Style and Information: An Analysis of Susiana Ceramics

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Style is viewed as a mode of communication that signals social group identi-
fication and helps to maintain boundaries between social groups. A theoretical
framework is developed which relates changes in social messaging in the stylistic
mode to changes in the sociopolitical organization of chiefly societies. Observable
changes in style are specified for situations in which sociopolitical organization
becomes more complex through an increase in horizontal differentiation of social
units, as well as those in which complexity increases through vertical differentia-
tion. A methodology for quantifying changes in stylistic complexity, using two
measures of redundancy and the information statistic H, is outlined. A specific
proposition relating changes in sociopolitical and stylistic complexity in chiefly
societies is tested using painted ceramic bowls from several late sixth and fifth
millennium B.C. sites on the Susiana Plain in Iran.

INTRODUCTION

Communication is an integral component of all human social interac-
tions. As such, processes of communication may be studied using a wide
variety of different approaches and kinds of data. In this paper I will be
concerned with style as one mode of communication which, in its material
manifestations, is well suited to study by archaeologists.

In a recent paper, Wobst (1977) has argued that style transmits infor-
mation about social group membership and helps to maintain social
boundaries. Using Wobst's framework as a basis, I have developed a set
of theoretical constructs which specify how style changes as the socio-
political organization of chiefly societies becomes more complex. A spe-
cific proposition derived from these constructs is then tested using
painted ceramics from ranked societies of the late sixth through fifth
millennium B.C. from the Susiana Plain in Iran (see Fig. 1).

PREVIOUS WORK

It is not my intention to attempt a comprehensive review or critique of
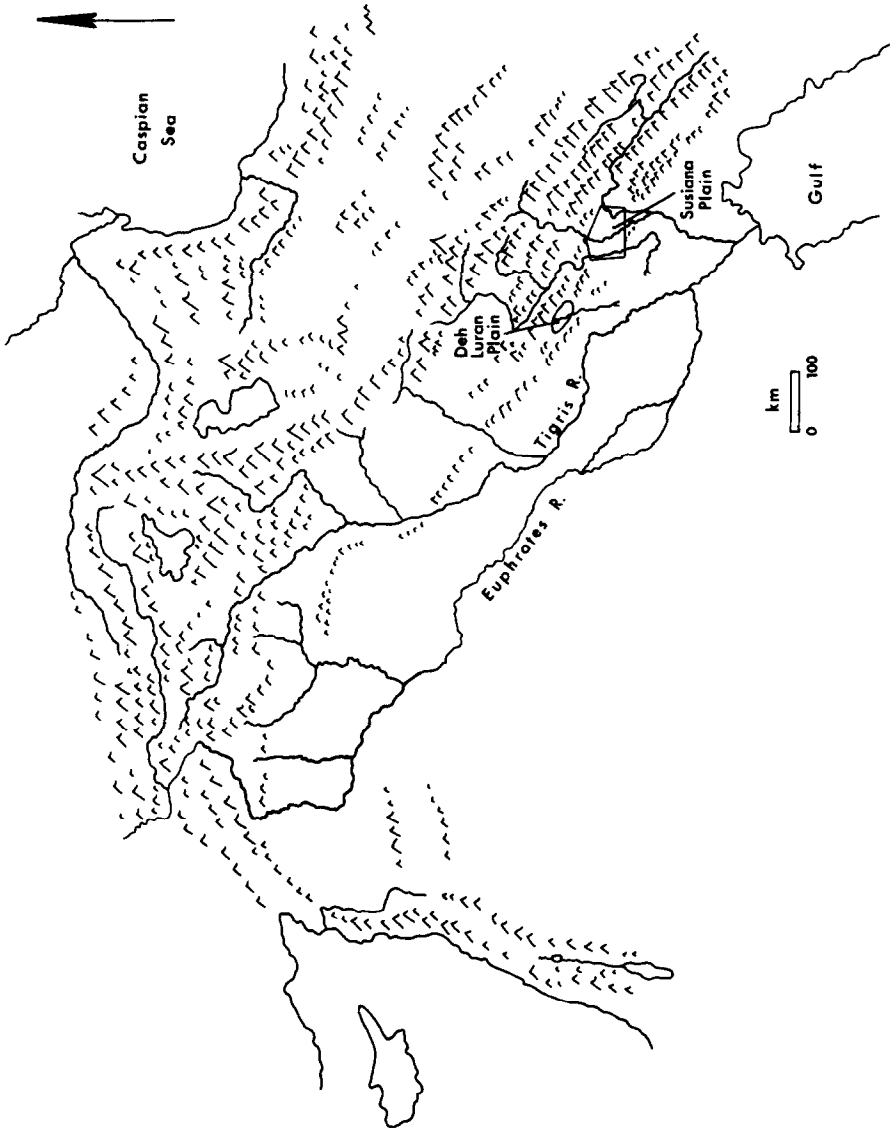the anthropological literature on style. This has been more than ade-

354

FIG. 1. Map of the Near East showing the location of the Susiana Plain.

quately accomplished by Plog (1977, 1980). Rather, I will very briefly outline some specific differences between the issues addressed in the present work and those focused on in previous studies of style.

The emphasis in this paper is primarily on the relationship between regional changes in the complexity of sociopolitical organization and changes in the complexity of stylistic representation. I suggest that the form in which stylistic change is manifested as well as the degree of change will vary depending upon the form and degree of sociopolitical change. In this respect the present study differs from previous works which have considered the overall amount of stylistic variability (Deetz 1965; Whallon 1968; Hill 1970; Longacre 1970; Braun 1977), the loci of stylistic variation (Hardin 1977; Voss 1980), or the presence or absence of stylistic messaging in particular loci in different social circumstances (Wobst 1977; Sinopoli n.d.).

In this study I consider stylistic change from a single, regional perspective without distinguishing between intra- and interlocal variability. This is not to deny the fruitfulness of approaches that focus on intra- versus intercommunity variability (e.g., Braun 1977) or on intracommunity variability alone (e.g., Longacre 1970; Hill 1970; Hardin 1977). Rather, my particular emphasis results from a concern with broader, regional changes in sociopolitical organization and their relationships to stylistic variability.

The argument set out in this paper falls squarely within the "information exchange" tradition of stylistic analysis. In the following section I will briefly outline some of the basic points of such an approach.

STYLE AS A MODE OF COMMUNICATION

In his paper on stylistic behavior, Wobst defines style as "that part of the formal variability in material culture that can be related to the participation of artifacts in processes of information exchange" (Wobst 1977:321). Unlike more traditional definitions, this one emphasizes the communicative aspects of stylistic behavior and the active part that stylistic manifestations play in social process. Although there is also formal variation that may be considered stylistic in nonmaterial aspects of culture, such as speech patterns, I will be concerned here only with stylistic manifestations in material objects.

The production and utilization of artifacts constitutes just one mode of human communication. The artifact mode exhibits some differences from other types of communication because of the tangible and durable nature of its messages. Messages in the artifact mode change slowly and are relatively "costly" to produce, thus requiring a certain commitment to

their content on the part of the producers. Messages may include those which indicate emotional state, membership in a class or other social group, social rank, authorship, ownership, religion, political affiliation, prescription, or proscription. Regardless of their precise content, they all contribute to processes of social integration and differentiation. This is at least in part because stylistic messages help to define and establish predictable patterns of behavior prior to or in the absence of verbal communication (Wobst 1977:322–323,327).

Stylistic messages will be relevant only to people within a certain social range. The greater the amount of social interaction between the producer and receiver of the messages, the more redundant the stylistic messages will be, due to the number of other modes in which these messages are transmitted. On the other hand, if social distance is too great, the receiver will have little chance of actually encountering the message or of being able to decode it (understand its content). Between the two extremes lies a "socially distant target group" for whom stylistic messaging is most relevant (Wobst 1977:323–325).

SOCIOPOLITICAL AND STYLISTIC COMPLEXITY

Complexity of sociopolitical organization is related to the number of distinct social units in a society—with an increment in the number of social units, sociopolitical complexity is augmented. The number of social groups may increase through vertical additions of units (an increment in rank or hierarchy), horizontal additions (an increase in or differentiation of units at the same level), or both (Johnson 1978:87–88).

