

THE MEASUREMENT AND MEANING OF STYLISTIC DIVERSITY

Warren R. DeBoer and James A. Moore

Preface

For archaeologists of many persuasions, style is a hard-working oracle. Style is asked whether prehistoric post-marital residence rules were patrilocal or matrilineal, whether political institutions were religious or imperial in nature, whether populations were seasonally aggregated or dispersed, and whether production was domestically or industrially organized. Above all, cultural historians continue to use style as an ultimate sensor of space-time relations. Whenever so much is asked of a single oracle (even of the great ancient ones at Delphi and Pachacamac), answers are bound to be elliptic. It is small wonder that the very definition of style remains elusive and continues to exasperate many archaeologists (Sackett, 1977; Wobst, 1977). Style is a perfect black box: its works are omnipresent; its internal workings remain problematic.

In the following essay, we look at style, its works and its workings in an ethnographic context. We are concerned with how style can be measured for comparative purposes and how meaning can be attached to such comparisons. As measurement alone is always meaningless, we begin by delineating the context in which measurement and meaning take form. This context is social in nature.

The Social Context of Ceramic Use

For students of style, the social context of artifact use cannot be ignored. Not only do artifacts congeal matter into cultural form and transform energy through a wide range of utilitarian uses, they also transmit information. Style-bearing artifacts are messengers, and their message assumes meaning only in a social context.

Artifacts-as-messengers and the stylistic messages they carry imply senders and receivers, encoders and decoders, performers and audience. The interaction among senders, messengers, messages and receivers constitutes social context. Archaeologists are outside of this context. Except in the rare case of a time capsule, the messages are not sent to them. Archaeologists, and to a lesser extent ethnographers, are "outsiders" and disadvantaged decoders.

As archaeologists, we are unhappy with circumstances defined in terms of alienation and disadvantage. In the following paper, we try to specify relationships between style and its social context which are archaeologically knowable. For this purpose, we use evidence from the Shipibo-Conibo Indians as a trial balloon. We begin at the ground, float upwards to the clouds, and alas come down again. But we land in a new place.

The Shipibo-Conibo are a populous people who inhabit the banks of the Ucayali river, a large southern tributary of the Amazon which meanders northward along the eastern base of the Peruvian Andes.¹ The Shipibo-Conibo are "river Indians" whose life is intimately related to the Ucayali and its numerous tributaries and oxbow lakes. The traditional means of transportation is the dugout canoe. Subsistence is based on a mix of farming the fertile floodplains

of the Ucayali and fishing its waters. Accordingly settlement pattern is geared to the river. Villages are generally situated on *terra firme* banks abutting present or former courses of the Ucayali. These settlements vary greatly in size. The smaller consist of two or three houses, each occupied by a nuclear family; the larger number in the hundreds of individuals.²

The Shipibo-Conibo produce a distinctive art style which decorates most of their artifacts. This decorative style is painted and incised on ceramic vessels; it is painted and embroidered on clothing; it is carved on canoe paddles, clubs, and gourd containers; and it is stamped on skin. Here we consider style as it is expressed in the ceramic medium, the most durable and archaeologically visible part of Shipibo-Conibo material life.

The Shipibo-Conibo distinguish several ceramic vessel categories. Each of these categories is named, has a distinctive form and function, and is used in a distinctive set of social situations. The formal and functional characteristics of Shipibo-Conibo ceramics have been relatively well described (Tessmann, 1928; Vossen, 1969; Lathrap, 1970; DeBoer and Lathrap, 1979). These same sources furnish a sketch of the social context of ceramic use. In the following discussion, this sketch is amplified on the basis of field observations made of the Shipibo-Conibo and their ceramics.³

First we must elaborate our notion of social context. Earlier we looked at social context in terms of communicational phenomena linking people and artifacts. For archaeological purposes, such phenomena need to be phrased in a different idiom. As an operational device, we suggest that social context can be expressed in terms of the number and spatial arrangement of people and their artifacts. Such an approach potentially enables us to view social context in a way which is detectable in the archaeological record. It should be recalled that this archaeological record reduces to the form, quantity and provenience of artifacts (Taylor, 1948, p. 145). Let us explore and illustrate this point in the Shipibo-Conibo case.

As already pointed out, Shipibo-Conibo settlements vary greatly in size. Despite this variation, however, all settlements are composed of the same underlying "building block" or module. This module is the compound. In social terms, the compound is ordinarily a matrilineal extended family. Its members typically include a mother, her daughters, their unmarried offspring and their "imported" husbands. In spatial terms, a compound consists of a group of two or more houses, each occupied by a nuclear family. As shown in fig. 1, these houses and their associated kitchens flank a cleared plaza. The smallest settlements consist of a single compound (fig. 1A). Larger settlements may contain dozens of compounds which are arranged linearly, like beads on a string, along a river or lake shore (fig. 1B). This linear arrangement enables each compound to have ready access to a canoe port, bathing site, and domestic supply of water.

