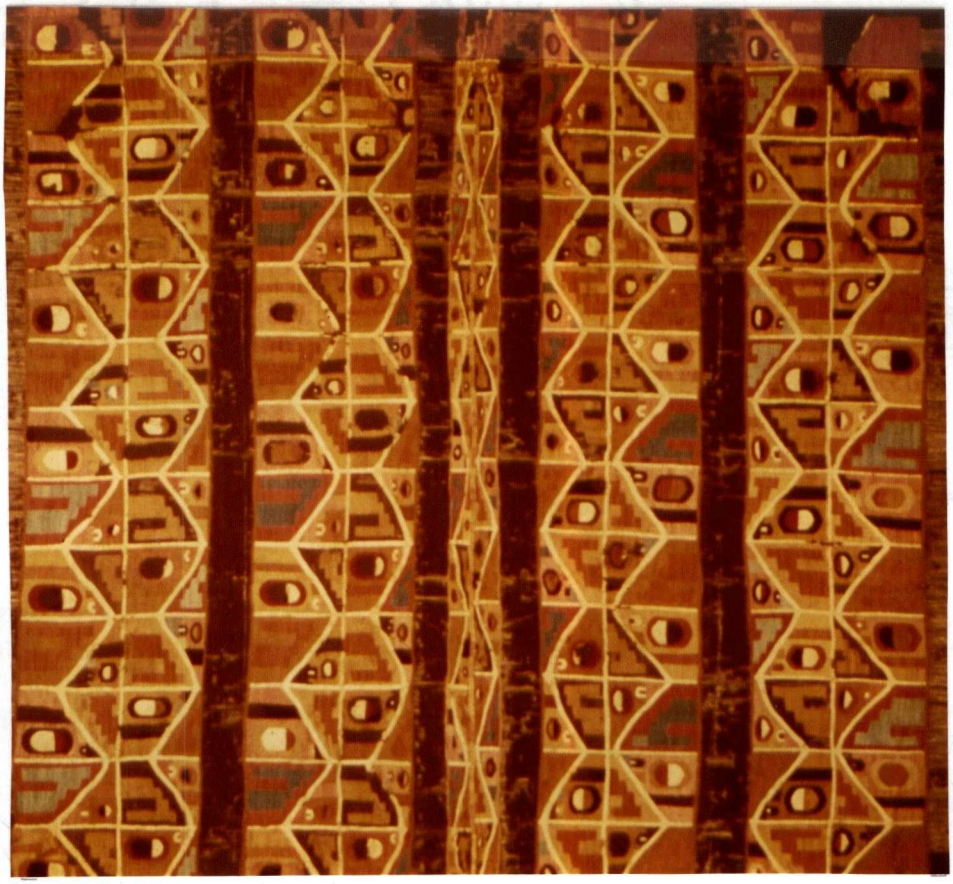


Figure 47. Sample number 19. TM 91.342
Group 3
Type 1A
Collection: Textile Museum, Washington, D. C.
Photograph: Courtesy Alan Sawyer

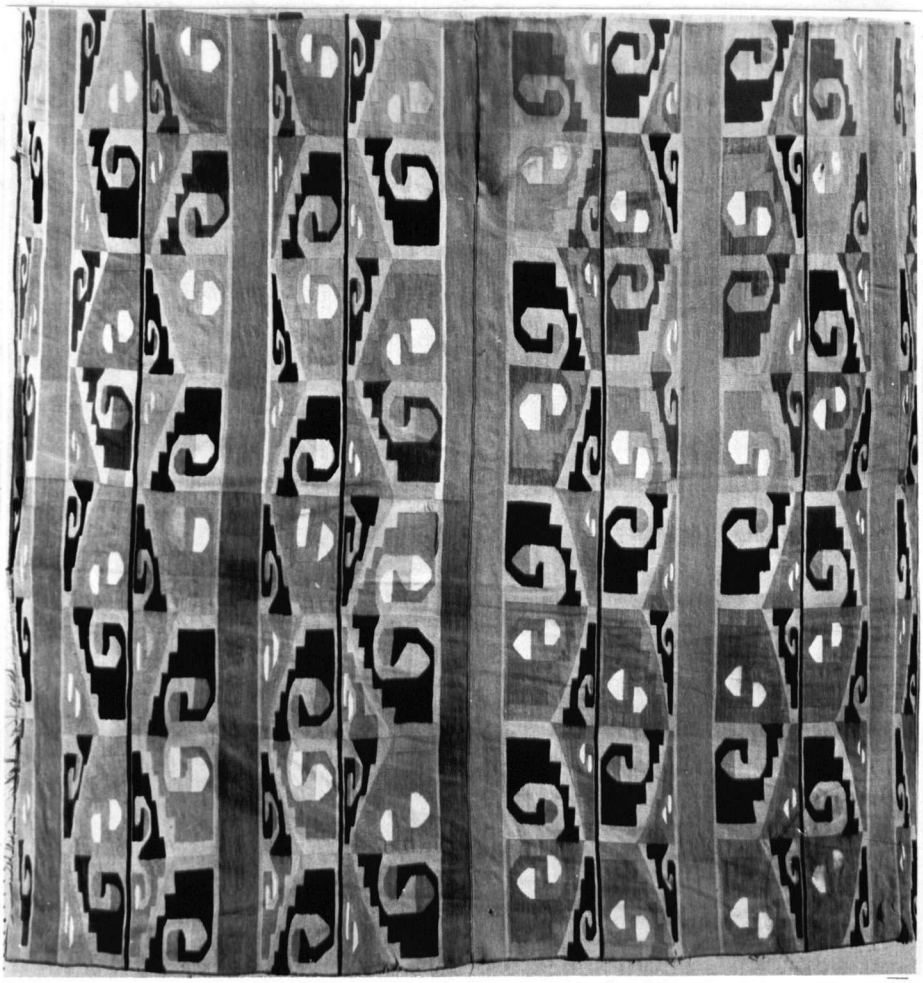


Figure 48. Sample number 20. TM 91.1966.12.5
Group 3
Type 1B
Collection: Textile Museum , Washington, D. C.
Photograph: Courtesy Alan Sawyer

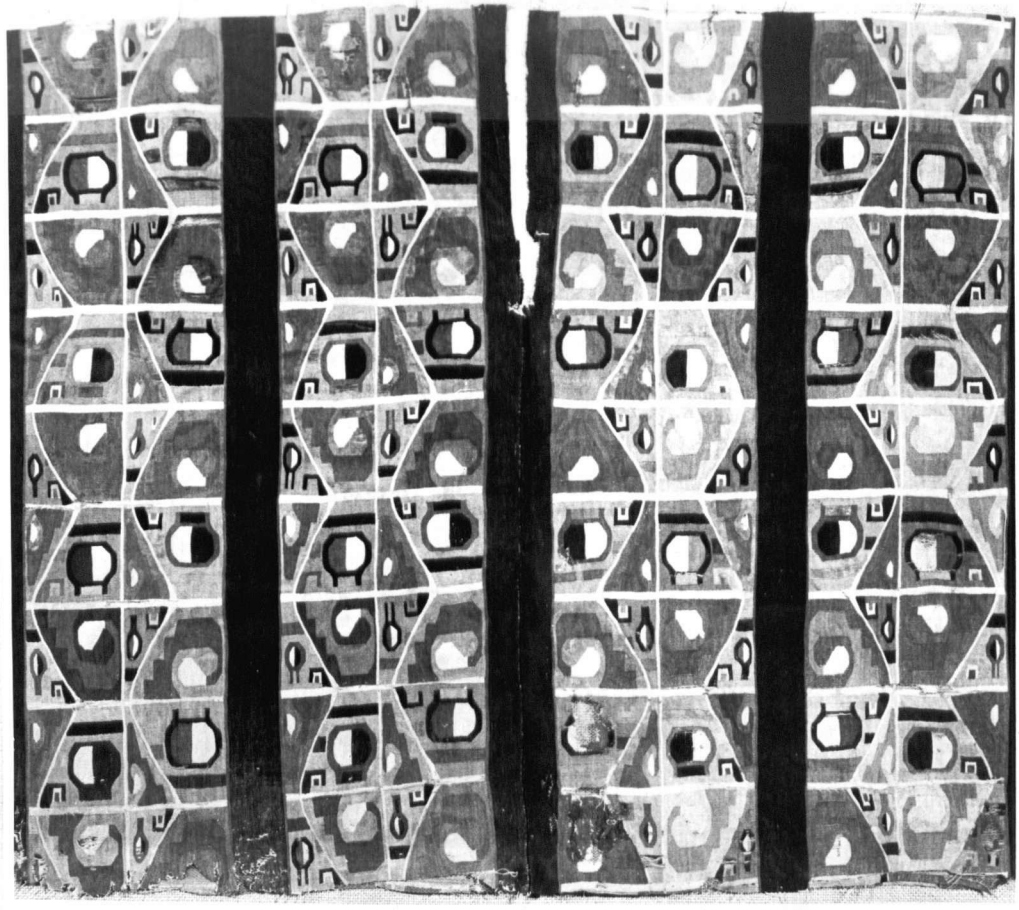


Figure 49. Sample number 21. Museo de Lujan
Group 3
Type 1B
Collection: Museo de Lujan, Argentina
Photograph: After Taullard, 1949: plate 18

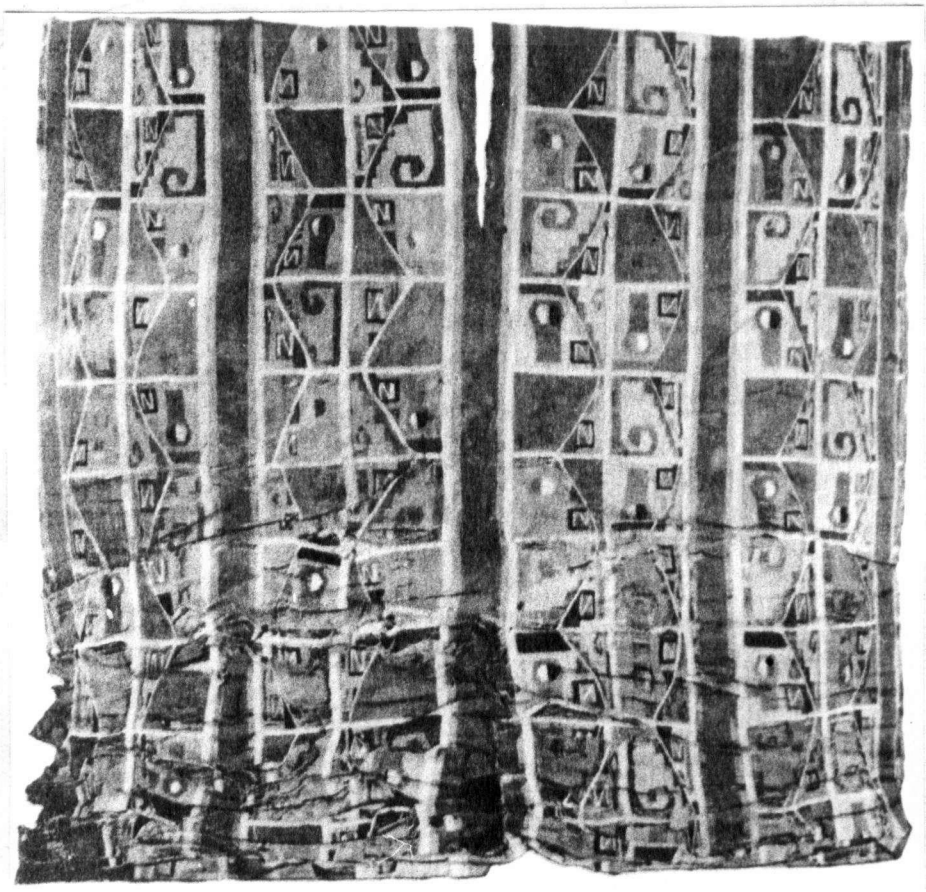


Figure 50. Sample number 22. Private Collection
Group 3
Type 1B
Collection: Private Collection
Photograph: After Taullard, 1949: plate 47

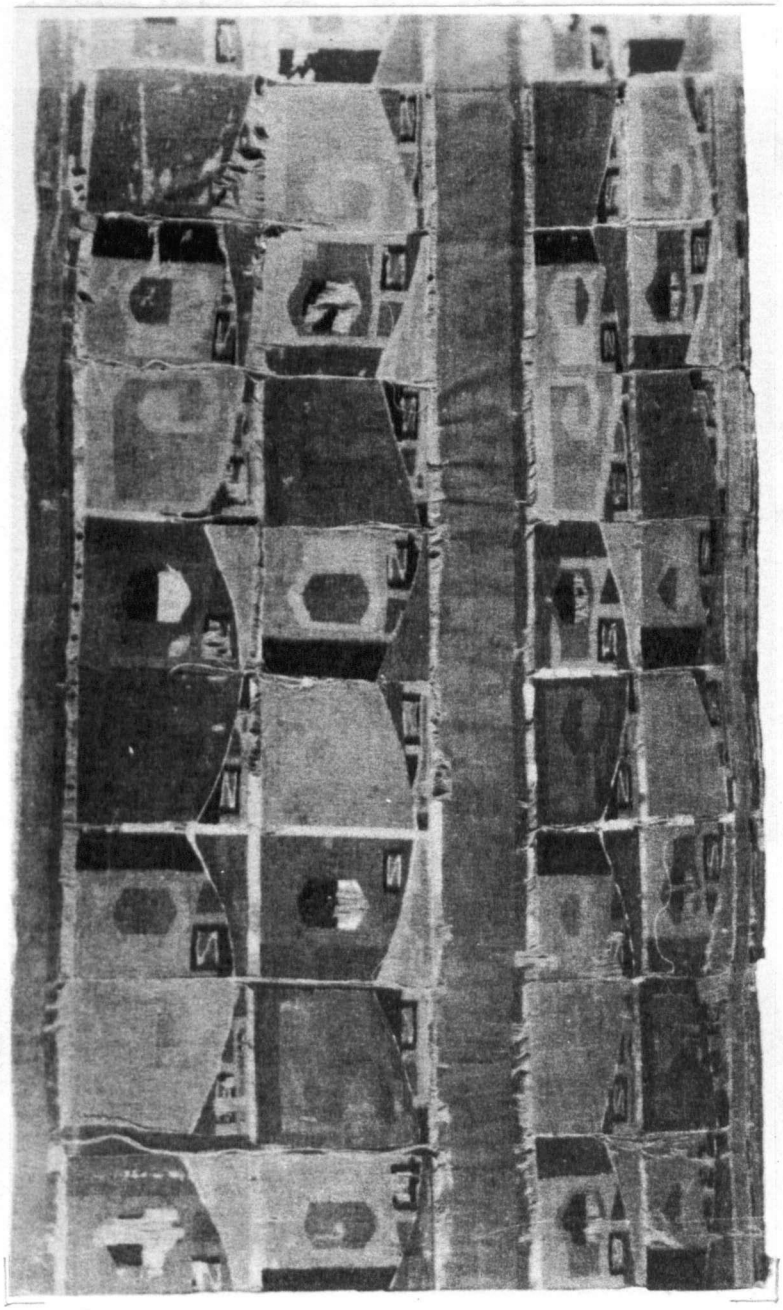


Figure 51. Sample number 23. AMNH 41.2 768
Group 3
Type 1A
Collection: American Museum of Natural History, New York
Photograph: Author

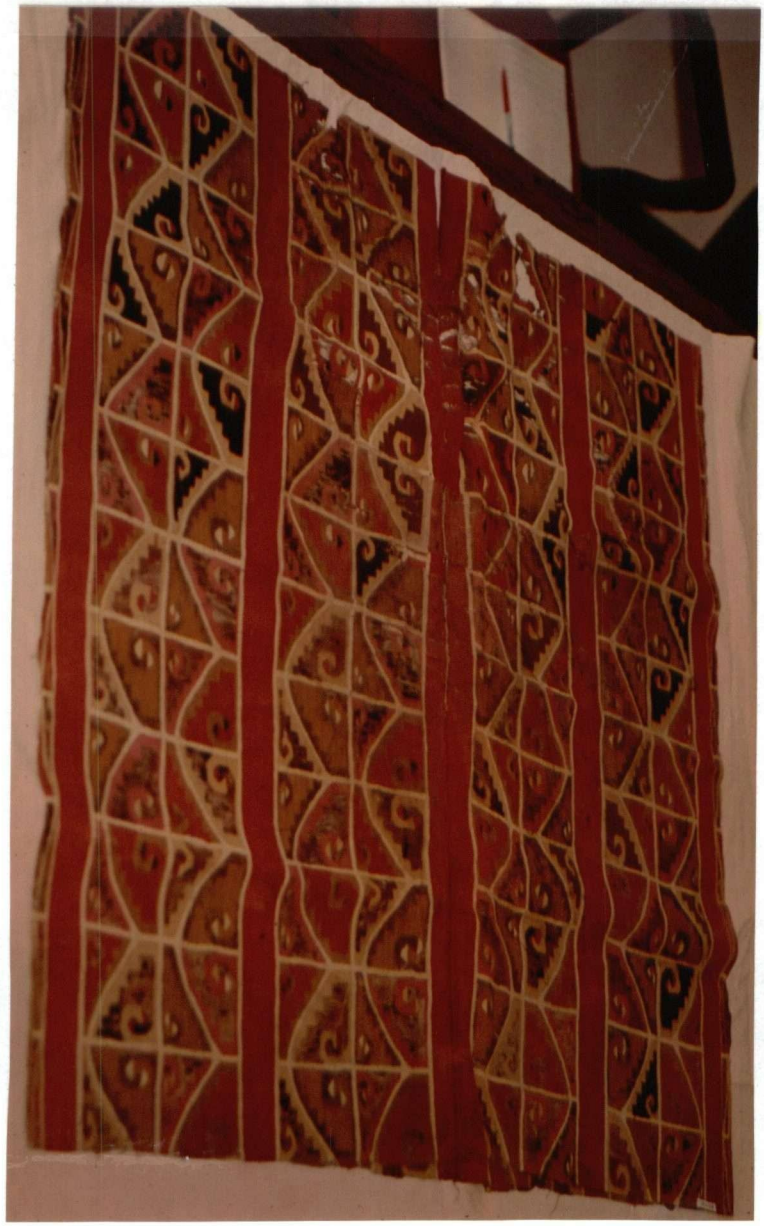


Figure 52. Sample number 24. D.O. B.499 PT
Group 3
Type 1B
Collection: Dumbarton Oaks, Georgetown
Photograph: Courtesy Dumbarton Oaks

Figure 53. Sample number 25. PM 42.12.30.3346
Group 3
Type 1B
Collection: Peabody Museum, Harvard
Photograph: Courtesy Alan Sawyer

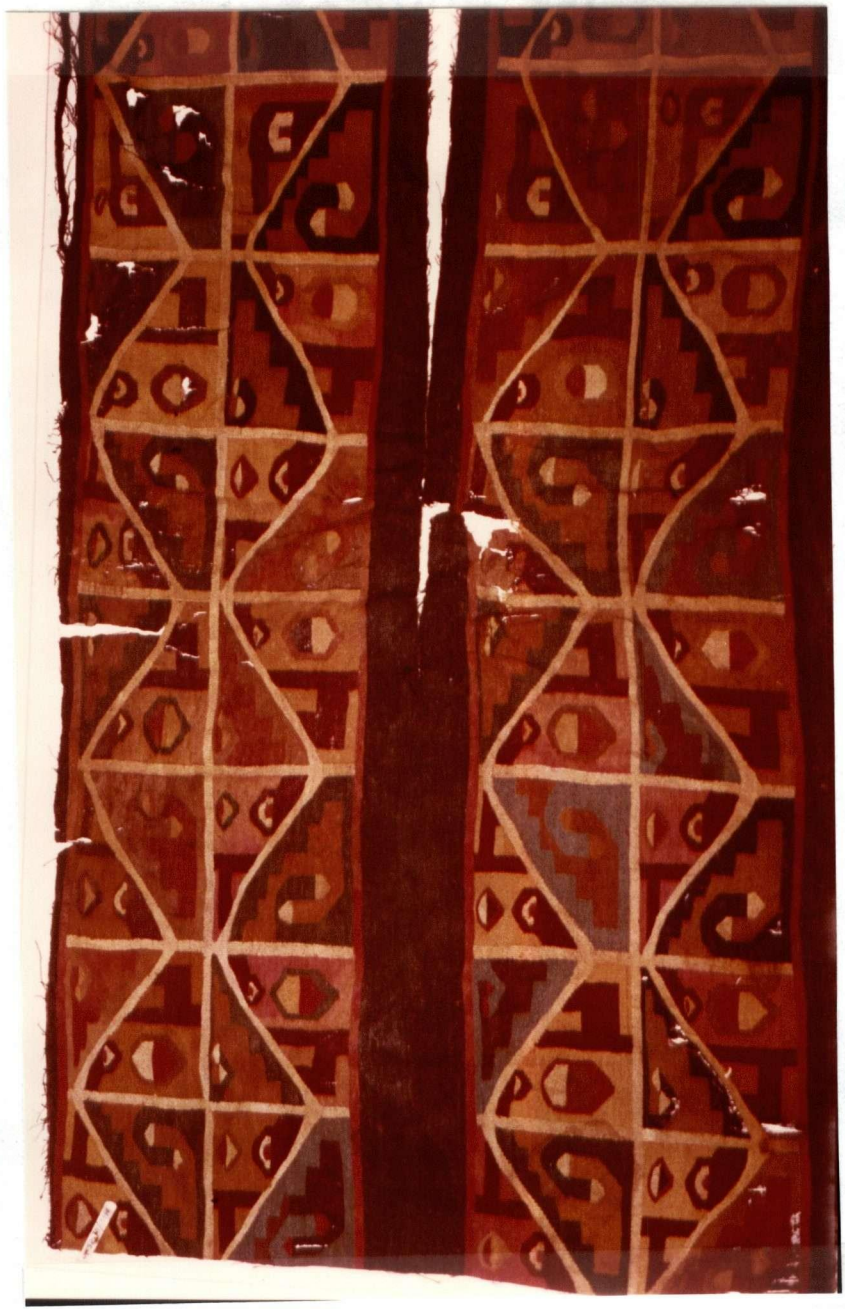


Figure 54. Sample number 26. Amano Museum
Group 3
Type 1B
Collection: Amano Museum, Lima
Photograph: Courtesy Mary Frame

Figure 55. Sample number 27. AMNH 41.0 1192
Group 3
Type 1A
Collection: American Museum of Natural History, New York
Photograph: Author

Figure 56. Sample number 28. Oberlin 61.29
Group 3
Type 1A
Collection: Oberlin College, Allen Art Museum, Oberlin, Ohio
Photograph: Courtesy Alan Sawyer