A major role of stylistic communication is to signal and maintain boundaries between social groups (Wobst 1977:328; Conkey 1978:67). As the number of distinct social groups increases, the number of different messages to be signaled will also increase, because there will be a potentially greater number of social boundaries and interactions across these boundaries. Therefore, an increase in the complexity of stylistic messaging is to be expected concomitant with an increase in the number of social units and thus of sociopolitical complexity. I suggest that such increases in stylistic complexity will occur in different ways depending on whether sociopolitical complexity is augmented through changes in the number of vertical or horizontal units.

Stylistic changes may occur through changes in form of objects and/or in design complexity. In the present study, I have focused on changes in design complexity. A design is considered to be the configuration of stylistic units used on an object. The complexity of design may be altered by the addition or elimination of units of which designs are composed

(elements), changes in the organization of design, that is, changes in the combinations of elements which co-occur, or both.

Let us first consider how sociopolitical changes which result in a change in the number of vertical units will affect the communication of stylistic messages. In a discussion of mortuary analysis, Binford (1971:17) proposes that there is a direct correlation between a person's status and the number of duty-status relations in which he or she is involved. Tainter (1978:125) argues that this will mean that higher-status individuals will have more energy expended on their funerals. He suggests that clusters of mortuary practices which are based on distinct levels of energy expenditure will reflect distinct levels of rank.

A similar argument may also be applied to other forms of social communication and ritual outside the mortuary domain. Within a category of artifacts (for example, pottery or clothing), there may be groups characterized by differential levels of energy/labor expended in their manufacture or symbolic embellishment. "Fancy" objects, often termed sumptuary or prestige goods, are generally those which require high energy expenditures to produce (see, for example, Upham et al. 1981:826). The amount of energy/labor utilized in embellishing artifacts may be manifested in one or more of the following characteristics: (1) the nature of the raw material (whether it is locally available and in plentiful supply or must be obtained from elsewhere at a high "cost"), (2) the quality of the finished item, (3) the abundance of some attribute(s) of the object (for example, the quantity of embroidery applied to a costume or the number of motifs on a pot). On the basis of this argument, I suggest that sets of artifacts that exhibit distinct levels of energy/labor expenditure represent distinct levels of social ranking. In addition to differential energy expenditure, sumptuary items may also be expected to have their own set of symbolic attributes which are not found on ordinary objects, further emphasizing their distinctiveness.

Unlike an increase in vertical complexity, an increment in horizontal units will not be manifested as a discrete level of energy expenditure. Rather, the distinctions among horizontally related groups will be signaled through variations in attributes on the same (vertical) level. In the case of design, one can expect such variation to take the form of differences in design elements and/or differences in combinations of these elements. These variations will tend to be those of form but not of quantity or degree of elaboration which are indicative of vertical differentiation.

This discussion of stylistic change under conditions of change in sociopolitical complexity rests on the assumption that as social units are differentiated and thereby increase in number, the size/composition of the smallest social unit with which people identify will remain essentially

constant. If, however, the smallest social units become larger in scale and therefore fewer in number while differentiation of higher order units is occurring, the total number of social units (and messages) may decline. Such a change may occur if, for example, the household unit becomes less important in structuring the major events of an individual's life and the lineage takes over this role (cf. Johnson 1982). Insofar as these lowest level units may be said to be more basic to the social order and to maintain a more fixed membership than other social groups, changes in the scale of the former may occur rather more infrequently than in higher order units. Nonetheless, one must bear in mind the possibility that changes in the general composition of the lowest level unit may bring about changes in the number and types of stylistic messages to be signaled. The resultant changes in design complexity may then appear to be contrary to the expectation that increased stylistic complexity will be associated with greater complexity of sociopolitical organization.

One other caveat is also necessary. Stylistic messages will have to be altered as often as group affiliations and relationships change, since the content of the messages will, definitionally, have changed. Under very unstable social conditions in which there are frequent fluctuations in social group membership and in the relations between social groups, change in messages may occur more frequently than the objects would otherwise be replaced. Under such conditions it is to be expected that stylistic communication through the medium of these items will cease completely (Wobst 1977:326–327).

MESSAGE CONTENT

At any given place and time, many different classes of objects may convey stylistic messages. Some types of objects may carry more than one kind of message, varying with the contexts in which they are used (Bogatyrev 1971:41, 48). More than one class of items may bear the same kind of messages. Outsiders to the system, be they members of an unrelated society or archaeologists, do not have any direct knowledge of message content. In such cases, content can be inferred, at least in a general sense, from the contexts in which the items are used. (In fact, people also learn the meaning of stylistic messages in their own society in much the same way (Bogatyrev 1971:83).) The context of use directly affects the visibility of objects which in turn circumscribes a set of possible messages which may be transmitted—those which refer to the social relations between the people who are using the items and the people who view these activities. The term activity, as used here, encompasses such passive actions as display of an object.

By saying that message content may be inferred from context, I do not

claim that one can learn the meaning of each design on a particular group of objects. Rather, I suggest that it is possible to determine what general range of meanings (as discussed above) is being signaled. Among the types of messages expected to be signaled stylistically are those which may be termed sociopolitical. Such messages indicate identification with some socially recognized unit(s), be they kin groups, ranked groups, political units, or the like. To determine which class(es) of items may transmit such messages stylistically, one must be able to specify the contexts in which these items are used and are visible to the socially distant target group.

For messages of group identity and membership to be useful, they must be highly visible and comprehensible to members of other groups in the society. Among those classes of items which would satisfy this criterion are those that are used by members of all social groups but which exhibit a range of formal variability that signals message variations (e.g., high rank–low rank, lineage A–lineage B). To acheive the requisite visibility, such objects not only have to be used by members of more than one social group, but they also must be used frequently and predictably in situations in which there is interaction between members of these different social groups. Many kinds of objects fit these criteria, including certain types of pottery vessels as they are used in chiefly societies.

USE AND VISIBILITY PATTERNS OF SERVING VESSELS IN CHIEFLY SOCIETIES

Pottery vessels are employed in a variety of activities including those for which their forms may not really be suited (Shepard 1976:224, 228; DeBoer and Lathrap 1979: 124). However, it is possible to make some general statements about the uses to which vessels of rather broadly defined shape categories are put. Jars are best suited for storage of foodstuffs. Those with necks and/or spouts are particularly appropriate for pouring and may be used in serving contexts (Shepard 1976:228). Jars may also be used for cooking. Bowls tend to be used for display, food preparation, serving, and eating (Shepard 1976:228; Braun cited in Plog 1977:113). Those vessels that are used for storage or preparation of food will probably have low visibility to members of other social groups by virtue of the contexts in which they are used. On the other hand, bowls used for serving and display, as well as small jars which may be used for serving and pouring liquids, will be visible to anyone to whom food is served.

It is possible to make some statements about patterns of food exchange (hereafter termed hospitality) among social groups in chiefdoms, based on ethnographically recognized characteristics. Chiefs can, to varying

degrees, requisition labor and other services from their people. In return, the chiefs are usually expected to provide food, in the form of prepared meals, for the workers, at least for the duration of their service (for example, see Earle 1978:183). Life-crisis ceremonies for members of chiefly families, as well as other public ceremonies, frequently are occasions for public feasting and celebration (cf. Mead 1930:53; Swanton 1911:113, 119). The obligations of high-ranking figures to provide hospitality to important visitors is also well documented (Sahlins 1972:256, 260). Different low-level social groups frequently exchange hospitality, on occasions of marriages, funerals, enterprises involving communal labor, and the like.

Pottery often figures in exchange networks, a factor which also contributes to its visibility (Plog 1977:177). In societies where all communities produce pottery, exchange of pots may be mainly confined to fancy, status-related wares exchanged among elites (cf. Powell 1967). Pottery may also be exchanged primarily for its contents, for example, oil or cosmetics.

Through serving contexts and exchange, ceramic vessels achieve the amount and type of visibility that would seem to be necessary if they are to transmit sociopolitical messages. This argument may be further supported by examining contextual evidence for the particular society under study (see subsequent discussion of pottery use during the Susiana sequence).