The modular structure of Shipibo-Conibo settlements readily translates into our notion of social context. In a dramaturgical sense, the house is a small stage on which the family members play out day-to-day roles. Meals are prepared and eaten, infants are suckled and swaddled, pottery is molded, decorated, and fired, and, at night, there is sleep inside mosquito nets suspended from the rafters. The compound is a larger stage which incorporates more actors but is only somewhat less intimate. All houses overlook the same plaza. In the heat of early afternoon, the house is a shade, and lounging on

the house floor or swaying in a hammock are pastimes. Idle conversation wafts from house to house, perhaps referring to the strange and comical behavior of a visiting anthropologist or to a scandalous love affair which is rumored to be taking place in the forested perimeter of the compound. Occasionally talk converts to action. A vagrant iguana, wandering from the surrounding bush onto the baked clay plaza, is clubbed to death.⁴ A dolphin, swimming too close to the canoe landing, is identified as a transformed evil shaman and is harpooned by the men.⁵ Privacy is virtually impossible within the household; it is difficult within the compound. Fishing trips, walks to the *chacra*⁶ to procure bananas or manioc tubers and visits to nearby Peruvian settlements to sell crafts are more than economic activities. They are also escapes from a small stage and an intensely watchful audience.

Beyond the compound are other compounds. In multi-compound settlements, these are but a minute's walk away, and inter-compound visiting is commonplace. When compound and settlement are one, neighbors may be many kilometers distant, either up or downstream. Even in the latter case, however, the compound is not an isolated or independent unit. This interdependency is realized in the frequent fiestas, invariably lubricated by alcoholic beverages, which draw participants from many compounds. Traditionally the biggest fiesta, drawing participants from hundreds of kilometers, was the *ani šhrëati*, or female puberty rite.⁷ This fiesta was essentially a demographic signal announcing the number and distribution of nubile females to a long section of river. Today the *ani šhrëati* is effectively suspended, but the fiesta pattern goes on, rescheduled according to the Catholic calendar of religious holidays and to the Peruvian calendar of national holidays. These latter-day fiestas, although somewhat reduced in scale and diluted in traditional content, still assemble large numbers of people, many from distant villages. By evening, successful participants are drunk and, as in the *ani šhrëati*, men still fight over charges of adultery.

The preceding paragraphs, perhaps more impressionistic than analytic in character, outline a series of nested social contexts which extend from household to compound to settlement to region. It is time to see how ceramics map onto these progressively expanded social arenas.

The roster of Shipibo-Conibo vessel categories can be sketched quickly. *Kënpo*⁸ and *këncha* are both serving vessels, the former a beer mug, the latter a food bowl. The *chomo* is a jar and comes in three functionally distinct sizes. *Chomo ani*, literally "big jar," is a beer storage vessel. *Chomo anitama*, or medium-sized jar, is a water carrying and storage vessel. *Chomo vacu*, or small jar, serves as a canteen. All of the preceding vessels are painted and are never used over a fire. In contrast, *kënti* (cooking vessels) are incised rather than painted. The following discussion is restricted to the elaborately painted noncooking ware.

These painted vessels differ markedly in the social contexts in which they are ordinarily used. As beer containers, *chomo ani* and *kënpo* are indispensable to the hosting of a fiesta. A big fiesta requires several *chomo ani* filled with manioc beer, as no conscientious host would want to see the party end early on account of an exhausted beer supply. Beer is served in *kënpo*, either an individual-sized *kënpo anitama* (which also acts as an everyday drinking vessel) or a large *kënpo ani* which is passed from guest to guest.

As essential paraphernalia for fiestas, *chomo ani* and *kënpo* are above

all public vessels. In contrast, *këncha* are vessels of low publicity. They are basically everyday eating vessels and are used primarily within the household. This domestic context of use applies both to *këncha* proper, used for serving stews and soups, and to *oso këncha*,⁹ used for serving dry foods.

The preceding description and interpretation suggest an axis ranging from high to low public exposure. *Chomo ani* and *kënpo* constitute the high pole of this axis, *këncha* the low. On such an axis, *chomo anitama* and *chomo vacu* assume an intermediate position. As said before, the former is a water carrying and storage vessel, although it may also serve as a supplementary beer keg during fiestas. Early morning activities within the compound commonly include a woman or group of women walking to the port, *chomo anitama* perched on their heads or carried at their sides, in order to procure the daily supply of water. The *chomo vacu* is an even more portable vessel. Each adult typically has his own. On fishing trips or on visits to neighboring settlements, the *chomo vacu* serves as a canteen laden with manioc beer or with a banana mash which, when mixed with water, produces a refreshing drink. The portability of *chomo vacu* and *chomo anitama* potentially increases their public exposure. On the other hand, these vessels are not ordinarily used in fiestas and, therefore, their level of exposure is less than that of *chomo ani* or *kënpo*.

Our arguments correlating the dimensions of social context and ceramic use are summarized in fig. 2. It is now time to evaluate the utility of these correlations by turning to the painted messages carried by Shipibo-Conibo vessels.