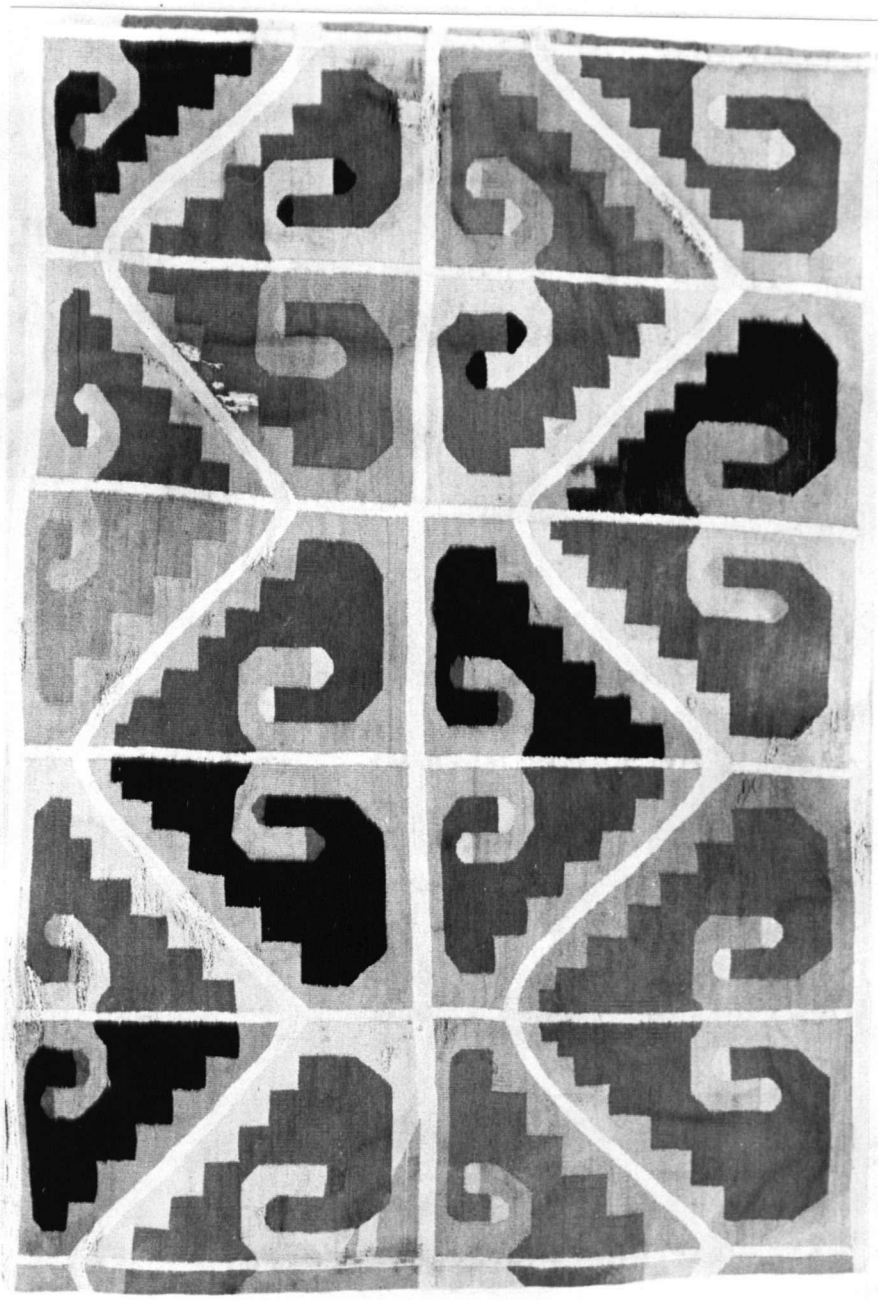


Figure 57. Sample number 29. Private Collection
Group 3
Type 1B
Collection: Private Collection
Photograph: After Taullard, 1949: 136

Figure 58. Sample number 30. Private Collection
Group 3
Type 1A
Collection: Private Collection, Osaka
Photograph: Courtesy Joanna Staniszkis

Figure 59. Sample number 31. Private Collection
Group 3
Type 1B
Collection: Private Collection, Osaka
Photograph: Courtesy Joanna Staniszkis

Figure 60. Sample number 32. Private Collection
Group 3
Type 1B
Collection: Private Collection, Osaka
Photograph: Courtesy Joanna Staniszkis

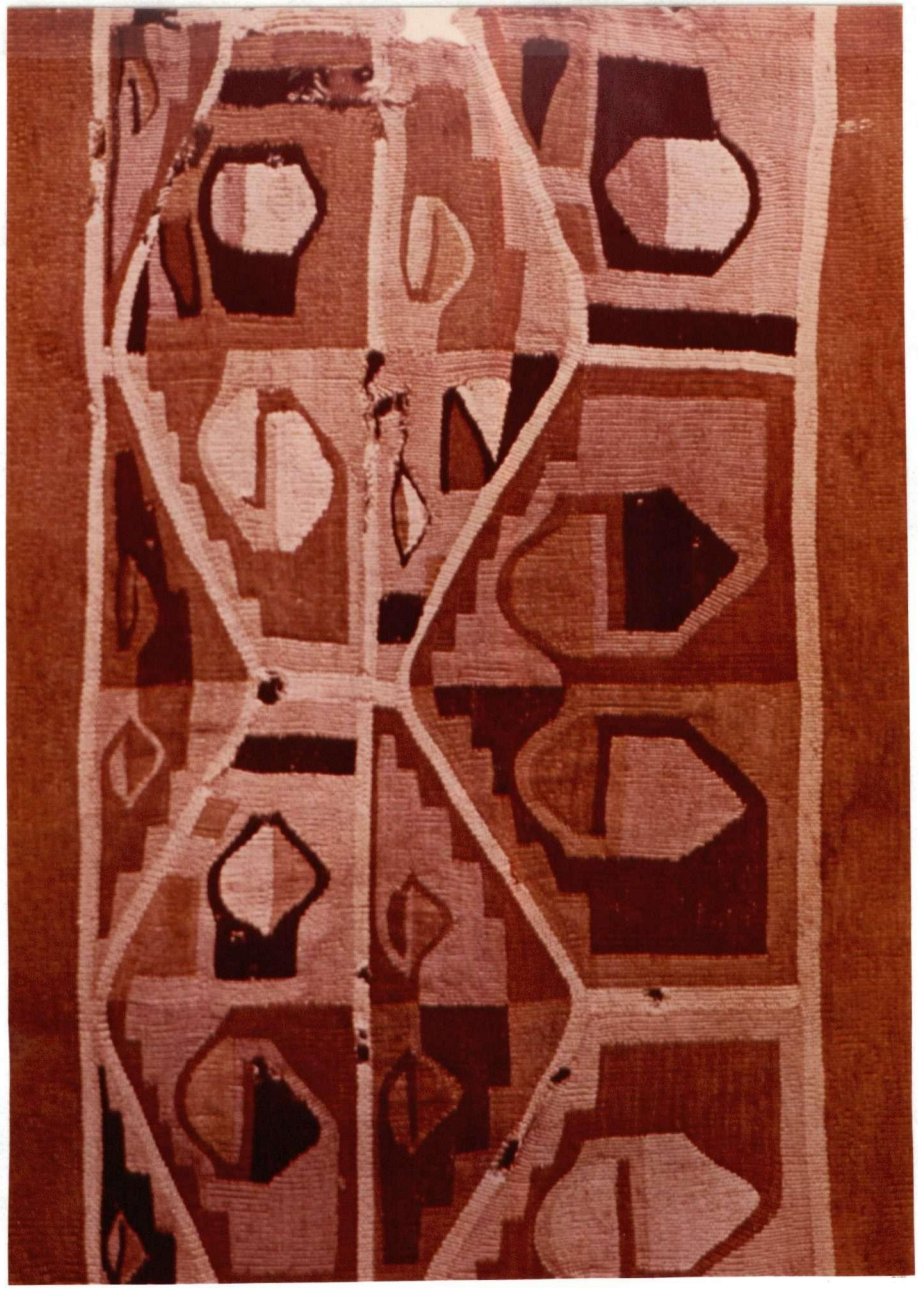


Figure 61. Sample number 33. University of Illinois
Group 3
Type 1B
Collection: University of Illinois, Urbana
Photgraph: Courtesy Alan Sawyer

Figure 62. Sample number 34. PM
Group 3
Type 1B
Collection: Peabody Museum, Harvard
Photograph: Courtesy Alan Sawyer

Figure 63. Sample number 35. TM 91.471
Group 4
Type 1A
Collection: Textile Museum, Washington, D. C.
Photograph: Courtesy Alan Sawyer

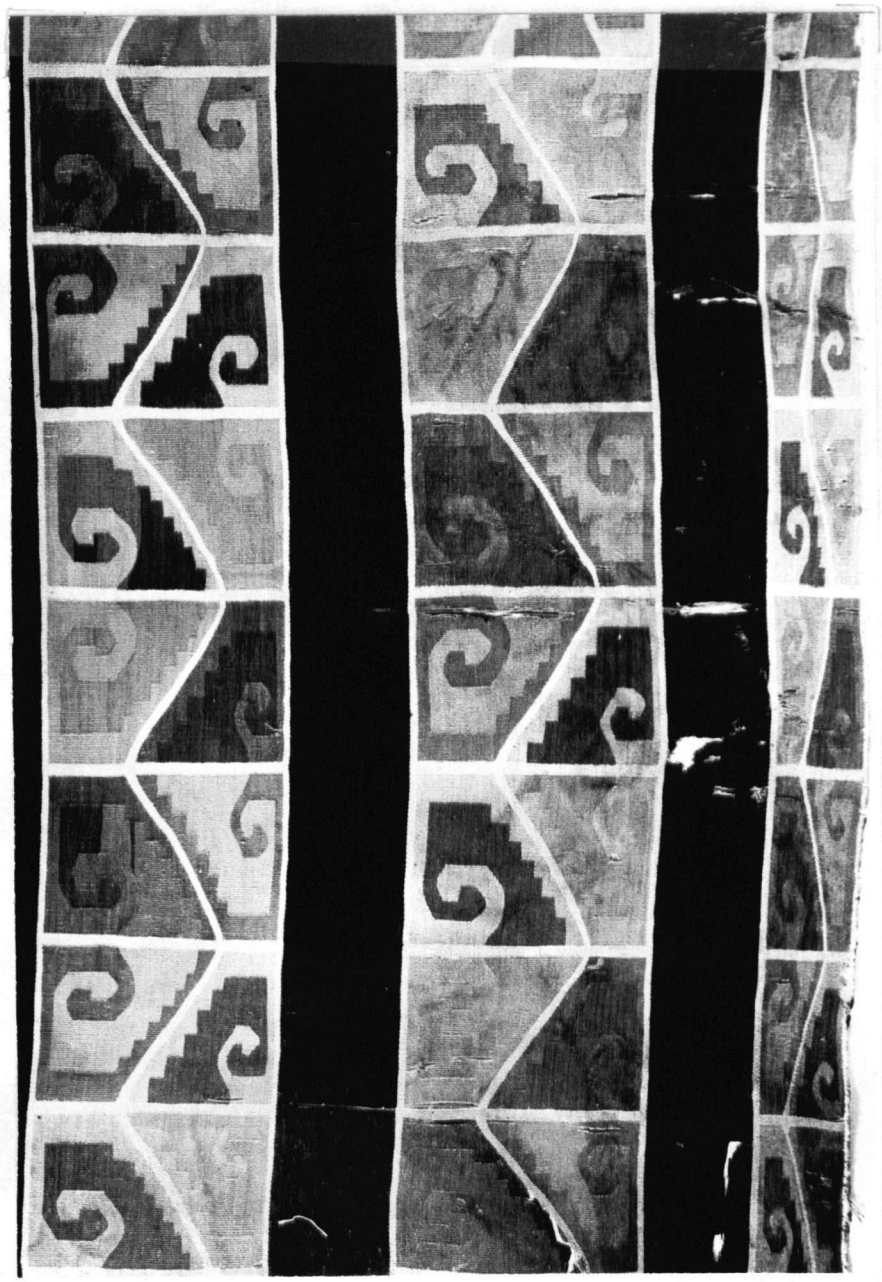


Figure 64. Sample number 36. AMNH 41.2 764
Group 4
Type 1A
Collection: American Museum of Natural History, New York
Photograph: Author

Figure 65. Sample number 37. TM 91.343
Group 4
Type 1B
Collection: Textile Museum, Washington, D. C.
Photograph: Courtesy Alan Sawyer

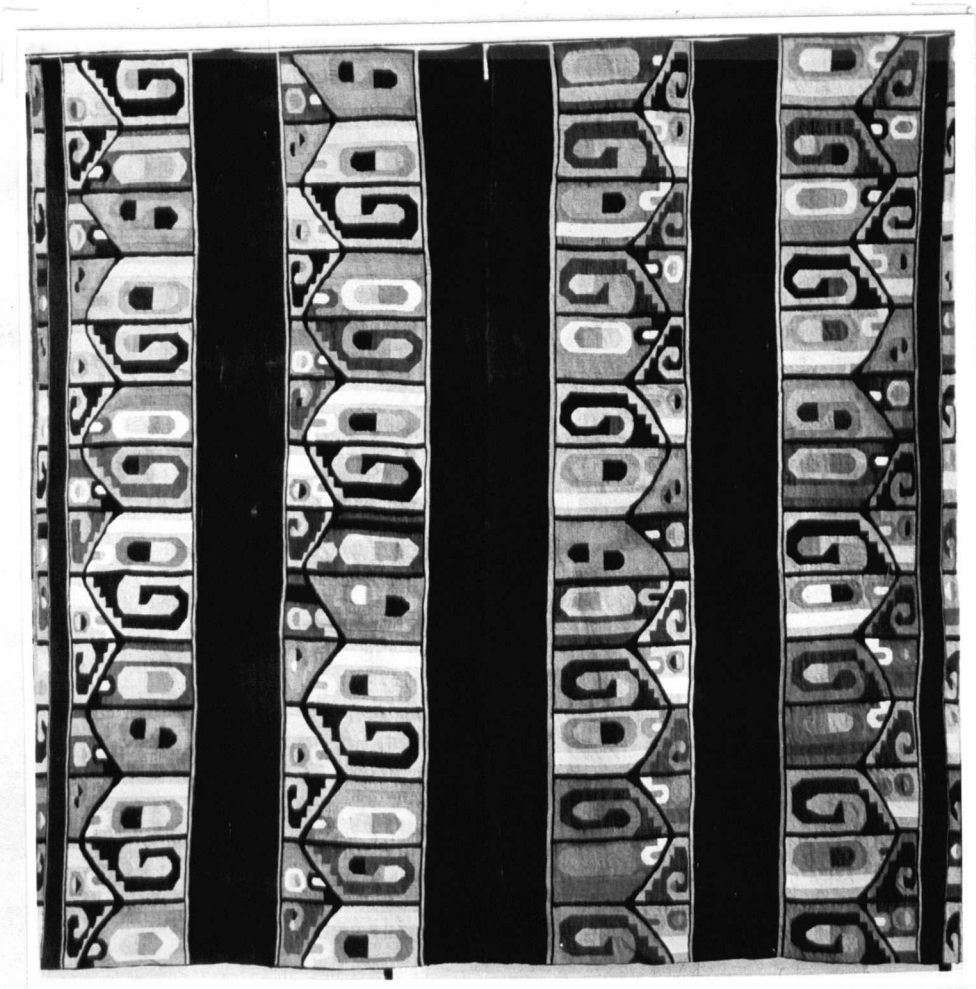


Figure 66. Sample number 38. Private Collection
Group 4
Type 1A
Collection: Private Collection, New York (1977)
Photograph: Courtesy Alan Sawyer

Figure 67. Sample number 39. TM 91.301
Group 4
Type 1A
Collection: Textile Museum, Washington, D. C.
Photograph: Courtesy Alan Sawyer

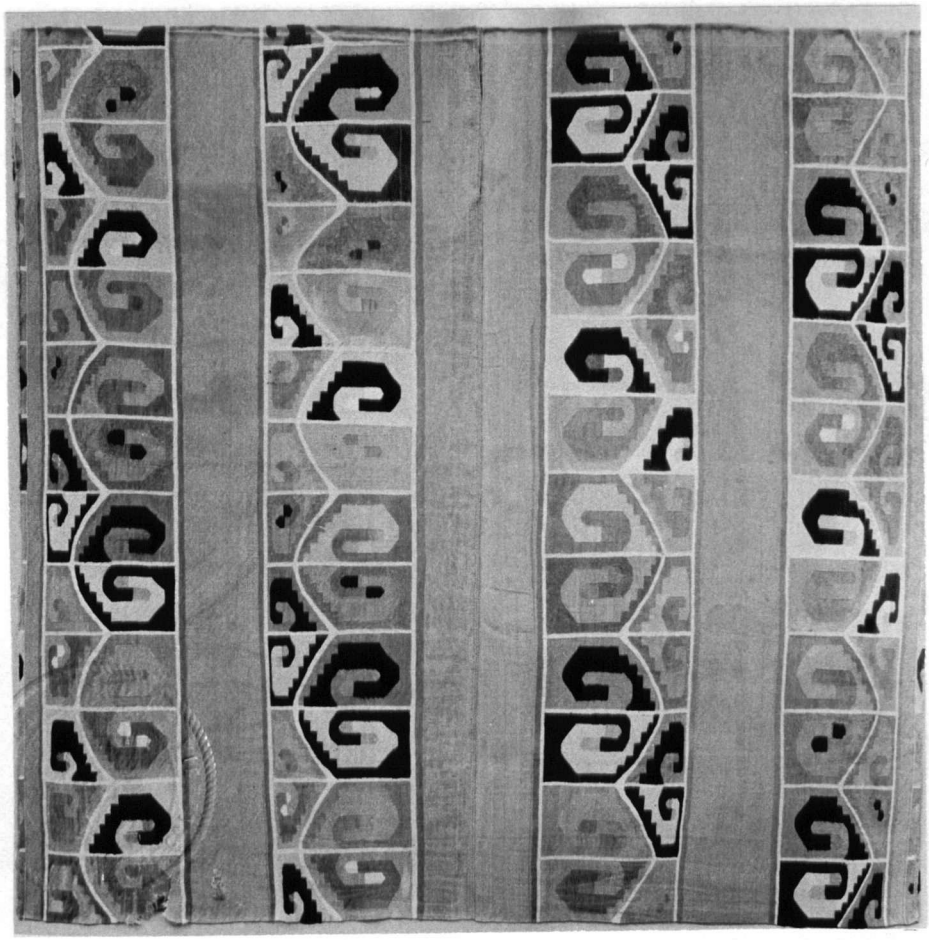


Figure 68. Sample number 40. Private Collection
Group 4
Type 1B
Collection: Private Collection, New York (1960)
Photograph: Courtesy Alan Sawyer

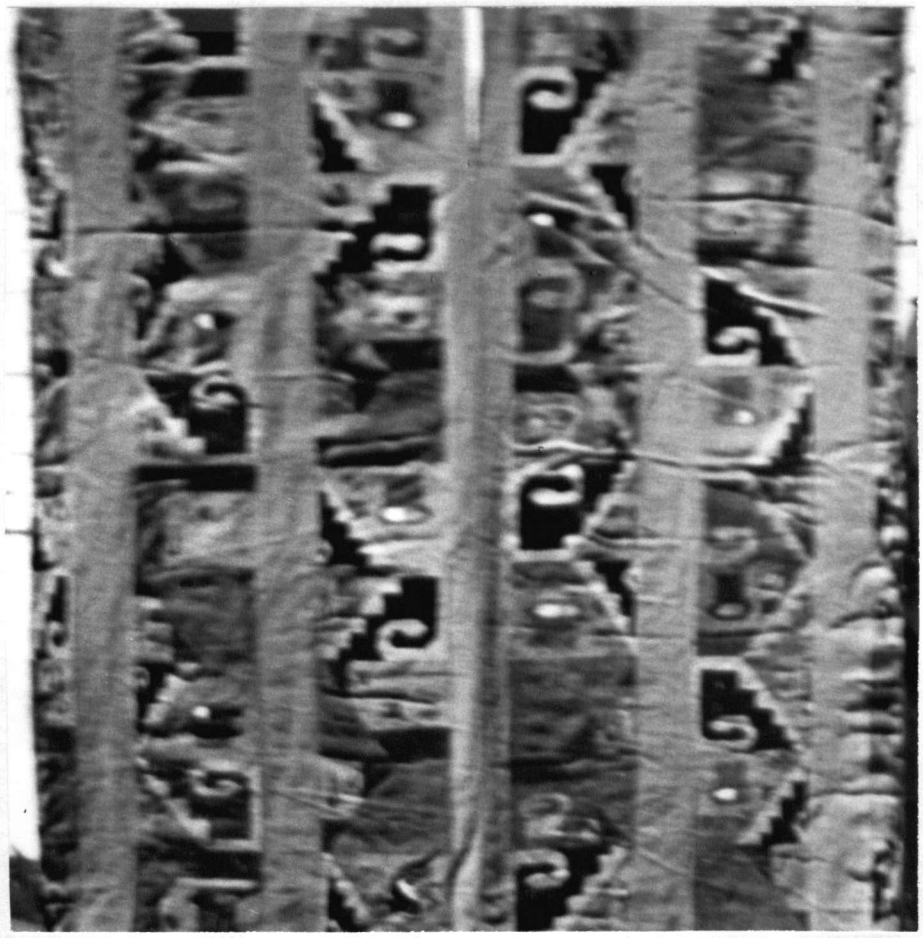


Figure 69. Sample number 41. Museo de Arte
Group 4
Type 1B
Collection: Museo de Arte, Lima
Photograph: Courtesy Alan Sawyer

Figure 70. Sample number 42. TM 91.9
Group 5
Type 1B
Collection: Textile Museum, Washington, D. C.
Photograph: Courtesy Alan Sawyer

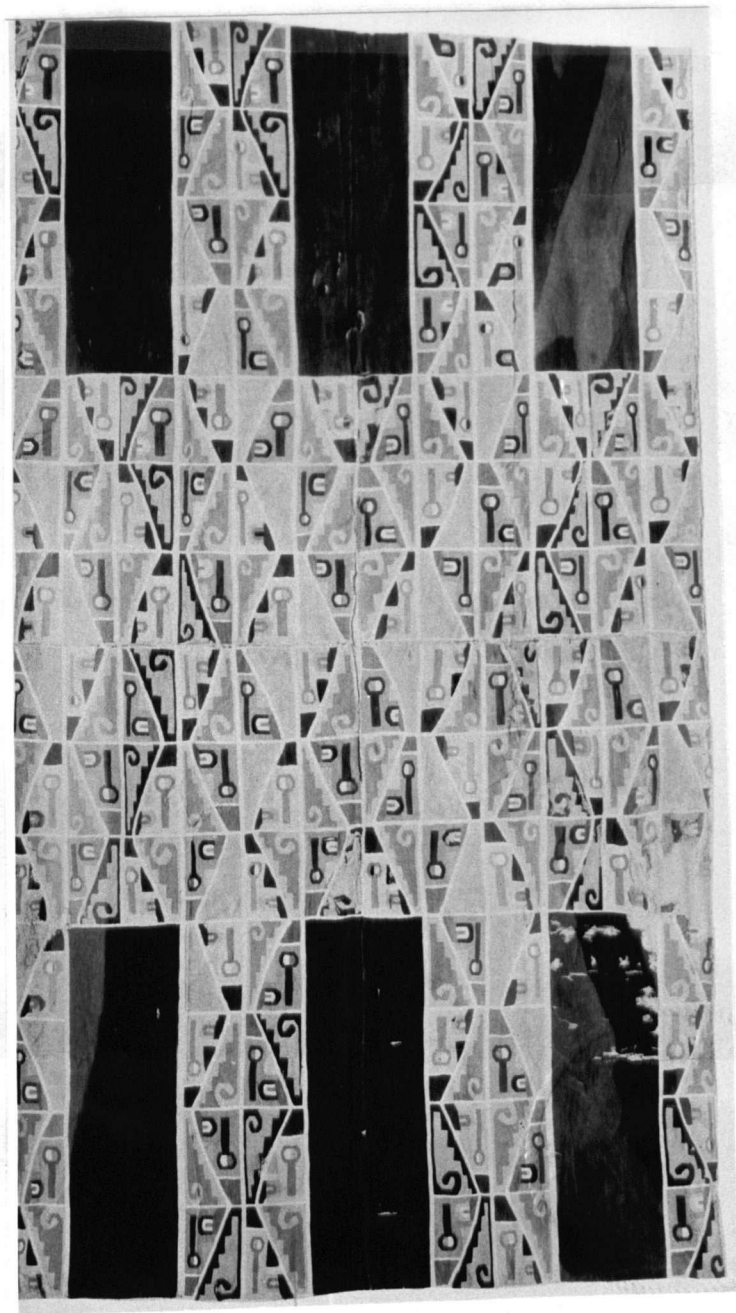


Figure 71. Sample number 43. Private Collection
Group 5
Type 1B
Collection: Private Collection, Chicago (1960)
Photograph: Courtesy Alan Sawyer

Figure 72. Sample number 44. AMNH 41.2 763
Group 5
Type 1B
Collection: American Museum of Natural History, New York
Photograph: Author

Figure 73. Sample number 45. D.D. B.497
Group 5
Type 1B
Collection: Dumbarton Oaks, Georgetown
Photograph: Courtesy Dumbarton Oaks