It is also possible that ceramic serving vessels may simultaneously carry other stylistic messages of different content, such as indications of the individual or workshop group who made the vessels. Some of this "extraneous" message variability can be identified and subsequently ignored. For example, there is evidence that individual stylistic differences may be manifested as subelemental variability (Friedrich 1970:340; Johnson 1973; Hill 1977) which one can choose not to record as distinct attributes when measuring design complexity. However, there may also be other types of messages which are simultaneously transmitted of which the analyst is unaware and therefore cannot control for.

If changes in style are to be monitored, we need a method for measuring stylistic complexity. Such a method will be presented below, following a brief introduction to the concept of information.

INFORMATION

The Concept of Information

In the preceding sections, I have been primarily concerned with the ways in which general message *content* can be understood from a knowl-

edge of message context. In contrast, the present discussion considers how the *complexity* of messages can be measured. For this I propose to use information statistics, where information, used in an information-theoretic sense, is essentially divorced from message content and monitors only the complexity of the message. Information, in this sense, refers to perceived distinctions between items or states of some item. Messages which are all identical transmit no information since there are no differences among them. Phrased alternatively, no information is conveyed because there is no uncertainty about the contents of the message prior to its receipt (see Abramson 1963:46). At the opposite extreme, the maximum amount of information is conveyed in a situation where there are n possible messages each of which occurs with equal probability $(1/n)$. This is the situation in which a receiver has the greatest degree of uncertainty about the contents of the message prior to its receipt. In short, information is not an inherent part of a message but depends on what is transmitted relative to what could be transmitted. Information is not synonymous with meaning nor does it necessarily imply anything about meaning. Information measures only express the fact that there are a variety of distinguishable items or states of some item. What these distinctions mean—their message content—must be determined in other ways.

By definition, one can use an information statistic in any situation in which categories can be distinguished. However, information functions are not sensitive to rank order or numerical differences and should not be applied in cases in which such factors are important (Quastler 1955:3). In other words, if the existence of distinct categories is of primary importance while neither the relative nor the absolute degrees of difference among them are significant for the proposed study, the use of an information statistic is appropriate. Such is the case in the present study.

Another important concept is that of redundancy which can be defined as "the percentage of predictable information" (Fritz and Grier 1955:241). Phrased differently, redundancy is a measure of the degree to which a decision made at some stage in a hierarchical classification circumscribes the set of subsequent decisions available at lower levels in the classification (Tainter 1978:111). Redundancy is expensive in terms of the energy necessary to encode and transmit messages, but it decreases the cost and time involved in decoding the messages. The accuracy of transmitted messages can be augmented through the use of redundancy, which helps to counterbalance the loss of information due to other factors (Beer 1966:197, 200).

Redundancy should not be confused with standardization; although standardization entails redundancy, the reverse does not necessarily hold. For example, in a maximally standardized set of objects all items may

have attributes *a* and *b* and no others. Thus all objects are identical and perfectly redundant. However, redundancy also refers to situations in which objects with attributes *a* and *b* necessarily have attribute *c*, while those with *a* and *d* necessarily have *e*. The addition of attribute *c* in the first case and *e* in the second provides no additional information: attributes *c* and *e* are redundant. It is this elaborative aspect of redundancy, in which additional, "unnecessary" attributes are included in a message, that makes redundant messages "expensive."

The information statistic *H* and redundancy measure different aspects of complexity. Both are appropriate in this study. On the basis of previous arguments, vertical complexity should be measured using a statistic that monitors the energy expended in producing stylistic messages. Since redundancy tends to be "expensive," a measure of redundancy is appropriate for this purpose. In addition, redundancy helps to emphasize the distinctiveness of a particular message or set of messages relative to all other messages; thus, important ceremonial occasions are usually marked by elaborate, formalized behaviors that are highly redundant (cf. Keesing and Keesing 1956:68).

To measure horizontal complexity, one can use the *H* statistic. *H* monitors distinctions between attributes and combinations of attributes and their frequency of occurrence (see Braun 1977:188–189 for a similar justification for the use of *H*). It largely ignores differences in the abundance or elaboration of attributes that characterize vertical differentiation.

Measurement of Information and Redundancy

The amount of information transmitted in a system depends on the total number of elements (distinguishable items or states of some item), the probabilities of each element occurring (including simple, conditional, and joint probabilities), and the number of transmitters.[1] Discussions of the derivation and calculation of the information statistic *H* can be found in Shannon (1949) and Quastler (1955), among others.

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[1] For the purposes of this paper I will consider only the case of one transmitter. However, as mentioned earlier, more than one class of objects may carry the same kind of messages simultaneously. This is a difficult factor to control for, especially in archaeological cases where we may lack many of the classes of artifacts which carry stylistic messages due to problems of preservation. One must make the assumption that if several types of artifacts communicate the same types of messages, a change in the amount of information they carry will be similarly reflected in stylistic changes in each type. This is clearly not true in every case, since a class of objects may become "nontransmitters" under certain circumstances (see the end of the section on Sociopolitical and Stylistic Complexity) while other artifact categories continue to carry stylistic messages. However, it is reasonable to assume that either all categories conveying the same kinds of messages will vary similarly or one or more categories will become nontransmitters.

Redundancy can be measured in more than one way. The most common measure is the ratio of the observed to the maximum possible value of H. A second redundancy statistic, used by Tainter (1978:111–113), is a function of the number of observed outcomes (whether these be stylistic messages, mortuary modes, or whatever) relative to the total number of possible outcomes, calculated as the product of the total number of choices available at each level in the hierarchical classification.

Both of these measures of redundancy monitor the length (here, the number of motifs per vessel), and repetitiveness of messages, which, as previously mentioned, constitute one of the variables that distinguishes sumptuary from ordinary goods. Neither redundancy measure directly monitors the nature of the raw materials or the quality of the finished products, the other two distinguishing characteristics of prestige-related as opposed to "ordinary" goods. One does not usually expect ceramic manufacture to involve the use of exotic raw materials. Care and precision in manufacture resulting in higher quality products has not been considered in this study, but it is expected to covary with the degree of labor invested in artifact production. "Quality" of manufacture could doubtless be quantified in some fashion in order to test this statement.

On the basis of the preceding discussion, I suggest a two stage procedure for monitoring stylistic complexity. First, one must establish the existence of any separate categories of high-status items. Any such categories should be distinguishable on the basis of one or more criteria such as form. Further, one would expect the items in each category to have a set of distinct symbolic attributes, in this case a distinct repertoire of motifs. On the basis of these distinguishing characteristics, one can tentatively isolate groups of items whose redundancy measures can be compared. Second, categories on the same vertical level can be compared in terms of their horizontal complexity, using the information statistic H.

PROPOSITION TO BE EVALUATED

Before presenting the specific proposition to be tested, let me briefly summarize the basic assumptions and arguments on which it is based.

1. Style communicates social messages.
2. Stylistic messages serve to mark and maintain boundaries between social groups.
3. Since sociopolitical complexity is related to the number of distinct social groups, as sociopolitical organization becomes more complex there will be an increase in stylistic messaging.
4. Given the patterns of hospitality in chiefly societies, pottery vessels

will be one category of artifacts which will carry stylistic messages
with sociopolitical content.
5. Changes in the complexity of designs can be monitored using mea-
sures of redundancy and information.

The proposition to be evaluated can be stated as follows. If, in a society
which exhibits patterns of hospitality such as those found in chiefdoms,
complexity of sociopolitical organization increases or decreases through
time and if the messages transmitted stylistically by a class of items in
that society remain similar in general content, there will be a measurable
increase or decrease—corresponding to the change in sociopolitical com-
plexity—in the complexity of the stylistic messages carried by these
items. If the change is in vertical complexity, there will be a change in
the redundancy of the stylistic embellishment on some of these items. If
the change in sociopolitical complexity is the result of a change in the
number of horizontally related units, the change can be measured using
the information statistic H, and will occur through a change in the total
number of elements, a change in the probabilities of occurrence of ele-
ments or both. In the following section I will present the data used to
evaluate this proposition.

THE TEST CASE

Chronological Considerations

As a test case I have chosen to analyze material of the Susiana se-
quence from the Susiana Plain in southwestern Iran. The traditional Su-
siana chronology is based primarily on the work of Louis Le Breton who
divided the first Susiana painted pottery sequence into five periods which
he called (from earliest to latest) Susiana a, Susiana b, Susiana c, Susiana
d, and Susiana e or Susa A (Le Breton 1957). This classification was
widely adopted and, for the most part, is still followed today, although
there are increasing difficulties with certain portions of it. Geneviève
Dollfus, the excavator of several Susiana sites, is presently engaged in a
thorough reevaluation of the chronology and classification of the Susiana
sequence. When this is complete it will be possible to supplement and
reanalyze many aspects of these data. For the present, however, I have
retained the Le Breton phases and phase names, awaiting a definitive
revision of the chronological sequence.