The Measurement of Stylistic Diversity

The Shipibo-Conibo design style is complex. No two artifacts are ever decorated in precisely the same way. For Shipibo-Conibo artists, the prospect of such an identity is embarrassing. Such a situation bodes ill for comparative analysis. If all designs are unique, comparison is impossible; alternatively, if all designs are identical, comparison is unneeded. Clearly, comparison thrives on intermediate ground.

Gratefully, the superficial complexity of the Shipibo-Conibo style reduces to a manageable corpus of design elements and compositional rules, much as the potentially infinite variety of speech reduces to a finite grammar. Although a complete grammatical account of Shipibo-Conibo decoration has not yet been achieved, partial solutions have been advanced (DeBoer, ms.b; Roe, 1980). Pending fuller solutions, we will restrict our discussion to a rather limited aspect of Shipibo-Conibo ceramic decoration, namely border designs. Border designs are circumferential bands, composed of lines and appended elements, which demarcate the major decorative fields of vessels. Unlike the total designs adorning vessels, always unique at a superficial level, border designs are highly redundant, i.e., they are often repeated within and between vessels. They are therefore simple and easy-to-analyze components of ceramic decoration.

Fig. 3 illustrates the 22 different rim designs which are readily distinguished in a sample of 178 vessels from 5 settlements.¹⁰ Table 1 lists the frequencies with which these designs are found on different vessel categories. In addition to analytical ease, two other factors prompt our decision to focus on rim designs as a convenient guide to Shipibo-Conibo ceramic decoration.

First, rim designs furnish a reasonable summary of *all* border designs, as it can be shown that in over one half of all vessels, shoulder or subshoulder border designs are mirror reflections of the rim design. Second, our archaeological frame of reference invests rim designs with special significance. In the archaeological record, rim sherds are those relatively common ceramic remains which simultaneously carry clues to vessel decoration and form. This latter point is obvious enough and helps to explain why archaeologists routinely place such a heavy interpretive burden on rim sherds.

But archaeological apologetics are infinitely expandable, and it is time to turn to the issue at hand. This issue can be phrased as a question. How does the style of rim designs relate to the social context of vessel use? We have already suggested how social context can be treated as an ordinal variable related to degree of public exposure. We have not yet considered how style itself can be comparatively scaled.

For the purpose of scaling style, we choose to employ the concept of diversity. Several factors prompt this choice. First, inspection of Table 1 suggests that vessel categories are not so much distinguished by specific rim designs as by a specific range of rim designs. Thus only 5 different rim designs are found on all *këncha*, the most numerous vessel category. In contrast, 17 different rim designs adorn a smaller sample of *kënpo*. This situation raises the possibility that it is not the rim designs themselves but rather the diversity of such designs which carry social information. Second, diversity is an appealing concept in that it addresses the actual variability rather than the modal characteristics expressed in style. This emphasis on variability rather than modal summation is important for, as noted above, specific rim designs are not emblematic of Shipibo-Conibo vessel categories. Third, we hope to show how the Shipibo-Conibo evidence relates to a large and growing archaeological literature which employs the diversity concept.

In operationalizing diversity for archaeological purposes, a considerable amount of effort has gone into attempts which use the Shannon-Weaver information statistic (Braun, ms.; Yellen, 1977; Conkey, 1980; Rice, 1981; Stark and Hepworth, ms.). Yet the interpretation of the information statistic as a measure of diversity remains problematic. The interpretive difficulties arise because this statistic summarizes two separate dimensions: the number of types (in our case, rim designs) and the evenness of the distribution among the types. In plant ecology, where the use of the information statistic as an index of diversity originated (Pielou, 1969), this combination of dimensions was justified by the ecosystem concept in which ecological interactions such as cooperation, competition and predation combine to determine the number and abundance of species (types). In this context, the information statistic is a sensible, although difficult to interpret, index of the character of the ecosystem. For the archaeologist looking at a stylistic system where the analogs of cooperation and predation are lacking, it is not at all clear why both the number of types and abundance of types should be combined.

In this light, the recent investigation into the measurement of diversity by Kintigh (ms.) is especially apt.¹¹ Kintigh's measure of diversity is both simple and intuitive. Diversity is simply the number of different designs represented in a grouping of artifacts. The observed number of different designs is then compared to the number of different designs expected in an assemblage of that particular sample size.

As Kintigh states: "The obvious question then, is how are these expectations of diversity to be derived" (ms., p. 6). His solution to this problem is both simple and elegant. If we sum the number of times any design appears in any assemblage or category of material culture, we can create a grand relative frequency distribution for all designs. We can then further assume that this empirically derived frequency distribution represents the underlying probability distribution as determined by the popularity or cultural rules governing design production. Finally, we assume that the designs are chosen at random according to this probability distribution and independently of the social context or the artifact category to which they will be applied.