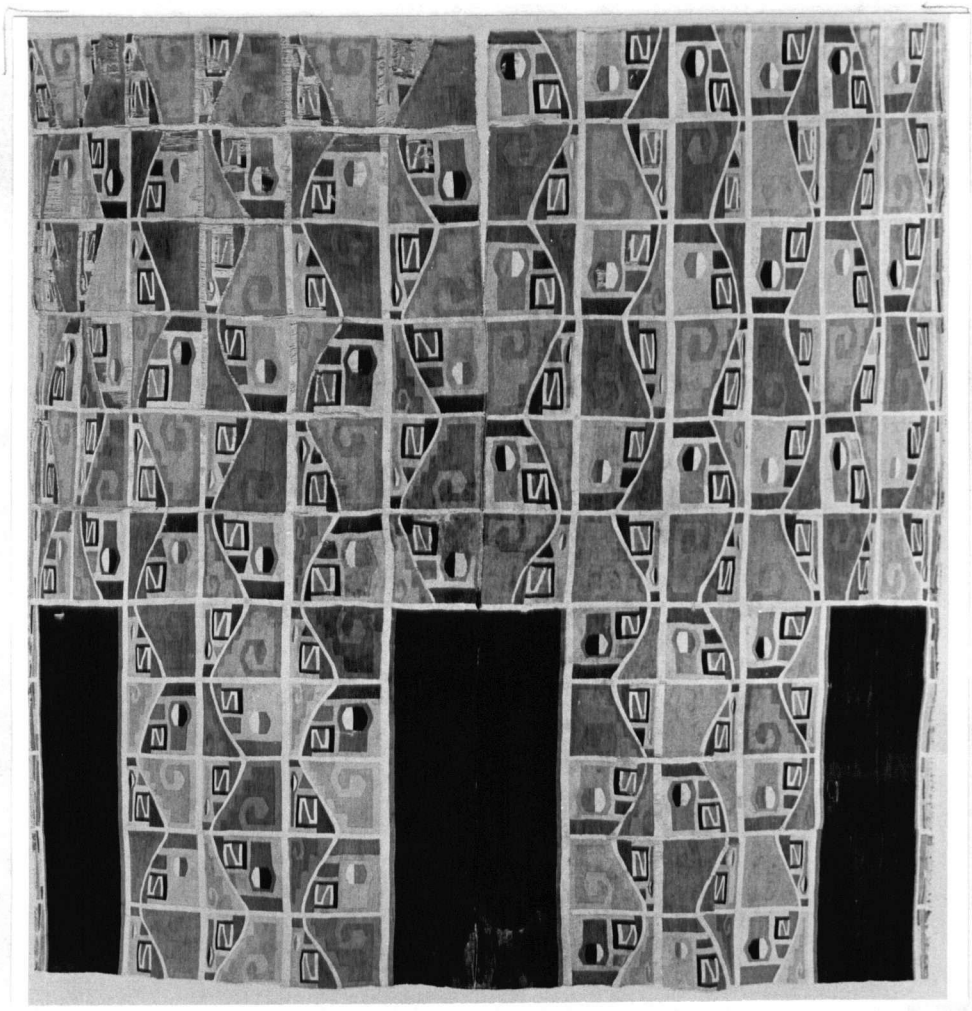


Figure 74. Sample number 46 · AIC S.1182.55.1702.M5600
Group 5
Type 1B
Collection: Art Institute of Chicago
Photograph: Courtesy Alan Sawyer

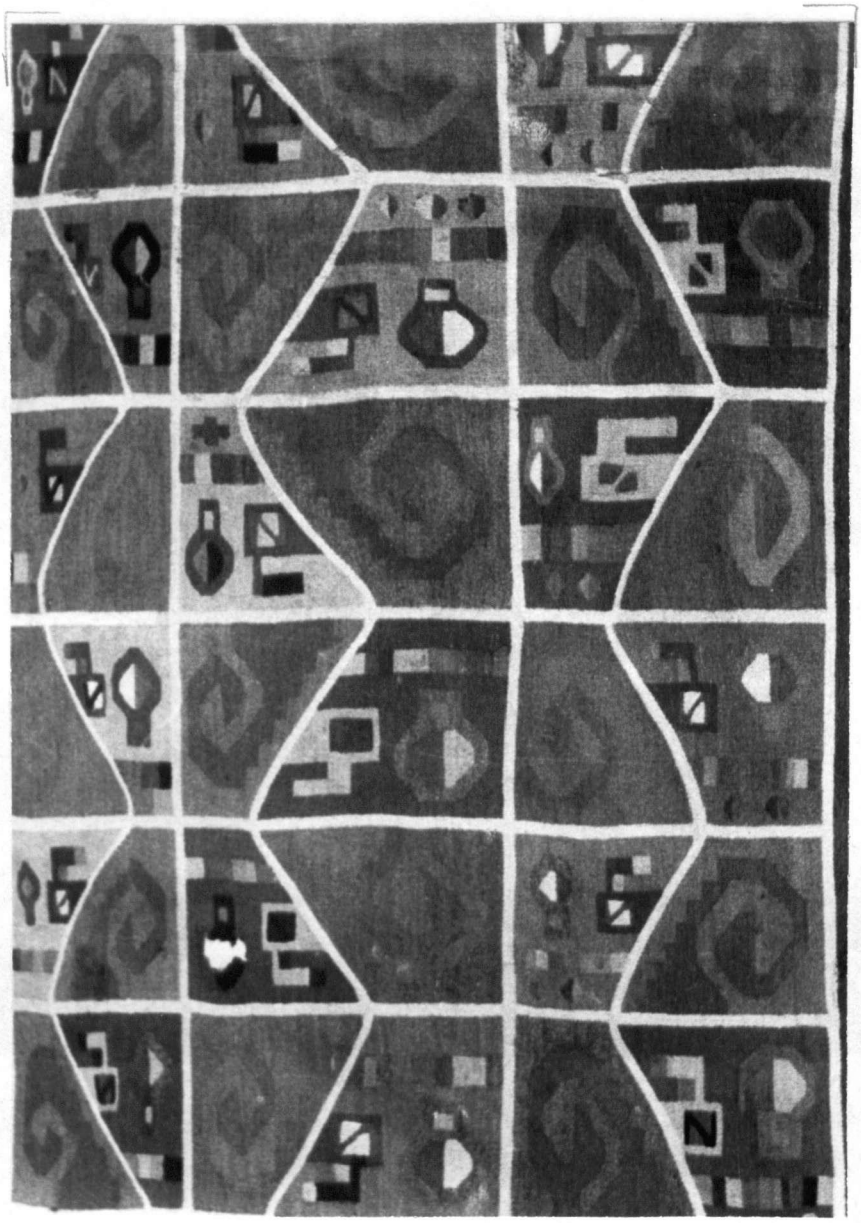


Figure 75. Sample number 47. AMNH
Group 5
Type 1B
Collection: American Museum of Natural History, New York
Photograph: Author

CHAPTER 4 LATERAL DISTORTION

The design convention of lateral distortion is not seen in Tiahuanaco textiles (p.c. Conklin), stonework or ceramics and appears to be an innovation of the Wari applied exclusively to their official garments. To the author's knowledge, the use of lateral distortion is not seen elsewhere in the history of Peruvian art. Following Sawyer's hypothesis that the use of lateral distortion increased over time and his suggestion for a methodology to establish a textile chronology, an examination of lateral distortion in this sample permits the arrangement of the specimens in chronologic order.

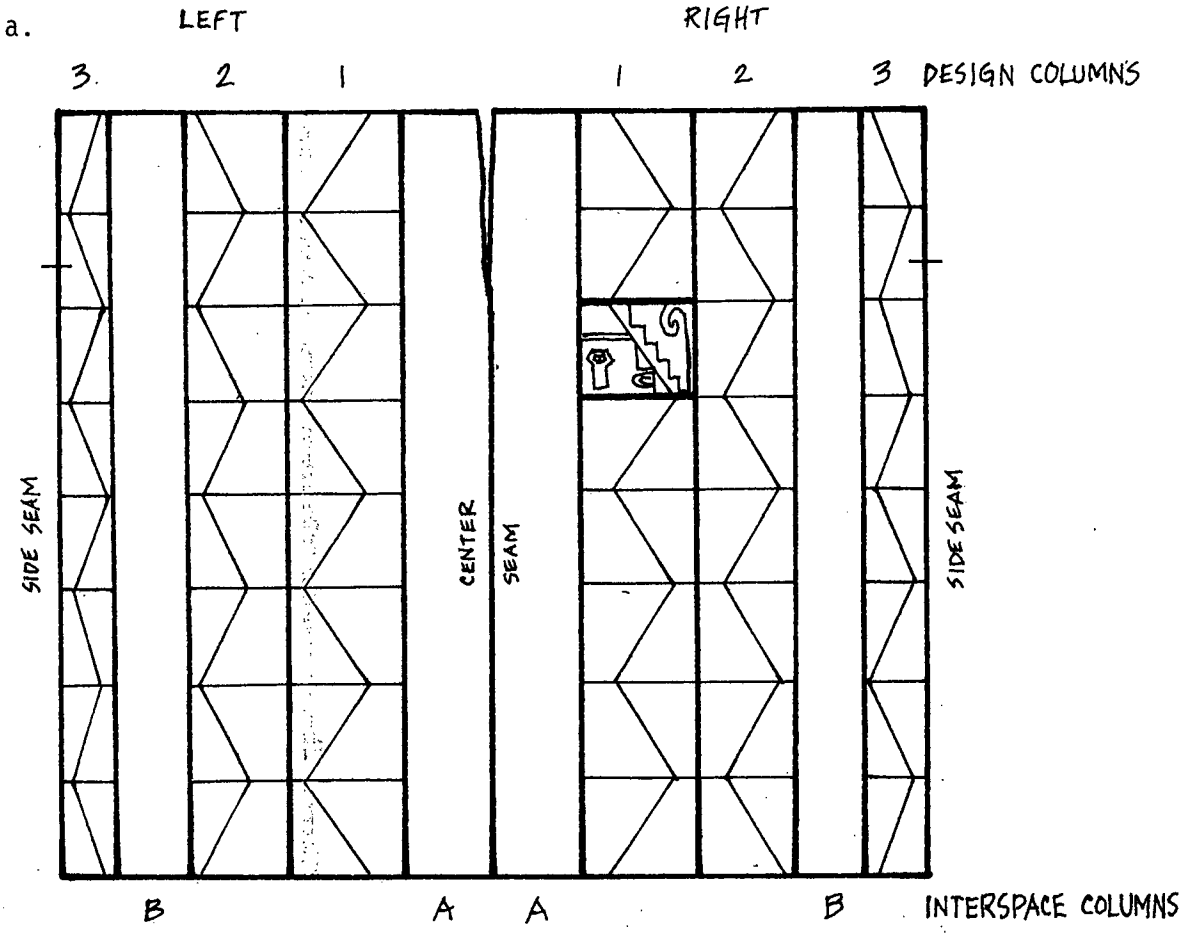
A. Charting Methodology

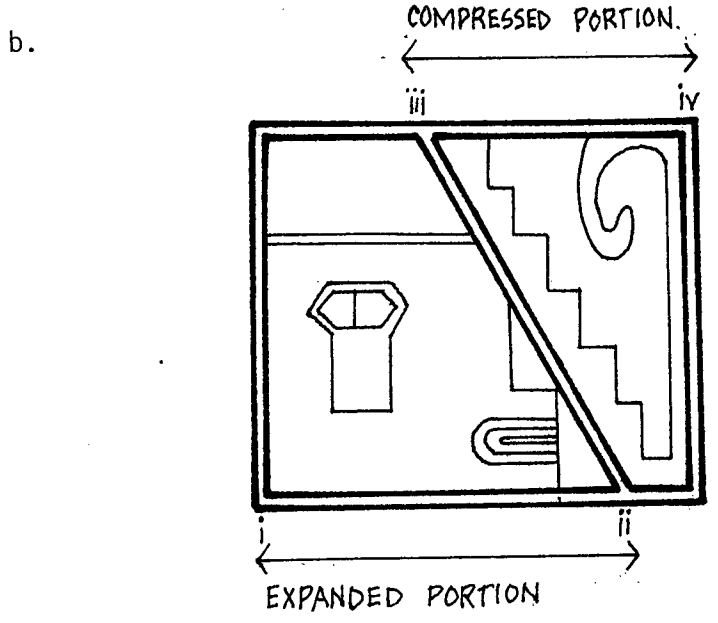
1. Measurements

In order to chart the degree of lateral distortion, several measurements were made from available photographs. Fortunately, the direct angle of most photographs allowed accurate relative measurements. Examples photographed from an angle have been omitted from the charts but will be discussed later in terms of the other design conventions.

To distinguish between design columns within the same tunic, columns were numbered from one to eight starting with the design column nearest the center seam and working towards the side seam. This numbering system is used for both the left and right sides as diagrammed in figure 76a. Similarly, interspace columns were assigned letters, beginning with 'A' nearest the center seam.

Figure 76. a. Column Numbering System.
b. Expanded and Compressed Portions of the Design Unit.





To measure lateral distortion (expansion and compression) the following procedure was followed. To measure lateral expansion, the expanded portion of each design unit (that portion of the design unit nearest the center seam) was measured in the first design column (fig.76b). To arrive at a single value, these measurements were then averaged. This average became the standard to which the average of the expanded portions of the design units for each of the other columns was then compared. This comparison was expressed as a percentage of the standard. Care was taken to determine if a consistent variation existed. However, none, was detected.

To measure compression, the same procedure was followed, the compressed portion of each design unit (that portion of each design unit furthest away from the center seam in each column) was measured, then averaged and then compared to the expansion standard. Figure 76b indicates the **expanded portion** of the design unit (i to ii) and the **compressed portion** (iii to iv).

During the process of measuring, another variable became apparent. Comparable design columns (column 1 right and column 1 left) did not always produce an equal measurement of the expanded portion. Most examples had virtually identical distortion on the left and right sides, however some displayed a significant difference. To simplify the charts, only the right side of each tunic was included. When a major difference occurred, a separate chart was made for the left side to see if the total distortion was consistent between sides.

Variations can be attributed to several factors. It has been demonstrated that two weavers worked simultaneously on each half of a tunic, and one might assume that one weaver would pack the weft

differently than the other. If this were true, a consistent variation within a design column would be expected, but none was found. The variations within design columns probably relates to the unevenness of the weft, while the disparity between the left and right side is likely due to the fact they were loomed separately.

It is the premise of this study that the Wari artists possessed a highly trained eye and were primarily concerned with the visual consistency of the entire garment. Minor variations were permitted, or were even deliberate, as long as the overall visual consistency was maintained.

In total, twenty-nine of forty-seven examples were charted for lateral distortion. As noted, examples photographed from an angle were excluded. Similarly, several examples which are fragments not displaying the design column nearest the center seam (required to establish the standard) were also omitted. Both of these excluded groups will be discussed later in terms of the other design conventions.

2. Conversion to Percentages

Once complete measurements for both the expanded and compressed elements were obtained, they were converted to percentages using the expanded portion of design column 1 as the standard. Percentages were obtained by dividing each measurement by the standard, thus producing a series of numbers that show the relation of each measurement to the standard as a percentage, with the standard always 100 per cent. A sample of this process can be seen in figure 77. In some examples, a

Figure 77. Sample of Measuring Process.

LEFT RIGHT

CENTER SEAM

	3		2		1		1		2		3	
	COMP.	EXP.	COMP.	EXP.	COMP.	EXP.	EXP.	COMP.	EXP.	COMP.	EXP.	COMP.
i	1.0	1.0	1.5	1.55	1.7	1.6	1.6	1.7	1.6	1.6	1.0	1.0
			1.7		1.8			1.8	1.5	1.7		
ii	1.0	1.0	1.6	1.55	1.75	1.6	1.6	1.75	1.55	1.65	1.0	1.0
iii							1.6					
iv	63%	63%	100%	97%	109%	100%	100%	109%	97%	103%	63%	63%

SAMPLE NUMBER 4, FIGURE 32

NOTE: IN THIS EXAMPLE THE COMPRESSED PORTION IS ACTUALLY LARGER THAN THE EXPANDED PORTION, HOWEVER THE AMOUNT OF LATERAL DISTORTION IS SMALL.

i MEASUREMENTS FOR EXPANDED AND COMPRESSED PORTIONS OF DESIGN UNITS.
ii AVERAGE MEASUREMENT IN EACH DESIGN COLUMN
iii STANDARD = EXPANDED PORTION OF 1ST DESIGN COLUMN (RIGHT)
iv EACH MEASUREMENT DIVIDED BY STANDARD SHOWS PERCENTAGE IN RELATION TO STANDARD

measurement resulted in a percentage greater than 100 percent. In order to maintain consistency, the standard was not altered to accommodate these larger percentages.

3. Charting Process

The examples have been charted according to the five groups shown in figure 28. Based on the hypothesis that the degree of distortion increased over time, the sample numbers have been arranged in proposed chronologic order for each group, from left to right along the horizontal axis. The vertical axis represents the percentage distortion with one hundred percent at the top working down to one percent at the bottom. Examples showing percentage distortion closest to one hundred per cent display the least distortion. Expansion and compression were charted separately.

A single vertical line joins all the design column numbers on both the expanded and compressed charts. The design column numbers are placed along the vertical lines to indicate the value of expansion or compression of that column relative to the standard. When concerning expansion, the design column numbers have been circled; when concerning compression, they have been boxed.

While it was hoped that a clear relation or progression could be demonstrated between comparable columns of different tunics, this proved difficult without the use of a computer. Some trends, however, are seen and will be discussed for each chart.

B. Lateral Distortion Charts

Charting is based on the five groups shown in figure 28 to produce comparable samples. My hypothesis, however, is that the five groups occurred contemporaneously, a not unreasonable assumption given their

probable function as official garments. Each group is examined separately with a summary of group tendencies. A composite chronology chart follows this individual examination.

1. Group 1 (fig. 78).

Only two samples of this group have been located, and therefore it is difficult to draw many conclusions about them. The textiles, sample numbers 1 and 2 (figs. 29 and 30) represent a distinct grouping.

Unlike the other specimens in the study they display only one design column, the single compressed edge. The rest of the tunic consists of overall stripes which can be considered as the interspace. In both samples the expanded portion is greater than the compressed portion and follows the normal pattern of the expanded portion oriented closest to the center seam.

It is likely that more samples of this group exist in collections, but may only include fragments of the striped interspace portion and therefore could easily be mistaken as textiles from another culture.

This group may represent officials of a low hierarchical status since the only design column appears at the side seam. With the effect of draping when the tunics are worn, this design column would barely be visible.

2. Group 2 (fig. 79)

The chart shows five samples arranged from least to greatest distortion. Some useful comparisons between the five samples can be made using the following three simple mathematical symbols:

Figure 78. Lateral Distortion Chart: Group 1.

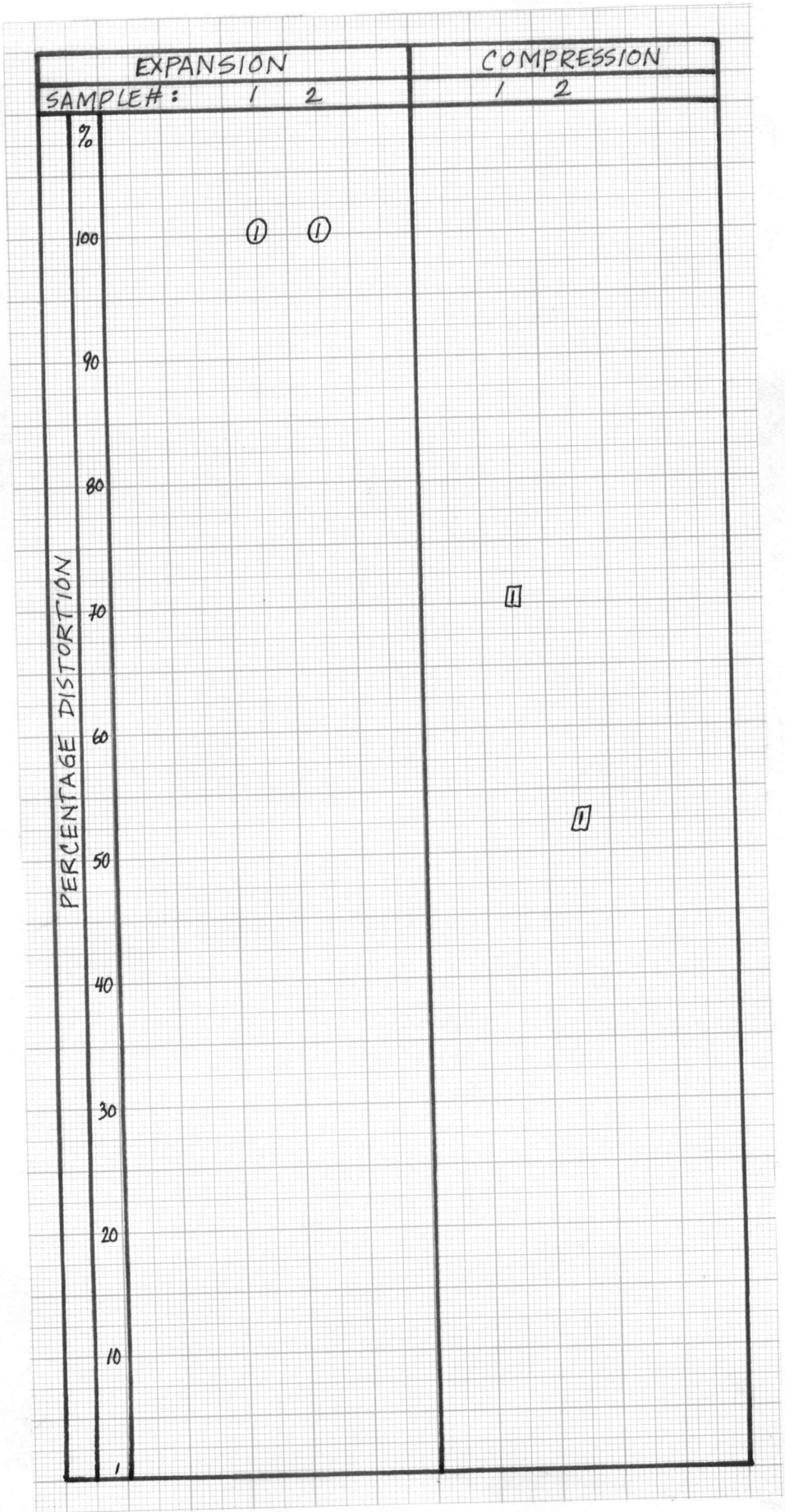
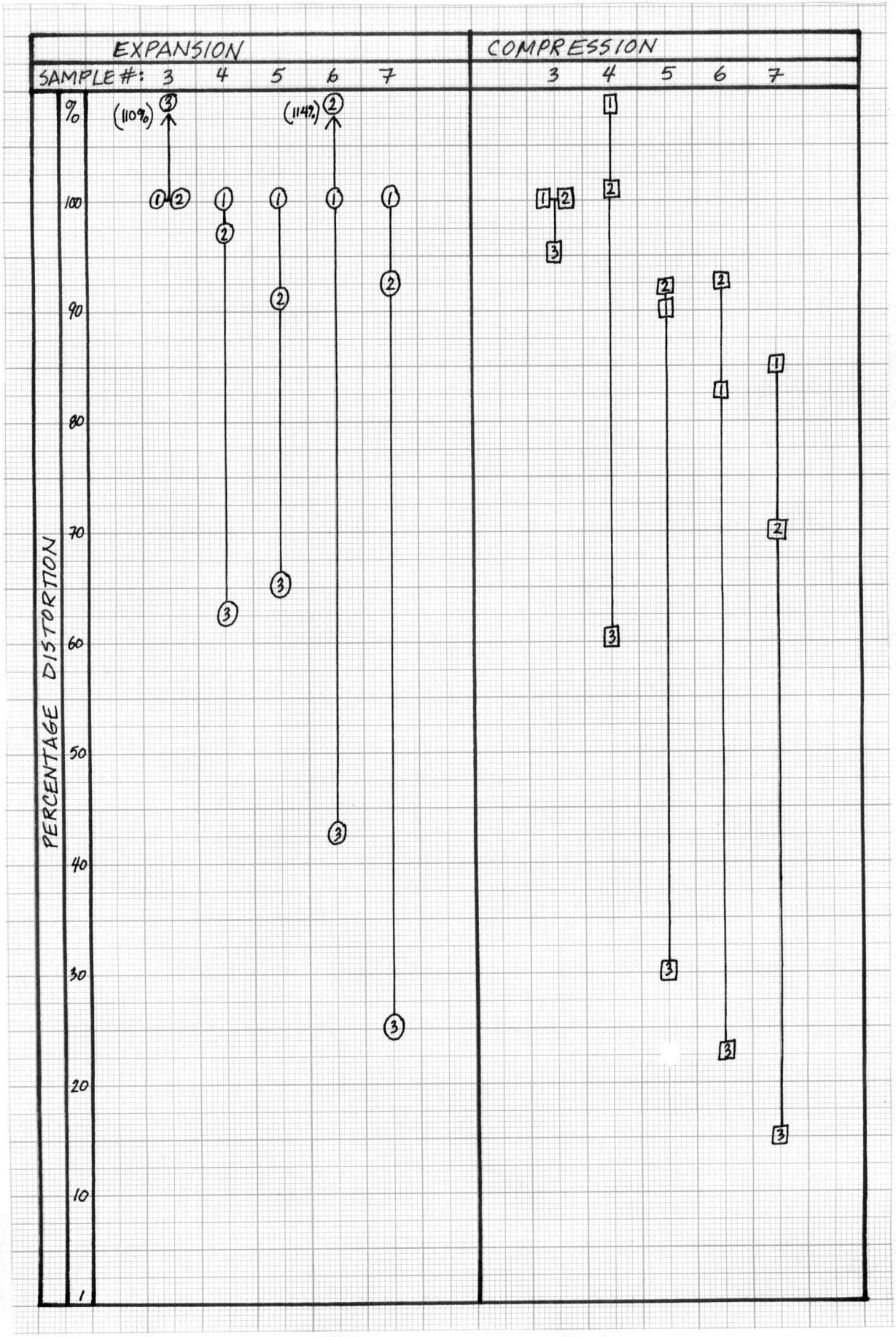


Figure 79. Lateral Distortion Chart: Group 2.