An outline of the relative chronology used in this study is presented in
Table 1. The absolute chronology of the Susiana sequence is poorly
known, because of the small number of radiocarbon dates, exacerbated
by the lack of correction factors for dates older than approximately 4000

SUSAN POLLOCK

TABLE 1
RELATIVE CHRONOLOGY OF THE SUSIANA SEQUENCE[a] (DASHED LINES INDICATE
PARTICULARLY UNCERTAIN BOUNDARIES BETWEEN PERIODS)

	Jaffarabad	Jowi	Bendebal	Susa	Chogha Mish	Sharafabad	Qabr Sheykheyn
				25			
					Late	Susa A	
				26 A2			
	III	1			Susiana		
				27			
Susa	(−2 m	2					
		3a					
A	to	|					
		d	10				
	surface)						
			11		M		
			|		i		
Susiana			|		d		
			|		d	3	Qabr
d			|		l		
			16		e		
							Sheykheyn
	II	5	17		S		
		|	|		u		
Susiana	(−3.5	|	|		s		
		3m−n	|		i	2	
c	to	|	|		a		
		12	22		n		
	−2 m)				a		
		13					
		|			1		
Susiana		|					
b		17					
	I	4			Early		
Susiana							
	(−6 to	5					
a					Susiana		
	−3.5 m)	6					

[a] This represents my own interpretation, but it is based, to greater and lesser degrees, on the chronological schemes of Le Breton (1957), Le Brun (1971), Stève and Gasche (1971), Weiss (1976), Kantor (1976), and Dollfus (1971, 1975, 1978).

b.c. Based on a small series of Susa A dates from Jaffarabad (see Dollfus 1971:79) and Susa (see Stève and Gasche 1971:38), it appears that Susa A ends ca. 4000 B.C. (MASCA-corrected) and may begin ca. 4200 B.C. or slightly before. Based on dates available from comparable traditions in the neighboring areas (see Hole 1977b:24–28), the beginning of the Susiana sequence may date to the mid to late sixth millennium B.C.

Before proceding to a consideration of sociopolitical developments during the Susiana sequence, some difficulties with the available data must be discussed. The two phases Susiana b and c were not, for the most part, distinguished in the reporting of survey results, which I have used as my primary source of data on sociopolitical complexity and change (see below). This is unfortunate, as the ceramics of the two periods seem to exhibit considerable differences (see Dollfus 1978, n.d.), and significant developments in sociopolitical organization occur sometime during these periods. Furthermore, the available sample of Susiana b pottery is too small to be included in the quantitative ceramic analysis undertaken in the present study. As a result, there is a gap corresponding to Susiana b in the ceramic analysis, and the Susiana b and c periods have had to be treated as an aggregate—Susiana b/c—in the evaluation of sociopolitical organization and change. The effects of these inadequacies in the data will be discussed as appropriate in subsequent sections.

Changing Sociopolitical Organization on the Susiana Plain

The Susiana sequence has long been regarded as an important developmental one, witnessing fundamental changes in craft production, subsistence production, and sociopolitical organization. However, there have been few systematic analyses of these developments. I will briefly discuss the results of the work that has been done and then present the analyses I have undertaken, using changes in settlement patterns as an indication of changing sociopolitical complexity.

The organization of craft production is not well documented, but it has been suggested that the high quality of some painted ceramics, especially in Susiana b through Susa A, indicates the existence of specialized craftsmen (Hole and Flannery 1968:189, 191; Hole et al. 1969:359, 362; Wright et al. 1975:130). Kilns dating to Susiana c have been discovered at Jaffarabad (Dollfus 1975:61) and Chogha Mish (Kantor 1974:16) lending some support to the proposition that there was specialized pottery production. However, most, if not all, villages apparently continued to produce some ceramics (Wright 1977:387). In short, there appears to have been some specialization of pottery production, though such specialization was probably restricted to prestige-related items. Evidence for the organization of production of other craft goods is minimal.

Based on locational evidence from surveys and faunal and floral remains from excavations (primarily from the nearby Deh Luran Plain where subsistence data are much more abundant), there appears to have been a gradual shift during the course of the Susiana sequence from a wheat–goat–dry farming complex to a barley–sheep–small-scale irrigation complex (Adams 1962; Hole et al. 1969:368–369; Miller 1977:51).

Along with the initiation of irrigation agriculture there was a large-scale increase in the number of sites, assumed to indicate population growth (Hole 1977b:16), and, at least at contemporary sites in southern Mesopotamia, the appearance of social ranking (Hole and Flannery 1968:202–203). Thus, although no direct causal links are postulated, there seems to be an association between the beginnings of small-scale irrigation and the development of ranked societies.

A number of scholars have suggested that ranked societies existed on the Susiana Plain at least in the later phases of the Susiana sequence (Wright and Johnson 1975:273; Wright et al. 1975:130; Wright 1977:387; Johnson 1973:89). This proposition is based on several lines of evidence including the presence of some residential structures on mudbrick platforms at some Susiana d and Susa A sites (Hole 1969:61, 63; Wright 1977:387; Weiss 1976:57), the apparently high-status Susa A cemetery at Susa (Nécropole) which was located near a central mudbrick platform on which stood a temple and a high-status residence (Morgan 1912:7; Hole 1977a), and the distribution of Susa A seals and sealings at Susa and smaller sites which indicates that there was some regulation of the distribution of goods (Wright 1977:387). The present study requires a more precise monitoring of changes in sociopolitical organization. This can be accomplished using settlement pattern data available from the numerous surveys of the Susiana Plain.

I have chosen to rely on settlement pattern analyses to assess changes in sociopolitical organization in part because of the high quality of the survey coverage of the Susiana Plain, which is probably as complete as we can hope to achieve with presently available methods.[2] Although there has been a considerable amount of excavation on Susiana sites, much of it is not as yet fully published. This makes it difficult to attempt any rigorous or quantitative analysis of sociopolitical developments using data from excavation alone. Furthermore, a comparable range of sites has not been sampled from each period.

It is not expected that the results of a settlement pattern analysis will be identical to the data on sociopolitical change that could be obtained from a series of well-controlled excavations. However, since this paper focuses on regional changes in both style and sociopolitical organization, settlement pattern analysis should be adequate to monitor the broad sociopolitical developments of interest here.

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[2] Adams was the first to attempt a systematic survey of the Susiana Plain and published a brief report on his findings (Adams 1962). The subsequent survey of Susiana sites by Hole and the Susiana sequence materials recovered by Johnson and Wenke are as yet unpublished. The data used here come from collections in the University of Michigan Museum of Anthropology and notes from the various surveyors in the possession of Henry Wright.

As noted above, for most sites no distinction was made between Susiana b and c occupations in the reporting of survey results. Thus, for the subsequent analyses I have used an aggregated phase, Susiana b/c. Although this is less than ideal, the distortion, at least for the measures of vertical complexity, may not be too severe, since we know that the largest sites, the measures of which are most critical, were all occupied in Susiana c. It is, however, likely that the figure for total settled area, used as a measure of horizontal complexity, is somewhat inflated.

Let us begin the analysis with a consideration of vertical complexity. I have used two approaches to the measurement of vertical complexity — the construction of histograms of site size for each period and rank–size analysis. These two techniques yield broadly similar results for the Susiana data.

The histograms for the Susiana settlement systems (see Fig. 2) are all relatively similar, the majority of the settlements being less than 3 ha while a few sites are larger. In Susiana b/c, d, and Susa A, there are one or more settlements larger than 4 ha which can be classified as centers (cf. Taylor 1975:73–75); in Susiana b/c and Susa A a single site attains a much larger size than any of the others, a phenomenon which is lacking in Susiana d. In Susiana a there are no sites larger than 4 ha—this may either indicate that there are no centers or that they are smaller and not yet as clearly differentiated from other sites. Based on the relative discreteness of the mode of larger sites (2.8–3.0 ha) and the findings of Taylor (1975:73–74) which suggest that patterns similar to this one are to be expected in low level chiefdoms, I have considered the Susiana a sites in the range 2.8–3.0 ha to be centers.