Given these assumptions, we can now simulate the construction of an assemblage of a particular sample size in order to determine the number of expected designs. Of course, this is a probabilistic exercise, and a single assemblage constructed in this manner tells us little. If we repeat this process for a large number of assemblages, however, it is possible to construct a frequency distribution for the number of different designs which will appear in an assemblage of a given sample size. It is the mean of this distribution which defines the *expected* diversity. Furthermore, we can use the distribution to evaluate the probability that a value equal to or greater than the *observed* diversity could arise randomly. If the observed diversity is sufficiently improbable, it is then possible for us to conclude that the social context or the category of material culture to which the design is applied influences the diversity of stylistic behavior.

We developed a computer simulation on the basis of the ideas presented in Kintigh's paper. The results of this simulation for the Shipibo-Conibo data are presented in fig. 4. The heavy line represents the mean expected diversity for each sample size calculated on the basis of 200 repetitions of the simulated assemblage construction. The thin line represents one standard deviation around the mean.

Examining fig. 4, we can see that the social context of use does influence stylistic behavior. The vessel categories with low public exposure, *këncha* and *oso këncha*, have a diversity measure lower than the expected value, while the festive and publicly used vessels, *kënpo* and *chomo ani*, have a greater diversity. *Chomo vacu* and *chomo anitama*, as portable vessels with intermediate exposure, fall between the two extremes of diversity. These results are summarized in Table 2.

The Meaning of Stylistic Diversity

The Shipibo-Conibo evidence is clear enough: the greater the public exposure of a vessel category, the greater the diversity of its rim designs. Why this should be so is less clear. In other words, we have discovered a significant¹² correlation which lacks a theoretical context. Such a correlation, if not meaningless, is at least subject to many meanings.

Let us consider some of these meanings. First recall our argument that the most salient local group in Shipibo-Conibo society is the compound. If ceramic rim designs were indeed one stylistic vehicle for signaling compound affiliation, then we might expect that such designs would tend to be standardized on those vessel categories which are ordinarily activated at the boundaries between compounds. This is not the case. In fact, rim designs become less

standardized and more diversified on precisely those vessels which primarily operate at compound boundaries.¹³ In the Shipibo-Conibo case, such interfaces are arenas for social display and for ostentatious "showing off" rather than for stylistically codified boundary maintenance. In inter-compound fiesta contexts, rim designs seem to be saying "see how fancy and different we are" rather than "recognize us as emblems of the host compound." Within the compound, however, rim designs virtually abandon their communication role altogether and assume the simplicity of sameness. For example, two rim designs (1 and 4 in Table 1) comprise over ninety percent of all rim designs appearing on low publicity *këncha*.

The observed relationship between rim design diversity and public exposure is somewhat unexpected, and we certainly do not suggest that this relationship has universal application. We wonder if it even applies to other style-bearing media in Shipibo-Conibo society. After all, rim designs constitute a rather small and inconspicuous part of the Shipibo-Conibo decorative style. The total designs adorning vessels may behave differently. In addition, ceramics themselves cannot be assumed to have a limitless message-bearing capacity. In follow-up studies of the Shipibo-Conibo, it would be useful to compare the communication role of ceramics with the roles played by other media such as clothing and body painting (visible for greater distances than ceramic vessels) as well as songs and drum signals (audible beyond the range of vision). We desperately need comparative studies in which the total range of communication devices employed in a society is considered. At present, archaeologists lack a well-developed theory which specifies the kinds of material remains that are likely to carry different kinds of social information. In this regard, Hodder's (1982) recent efforts are especially welcome.

But the small lesson of our study should not be lost simply because the theoretical waters are still murky and because there is still so much more to do. We have shown that artifacts do not soak up style uniformly; rather they participate differentially in style and they do so on the basis of the social context in which they are used. Archaeologists have barely begun to decipher the social information contained in their stylized artifacts.

Acknowledgements

This paper is a hybrid. One of us (W.D.) was trained by John Rowe and Dorothy Menzel during the years when Berkeley made the six o'clock news at least twice a week. It was a fantastic time, and somehow seriating the Uhle collections in the bowels of the Lowie Museum and marching on the streets were integral parts of a graduate education in anthropology. Fieldwork among the Shipibo-Conibo was also a major part of this education. This fieldwork was encouraged and arranged by John Rowe and Donald Lathrap, funded by the National Science Foundation and the Ford Foundation, and secretly inspired by Bob Dylan.

One of us (J.M.) comes from the following generation of anthropologists. Ramparts on the streets were gone, and Marx was being rediscovered within the sanctuary of the university (in this case, the University of Massachusetts). It was and is a generation coming down from the hubris of the "new archaeology" and left with the question, "what went wrong (besides the economy)?"

Both of us became interested in, and later obsessed by, style, that

pandemic feature of human behavior. For this obsession, we are forever indebted to John Rowe, Dorothy Menzel, Donald Lathrap and Martin Wobst--wildly different but equally creative savants of style. We hope the hybrid displays some vigor.