= equal to

> greater than

< less than

Figure 80 shows the range of expansion and compression for each sample, then compares these to determine if the expansion is greater than, equal to, or less than the compression.

Figure 80. Percentage Range of Distortion and Comparison of Expansion to Compression: Group 2.

Sample #	Expanded	Compressed	Expansion		Compression
3 (fig.31)	100-110%	100-95%	10	>	5
4 (fig.32)	100- 63	109-62	37	<	47
5 (fig.33)	100- 66	94-30	34	<	64
6 (fig.34)	114- 44	92-22	60	<	73
7 (fig.35)	100- 25	84-15	75	>	69

To see the relation between design columns for each tunic the mathematical symbols have again been used in figure 81, with the top symbol representing expansion and the lower symbol representing compression.

Figure 81. Relation Between Design Columns: Group 2.

Sample #	Design Column # 1	2	3	
3		= / =	< / >	
4		> / >	> / >	
5		> / <	> / >	
6		< / <	> / >	
7		> / >	> / >	

The general tendency for the relation of design columns is Column 1 > 2 > 3.

3. Group 3 (figs. 82 and 83)

Following the same form for the examination of this group as in the last group, the percentage range of distortion for both the expanded and compressed portions and the relation of expansion to compression can be seen in figure 84. Similarly, the relation between design columns can be seen in figure 85.

Figure 82. Lateral Distortion Chart (Expansion): Group 3.

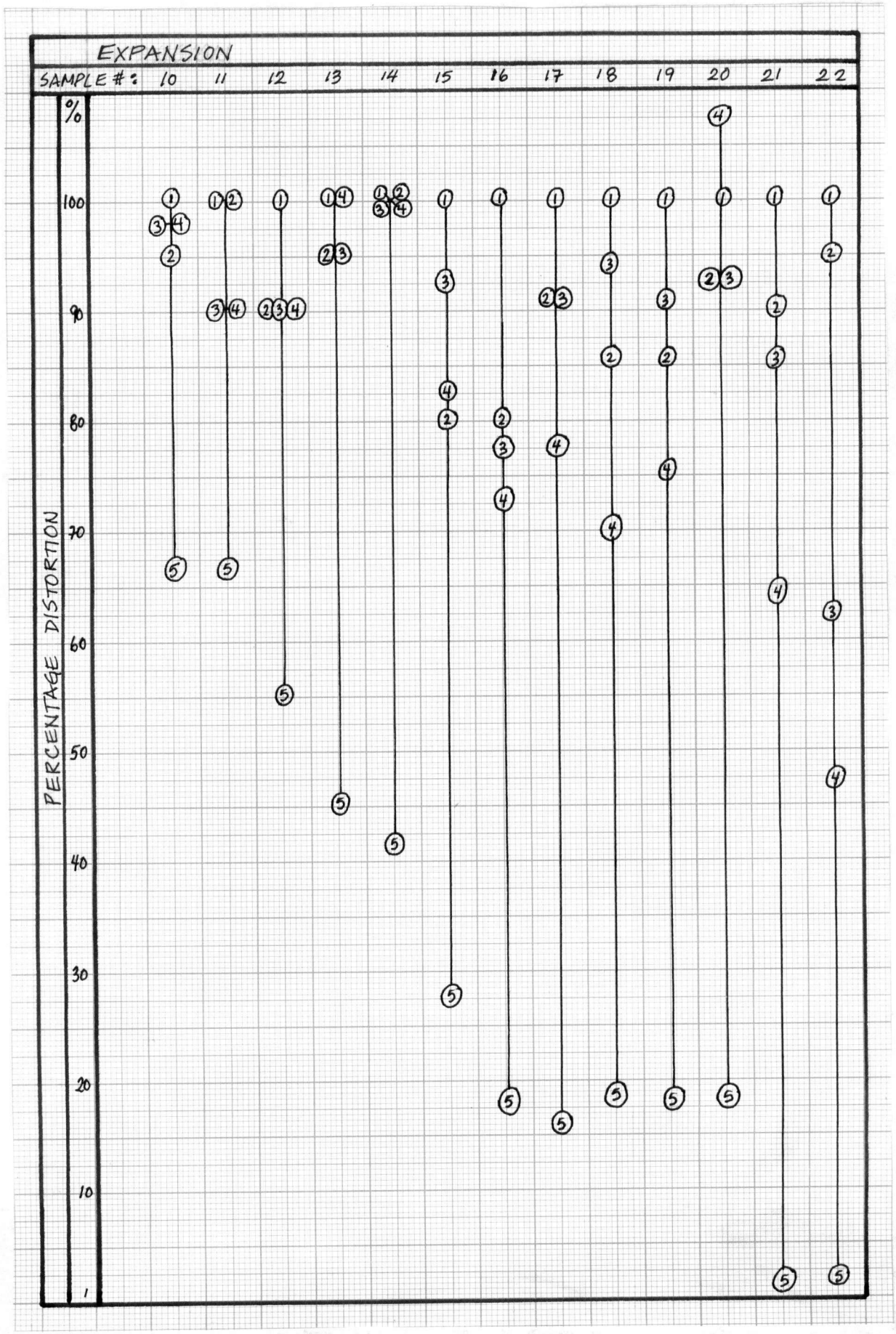


Figure 83. Lateral Distortion Chart (Compression): Group 3.

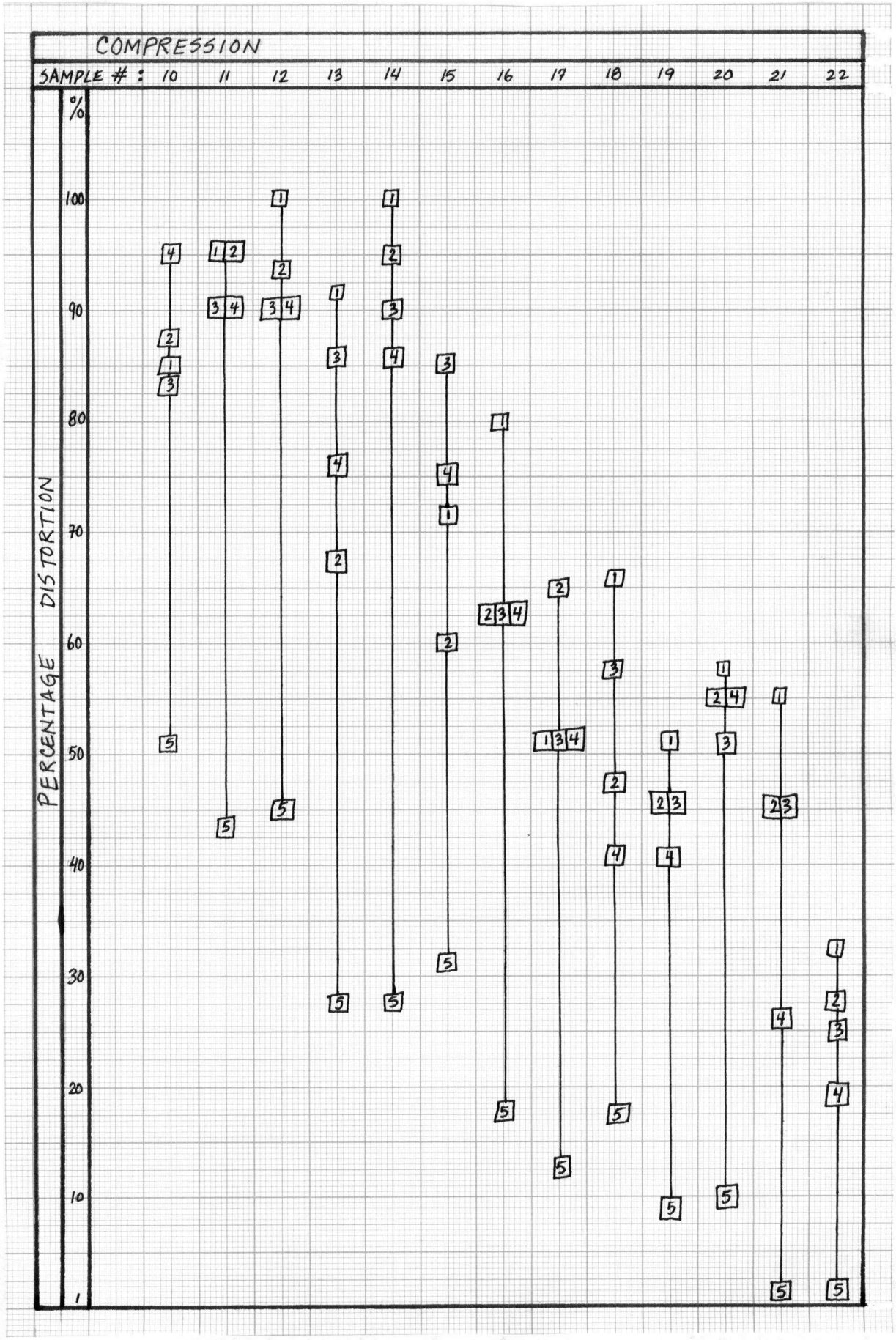


Figure 84. Percentage Range of Distortion and Comparison of Expansion to Compression: Group 3.

Sample #	Expanded	Compressed	Expansion	Compression
10 (fig. 38)	100- 67%	95-51%	33	< 44
11 (fig. 39)	100- 67	95-43	33	< 52
12 (fig. 40)	100- 55	100-45	45	< 55
13 (fig. 41)	100- 45	91-26	55	< 65
14 (fig. 42)	100- 41	100-26	59	< 74
15 (fig. 43)	100- 27	84-30	73	> 54
16 (fig. 44)	100- 17	80-17	83	> 63
17 (fig. 45)	100- 16	65-13	84	> 52
18 (fig. 46)	100- 18	66-18	82	> 48
19 (fig. 47)	100- 17	51-10	83	> 41
20 (fig. 48)	109- 17	57-11	92	> 44
21 (fig. 49)	100- 1	55- 1	99	> 54
22 (fig. 50)	100- 1	33- 1	99	> 32

Figure 85. Relation Between Design Columns: Group 3.

Sample #	Column #				
1	2	3	4	5	
10	> <	< >	= <	> >	
11	= =	> >	= >	> >	
12	> >	< =	= =	> >	
13	> >	< =	> <	> >	
14	> >	> >	> >	> >	
15	> >	< <	> >	> >	
16	> >	> >	> >	> >	
17	> <	> >	> >	> >	
18	> >	< <	> >	> >	
19	> >	< =	> >	> >	
20	> >	> =	< <	> >	
21	> >	> >	> >	> >	
22	> >	= <	> >	> >	

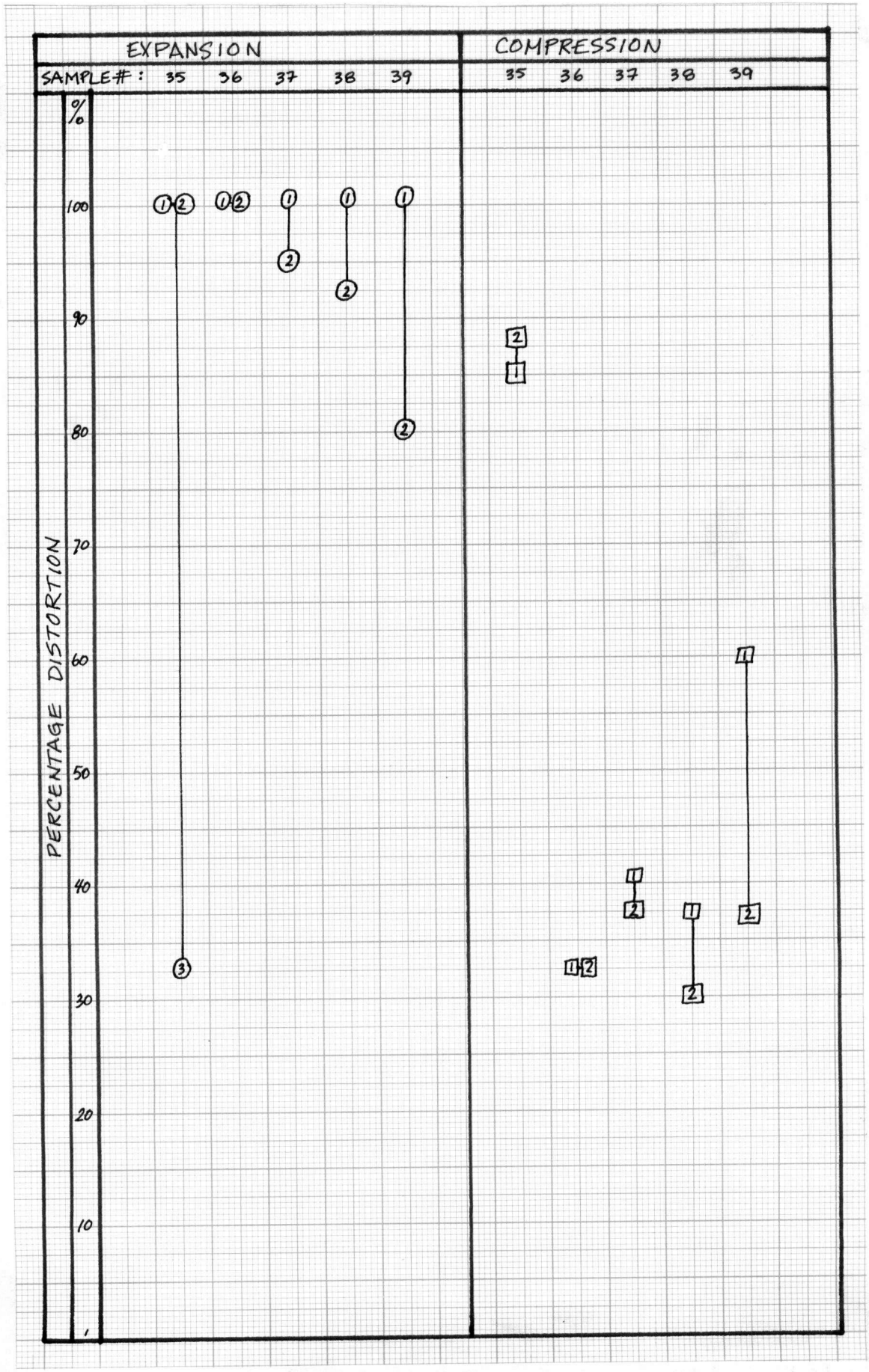
The general tendency for the relation of design columns is that the distortion of Column $1 > 2 > 3 > 4 > 5$. Since this group consists of two double design columns, however, a comparison between columns one and three was also made, because they begin the sets of double columns. This comparison shows that the expansion of column one is almost always greater than the expansion of column three. The same is almost always true for the compressed portions of these columns.

While there are some fluctuations, generally column 1 is greater than column 3 for both expansion and compression, however column 2 is occasionally less than column 3 suggesting a concept of lateral distortion based on a specific relation between particular columns (one and three, the first design column of each double unit column) rather than a more simplistic progression from right to left. This deviation from an easily predicted formula helps to alleviate monotony and reinforces the premise that the Wari were concerned primarily with overall visual impact.

4. Group 4 (fig. 86)

The third design column (compressed edge) has been omitted from the lateral distortion chart (fig. 86). This design column cannot be accurately considered because in all examples, except sample number 35 (fig. 63), no diagonal separation of the paired elements, necessary for measuring expansion and compression is apparent. Figure 87 reflects this omission and shows the range of distortion and the relation of expansion

Figure 86. Lateral Distortion Chart: Group 4.



to compression for the first and second design columns. This figure shows that the amount of distortion between adjacent design columns, for both expansion and compression, is only slight, however, in a single design column, the difference between the expanded and compressed portion is great. Similarly, figure 88, the relation of design columns for both expansion and compression, omits the third design column. The general tendency is Column 1 $>$2.

Figure 87. Percentage Range of Distortion and Comparison of Expansion to Compression: Group 4.

Sample #	Expanded	Compressed	Expansion		Compression
35 (fig.63)	100-100%	86-88%	0	$<$	2
36 (fig.64)	100-100	31-31	0	$=$	0
37 (fig.65)	100- 96	46-43	4	$>$	3
38 (fig.66)	100- 94	47-37	6	$<$	7
39 (fig.67)	100- 80	60-42	20	$<$	22

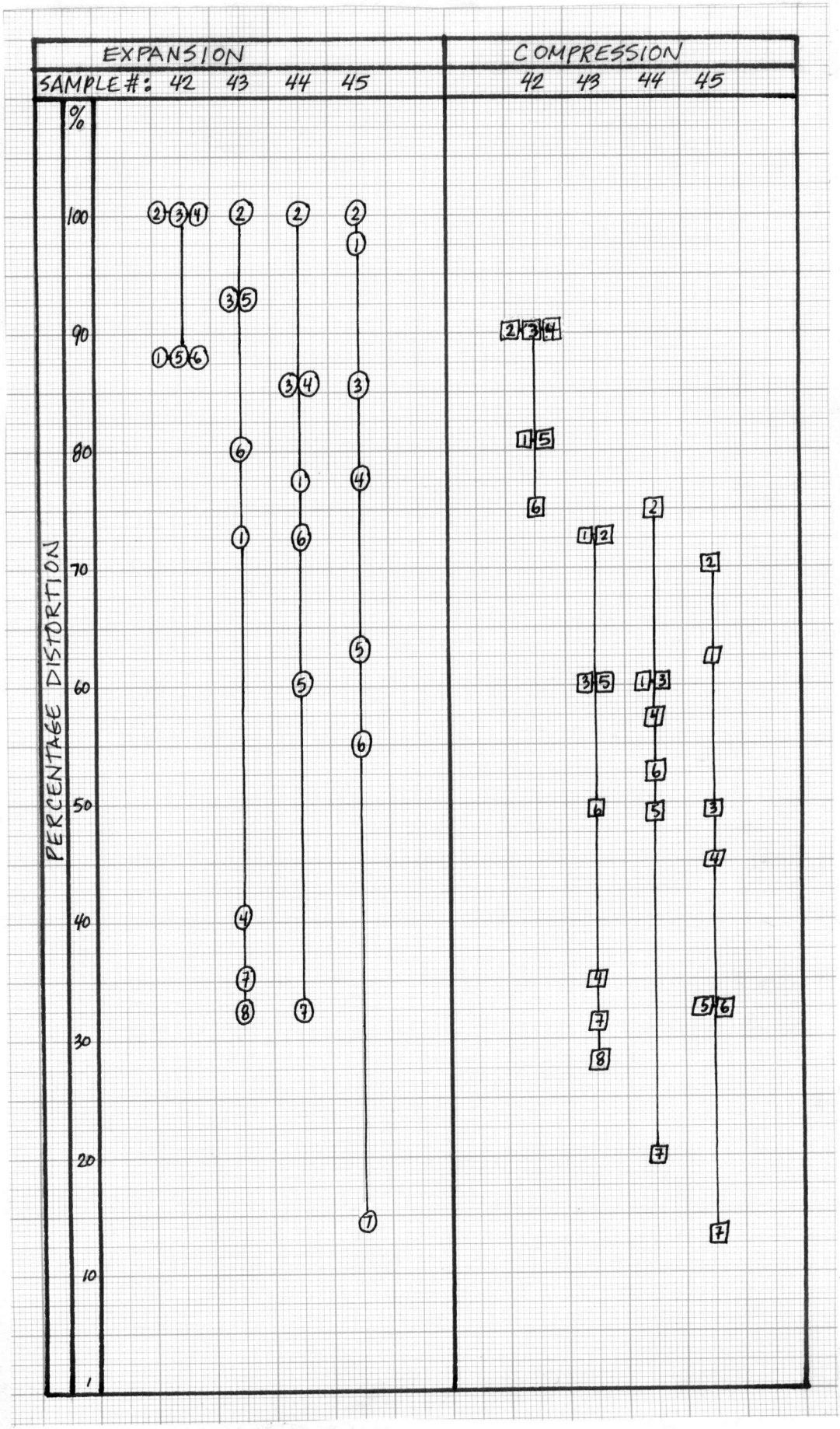
Figure 88. Relation Between Design Columns: Group 4.

Sample #	Column #		
	1	2	3
35	< =		
36	= =		
37	> >		
38	> >		
39	> >		

5. Group 5 (fig.89)

The charts for this group can be seen in figure 89. Unlike the other groups, the second design column was used as the standard rather than the first design column, because the second design column of Group 5 is equivalent to the first design column in Groups 1 through 4 for several reasons. The same lateral distortion that applied to the design columns appears in the interspace columns in terms of the relative width of the columns. The first interspace column to the right of the center seam is normally narrower in width than the second interspace column. In Groups

Figure 89. Lateral Distortion Chart: Group 5



one through four, the first interspace column on each half of the tunics are bound together at the center seam and appear as a single, central interspace column. The total width of this central column is usually greater than either adjacent interspace column to its immediate left or right. This combined column is not so wide as to make it the focal point and a consistent balance is maintained. Group 5 textiles represent the only category of Wari official garments where the center seam is along design columns, rather than along interspace columns. In order to preserve the visual balance of the tunic, the first design column to the left and right of the center seam are narrower than the adjacent columns.

The following figures (90 and 91) show respectively, the range of distortion for both expansion and compression (in percentages) and the relation between design columns.

Figure 90. Percentage Range of Distortion and Comparison of Expansion and Compression: Group 5

Sample #	Expanded	Compressed	Expansion	Compression
42 (fig. 70)	100- 88	90-75	12	< 15
43 (fig. 71)	100- 32	72-28	68	> 44
44 (fig. 72)	100- 33	74-20	67	> 54
45 (fig. 73)	100- 14	69-15	86	> 54

Figure 91. Relation Between Design Columns: Group 5

Sample #	Column #							
1	2	3	4	5	6	7	8	
42								
43								
44								
45								

In all cases design column 1 is narrower than design column 2 for the reasons noted previously, but the general tendency is for the other columns to be progressively narrower the further away from the center seam they are.

In general, samples of this group seem to be rarer than for the other groups and would be further subdivided if an enlarged sample were available. One such division might be based on the number of vertical design columns grouped together and separated by discontinuous interspace columns in the lower portion of the shirt.

The data presented in this chapter allows some chronologic assessment. The original division of the sample into five groups was made to produce comparable examples. Following Sawyer's hypothesis, with which the author concurs, a chronologic order has been suggested for tunics of the same group. This chronologic order is considered accurate, for each group.

The incorporation of the five groups into a single chronology, however, is effected by many complex factors, making it difficult to assess the temporal relations of different groups based on the incomplete evidence. Evaluation of significant factors necessary for group comparisons requires further research and is beyond the scope of this thesis. For reference, however, the sample has been integrated into a synthetic chronology (fig. 92). This is based on a comparison of lateral distortion in the first design column (nearest the center seam) and the compressed edge column (nearest the side seam). The chronologic order of tunics in each group has been maintained in this arrangement.

Some problems with this ordering are immediately apparent. Sample numbers 3 and 14 (figs. 31 and 42) are reputedly from the same grave lot, yet appear in different positions in the chronology. Sample number 3 is Group 2, while sample number 14 is Group 3. The differing number of design columns in Groups 2 and 3 obviously dictates the amount of available space for the compressed edge column, and therefore the use of this column does not give a true measure of lateral distortion. These two examples are of particular interest because as a grave lot they show that one individual owned tunics of different groups, implying a change in position or hierarchical status.