Rank-size analysis provides a more sophisticated means of evaluating changes in complexity (see Johnson n.d. for a summary of the method; also Johnson 1981). It is based on a pattern recognized empirically in many systems in which settlements, ranked in descending order by population/size, tend to produce a log-normal distribution with a slope of -1. Observed distributions which are concave (negative rank–size indices (RSI's)) relative to the predicted line have been interpreted as indicating a political minimization of economic competition within the system or the integration of the largest settlement into a larger system. Convex distributions, with positive RSI's, may point to the inclusion of more than one largely autonomous system in the sample or, perhaps, a lack of any effective integration of the units (Johnson 1977:496–498; Johnson n.d.).

For the Susiana data the RSI's for the plain as a whole are convex for every period (see Table 2). This suggests that the plain was not a fully integrated system during any of these periods. Rather, throughout the Susiana sequence there were apparently two or more smaller units on the
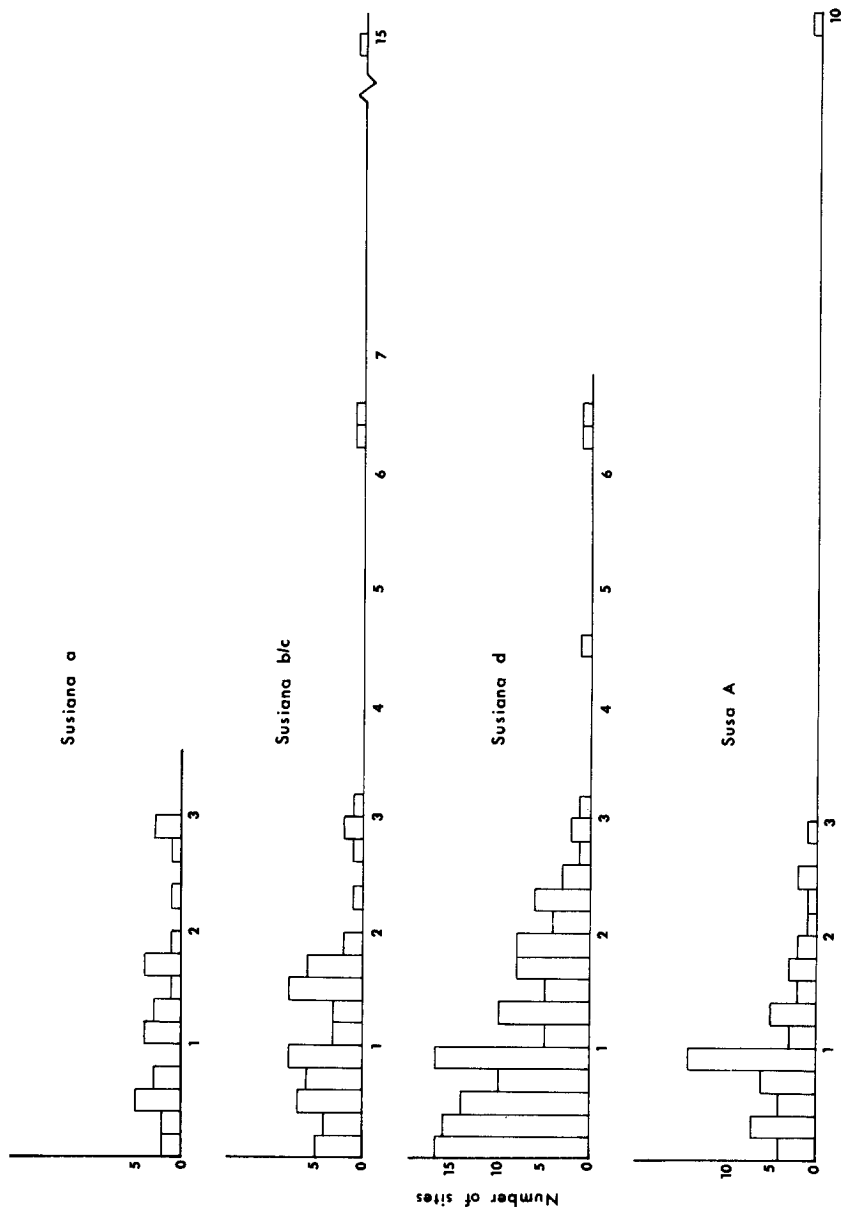
FIG. 2. Histograms of settlement areas.

TABLE 2
RANK–SIZE INDICES FOR THE SUSIANA PLAIN AS A WHOLE AND FOR SUBAREAS
(SEE FIGS. 4–6 FOR LOCATIONS OF SUBAREAS)

Period	Whole plain	Subareas	
Susiana a	0.568	—	
Susiana b/c	0.144	West Susiana:	0.620
		A:	0.607
		B:	0.358
		C:	0.503
		East Susiana:	−0.165
Susiana d	0.468	West Susiana:	0.658
		A:	0.273
		B:	0.370
		C:	0.602
		D:	0.510
		E:	0.374
		East Susiana:	0.358
		F + G[a]:	0.047
		H + I[a]:	0.120
		J:	0.170
		K:	0.227
Susa A	0.223	West Susiana:	−0.239
		East Susiana:	0.516
		A + B[a]:	0.432
		C + D[a]:	0.219

[a] The RSI's for these areas separately seem to indicate that they should be combined (for Susiana d—F: −0.426, G: −0.075, H: −0.498, I: 0.388; for Susa A—A: 0.701, B: 0.252; C: too small (only three sites), D: 0.516).

plain. One would expect each of these groups to have one or more centers which were more easily accessible to the other sites in the group than were the centers in other settlement clusters. Nearest-larger-neighbor distances can be used to define clusters on the basis of spatial proximity of sites to a center. Using this technique, I have divided the Susiana settlements of Susiana b/c, d, and Susa A into several clusters (Figs. 4–6). Table 2 lists the rank–size statistics for these components.

The pattern that emerges from a comparison of the rank–size indices of the component clusters of each period is somewhat cyclical, like that noted in the comparison of the histograms. The RSI for Susiana a is markedly convex. There do not seem to be any smaller clusters of sites which constitute more tightly integrated settlement units (Fig. 3). This may be interpreted as representing a system with little centralization or integration of components. In Susiana b/c the western portion of the plain (the area to the west of the Dez River) appears to be divided into three
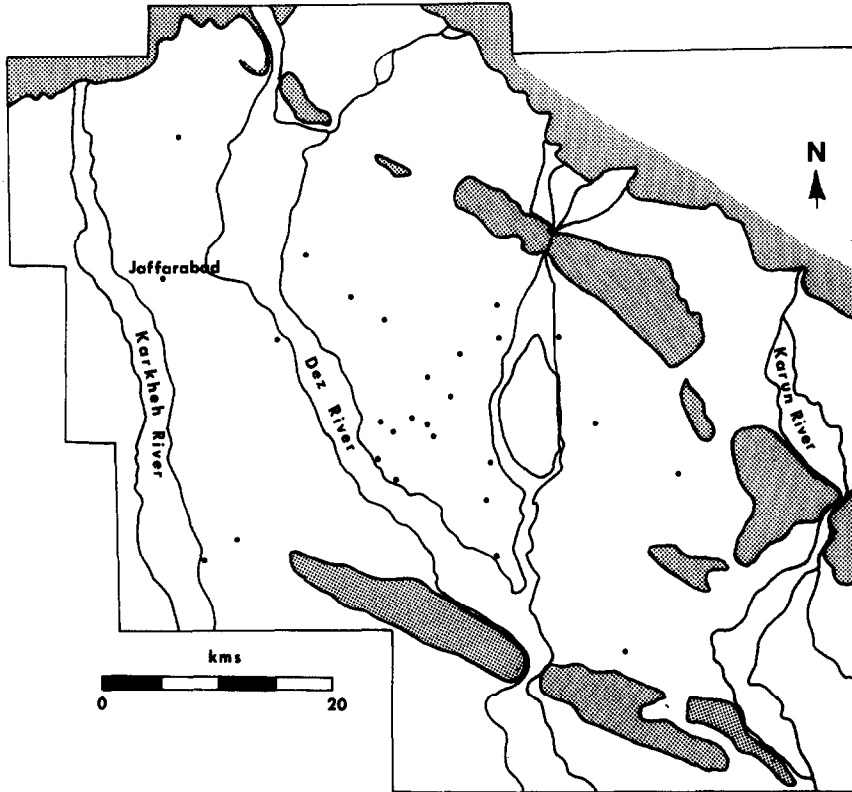
FIG. 3. Susiana a settlement system (after Johnson 1973).

smaller, relatively autonomous clusters of sites (Fig. 4), all of which have distributions which are convex, indicating a low level of integration. In the eastern plain, however, the somewhat concave distribution indicates that we are dealing with a much more centralized[3] system, centered around Chogha Mish.