NOTES

¹ As far as we know, there is no accurate census for the Shipibo-Conibo. Faust (1973) estimates a total population of 15,000.

² A historical survey of Shipibo-Conibo settlement patterns is included in DeBoer, 1981.

³ These field observations, always supplementary to archaeological survey and excavations, were made by W. DeBoer in June-August, 1969, February-October, 1971 and June-August, 1975.

⁴ DeBoer, field notes, 1975.

⁵ DeBoer, field notes, 1971.

⁶ Agricultural field in the vernacular of the Peruvian *moñtana*.

⁷ Much of the available information concerning the *ani šhrëati* ("big drink" in Shipibo-Conibo) has been assembled by Roe (1982).

⁸ Here and subsequently we use the orthography adopted in DeBoer and Lathrap, 1979.

⁹ *Oso këncha* ("white këncha") is so called because its exterior surface is painted in black and/or red over a white slip. This form is also called *kënpo këncha*, as its exterior color scheme is shared with *kënpo*. The exterior of *këncha* proper is invariably painted in white on red.

¹⁰ The nature of this "sample" needs to be specified. In 1971, *all* vessels in the north sector of San Francisco de Yarinacocha (113 vessels), the Conibo barrio of Iparia (32 vessels), and the Conibo hamlet of Sonochenea (13 vessels), were enumerated. In these three cases, we are dealing with the available *population* of vessels. Our records for Shahuaya (5 vessels) and Panaillo (15 vessels), the 2 other settlements studied, are incomplete and cannot be assumed to be representative. At a deeper level, however, all synchronous observations are samples.

¹¹ We are extremely grateful to Keith Kintigh of the Arizona State Museum for allowing us to cite and use his unpublished manuscript.

¹² It can be shown that there is only a .0026 probability that the observed match between the public exposure and the rim design diversity of vessels would occur through a random ordering.

¹³ It should be emphasized that the diversity is not to be confused with the notion of similarity. Elsewhere (DeBoer, ms.a), it has been shown that rim designs are indeed more similar within than between compounds.

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TABLE 1
Occurrence of 22 Different Rim Designs on Shipibo-Conibo Vessel Categories*

VESSEL CATEGORY	RIM DESIGN																						N
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
<i>Oso Këncha</i>	23	2	0	7	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	33
<i>Këncha</i>	14	0	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21
Total <i>Këncha</i>	37	2	2	12	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	54
<i>Kënpo</i>	20	1	1	7	1	1	1	0	0	1	1	0	1	1	0	0	1	1	1	1	1	1	43
<i>Chomo Vacu</i>	1	2	4	9	0	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23
<i>Chomo Anitama</i>	18	2	6	10	0	4	0	0	1	0	0	0	0	0	1	1	2	0	0	0	0	0	45
<i>Chomo Ani</i>	2	0	3	2	1	0	1	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	13
GRAND TOTAL	78	7	16	40	2	11	2	1	2	1	1	1	2	1	1	1	5	1	1	1	2	1	178

*The rim designs are those illustrated in fig. 3.

TABLE 2

Degree of Public Exposure and Diversity of Shipibo-Conibo Vessel Categories

Vessel Category	Degree of Public Exposure	Proportion of 200 Simulations Which Show Less than the Observed Diversity
<i>këncha</i>	low	.00
<i>oso këncha</i>	low	.00
<i>chomo vacu</i>	intermediate	.25
<i>chomo anitama</i>	intermediate	.29
<i>chomo ani</i>	high	.99
<i>kënpo</i>	high	1.00