Another problem with this synthetic chronology is the unmeasured compressed design column of Group 4. This results in an earlier placement of Group 4 tunics than the author feels is warranted.

Lateral distortion may also have been used to differing degrees on the South Coast than in the highlands, however incomplete scientific data limits the assessment of the validity of this hypothesis.

Figure 92. Proposed Chronology Based on Degree of Lateral Distortion.

Sample #	% Distortion	Group					Type	E<C	E=C	E>C
		1	2	3	4	5				
35	14				x		1A	x		
3	15		x							x
42	25					x		x		
1	29	x								x
4	37		x						x	
2	47	x								x
10	49			x				x		
12	55			x			1A	x		
11	57			x			1A	x		
37	57				x					x
39	58				x		1A	x		
38	63				x		1A	x		
36	69				x		1A		x	
5	70		x					x		
15	70			x						x
43	72					x				x
13	74			x				x		
14	74			x				x		
6	78		x				1A	x		
44	80					x				x
18	82			x						x
16	83			x						x
7	85		x							x
45	85					x				x
17	87			x						x
19	90			x			1A			x
20	98			x						x
21	99			x						x
22	99			x						x

Type 1A indicated, all others are Type 1B.

While chronologic implications for each group may be considered relatively accurate, the arrangement of groups in relation to one another does not permit accurate chronologic conclusions. Some form of arrangement is useful, however, and this synthetic arrangement of the five groups will be used in the following discussion of other design conventions.

CHAPTER 5 - SYMMETRY

Symmetry represents another type of design convention employed by the Wari. Using symmetry terminology as defined by Anna Shepard, it is possible to analyse design organization in a structural manner. The following discussion summarizes Shepard's work as it applies to these textiles.

Shepard describes symmetry as "the manner of arrangement of the regularly repeated part of a design." (Shepard, 1948:217) She goes on to state that this repetition "often involves change of orientation as well as a shift in position". Shepard notes that two essential steps must be used for the analysis of symmetry. They are "the identification of the fundamental portion of a design and recognition of the motion or combination of motions employed in its repetition".

> The symmetric figure is classified by its motion, that is, by the manner of repeating the fundamental portion, and motions are described by reference to imaginary lines and points or axis. (Shepard, 1948:217)

Two terms frequently referred to in the examination of the textiles are the fundamental portion and the design unit. Shepard describes the fundamental portion as "the unique part which is repeated to form the symmetric whole", while she describes the design unit as "that part which forms the basis of a serial repetition".

Lateral distortion effects the design units producing an inequality between design columns, and therefore, the term symmetry will be used in place of the more technically exact definition 'symmetry with lateral distortion'. The primary concern of this examination is the directional motion of repetition.

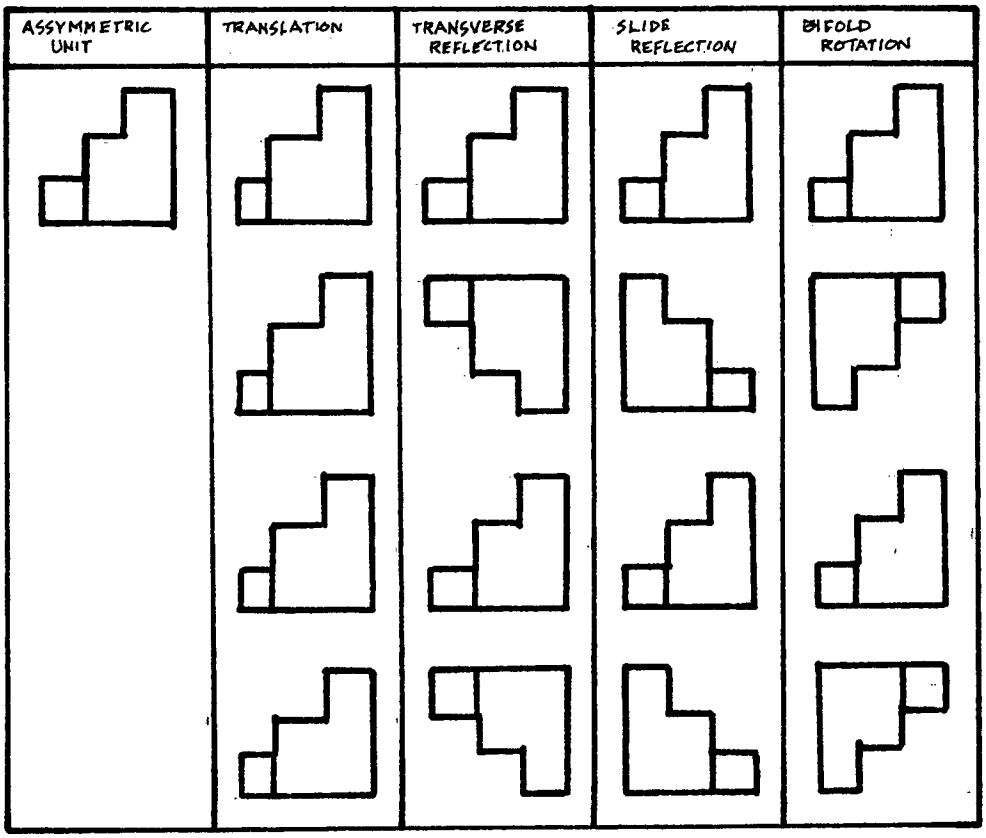
Four motions are apparent in Wari textiles. These are:

1. **Translation**
2. **Transverse Reflection**
3. **Slide Reflection**
4. **Bifold Rotation**

These terms are defined by Shepard in the following manner. The first, **translation** is "a shift in position without change in orientation". The second, **transverse reflection**, more commonly known as mirror imagery is the "reflection along a series of equally spaced transverse axes". **Slide reflection**, the third type of motion is "the alternation of right and left images in progression". Shepard equates this to the movement of footprints in nature, but notes that in designs, the images need not be spread laterally. The final motion, **bifold rotation**, is described as the "180 degree rotation about a series of equally spaced axes". (Shepard, 1948:219) Using a geometric assymmetric unit (or fundamental portion) these four motions can be seen in figure 93.

The application of these motions to Wari textiles shows a strong awareness on the part of the artists, of dynamic movement, which serves to alleviate monotony.

Figure 93. Symmetric Motions in Wari Official Garments.



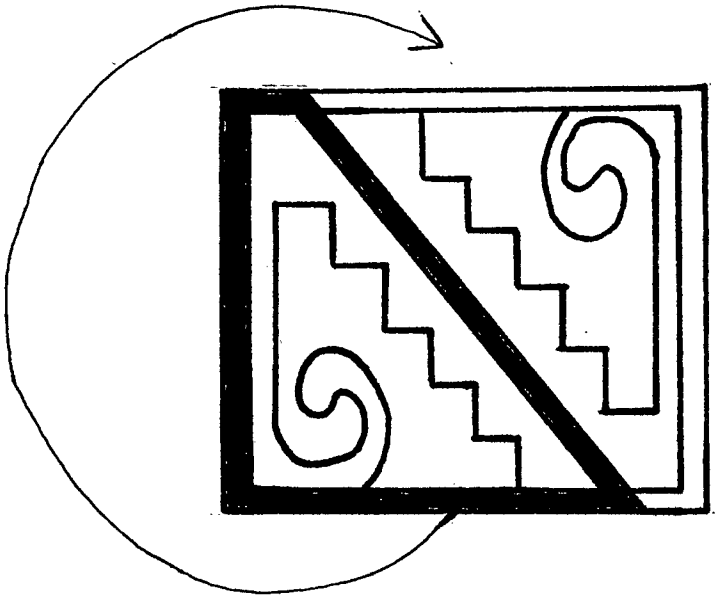
Symmetry analysis of Wari textiles begins with the identification of the fundamental portion and the design unit. In Type 1A textiles, the fundamental portion is one stepped spiral enclosed by trapezoidal outlining. If this portion moves through bifold rotation (fig. 94a), the result is the paired element encased in a rectangle which can be considered the design unit. This however is not the case with Type 1B textiles (fig.94b) where the paired elements are not identical, so the fundamental portion according to Shepard's definition is the entire rectangle. Since this rectangle is repeated throughout the textiles it may also be considered the design unit. For clarity, paired elements within a rectangle, whether identical or not will be consistently referred to as the design unit.

This study is concerned with how the four symmetric motions, translation, transverse reflection, slide reflection and bifold rotation are employed in Wari official garments.

As noted earlier, a design column consists of a vertical stack or set of design units. In Type 1B the orientation of elements within design columns and their mode of repetition is slide reflection, or the left and right progression of images (fig. 95a). In Type 1A textiles, the paired elements (stepped spirals) are identical and the motion used for repetition can also be considered as transverse reflection along a series of horizontal axes that separate the vertical stack of design units (fig.95b). For consistency, the term slide reflection will be used for both Type 1A and Type 1B textiles. Every design column, if considered separately is therefore produced by the vertical stacking of design units oriented by the motion of slide reflection. An exception to this is sample number 32 (fig. 67) where the mixture of profile head and stepped spiral elements is abberant.

Figure 94. Fundamental Portion and Design Unit.

a.



b.

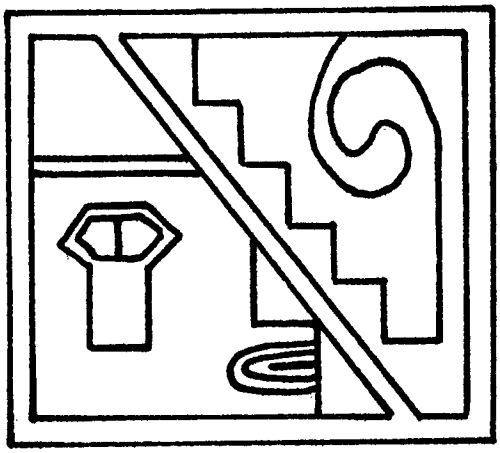
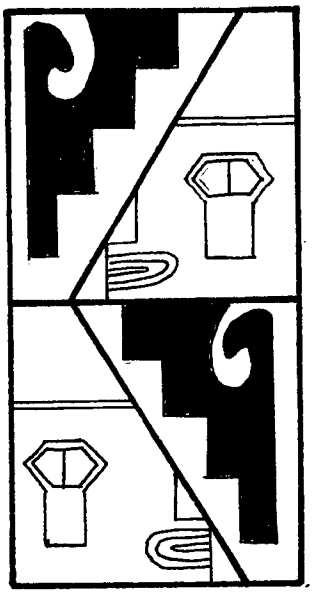


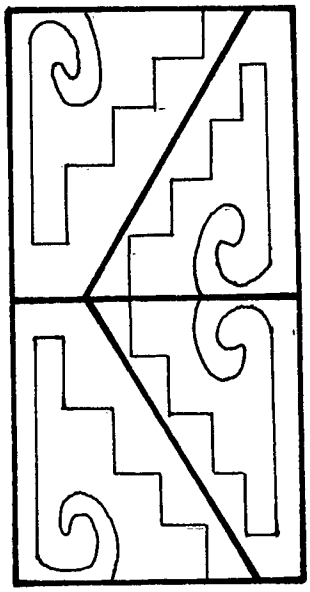
Figure 95. Orientation of elements through Slide Reflection.

a.



TYPE 1B

b.



TYPE 1A

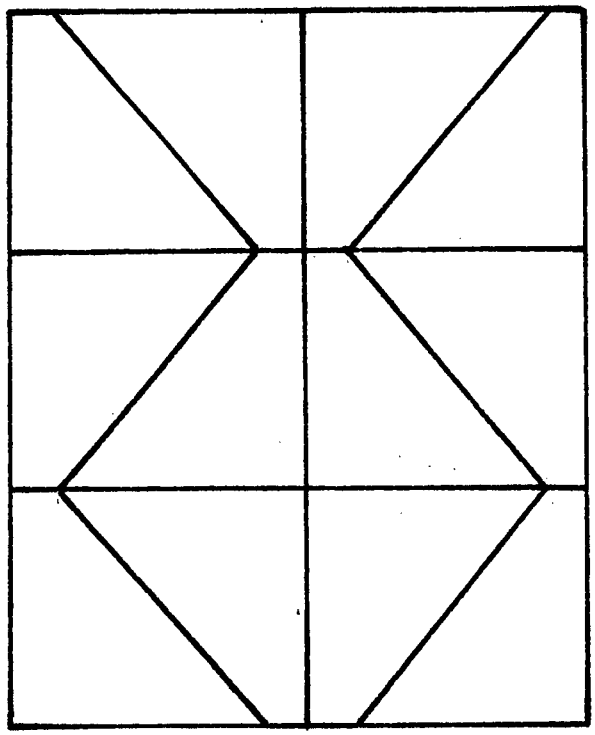
It has been shown that slide reflection determines the orientation of elements in design columns. The diagonal line that separates each paired element within design units moves alternately from left to right and from right to left producing a zig-zag line in each design column. To define the relative position of design columns, the term adjacent column will be used to refer to design columns that appear side by side, whether occurring as a double column or as a single design column separated by an interspace column. The relation of adjacent design columns results in one of two forms of outlining which will be called 'diamond' (or hourglass) and 'zig zag'. Zig-zag patterning between adjacent design columns should not be confused with the zig-zag line which occurs up the center of every design column (fig. 96)

If each design column is considered separately, the relation between adjacent design columns can be defined in terms of two motions, translation and bifold rotation. An examination of these motions reveals a direct relationship between the symmetric motion employed and the resulting pattern of outlining. Every textile in this study that shows both the back and front face of the tunic displays an even number of design units in a vertical design column, although some illustrations appear to have an odd number of design units when only the front (or back) face of the tunic is visible. Since the multiplication of both odd and even numbers by two always results in an even number, one can safely assume that the total number of design units in a loomed panel column will always be even.

Translation between adjacent design columns always results in a zig-zag form of outlining, while bifold rotation of an even number of design units in a design column always results in hourglass or diamond outlining (fig. 97).

Figure 96. Outlining Patterns between Adjacent Design Columns.
a. Diamond or Hourglass
b. Zig-Zag

a.



b.

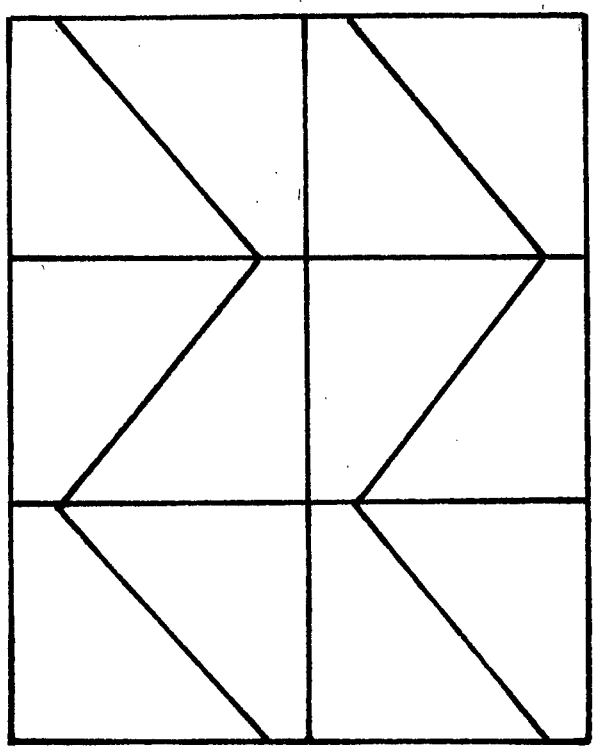
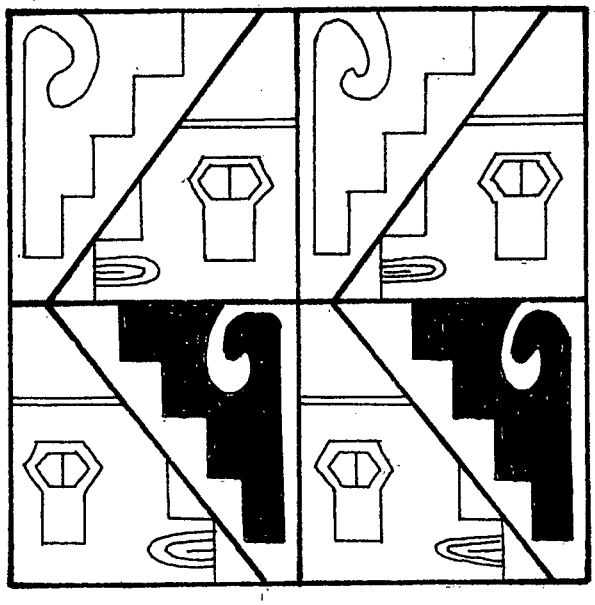
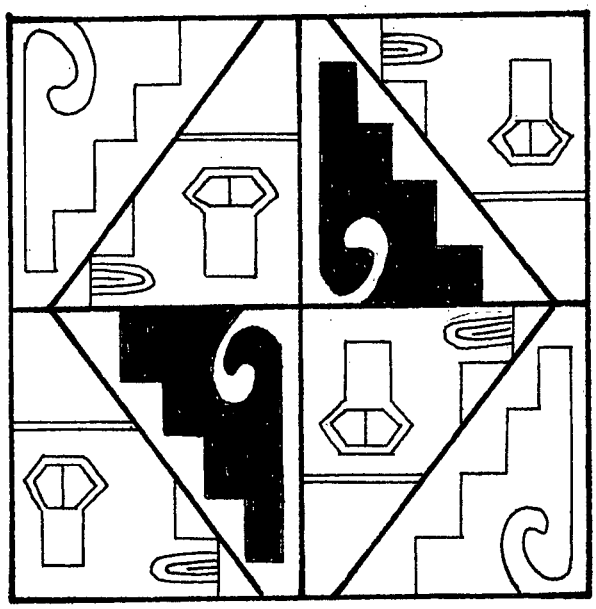


Figure 97. Symmetry of Adjacent Design Columns.



TRANSLATION



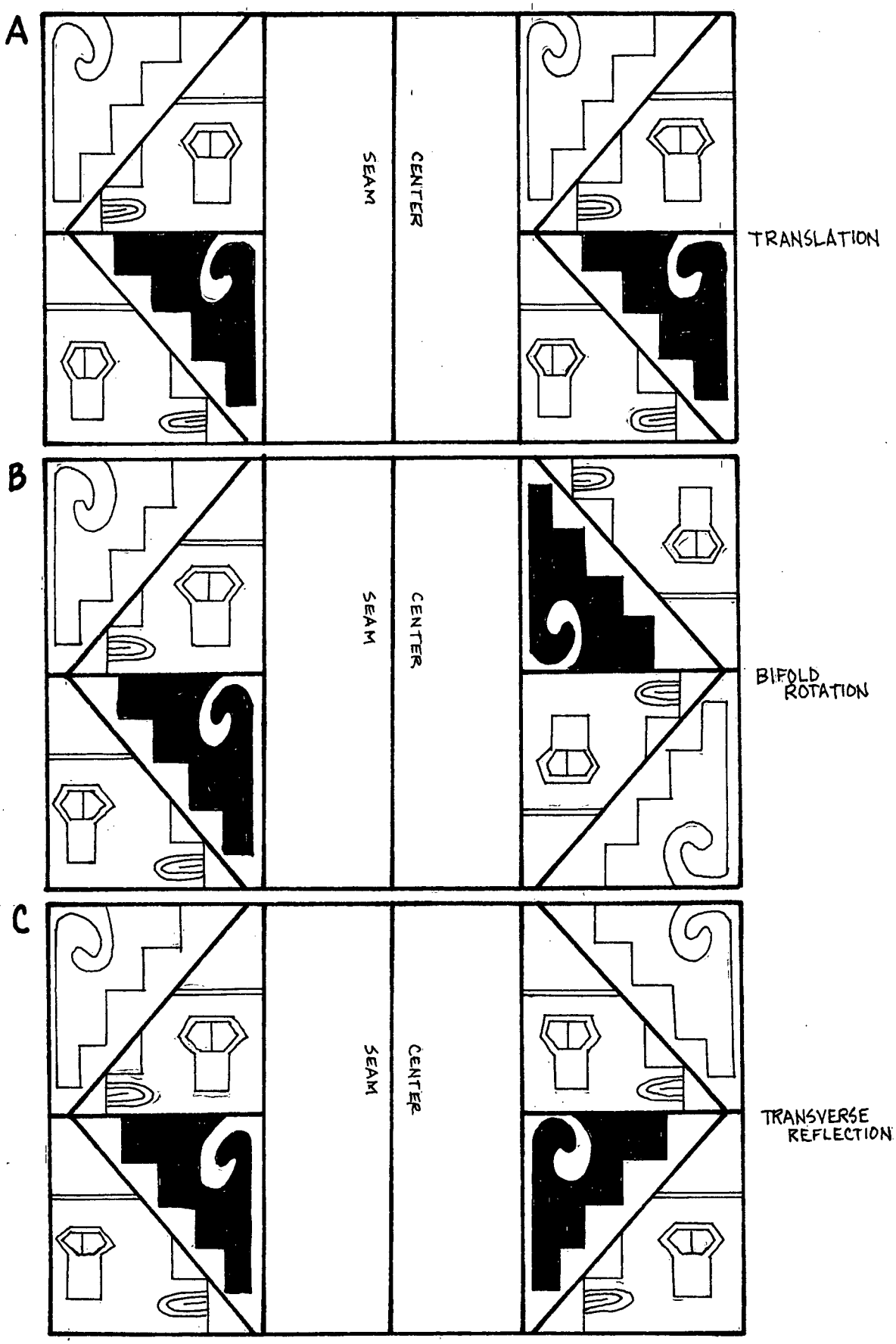
BIFOLD ROTATION

Most of the tunics in this study display only one form of outlining on both the right and left side of the garment. An exception to this is sample number 19 (fig. 47) which has diamond or hourglass outlining between design columns one and two and between design columns three and four, but at the same time displays zig-zag outlining between design columns two and three and between design columns four and five. This same piece appears late in the sequence of Group 3 textiles as seen in the proposed chronology chart (fig. 92). The overall effect of the combined use of diamond and zig-zag outlining (as well as extreme lateral distortion) suggest that it was executed by a talented artist who used these conventions to further alleviate monotony. This example may represent a breakdown in conventions allowing more personal control. Outlining will be discussed in more detail at a later point, however, it is interesting to note that the diamond form predominates.

It has been demonstrated that translation between adjacent design columns and bifold rotation of entire design columns results in two outlining forms. These two motions are seen again in the symmetric treatment of adjacent design columns on either side of the center seam. In addition, a third motion, transverse reflection appears. Transverse reflection between adjacent design columns on either side of the center seam results in an hourglass or diamond form of outlining as does bifold rotation, however, transverse reflection produces a mirror image of elements between adjacent design columns while bifold rotation shifts this orientation by one design unit (fig. 98).

Most samples in this study, whether outlined between adjacent design columns with either diamond or zig-zag forms, displays diamond outlining between the adjacent design columns on either side of the center seam. Two exceptions, sample number 13 (fig. 41) and sample

Figure 98. Symmetry of Adjacent Design Columns at the Center Seam.



number 10 (fig. 38) display zig-zag outlining between adjacent design columns at the center seam. These two pieces are the only ones in this study that employ translation between adjacent design columns at the center seam. Transverse reflection and bifold rotation are therefore the principle motions employed between adjacent design columns at the center seam. Some Type 1A textiles can be seen as displaying either transverse reflection or bifold rotation, but for the same reason slide reflection was used to describe the orientation of elements in an individual design column, the term that describes both Type 1A and Type 1B is used.

To summarize, all of the textiles in this study may be seen to form design columns through slide reflection. The symmetric relation between adjacent design columns dictates the form of outlining between them. Bifold rotation and transverse reflection both produce diamond or hourglass outlining between adjacent design columns at the center seam, but result in a different orientation of elements. Translation between adjacent design columns at the center seam is less common.

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CHAPTER 6 - COLOUR USAGE

The Wari artists were aware of the danger of monotony inherent in the repetitive use of the design unit. The orientation of the paired elements in design units was varied, as previously shown, through the use of symmetric motions. In addition, it has been shown that expansion and compression emphasized or de-emphasized the paired elements in every design column. Sawyer notes that without a similarly complex colour system, the complete textile would still be subject to geometric and colour repetitiousness. (Sawyer, 1963:38)

The use of colour in Wari official garments can be examined on two levels, colour patterning or the directional movement of colour, and the actual use of specific colours. While this study is limited to an examination of colour movement, some comments on the actual use of colour should be made.