The western plain remains largely unintegrated in Susiana d as indicated by the high positive value of the rank–size index. The eastern portion of the plain is composed of a number of smaller constituent systems (Fig. 5). These component units have slightly convex to nearly linear distributions, suggesting that they are not as highly integrated as the system centered in this portion of the plain in Susiana b/c.

In Susa A, the focus switches to the western portion of the plain which

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[3] I am using centralized in a relative sense here. No doubt, in comparison to later developments on the plain, all of these early systems had only low degrees of centralization.
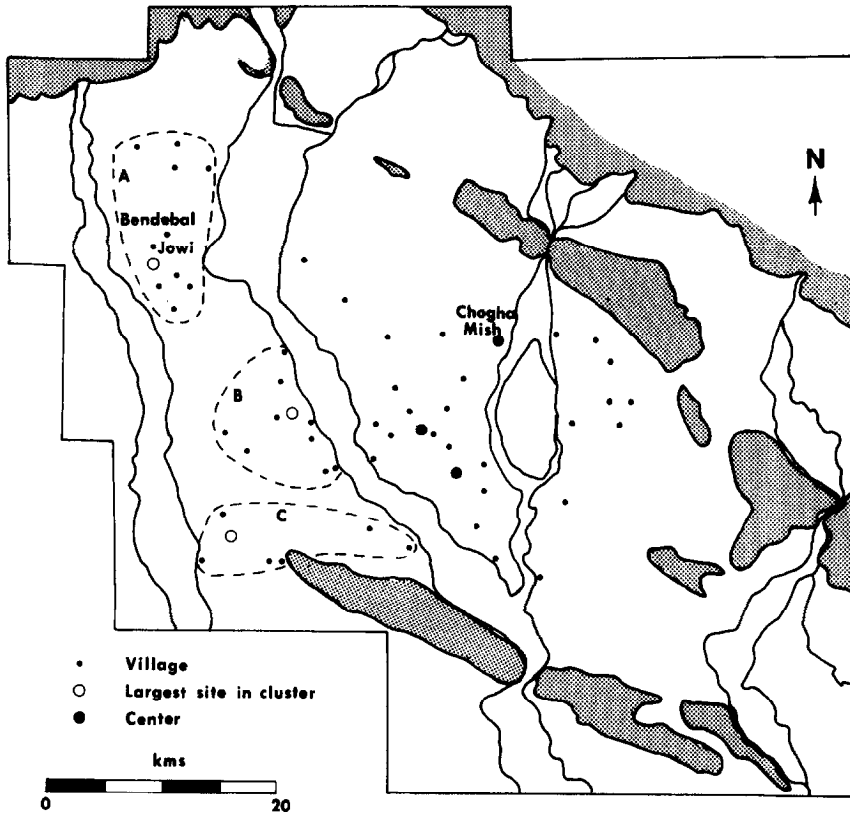
FIG. 4. Susiana b/c settlement system (after Johnson 1973).

is dominated by the newly founded site of Susa (Fig. 6). The distinctly concave rank–size distribution is indicative of the relatively high degree of centralization and integration of this system, greater than the one centered around Chogha Mish in Susiana b/c. On the other hand, the positive RSI's for the smaller units in the eastern plain indicate that they have a low level of integration. The pattern in Susa A is most closely similar to the one in Susiana b/c, but the Susa A system appears to be more highly integrated than the latter.

In contrast to the development of rather sophisticated techniques such as rank–size analysis to measure vertical complexity of settlement systems, there has been relatively little attempt to develop methods to monitor horizontal complexity using settlement pattern data. However, changes in population—assumed to be directly related to total settled area—are, in a fairly crude way, measures of change in the number of horizontal social units. For the Susiana sequence, this measure exhibits
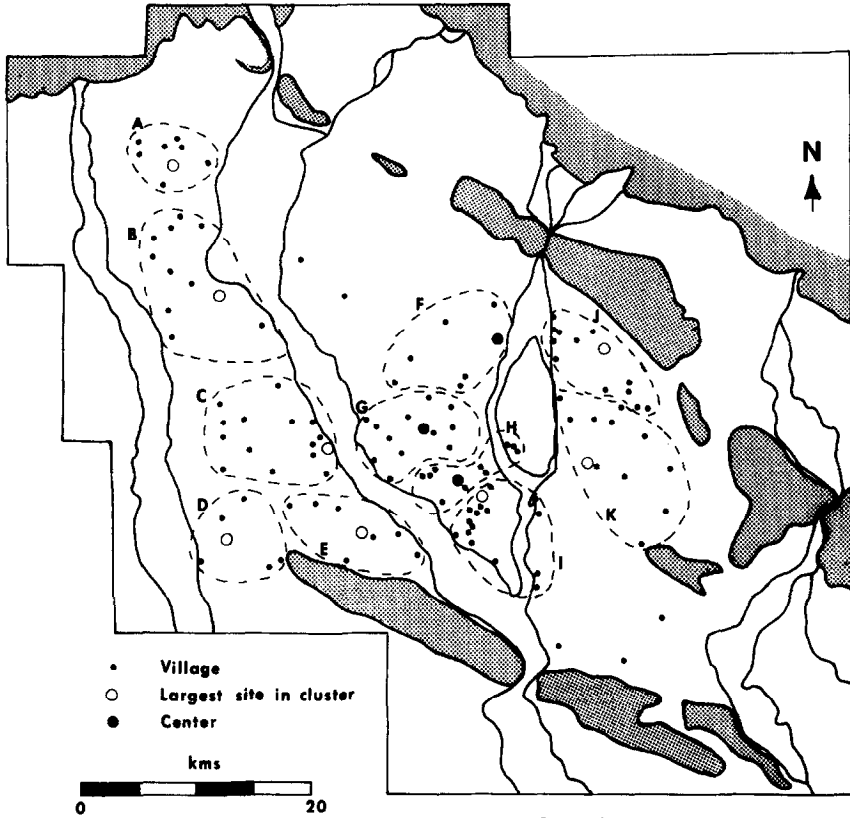
FIG. 5. Susiana d settlement system (after Johnson1973).

a continuous increase from Susiana a through d and then drops off in Susa A to below the Susiana b/c level (Fig. 7). The very high value for Susiana d is probably due in part to rapid shifting of sites within this period, resulting in some double counting of sites. Nonetheless, the total settled area does appear to peak in Susiana d and then decline markedly in Susa A. The aggregation of Susiana b and c sites has doubtless resulted in some inflation in the estimate of settled area for that period. It is clear, however, that more area was settled in Susiana c than in Susiana a, although the magnitude of the difference cannot be precisely ascertained.