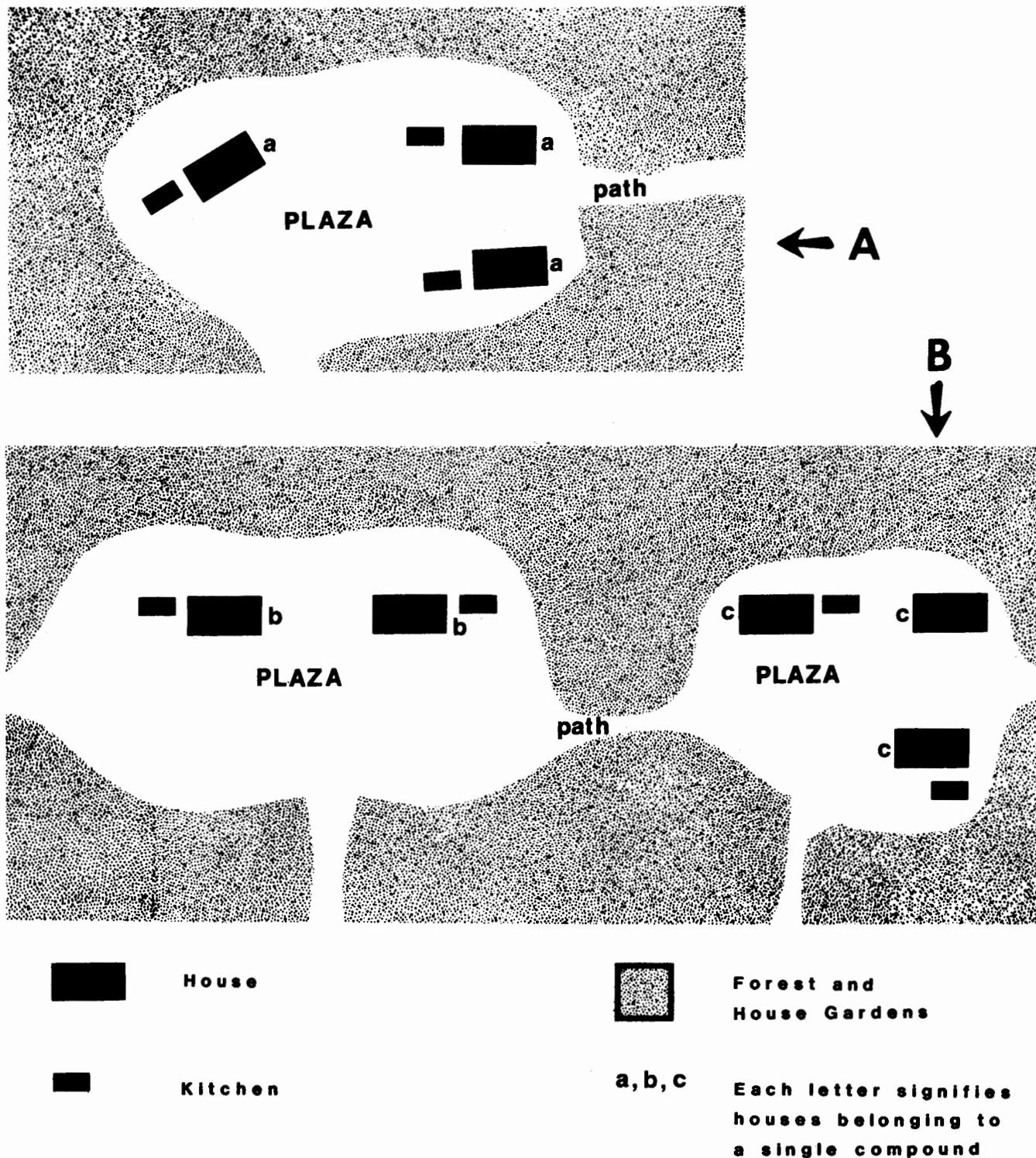


Fig. 1, schematized layouts of Shipibo-Conibo settlements. A: a settlement consisting of a single compound; paths connect the compound with nearby *chacras* (see note 6) and a canoe port. B: a segment of a multi-compound settlement; adjacent compounds are interconnected by a path cut through the bush, and each compound has a path leading to its canoe port.