A. Specific Colour Use

The Wari favoured certain colour ranges. The main ones were the red and yellow ranges appearing as reds, pinks and oranges, or as yellows, golds, tans and soft browns. In addition, black and white were commonly used for paired elements (particularly the stepped spiral portion), for outlining and as accents within design units. Black appears more frequently than white except in outlining. Intense blues and soft greens are seen in many tunics, however, their application is usually limited to secondary accents.

A general progression from the use of strongly contrasting colours to more subtle colour harmonies is evident in most groups. Sample number 3

(fig. 31) of Group 2 features respectively, orange and red stepped spirals on dark gray and bright yellow background fields. Pink and yellow profile heads are accented with blue and dark brown highlights. The bright red seen in the stepped spiral is repeated in the interspace columns producing a vibrant, highly colour contrasted tunic. Another example from Group 2 is sample number 7 (fig. 35) which displays greater lateral distortion than sample number 3. It uses many of the same colours as the previously discussed example, however, the extreme contrast is replaced by a more subtle use of colour. The soft yellow-tan of the interspace column repeats itself in the profile head elements and background fields softening the entire colour system. The strong oranges of the first example become soft golden-orange on a tan background rather than the previously shown dark gray background. In the first example, the white outlining stands out; however, in the second example, the white outlining is de-emphasized with yellow hues. Blue accents appear more frequently in the earlier piece but are replaced with a soft green applied to only two or three areas in the later piece.

Two examples of Group 3 tunics, sample number 12 (fig. 40) and sample number 13 (fig. 41) show a similar progression from strong contrasting colours to subtler harmonies. Both sample number 3 (discussed above) and sample number 12 employ strong contrasting colours and have known provenience. The first is from the South Coast while the second is from the Southern Highlands near Ayacucho, suggesting the progression from high contrast to more subtle harmonies is temporal rather than regional. The same progression is evident in Group 4 and 5 and is demonstrated respectively between sample numbers 37 and 38 (figs. 65 and 66) and sample numbers 42 and 43 (fig. 70 and 71).

In addition, textiles of different Groups often use specific colours in similar ways. For example, the use of colour in sample number 3 (fig. 31) of Group 2 closely resembles that of sample number 47 (fig. 75) of Group 5. Note particularly the orange stepped spiral on the dark gray background and the red spiral on a yellow background. Based on similar colour use and minimal lateral distortion, sample number 47 can be placed early among other Group 5 tunics. The progression of colour use can therefore be used as an additional way of determining the relative dating of tunics.

B. **Colour Patterning**

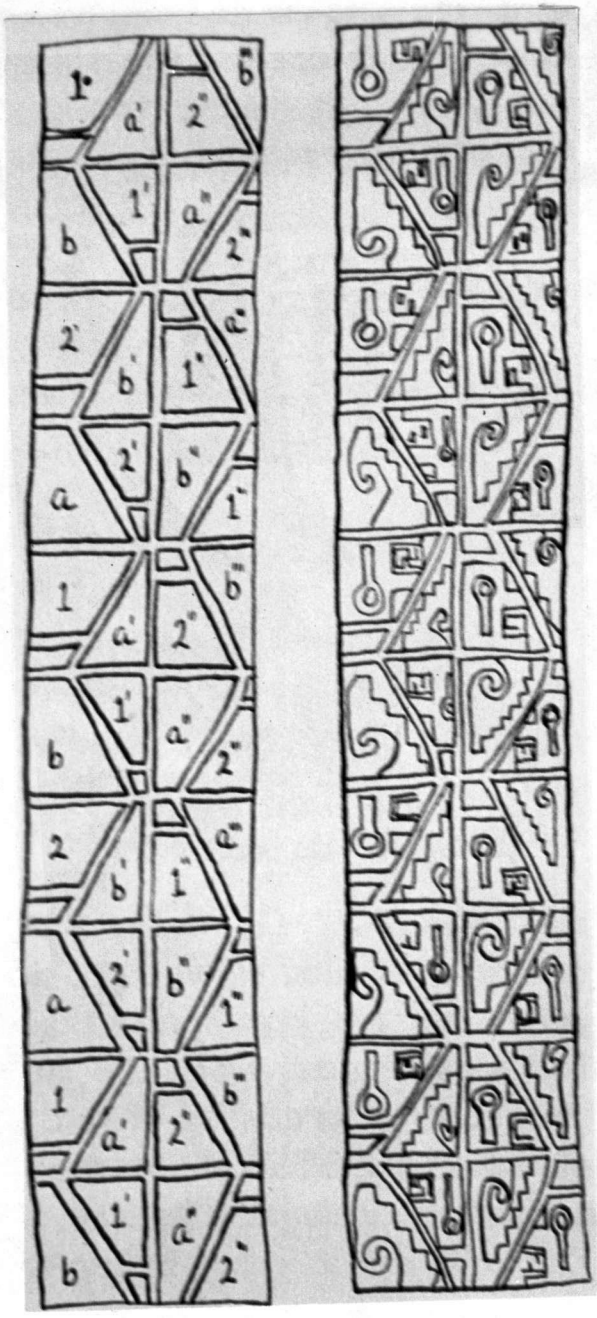
1. Charting Methodology

No specific study of the use of colour in Wari official garments exists to date. Franz Boas touched upon the subject briefly in his treatise Primitive Art (Boas, 1955:38-39) where he examined a double design column of a Type 1B tunic and set out a basic charting system (fig. 99). In his general discussion he calls the movement of colour "rhythmic repetition" and goes on to state:

> The virtuoso who varies the monotony of his movements and enjoys his ability to perform a more complex action produces at the same time a more complex rhythm. ... In many cases, rhythmic complexity is clearly the result of careful planning. (Boas, 1955:41)

Such deliberate planning is apparent in all Wari official garments.

Figure 99. Colour Charting System. (after Boas, 1955: 39, fig. 34)



Following Boas' charting system which involves a series of numerical and alphabetical notations, letters are assigned to the stepped spiral elements, while numbers are used for the profile head elements. Two parts of each paired element are used for charting; they are:

Stepped Spiral A, B, C....

1. **Spiral Colour**
2. **Spiral Background Colour**

Profile Head 1, 2, 3....

1. **Predominate Face Colour**
2. **Background Colour**

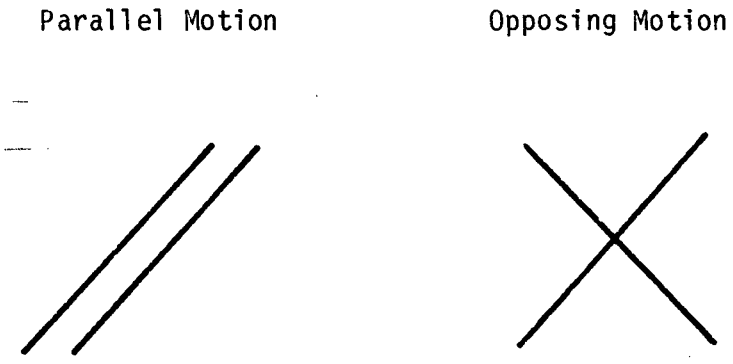
The quantity of letters or numbers used depends on the total variety of colours appearing in the garments.

All samples available in colour have been charted. Since this study is concerned with colour movement rather than specific colour use, it was possible to enlarge the sample by judging colour movement based on relative value (light and dark) of black and white illustrations.

2. Chart Analysis

When the charts were analysed, it became apparent that two major patterns existed which can be described as either parallel or opposing motions as diagrammed below (fig.100).

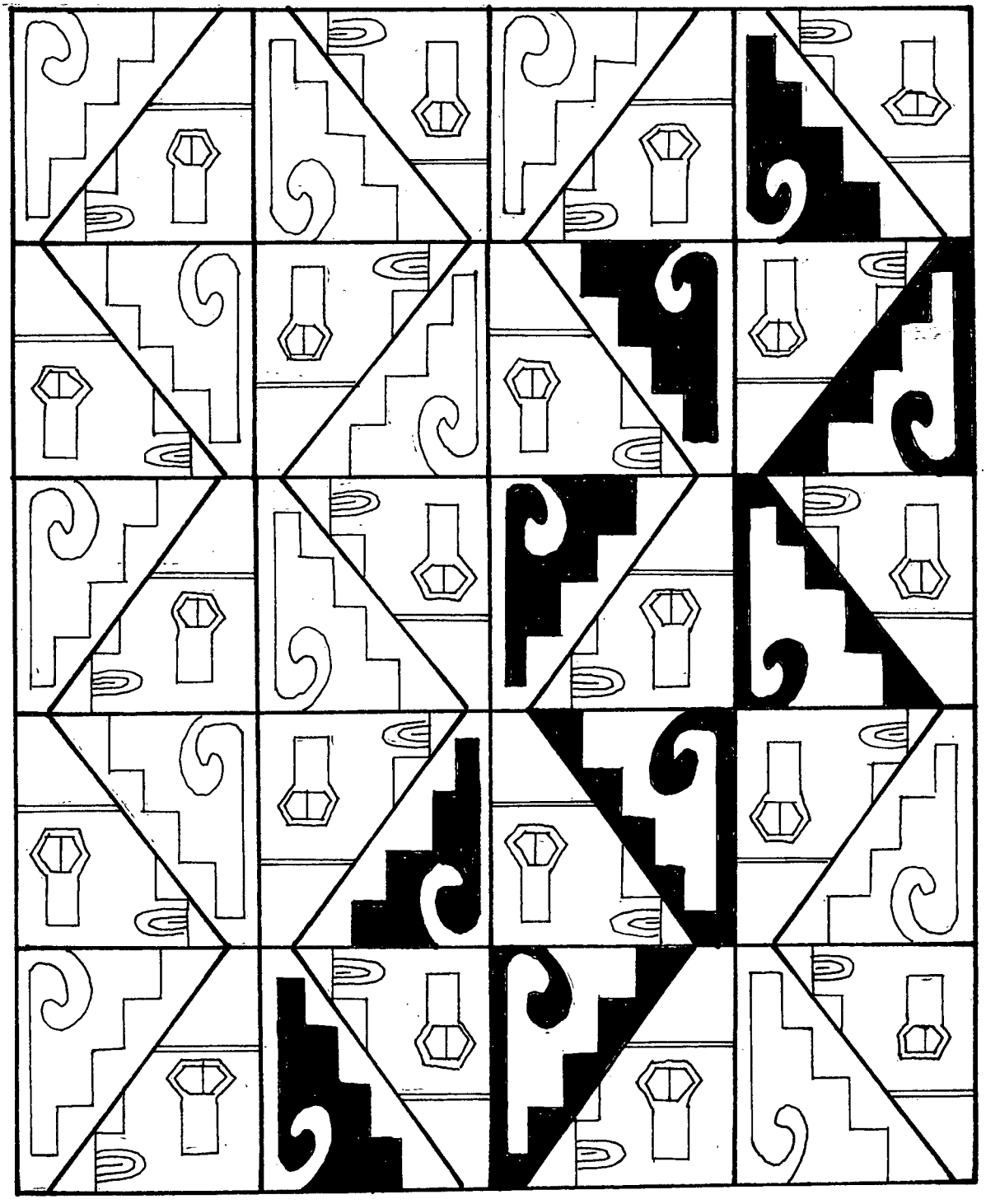
Figure 100. Colour Patterns: Parallel and Opposing Motions.



These motions indicate the direction of colour movement. Both involve diagonal movements across each side of the tunic, produced by the repetition of a series of colours for the paired elements in the design units. While clear diagonal motions occur, they are emphasized or de-emphasized by the use of lateral distortion and the symmetric orientation of design units. These colour diagonals continue uninterrupted between adjacent design columns, whether the design columns are side by side or separated by interspace columns (fig. 101).

Parallel and opposing motions are found on each side of the center seam, however the two sides often have a different orientation. When the

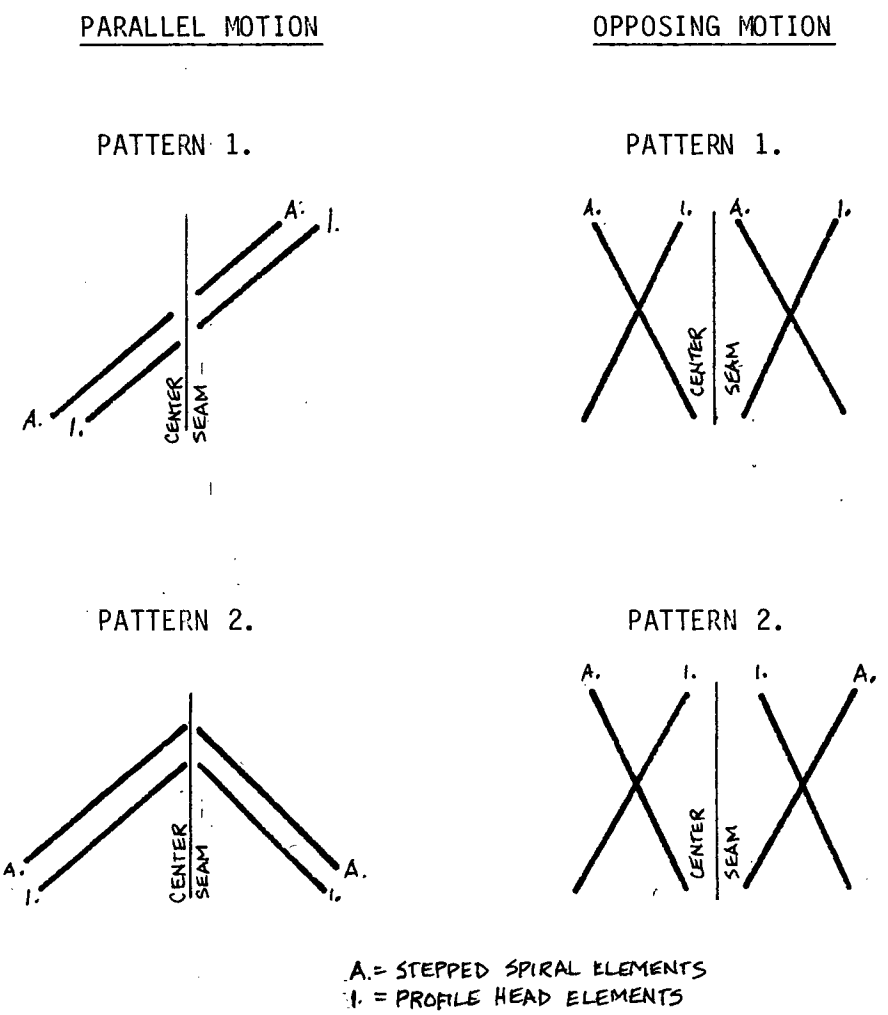
Figure 101. Diagonal Colour Movement.



BOTH BLACK AND WHITE STEPPED SPIRALS MOVE IN A PARALLEL DIAGONAL, DESPITE CHANGE IN ORIENTATION

changes in orientation are examined, two different colour patterns are evident for both the parallel and opposing motions (fig. 102).

Figure 102. Change in Orientation of Colour Patterns at Center Seam.



Both parallel and opposing motions are created independently of the symmetric organization of design columns on either side of the tunics, however, the change in orientation on either side of the center seam is usually determined by the same symmetric motion that determined the orientation of elements in adjacent design columns at the center seam.

If the two patterns for both parallel and opposing colour movements are considered in symmetric terms, the change in orientation at the center seam for Pattern 1 is produced by either bifold rotation or translation, while Pattern 2 is always produced by transverse reflection. It will be shown that the symmetric principles that determine the orientation of elements between adjacent design columns at the center seam are the same as those that determine the change in orientation of colour patterning at the center seam. It is useful to examine several colour charts that represent the two patterns for each parallel and opposing motions.

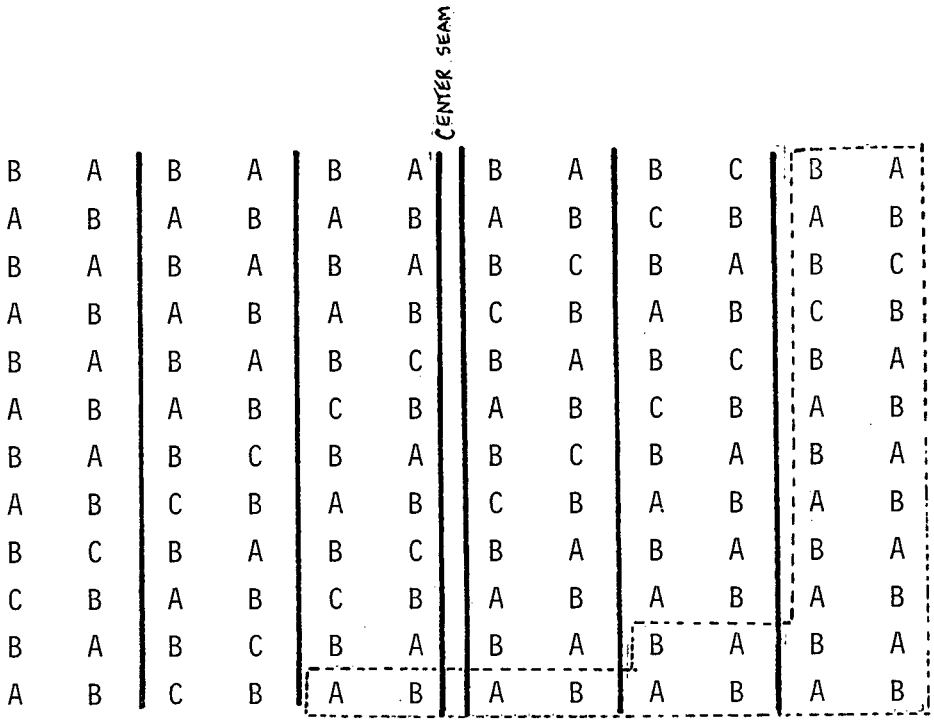
Pattern 1: Parallel Motion

Sample number 38 (fig. 103) and sample number 13 (fig.104) are two examples displaying Pattern 1 parallel motion. The first involves bifold rotation and the second involves translation, both resulting in the same colour pattern. In sample number 38, three colour variables (A,B,C) appear, moving parallel to one another diagonally from one side of the tunic to the other. It is interesting to note that one of the colour variables (B) also moves in an opposing direction, although the parallel movement is predominate. This dual motion is caused by the use of only three colour variables. In sample number 13, four colour variables (A,B,1,2) are evident. These variables move in a parallel diagonal on each side of the tunic, although only the profile head elements (1,2) move continuously across the center seam.

Pattern 1: Opposing Motion

Sample number 43 (fig. 105) is an example of Pattern 1 opposing motion. The symmetric treatment of adjacent design columns at the center seam is bifold rotation, and the change in orientation of colour movement

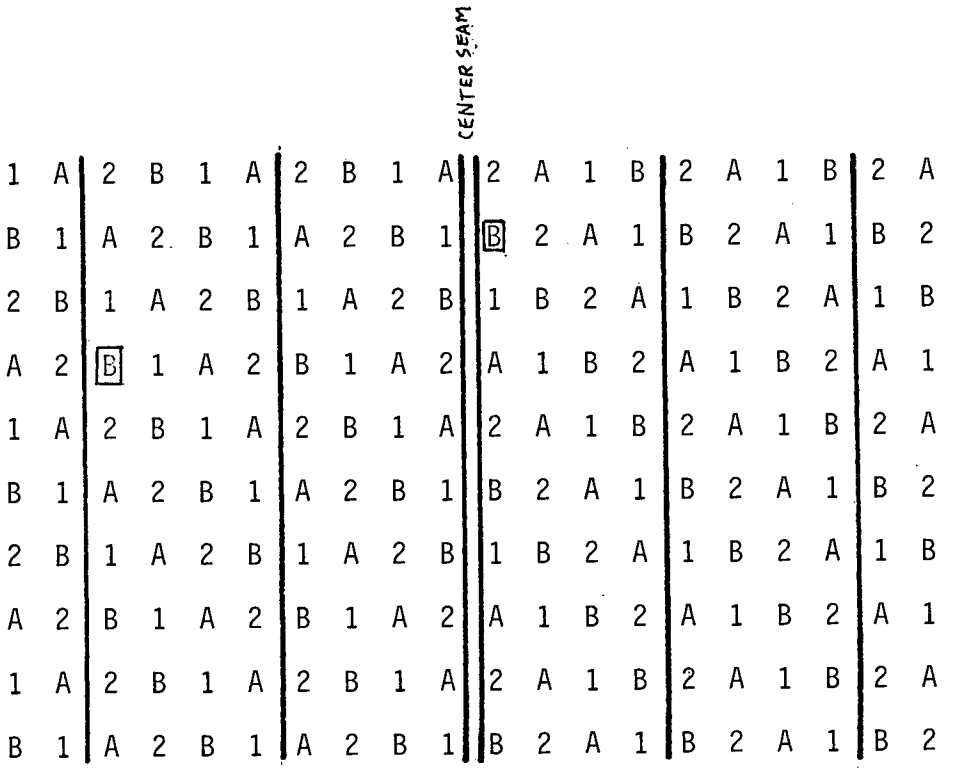
Figure 103. Colour Chart for sample number 38: Parallel Pattern 1.



Stepped Spiral	A	B	C
Spiral	Tan	Brown	Gold
Spiral Background	Blue	Tan	Tan

Interspace columns indicated by vertical lines.
Minor colour variations are boxed.
Dotted lines indicate reconstructed areas.

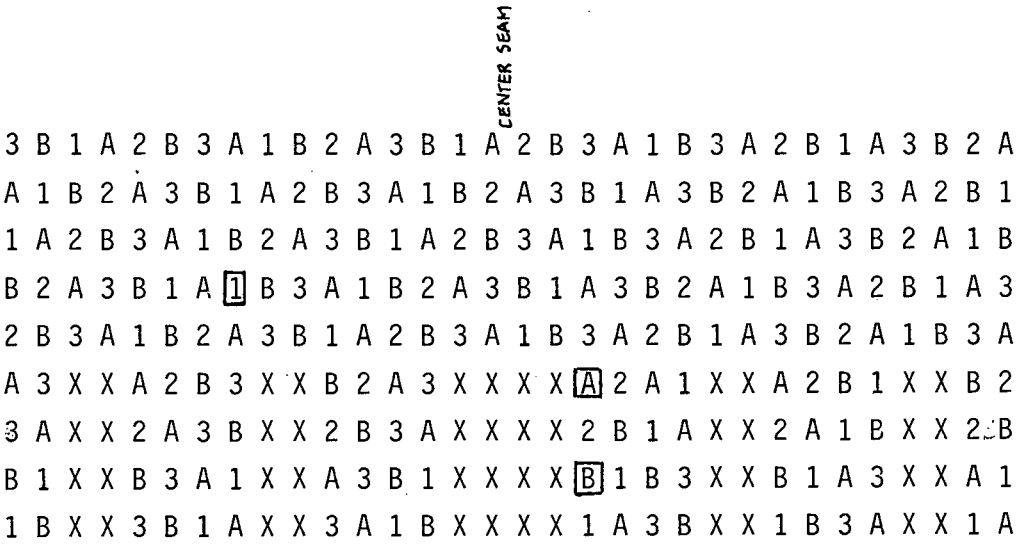
Figure 104. Colour Chart for sample number 13: Parallel Pattern 1.



Stepped Spiral	A	B
Spiral	Fuchsia	Orange-Gold
Spiral Background	Olive	Grey
Profile Head	1	2
Face	Pink	Gold
Background	Grey	Black

Interspace columns indicated by vertical lines.
Minor colour variations are boxed.
Dotted lines indicate reconstructed areas.

Figure 105. Colour Chart for sample number 43: Opposing Pattern 1.



Stepped Spiral	A	B
Spiral	Red	Orange
Spiral Background	Olive-Gold	Olive-Gold

Profile Head	1	2	3
Face	Brown	Pink-(pale)	Yellow
Eye pendant	Pink	Brown	Brown
Background	Orange	Brown	Black

Discontinuous interspace columns indicated by XX.
Minor colour variations are boxed.
Dotted lines indicate reconstructed areas.

is the same. Five colour variables (A,B,1,2,3) occur with only slight colour differentiation between two of the profile head colour elements (2,3). The tunic proportions in the colour chart (fig.105) appear distorted because of the notation system used, however the actual garment (fig. 71) follows normal proportions for Wari official garments. Both stepped spiral elements (A,B) and profile head elements (1,2,3) continue uninterrupted across the center seam, however, the stepped spiral elements move in an opposite direction to the profile head elements. Minor colour deviations, which will be discussed later, have been boxed.