On the basis of the analyses and discussion just presented, I propose the following general outline of changing sociopolitical organization on the Susiana Plain. In Susiana a, a low-level chiefdom with a low degree of integration of its constituent units existed in the central portion of the plain. Sometime during Susiana b or c Chogha Mish emerged as the paramount center, and the whole eastern portion of the plain was inte-
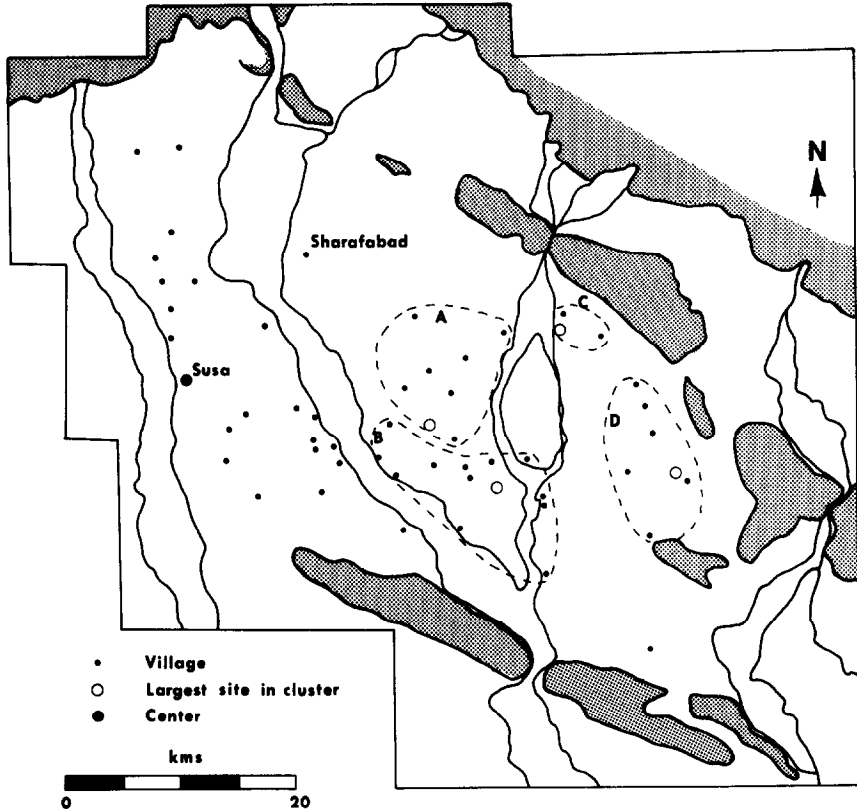
FIG. 6. Susa A settlement system (after Johnson 1973).

grated into a more coherent, centralized system. Settlement increased in the area west of the Dez, forming several small, loosely integrated clusters. Susiana d was a period which witnessed a large population increase and a large-scale proliferation of small sites. At the same time, the relatively centralized polity that had been centered around Chogha Mish fragmented, forming a number of smaller autonomous units with no single, dominant center. With the rise of Susa in Susa A, there was a return to a more centralized pattern, with an even higher degree of component integration than in Susiana b/c.

The Context of Pottery Use during the Susiana Sequence

I argued previously that serving vessels constitute a suitable class of items for this study. In addition to the general evidence for the visibility of such pottery due to the patterns of hospitality in chiefdoms, we can
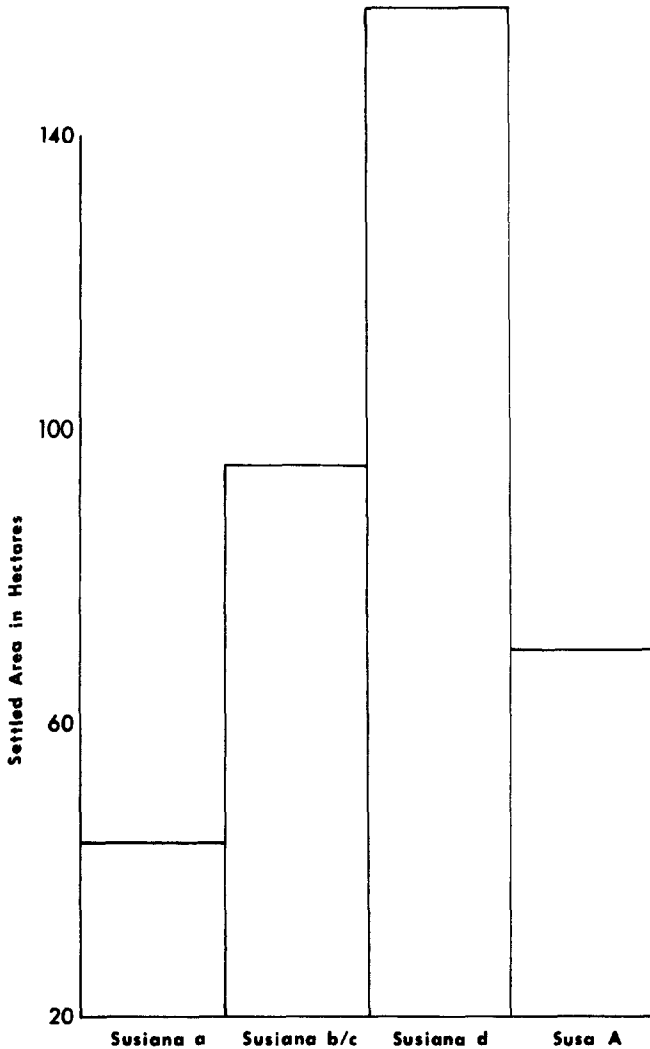
FIG. 7. The total settled area (in hectares) in each period.

use archaeological data to demonstrate, albeit indirectly, that the contexts of use of this pottery, and thus in general terms its message content, remained relatively constant throughout the Susiana sequence. To do this, we must rely on material recovered from secondary refuse, due to the rarity of excavated Susiana material from primary contexts. Since secondary deposits will contain artifacts used in a range of activities performed in many locations, it is not possible to make any direct statements

about the contexts in which the items were used.[4] If, however, the relative proportions of different artifact types remain reasonably constant, we can at least assume that the activities in which they were used were performed with similar frequencies throughout that time.

The data on the proportions of total serving vessels and painted serving vessels in each period, calculated as a percentage of the total diagnostic sherds, are presented in Tables 3 and 4 and Figs. 8 and 9. I have combined sherds of vessels classified as basins, pots, redware bowls, and jars with fire blackening under the heading of food preparation vessels. All non-fire-blackened jars are listed as jars. Bowls, cups, goblets, and plates are combined as serving vessels, the category of particular concern here.

I have included statistics for Tepe Sabz and Tepe Farukhabad, two sites on the Deh Luran Plain to the northwest of the Susiana. The sociopolitical development in Deh Luran, though by no means fully comparable to that in the Susiana, appears to have followed similar lines until the Susa A period when the Deh Luran Plain was nearly abandoned (Hole et al. 1969; Wright 1981). The data from Tepe Sabz and Tepe Farukhabad were included to supplement the otherwise patchy evidence from the Susiana Plain. The Bayat phase is approximately contemporary with Jaffarabad II and the Farukh phase with Qabr Sheykheyn.

A look at the tables and graphs indicates that the proportion of serving vessels in general and painted serving vessels in particular does not vary greatly through time. There are, however, a few specific points which require comment.

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[4] There is, however, a large corpus of primary context material from the level AIII settlement of Tall-i Bakun (Langsdorff and McCown 1942), a site on the Marv Dasht Plain in southern Iran. Level AIII, which is approximately contemporary with late Susiana d or Susa A, shares a similar ceramic tradition with the Susiana Plain. The settlement is composed of a number of building complexes, each with at least three rooms of differing sizes. The smallest rooms were apparently storerooms, an interpretation based on their dimensions, locations, and the occurrence of storage jars which are too large to have been brought through the doorways (Langsdorff and McCown 1942:10–11). The presence of cooking pots, grinding stones, a soot-blackened stone, and animal bones in these rooms (Langsdorff and McCown 1942:15–16) suggests that they may also have been used as kitchens. The range of pottery forms in these storeroom/kitchens includes painted bowls, jars, and cups, as well as plain, fire-blackened pots. Some of the vessels lay upside down or propped on their sides on the floors and so could not have been used for storing other goods but must themselves have been stored in these locations until needed for other uses. At least some of the medium-sized rooms had hearths. Painted jars, painted bowls, and cooking pots are found there. The occurrence of hearths and cooking pots suggests that some cooking was also done in these rooms. In the largest rooms, some of which have small mud benches or platforms, plain and painted cups, painted bowls, and painted jars occur, but cooking utensils are lacking. Thus, serving vessels (cups, bowls, and possibly painted jars) are found in a variety of contexts—in storage for later use, in areas where food was prepared, and in areas where it was probably served and consumed.