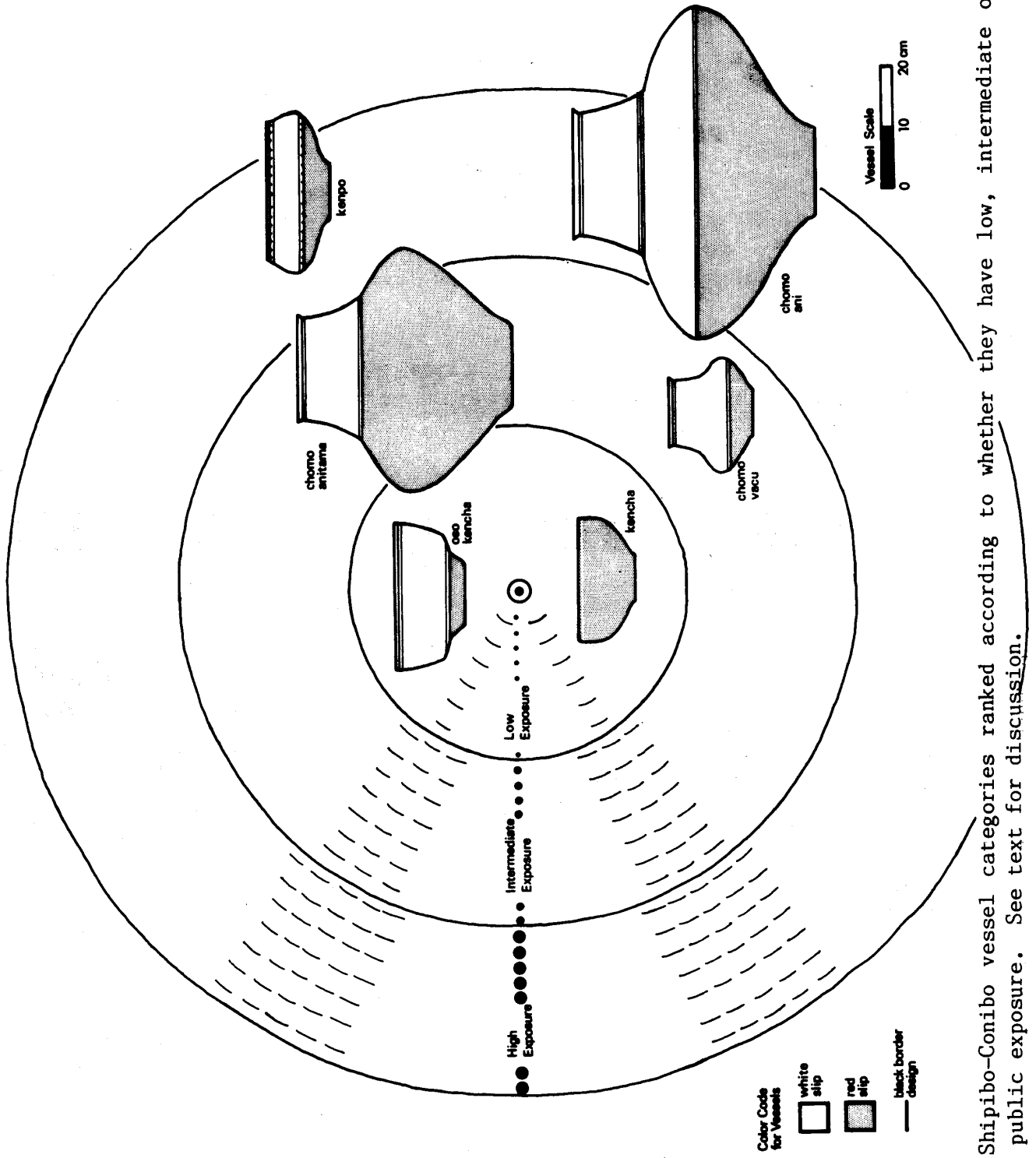


Fig. 2, Shipibo-Conibo vessel categories ranked according to whether they have low, intermediate or high levels of public exposure. See text for discussion.