Pattern 2: Parallel Motion

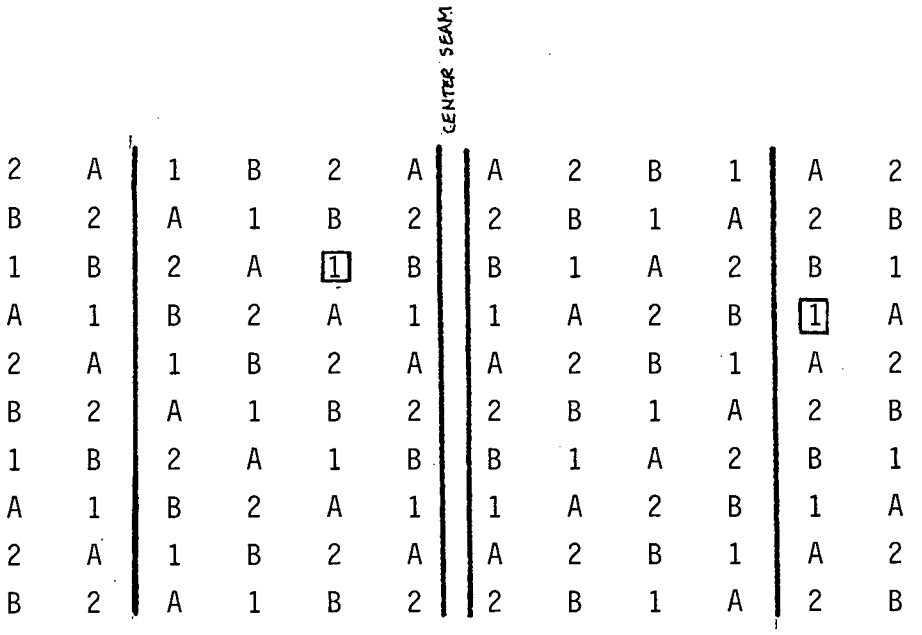
Sample number 7 (fig. 106) shows a change in direction of the parallel movements at the center seam which is the result of transverse reflection or mirror imagery. Note that the orientation of the parallel lines appear to be upside down to the pattern diagrammed in figure 102. This does not signify a change in orientation, but rather indicates either the back or front face of the tunic.

Pattern 2: Opposing Motion

Sample number 14 (fig. 107) is another example of transverse reflection. Five colour variables (A,B,1,2,3) appear, but only one of the profile head elements (1) meet at the center seam. Note that only part of the left side of the tunic was visible for charting (fig. 42), but following the pattern of the rest of the tunic, the missing portion can be reconstructed.

The sample is divided into parallel and opposing motions according to the five groups. Complete tunics and fragments that show sufficient

Figure 106. Colour Chart for sample number 7: Parallel Pattern 2.

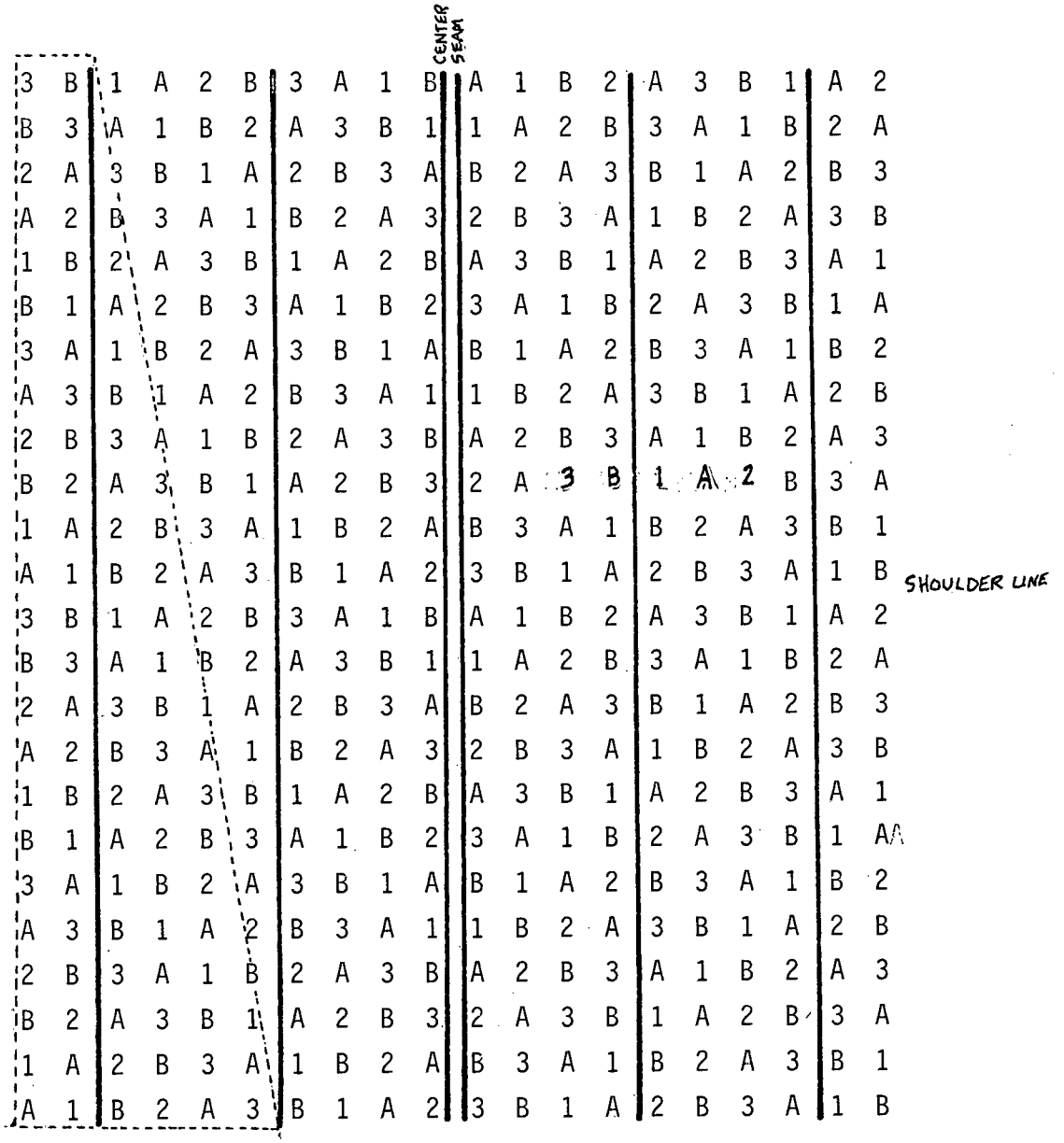


Stepped Spiral	A	B
Spiral	Wine	Gold-Orange
Background	Gold-Tan	Olive-Tan

Profile Head	1	2
Face	Pink	Yellow
Background	Olive-Tan	Dark Brown

Interspace columns indicated by vertical lines.
Minor colour variations are boxed.
Dotted lines indicate reconstructed areas.

Figure 107. Colour Chart for sample number 14: Opposing Pattern 2.



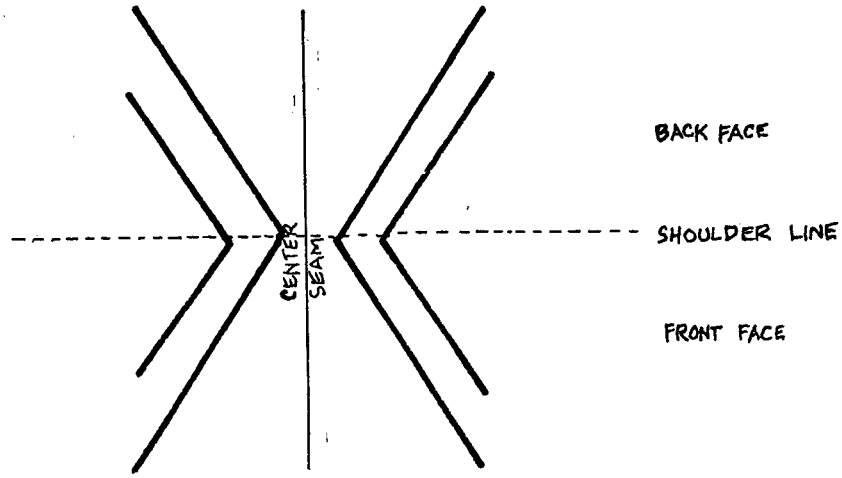
Stepped Spiral	A	B
Spiral	Black	Orange
Background	Orange	Dark-Orange

Profile Head	1	2	3
Face	Pink	Yellow	Brown

Interspace columns indicated by vertical lines.
Minor colour variations are boxed. Dotted lines indicate reconstruction.

patterning on both sides of the center seam to determine the specific pattern, are indicated as Pattern 1 or 2 on the chart (fig. 108). From this figure it can be seen that thirty tunics out of forty-seven display parallel motion, while only sixteen tunics display opposing motion. Sample number 18 (fig. 46) does not follow the defined patterns for colour use. In addition, sample number 3 (fig. 31) and sample number 42 (fig. 70), while both displaying parallel colour patterning, form another pattern type with a change in orientation at the shoulder line as diagrammed below in figure 109.

Figure 109. Parallel Pattern 3.



A colour chart for sample number 3 is shown in figure 110. Illustrations of both the front and back were available for eleven tunics. Seven of these display parallel motion. Since only two examples of Parallel

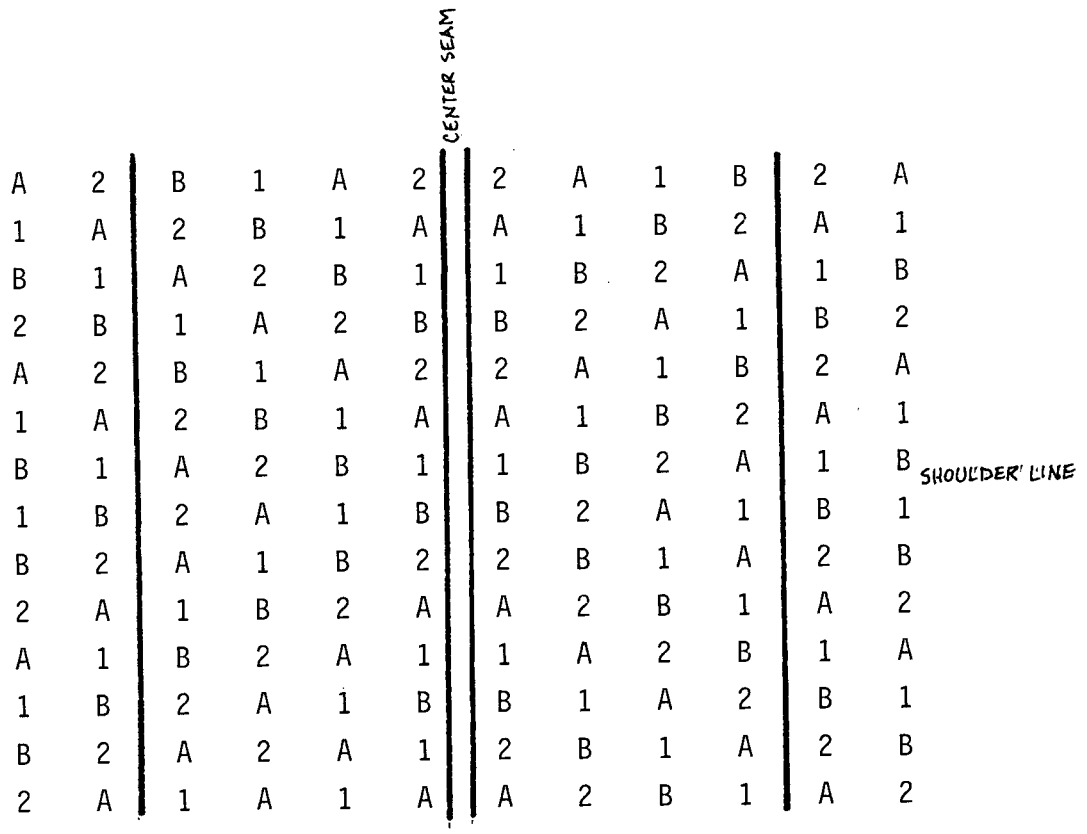
Figure 108. Sample Divided into Parallel and Opposing Motions.

Group	Parallel Pattern				Opposing Pattern		
	Sample #	1	2	3	Sample #	1	2
1.	1	(x)					
	2	x					
2.	3			x	4	x	
	7		x		5	x	
	8				6	x	
	9						
3.	11	x			10		x
	12	(x)			14		x
	13	x			15	x	
	16	x			19	x	
	17				20		x
	23	x			21	x	
	24				22		
	26				25		
	27				29		
	28						
	30						
	31						
	32						
	33						
	34						
4.	35	x			40	x	
	36	x					
	37	x					
	39	x					
	41	x					
5.	42			x	43	x	
	46				44		x
	47				45	x	

Note: Sample number 18 does not follow the colour patterning logic of the rest of the sample and is therefore omitted.

() - Tentative pattern number assignment.

Figure 110. Colour Chart for sample number 3: Parallel Pattern 3.



A	2	B	1	A	2	2	A	1	B	2	A
1	A	2	B	1	A	A	1	B	2	A	1
B	1	A	2	B	1	1	B	2	A	1	B
2	B	1	A	2	B	B	2	A	1	B	2
A	2	B	1	A	2	2	A	1	B	2	A
1	A	2	B	1	A	A	1	B	2	A	1
B	1	A	2	B	1	1	B	2	A	1	B
1	B	2	A	1	B	B	2	A	1	B	1
B	2	A	1	B	2	2	B	1	A	2	B
2	A	1	B	2	A	A	2	B	1	A	2
A	1	B	2	A	1	1	A	2	B	1	A
1	B	2	A	1	B	B	1	A	2	B	1
B	2	A	2	A	1	2	B	1	A	2	B
2	A	1	A	1	A	A	2	B	1	A	2

Stepped Spiral	A	B
Spiral	Red	Orange
Background	Gold	Dark-Grey

Profile Head	1	2
Face	Pink	Yellow
Background	Blue	Dark-Brown

Interspace columns indicated by vertical lines.
Minor colour variations are boxed.
Dotted lines indicate reconstructed areas.
Shoulder line indicated by horizontal line.

Pattern 3 have been located, few conclusions can be drawn, however, it is possible that other pieces (with only the front or back face illustrated) in the sample may also fall into this pattern. The data indicates that Parallel Pattern 3 occurs with less frequency than the other parallel patterns. It has already been noted that sample number 18 (fig. 46) does not follow the same logic as the other examples in this study for colour patterning, and may represent a fourth pattern.

Every specimen in this study, with the exception of sample number 10 (fig. 38), employ the same symmetric motion for orientation of elements between adjacent design columns at the center seam as determined by the directional change in colour pattern orientation at the center seam. Sample number 10 shows Opposing Pattern 2 which is normally the result of transverse reflection at the center seam, however, the symmetric relation between adjacent design columns at the center seam is translation. As noted earlier, sample number 10 is one of only two pieces that have the zig zag form of outlining between adjacent design columns at the center seam. Since it also displays little lateral distortion, it is probably an early example and may reflect a time when formal rules were still being developed.

To determine the regional or temporal significance of colour patterning, some comparisons can be made. Sample numbers 11 and 12 (figs. 39 and 40) have known provenience from the Southern Highlands, and because sample number 12 so closely resembles sample number 11, it is expected that both are Parallel Pattern 1. Other examples in this study with known provenience are sample numbers 3 and 14 (figs. 31 and 42), both coming from the South Coast. The first, as previously noted, falls into Parallel Pattern 3, while the second is Opposing Pattern 2. This suggests colour patterning is not regionally determined.

In order to assess the temporal significance of colour patterning, a composite chart showing colour patterning for the twenty-nine examples charted for lateral distortion has been compiled (fig. 111). From this chart is is clear that the two examples that display Parallel Pattern 3 (sample numbers 3 and 42) appear at the beginning of the chronology chart. One explanation for the orientation in Pattern 3 relates to the staff bearing anthropomorphic figures in Type 3 tunics (fig. 19). In Type 3 textiles, a change in orientation often occurs at the shoulder line so that the staff bearing figures are oriented feet towards the ground on both the front and back face of the tunics. The author feels, because of the close iconographic relationship of Type 3 textiles to Tiahuanaco art, that Type 3 tunics may have originally appeared in the Wari culture prior to Type 1 textiles. Accordingly, some of the conventions originally applied to Type 3 tunics may have also been used for Type 1 tunics, however, no actual evidence to support this hypothesis has been found.

Type 1A tunics have also been indicated in figure 111. Most of the Type 1A textiles in this chart display parallel patterning, however, sample numbers 6 and 19 (figs. 34 and 47) which display opposing patterns, appear later in the chronology chart than the other Type 1A examples which all display parallel motion. The visual appearance of the opposing pattern produces a kaleidoscopic effect. Given the Wari artist's concern with alleviating monotony, this supports a later temporal placement.

It has been mentioned that sample number 19 (fig. 47) displays a different symmetry, in terms of outlining, than other examples. This, teamed with extreme lateral distortion and the use of opposing colour patterning, supports its late placement in the chronology.

***

Figure 111. Colour Patterning and Chronology.

Sample #	Group #	Parallel Motion	Opposing Motion
35 1A	4	x	
3	2	x	
42	5	x	
1	1	x	
4	2		x
2	1	x	
10	3		x
12 1A	3	x	
11 1A	3	x	
37	4	x	
39 1A	4	x	
38 1A	4	x	
36 1A	4	x	
5	2		x
15	3		x
43	5		x
13	3	x	
14	3		x
6 1A	2		x
44	2		x
*18	3		
16	3	x	
7	2	x	
45	5		x
17	3	x	
19 1A	3		x
20	3		x
21	3		x
22	3		x

*Does not follow demonstrated colour patterns.

Type 1A indicated, remainder type 1B

CHAPTER 7: SECONDARY TRAITS

The primary design conventions used in Wari textiles - lateral distortion, symmetry and colour patterning - have been discussed. An examination of secondary traits will help to further assess regional and temporal characteristics. These traits will be discussed in the following order:

A. **Outlining**

1. Type: Diamond or Zig Zag
2. Form: Complete, Partial or Absent
3. Colour: Light or Dark

B. **Colour**

1. Additions: To Stepped Spiral Elements
2. Variations: Minor variations from Colour Patterning

C. **Facial Details (Type 1B)**

1. Mouth Form
2. Mouth Orientation
3. Eye Form
4. Eye Orientation

A discussion of the relation of these secondary traits to the major design conventions will follow their individual examination.

A. Outlining

1. Type: Diamond or Zig Zag

It has been shown that adjacent design columns, whether appearing side by side or separated by an interspace column, result in either a diamond (or hourglass) or a zig zag type of outlining. Translation between adjacent design columns results in the zig zag type, while bifold rotation of design columns produces the diamond type of outlining. It has also been shown that the type of outlining is the same on both sides of the tunic, with one exception, sample number 19 (fig. 47) already noted. In addition, it has been shown that all examples except sample numbers 10 and 13 (figs. 38 and 41) display diamond outlining between adjacent design columns at the center seam, whether or not diamond or zig zag is the predominant form on either side.

Outlining appears in several forms, however, the type of outlining is determined by the construction of the design unit. A delineation between the paired elements occurs whether it is emphasized by a solid diagonal line or appears solely as the juncture between the paired elements. In addition, the complete design unit appears separately from other design units, again whether or not it is emphasized by outlining. For these reasons, every example in this study has an outline, which is emphasized, in most cases, by a line (outline) of a different colour than that of background field of the paired elements. The predominant type of outlining is diamond shaped, with thirty-nine of forty-seven examples falling into this category. The remaining eight display zig zag outlining. Of these eight, sample numbers 4 and 6 (figs. 32 and 34) appear in Group 2. The remainder all occur in Group 4, and in fact, every example of Group 4 textiles in this study, except sample number 40

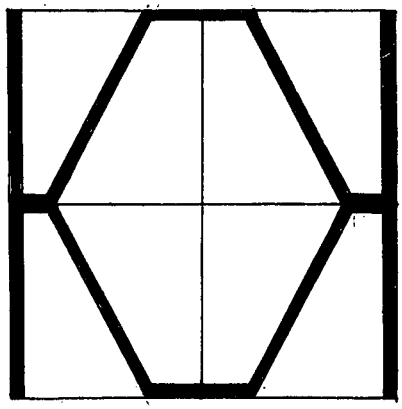
(fig. 68), have zig zag outlining. It is also interesting to note that five of the eight zig zag examples are Type 1A.

2. Form: Complete, Parial or Absent

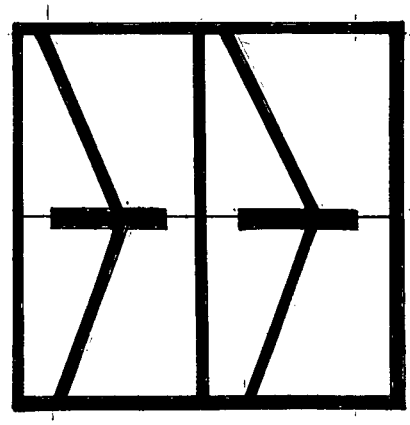
The three forms of outlining evident in this sample can be termed complete, partial or absent. Thirty-nine of the forty-seven pieces display complete outlining. This means a solid colour line separates paired elements within a design unit as well as outlining the entire design unit. Six of the forty-seven have these lines around only portions of the paired elements and design units and are considered only partially outlined. The six examples can be further separated into two categories as diagrammed below:

Figure 112. Partial Outlining: Pattern 1 and 2.*

OUTLINE PATTERN 1.



OUTLINE PATTERN 2



*HEAVY LINES - PARTIAL OUTLINE

Four of the six examples with partial outlining follow Outline Pattern 1. These are sample numbers 11, 12, 30 and 32 (figs. 39, 40, 58 and 60). The

other two with partial outlining are sample numbers 4 and 8 (figs. 32 and 36) which follow Outline Pattern 2. Since sample numbers 11 and 12 have known highland provenience, partial outlining may be a highland trait.

Two examples of the forty-seven, sample numbers 19 and 40 (fig. 47 and 68) have no distinct line separating the paired elements and the design units. The absence of a distinct line does not prevent the overall impression of diamond or zig zag outlining as noted earlier. Sample number 19, as previously discussed, is the one example in this study that has a combination of zig zag and diamond outlining on each side of the tunic, and the absence of a solid line delineating the elements (another abberrant trait) is not unexpected.

3. Colour: Light or Dark

With the exception of the two examples with an absence of an outlining line, all other pieces in this study are outlined in white or a dark colour, either black or dark brown. White outlining is predominant with only seven of forty-five outlined in a dark colour. Three of the seven, sample numbers 4, 8 and 9 (figs. 32, 36 and 37) are in Group 2, while the remaining four, sample numbers 36, 37, 38 and 41 (figs. 64, 65, 66 and 69) appear in Group 4. As noted, one example in Group 4 (sample number 40) has no outlining, and in addition only two Group 4 examples, sample numbers 35 and 39 (figs. 63 and 67) have white outlining.

A narrow vertical line or **edging** separates the design and interspace columns, and is often the same as the outlining colour of the paired elements. Thirteen of forty seven examples have a different edging colour than outlining colour. Two of these, sample numbers 14 and 33 (fig. 42 and 61) have known provenience, the first from the South Coast

and the second from the highlands near Ayacucho. This indicates that variations in edging colour are not regionally determined. Most of the other examples in this category are Group 3 and appear late in the Group 3 sequence, indicating temporal significance. Further, most examples with different colour edging are also abberrant in one or more other traits.

Eleven of forty-seven examples have two vertical edging colours, one matching the outlining colour, and the other of an opposite value. Most of Group 4 falls into this category, and the other examples are from Group 3 (sample numbers 17, 21 and 22) all appearing late in the chronology. This suggests variations in edging colour are a late trait, and this supports a later placement of Group 4 than indicated by the chronologic arrangement, as previously suggested.

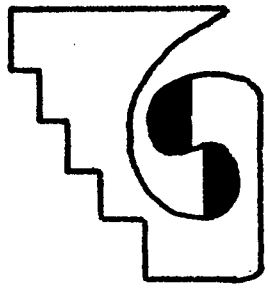
B. **Colour**

1. Additions: To stepped spiral elements

Colour additions to the stepped spiral elements in the sample appear simultaneously in two areas. These areas are the tip of the spiral and

the inside curve of the spiral as diagrammed below.