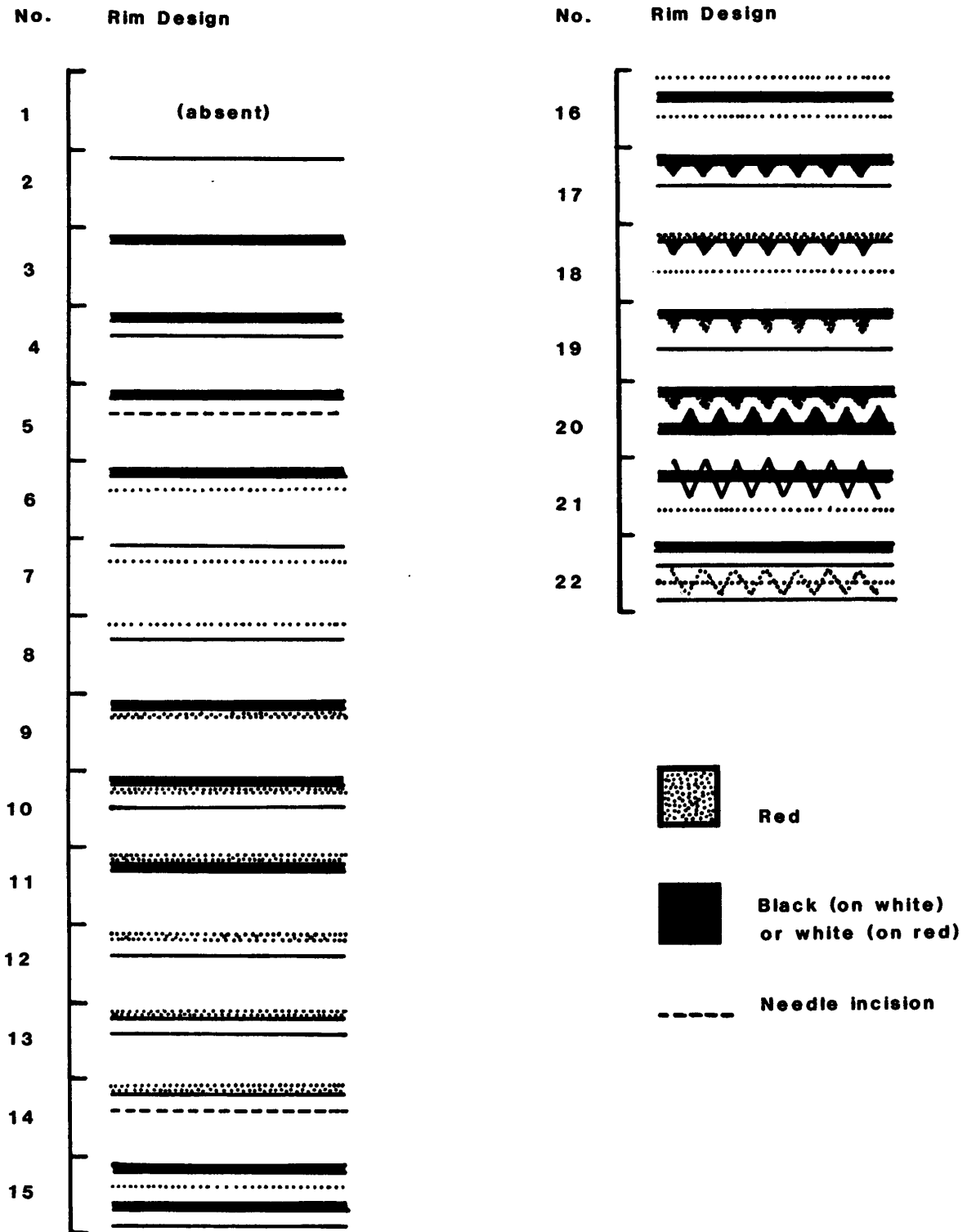


Fig. 3, distinctive rim designs observed in a sample of 178 painted Shipibo-Conibo vessels; modified from DeBoer (ms.a).

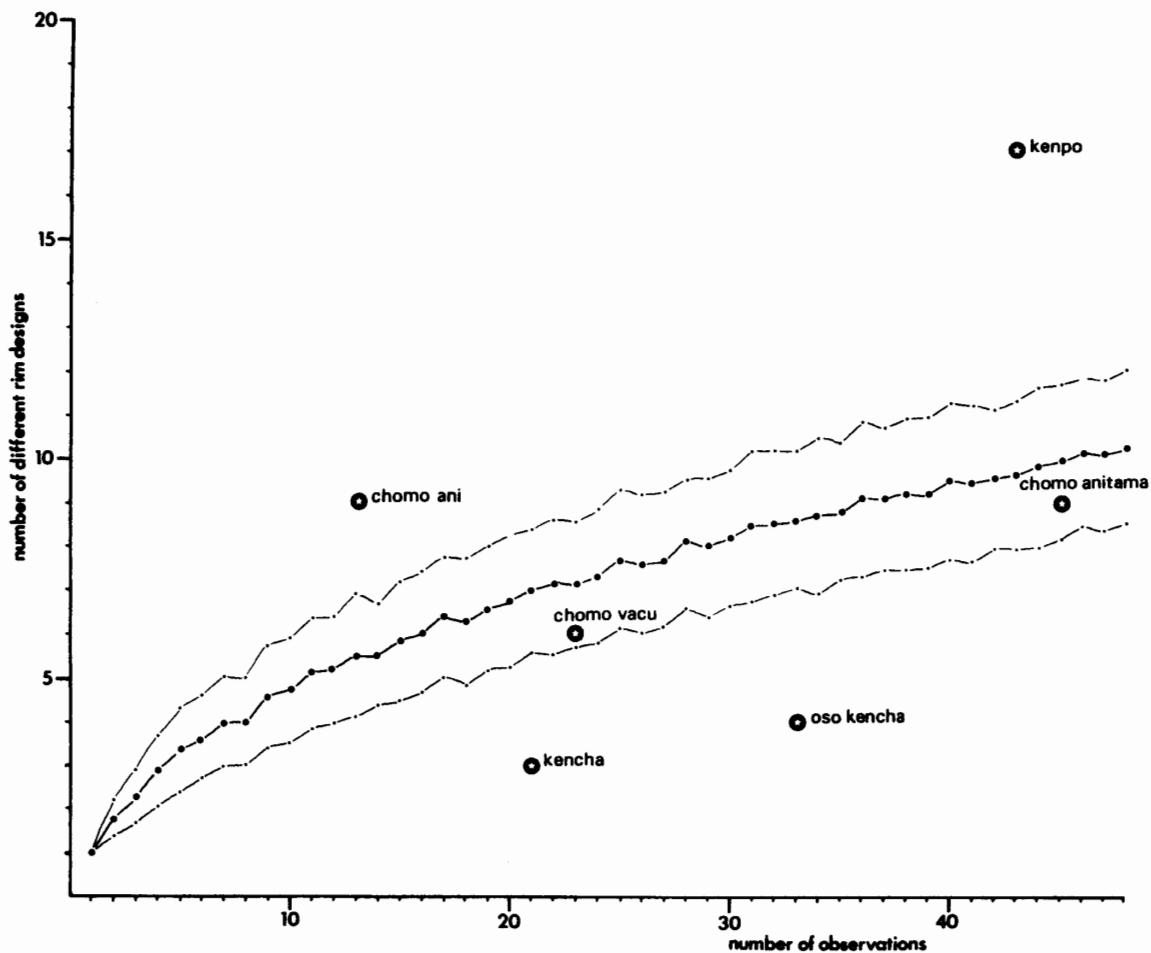


Fig. 4, plot of the expected number of different rim designs (diversity) against sample size. The heavy central line shows the expected mean; the light lines indicate one standard deviation. Circled stars plot the observed diversity of various vessel categories. Contrary to the suggestion of an anonymous reviewer, any resemblance that this graph has to the tail of a New World crocodilian is purely coincidental.