Figure 113. Colour Additions to Stepped Spiral Element.*



*Dark areas indicate colour additions.

Nineteen of the forty-seven examples display colour additions. A comparison of the occurrence of this trait to the proposed chronology based on lateral distortion shows that the frequency of colour additions increases with greater lateral distortion.

One interesting feature that is most apparent in Group 4 textiles is that the use of light coloured additions to the stepped spiral elements of Type 1A textiles produces an optical illusion which imitates the eye forms of Type 1B examples. A comparison of sample number 36 (fig. 64) of Type 1A to sample number 37 (fig. 65) of Type 1B demonstrates this point. The distinction between Type 1A and 1B displaying this trait is often difficult to discern and might represent an attempt to imitate the rank or status of another type while remaining within the accepted format.

2. Variations: Minor Variations from Normal Colour Patterning

As shown earlier, consistent diagonal colour movements occur in the sample, however within many tunics, several design units, or portions of

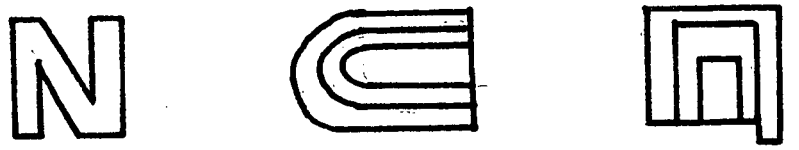
them, deviate from the normal colour patterning. No consistency in occurrence, either within one textile or between comparable textiles was evident. In most examples the variations appear in several places randomly scattered. It has been suggested (p.c. Sawyer) that deviations were deliberate and used to alleviate the inherent monotony. It might also represent schools or workshops of particular artists. No increase in the appearance of minor colour variations with greater lateral distortion was detected. An example of minor colour variations can be seen in sample number 7 (fig. 35), where a cream coloured eye band has been substituted for a maroon eye band, and in details of the profile head element light green is substituted for gray.

C. Facial Details: Type 1B

1. Mouth Form

Three mouth forms are evident in the sample and are diagrammed below.

Figure 114. Mouth Forms.



Sixteen of the thirty-five Type 1B textiles in this sample have Mouth Form 1 or the 'N' shaped fangs, and sixteen have Mouth Form 2 or the ' ⋐ ' shaped mouth. Only three examples, sample numbers 1, 2 and 20 (figs. 29, 30 and 48) have Mouth Form 3 or the ' ⊐ ' shaped mouth.

Variations from these major mouth forms occur in the sample, and may prove to be highly significant for further categorizing sub-groups. For examples, sample numbers 10, 13 and 31 (figs. 38, 41 and 59) have a mouth form in the shape of a sideways "S" scroll, a variation on the "N" shaped mouth. This scroll is a common motif in both Tiahuanaco and Wari ceremonial art, although it appears in a different context in the tunics, and may, as with the colour additions to the stepped spiral motif, represent an attempt to imitate a prestige design. Sample numbers 32 and 44 (figs. 60 and 72) have dark shading in half of the "N" shaped mouth. Both examples are very distorted and considered late. This variation on the "N" shaped mouth may therefore represent a late temporal trait.

Three Type 1B tunics with known coastal provenience, sample numbers 3, 4 and 14 (figs. 31, 32 and 42) all display a ' ⋐ ' shaped mouth form, while the only Type 1B textile with known highland provenience, sample number 33 (fig. 61) has the 'N' shaped fang mouth indicating regional significance.

2. Mouth Orientation

As noted, sixteen of the thirty-five Type 1B textiles have the 'N' shaped mouth form. This fang form is commonly referred to as the mouth

of a feline. In the sample, the fangs can appear as either 'N' or reversed in orientation ' И '.

> The depiction of fangs in Middle Horizon art, found in some of their anthropomorphic, mythological figures, and in these heads, may well be a survival of the feline attributes so frequent in the Chavin art and the mythology of Peru a thousand or more years earlier. In this case [sample number 7 (fig. 35)] or perhaps by the time this shirt was made, the treatment of the fangs was casual. Fifty-one of the 120 depictions are incorrect and show the lower jaw fang behind the upper instead of in front as they actually are in cats. (Bird and Skinner, 1974:11)

A count of fangs and their orientation for the sixteen examples with 'N' shaped fangs reveals that approximately fifty per cent (45-55% range) of the 'N' shaped fangs in each tunic show the lower fang behind the upper fang, while fifty per cent show the reverse. No consistency in the use of the "correct" form of orientation was found, confirming Bird and Skinner's observations that fang treatment was casual at this time. In Tiahuanaco art a deliberate attempt to portray the fangs in an anatomically correct manner is evident. This concern for realism was evidently abandoned by the Wari in their textiles.

3. Eye Forms

All examples in this sample have a vertically divided or split eye form with its roots in Tiahuanaco iconography. Two forms are apparent in the sample. The first eye form is banded, that is, a band or pendant

appears below the split eye. This banding also has its roots in Tiahuanaco iconography, and has often been referred to in the literature as a "tear line or tear mask", although the interpretation of meaning is at best questionable. (Bird and Skinner, 1974:11) The second eye form is an unbanded split eye.

Clearly the banded split eye form is predominant, with twenty-seven of the thirty-five Type 1B examples falling into this category, while only eight display the unbanded form. As noted, some minor variations occur in each eye form. Sample number 5 (fig. 30) is a banded split eye with banding occurring both below and above the split eye. Sample numbers 16, 20, 43 and 46 (figs. 44, 48, 71 and 74) are also banded, however, an addition of small colour areas within the banded portion, and outlining of the split eye portion in the case of sample number 16 are evident. Similar variations appear in the unbanded form, notably in sample numbers 8 and 25 (figs. 36 and 53) where the unbanded forms are more rounded than the normal rectilinear form. Similarly, sample number 4 (fig. 32) is more rounded, and at the same time is unusually small. Relative sizes of both eye forms vary according to the application of lateral distortion.

It has been noted that the 'N' shaped fang appears in the one example with known highland provenience, and the ' ⋐ ' shaped mouth appears in examples with known coastal provenience. Following this observation, which will be demonstrated in a composite chart, every example of Type 1B textiles in this sample with the 'N' shaped fangs has a banded eye. In Type 1B textiles with the ' ⋐ ' shaped mouth, the eye forms appear as both banded and unbanded. This may be the result of less rigidly imposed standards on the South Coast artists, than imposed on highland weavers at Wari, although there is no specific evidence to support this.

4. Eye Orientation

As noted, all thirty-five examples of Type 1B textiles in this study have a split eye. This split eye is composed of light and dark segments on either side of the vertical split. William Conklin has noted that in Tiahuanaco textiles, the dark portion is usually oriented towards the front of the face, as an eye in nature appears from a profile view. (p.c. Conklin) This feature, like the orientation of the 'N' shaped fangs does not appear to have been as significant to the Wari as it was to the Tiahuanaco.

The reversal of the dark and light portions of the split eye occurs with approximately the same frequency as that of the 'N' shaped fangs. In the thirty-five Type 1B examples, approximately fifty percent of the split eyes in each tunic show the dark portion oriented towards the back of the face, while fifty percent are the reverse. Several examples in this sample deviate from these percentages, notably sample numbers 20 and 44 (figs. 48 and 72), where approximately thirty-five percent of the dark portions of the split eye are oriented towards the front of the face, while sixty-five percent are the reverse. In addition, four others, sample numbers 3, 22, 42 and 45 (figs. 31, 50, 70 and 73) consistently show between ninety and one hundred percent of the dark portion oriented towards the back of the profile head. All of these examples that deviate from the fifty-fifty relation appear late in the chronology, except sample numbers 3 and 42, which appear early in the chronology and are the only two located examples of Parallel Pattern 3 for colour patterning. Sample number 3 has known South Coast provenience and sample number 42, which displays similar characteristics, may be coastal as well.

A composite chart (fig. 115) of secondary traits and other design conventions plotted against an increasing use of lateral distortion demonstrates some interesting relations. A similar chart (fig. 116) for examples not previously included in the lateral distortion chart (fig. 92) facilitates some chronological assessments. Some interesting temporal and regional traits emerge from the composite chart in figure 115. These are:

1. The five groups appear throughout the chronology. Group 1 appears early, but this is attributable to the small sample size of this group. One example of Group 4 occurs at the beginning of the chronology, while the rest appear in the middle. As noted earlier, this placement of Group 4 is considered inaccurate.

2. Both Type 1A and Type 1B appear throughout the chronology, from beginning to end and are evident in most groups.

3. Colour additions to the stepped spiral elements are a later trait, and occur in most groups as well as in both Type 1A and 1B.

4. Parallel colour patterning, as noted previously, is more frequent in the first half of the chronology, while Opposing colour patterning is more frequent in the second half of the chronology.

5. The two examples with Parallel Colour Pattern 3 occur at the beginning of the chronology, which as suggested earlier, may represent the imitation of the design conventions used in Type 3 textiles.

Fig. 115. Composite Chart of Secondary Traits and Major Design Conventions, Arranged According to the Proposed Chronology.

SAMPLE NUMBER	GROUP	FIGURE NUMBER	TYPE	OUTLINING				COLOUR ADDITIONS	MOUTH FORM			EYE FORM			COLOUR PATTERNING			CENTER SEAM SYMMETRY				PROVENIENCE	
				ZIG ZAG	DARK	PARTIAL 1 or 2	ABSENT		②	④	⑤	BANDED	UNBANDED	VARIANT	PARALLEL 1,2 or 3	OPPOSING 1 or 2	OTHER	TRANSLATION	BIFOLD ROTATION	TRANSVERSE REFLECTION	VARIANT	COASTAL	HIGHLANDS
35	4	63	1A	x											1.								
3	2	31								x		x			3					x		x	
42	5	70								x		x			3				x				
1	1	29									x	x			1.				x				
4	2	32		x	x	2.				x			x	x		1.			x			x	
2	1	30									x	x			1.				x				
10	3	38							x		x	x				2.		x			x		
12	3	40	1A			1.									1.				x				x
11	3	39	1A			1.									1.				x				x
37	4	65		x	x			x		x			x		1.				x				
39	4	67	1A	x				x							1.				x				
38	4	66	1A	x	x			x							1.				x				
36	4	64	1A	x	x			x							1.				x				
5	2	33								x		x		x		1.			x				
15	3	43								x		x				1.			x				
43	5	71						x	x			x		x		1.			x				
13	3	41							x			x			1.			x			x		
14	3	42								x			x			2				x		x	
6	2	34	1A	x				x								1.			x				
44	5	72						x	x			x				2				x			
18	3	46								x			x				x		x				
16	3	44						x	x			x		x	1.				x				
7	2	35							x			x			2					x			
45	5	73							x			x				1.			x				
17	3	45						x	x			x			x								
19	3	47	1A	*			x	x								1.			x		x		
20	3	48						x			x	x		x		2				x			
21	3	49							x			x				1.			x				
22	3	50							x			x				x							

Type 1A indicated, remainder Type 1B
*-mixture of zig zag and diamond.

Fig. 116. Composite Chart of Secondary Traits and Major Design Conventions for Examples not Previously included in Chronology, Arranged According to Group.

SAMPLE NUMBER	GROUP	FIGURE NUMBER	TYPE	OUTLINING				COLOUR ADDITIONS	MOUTH FORM			EYE FORM			COLOUR PATTERNING			CENTER SEAM SYMMETRY				PROVENIENCE	
				ZIG ZAG	DARK	PARTIAL 1 or 2	ABSENT		3	4	5	BANDED	UNBANDED	VARIANT	PARALLEL 1,2 or 3	OPPOSING 1 or 2	OTHER	TRANSLATION	BIFOLD ROTATION	TRANSVERSE REFLECTION	VARIANT	COASTAL	HIGHLANDS
8	2	36			x	2.				x			x	x	x								
9		37			x			x		x			x		x								
23		51	1A					x							1.				x				
24		52							x			x			x								
25		53						x		x			x	x		x							
26		54								x		x			x								
27		55	1A					x							x								
28		56	1A					x							x								
29		57							x			x				x							
30		58	1A			1.		x							x								
31		59							x			x			x								
32		60				1.		x	x			x			x								
33		61							x			x			x								x
34		62								x		x			x								
40	4	68		x			x			x		x				1.			x				
41		69		x	x			x		x			x		1.				x				
46	5	74							x			x		x	x								
47		75								x		x			x								

6. The symmetric treatment of adjacent design columns at the center seam shows a consistent relation to the change in orientation of colour patterning at the center seam. This consistency is evident in figure 115. Bifold rotation of design columns is the predominant form resulting in either Parallel or Opposing Pattern 1. Transverse reflection appears with greater frequency in the latter part of the chronology. The three samples not displaying bifold rotation in the first part of the chronology include sample number 3 which displays Parallel colour Pattern 3, and sample numbers 10 and 13, which have zig zag outlining between adjacent design columns at the center seam.

7. As noted earlier, the banded split eye is the predominant eye form. A comparison of mouth and eye forms reveals that all examples with the 'N' shaped mouth have the banded eye form, while examples with the ' ⋐ ' shaped mouth form have both banded and unbanded eye forms.

8. The secondary outlining traits appear primarily in the first half of the chronology. Zig zag patterning, the partial or absent form of outlining and the dark colour of outlining, are often found in combination with one another. Two Type 1A examples with known highland provenience show partial outlining suggesting this trait occurred in the highlands.

Eighteen examples, many of them fragments, can now be included in the chronology chart based on the evidence cited above and through stylistic comparison. These are charted according to groups (fig.116) in the same manner as the examples in figure 115.

Group 2: Sample Numbers 8 and 9

Sample number 8 (fig. 36) closely resembles sample number 4 (fig. 32) and are together the only examples in this study with Partial Outlining Pattern 2. Sample number 8 also has dark outlining and an unbanded, rounded rather than rectilinear eye form similar to sample number 4. Sample number 4 has known coastal provenience, and sample number 8 could therefore expected to be the same. Sample number 9 (fig. 37) is similarly related, but its lack of partial outlining and its addition of colour to the stepped spiral elements indicates a slightly later placement.

Group 3: Sample Numbers 23 through 34

Sample numbers 26 and 33 (figs. 54 and 61) show little lateral distortion and no colour additions to the stepped spiral elements indicating an early placement.

Sample number 24 and 34 (figs. 52 and 62) appear to have moderate lateral distortion, but the lack of colour additions to the stepped spiral elements suggest a placement in the first part of the chronology.

Sample numbers 29 and 31 (figs. 57 and 59) similarly have no colour additions to the stepped spiral elements and both appear with highland attributes. Both display extreme lateral distortion that resembles that of sample number 22 (fig. 50) which appears at the end of the chronology. Sample number 22 also has no colour additions. This may indicate that the application of colour additions to the spirals became less important during the later period of Group 3.

Sample numbers 23, 27 and 28 (figs. 51, 55, 56) are all Type 1A examples with little lateral distortion but showing colour additions to the stepped spiral. They exhibit greater lateral distortion than sample numbers 11 and 12 and therefore are expected to be slightly later than the two highland examples.

Sample number 30 (fig. 58) is another Type 1A example that closely resembles sample numbers 11 and 12, (figs. 39 and 40) particularly with respect to the Partial Outlining Pattern 1. The addition of colour to the stepped spirals and the distortion evident in the spiral form indicates a later placement.

A comparison of sample number 30 to sample number 32 (figs. 58 and 60) shows a similar Partial Outlining Pattern 1, however in the case of sample number 32, the variant symmetry and greater lateral distortion place this example much later in the chronology.

Sample number 25 (fig. 53) has colour additions to the stepped spiral element and moderate lateral distortion.

Group 4: Sample Numbers 40 and 41

Sample number 41 (fig. 69) closely resembles sample number 37 (fig. 65) and indicates a similar placement. Sample number 40 (fig. 68)is one of the two examples with no solid colour outlining as is sample number 19 (fig. 47). While it seems to have less lateral distortion than other Group 4 textiles, the lack of outlining and the opposing colour patterning suggest placement near the end of the chronology.

Group 5: Sample Numbers 46 and 47

Sample number 47 (fig. 75) closely resembles sample number 44 (fig. 72) and is expected therefore to fall near it chronologically. Sample number 46 (fig. 76), however, has abberrant iconography. The eye band appears above the eye rather than below it. The 'N' shaped mouth form has a hooked line protruding from it and the headdress details are not seen elsewhere in this sample. These anomalies suggest a late placement and may indicate a breakdown of the style.

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CONCLUSIONS

The purpose of this thesis is to examine and identify the design conventions found in Wari official garments to determine the rules and logic governing their application. Observations resulting from the examination of the three major types of design conventions established in this study are summarized below.

Lateral Distortion

A synthetic chronology based on increasing lateral distortion has been proposed for reference, however, limitations to the validity are acknowledged. Lateral distortion generally appears with the greatest amount of expansion nearest the center seam and the greatest amount of compression nearest the side seam. In Group 3, which consists of two sets of double design columns, expansion and compression in the first design column of the second set of double columns (column 3) is greater than in the second design column of the first double set (column 2) in earlier examples. This changes with the increase of lateral distortion. The relation between Columns 2 and 3 indicates a concept of lateral distortion that is more sophisticated than the more straightforward progression of a decreasing relationship from right to left.

In most groups, the design column nearest the center seam displays the greatest amount of expansion, while the column nearest the edge displays the greatest compression. Similar progressions are evident in the width of both design and interspace columns in all Groups except

Group 5. The width of the interspace columns on either side of the center seam was reduced so that when viewed together the visual appearance of progressive lateral distortion was maintained. In Group 5, the only Group with design columns that meet at the center seam, the width of the first design column on either side of the center seam were similarly reduced in width to maintain visual consistency. These minor adaptions of the application of lateral distortion indicate a thorough understanding by the Wari artists of the specific design problems of each Group and demonstrate a sophisticated use of lateral distortion rather than a more simplistic progression of an easily predicted formula.

Symmetry

The design unit is composed of two paired elements, either paired stepped spirals (Type 1A), or a paired stepped spiral and profile head (Type 1B). Design columns are produced by the vertical stacking of design units oriented by the symmetric motion of slide reflection. Adjacent design columns, whether appearing side by side or separated by interspace columns are produced by the symmetric motions of translation or bifold rotation. The pattern of outlining between adjacent columns is determined by these motions. Translation produces a zig zag pattern, while bifold rotation produces a diamond or hourglass pattern. In addition to the employment of translation and bifold rotation between adjacent design columns at the center seam, a third symmetric motion has been observed, transverse reflection. Transverse reflection results in the same outline as bifold rotation with the principle difference being the orientation of the paired elements. Bifold rotation between adjacent design columns at the center seam is the predominant form, however transverse reflection appears with greater frequency in the latter part of the chronology.

Colour Patterning

A progression from the use of strongly contrasting colours to more subtle colour harmonies is evident in the sample. This study is primarily concerned with colour movement. Two motions, parallel and opposing appear in the sample on either side of the center seam. A direct relation between the symmetric treatment of adjacent design columns at the center seam has been noted. Both parallel and opposing motions change orientation at the center seam, with three patterns detected for parallel motion and two patterns for opposing motion. Since both motions appear in examples with known South Coast and Southern Highland provenience, it would seem that the two motions are not regionally determined. The chronology chart shows that parallel patterns appear with greater frequency at the beginning of the chronology, while opposing patterns appear with greater frequency at the end of the chronology.

Parallel Pattern 3 appears in two examples at the beginning of the chronology and it has been observed that the change in orientation at the shoulder line relates to patterning found in Type 3 textiles where the figures are oriented feet towards the ground on both the front and the back face of the tunics.

Secondary Traits

In addition to the three major types of design conventions, secondary traits were examined to determine temporal and regional significances. These traits were compared to examples with known provenience, to relevant ceramic evidence and to the major design conventions.

Diamond outlining in white is the predominant form of outlining while zig zag type, partial or absent form, and dark outlining are considered secondary traits. These appear primarily in the first part of the chronology and are considered temporal traits. The three outlining treatments often appear in conjunction with one another, and are more frequent in Type 1A.

An analysis of colour additions to the stepped spiral elements indicates they are a temporal trait and generally appear in the latter part of the chronology.

Minor colour variations in colour patterning appear in many of the tunics with no apparent temporal or regional basis. They are evident in examples with both South Coast and Southern Highland provenience, and evidently were used to alleviate monotony. It has been observed that they may represent particular artists or workshops.

The orientation of the 'N' shaped mouth and the dark and light portions of the split eye shows that these features were treated casually. This differs from Tiahuanaco iconography the source of these features, where their orientation was more consistent.

In conclusion, the design conventions established in this thesis provide a working tool for the analysis of Wari textiles and permit the categorization of fragments according to groups and design principles. Using this information, accurate reconstruction can be made of the basic symmetry and colour movement, but not of secondary traits and other anomalies which do not conform to strict rules.

As one moves further from the center of the Wari culture, control obviously lessened. Similarly, the use of these conventions changed over time, particuarly with regard to abberrances.

It is evident that the Wari skillfully used these conventions to produce these textiles and were primarily concerned with alleviating the monotony inherent in their simple form.

Similar use of lateral distortion is evident in other Types of Wari official garments; however, the use of symmetry, colour and iconography varied in the other Types. Future study of these types should help refine some of the ideas proposed in this study, particularly in terms of regional differences. Similarly, more scientific data is necessary to further the understanding of the textiles.

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BIBLIOGRAPHY

Batres, Carlos Milla. Guia de Arqueologia Peruana. Lima, Peru: Editorial Carlos Milla Batres, S.A., 1975

Bennett, Wendell C. "Excavations at Tiahuanaco." American Museum of Natural History Anthropological Papers. Vol. 34, Part 3, pp.359-494, 1934.

_____. Excavations at Wari, Ayacucho, Peru. New Haven: Yale University Publications in Anthropology, 49, 1953.

Bird, Junius B. and Milica D. Skinner. "The Technical Features of a Middle Horizon Tapestry Shirt from Peru." Textile Museum Journal. Vol. 4, No. 1, Dec. 1974, pp. 5-13.

Browman, David L. "Toward the Development of the Tiahuanaco (Tiwanaku) State." Advances in Andean Archaeology. Edited by David L. Browman. The Hague & Paris: Mouton Publishers, 1978, pp.327-349.

Boas, Franz. Primitive Art. New York: Dover Publications, Inc., 1955.

Emery, Irene. Primary Structure of Fabrics. An illustrated Classification Washington, D.C.: The Textile Museum, 1966.

Lanning, Edward P. Peru Before the Incas. Englewood Cliffs, New Jersey: Prentice-Hall Inc., 1967.

Lumbreras, Luis G. The Peoples and Cultures of Ancient Peru. Translated by Betty J. Meggars. Washington, D.C.: Smithsonian Institution Press, 1974.

Larco Hoyle, Rafael. The Ancient Civilization of Peru. Translated by James Hogarth. London: Barrie and Jenkins, 1971.

Lothrop, Samuel K. Treasures of Ancient America. Geneva: Skira, 1964.

Menzel, Dorothy. The Archaeology of Ancient Peru and the Work of Max Uhle. Berkeley: R.H. Lowie Museum of Anthropology, University of California, Berkeley, 1977.

_____. "Style and Time in the Middle Horizon." Nawpa Pacha 2. 1964, pp. 1-105, plates 1-9.

Rowe, John H. "Stages and Periods in Archaeologic Interpretation", Southwestern Journal of Anthropology. Vol.18, No.1, 1962. pp. 40-54.

Rowe, John H. and Dorothy Menzel. "Introduction", in Peruvian Archaeology Selected Readings. Berkeley: Peek Publications 1967, pp. i-vi.

Sawyer, Alan R. Ancient Andean Arts in the Collections of the Krannert Art Museum. Urbana-Champaign: Krannert Art Museum, University of Illinois, 1975.

_____. "Tiahuanaco Tapestry Design." Textile Museum Journal. Vol. 1, No. 2, 1963, pp.27-38.

Shepard, Anna O. "The Symmetry of Abstract Design with Special Reference to Ceramic Decoration." Contributions to American Anthropology and History. Vol. 47, May 1948, pp.211-293.

Taullard, Alfredo. Tejidos y Ponchos Indigenas de Sudamerica. Buenos Aires: Guillermo Kraft Limitada, 1949.

Willey, Gordon R. An Introduction to American Archaeology, Volume Two, South America. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1971.

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