TABLE 3
PROPORTIONS OF SHERDS OF SERVING VESSELS, FOOD PREPARATION VESSELS, AND JARS
FROM SEVERAL SITES ON THE SUSIANA AND DEH LURAN PLAINS[a]

Period/site	Serving vessels (%)	Food preparation vessels (%)	Jars (%)
Jaffarabad I (Susiana a)	68	31	1
Jaffarabad II (Susiana c)	75	16	9
Bayat (Tepe Sabz) (Susiana c)	86	8	6
Bayat (Farukhabad) (Susiana c)	70	15	16
Farukh (Farukhabad, Excavation A) (Susiana d)	72	10	17
Farukh (Farukhabad, Excavation B) (Susiana d)	66	14	20
Qabr Sheykheyn (Susiana d)	84	5	12
Sharafabad (Susa A pit)	64	23	13
Susa Acropole sondage (Susa A)	50	17	33
Susa Acropole I[b] (Susa A)	30.5	26	37

[a] These figures have been compiled from the following sources: Dollfus (1975); Dyson (1966); Hole et al. (1969); Le Brun (1971); Weiss (1976); and Wright (1981). The counts from Sharafabad were made by the author from the collections in the University of Michigan Museum of Anthropology.

[b] These percentages, taken from the excavator's report (Le Brun 1971), sum to only 93.5%. The raw counts are not given.

The high value for serving vessels from Qabr Sheykheyn in Table 3 and Fig. 8 is probably due in part to the excavator's system of classification. While all other authors have distinguished basins (large open vessels, seldom painted, which have been included with the food preparation vessels), Weiss (1976) has classified basins as bowls, thus somewhat inflating the category of serving vessels at the expense of the food preparation vessels.

The lower proportion of serving vessels in Susa A is clearly due to the increased proportion of jars in that period (see Table 3). More striking, however, is the tremendous amount of variability in the three Susa A

TABLE 4

SHERDS OF PAINTED SERVING VESSELS AS A PROPORTION OF THE TOTAL NUMBER OF
DIAGNOSTIC SHERDS FROM SEVERAL SITES ON THE SUSIANA AND DEH LURAN PLAINS[a]

Period/site	Percentage of sherds of painted serving vessels (%)
Jaffarabad I (Susiana a)	36
Jaffarabad II (Susiana c)	40
Bayat (Tepe Sabz) (Susiana c)	43
Bayat (Farukhabad) (Susiana c)	30
Farukh (Farukhabad, Excavation A) (Susiana d)	57
Farukh (Farukhabad, Excavation B) (Susiana d)	55
Qabr Sheykheyn (Susiana d)	48
Sharafabad (Susa A pit)	54

[a] The sources are the same as in Table 4 except that the relevant information is not available for the Acropole sondage or Acropole I.

samples. This is probably attributable to the differences in the types of sites from which the samples are drawn. One sample comes from the relatively small (2 ha) site of Sharafabad. The proportions of pottery types in this sample correspond to the figures from earlier periods, all of which are also from relatively small sites. The other two Susa A samples are from different portions of the 10-ha Acropole of Susa, the main center on the plain at this period where considerable internal differentiation is to be expected in activities and corresponding artifact samples.

Table 4 and Fig. 9 indicate that there is a small overall increase through time in the proportion of serving vessels that is painted. This increase occurs rather abruptly between the Bayat (Susiana c) and Farukh (Susiana d) phases and is probably due to the differential layout of painted decoration on pre-Susiana d versus Susiana d and Susa A bowls. In the earlier periods decoration is usually confined to the area just below the rim of the vessel, while in Susiana d and Susa A, many more vessels have decoration covering the entire exterior surface. This is probably sufficient to account for the small-scale difference in proportions of painted serving vessels between the earlier and later periods.
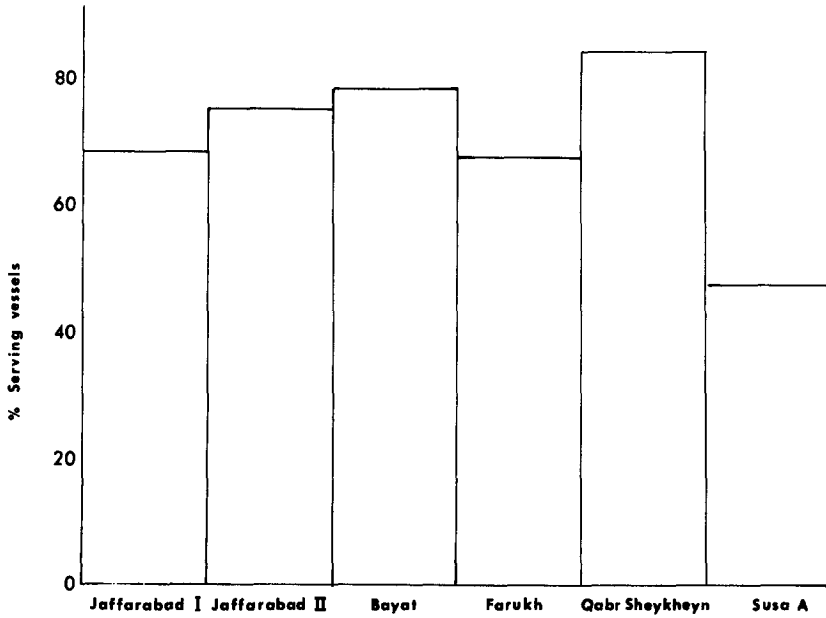
FIG. 8. Serving vessels as a percentage of the total diagnostic sherds. Figures for Bayat, Farukh, and Susa A are averages of all the available samples from those periods. Sources are Dollfus (1971, 1975), Hole et al. (1969), Wright (1981), Weiss (1976), Le Brun (1971), Dyson (1966), and the University of Michigan Museum of Anthropology's collections from Sharafabad.
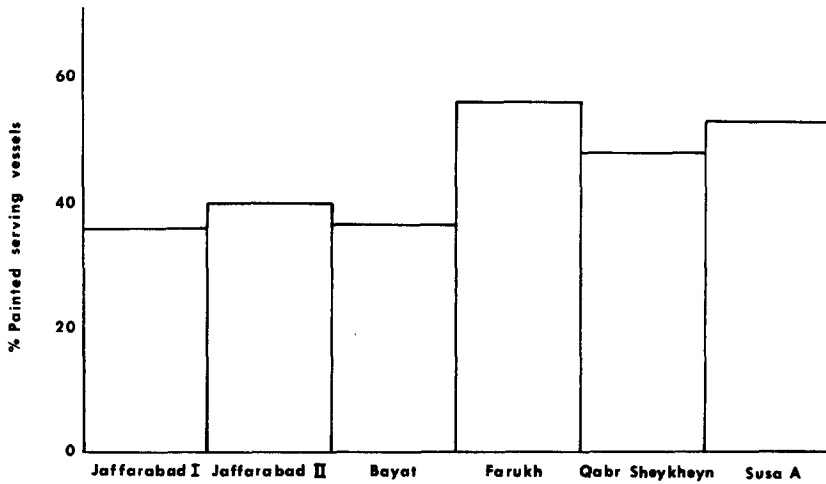

FIG. 9. Painted serving vessels as a proportion of the total number of diagnostic sherds. The figures for Bayat and Farukh are averages. Sources are the same as for Fig. 8, but there are no relevant data for Susa Acropole I or the Acropole sondage (Susa A).

With the preceding comments in mind, we can look again at Figs. 8 and 9 and Tables 3 and 4. With a small downward adjustment of the Qabr Sheykheyn figure for proportion of serving vessels to compensate for the inclusion of basins in that category and a consideration of the Sharafabad sample alone for Susa A, the relative proportion of serving vessels and particularly the proportion of painted serving vessels remain relatively constant throughout the sequence.

In sum, the evidence from the ceramics recovered on the Susiana and Deh Luran Plains indicates that similar proportions of painted serving vessels were used throughout the Susiana sequence. This suggests that the activities in which they were used were performed with approximately the same frequency throughout these periods.

The Ceramics Used in This Study

On the basis of earlier arguments, I have chosen painted[5] bowls as the class of pottery vessels with which to evaluate the previously presented proposition. During the Susiana sequence bowl forms range from deep, hemispherical forms which are painted on the exterior, to wide, shallow types, usually painted just on the interior though sometimes on the exterior as well, to tall, conical to nearly cylindrical vessels, often termed goblets, with exterior decoration only. Only those vessels with exterior painting are included in this analysis because of the small numbers of illustrated bowls with interior painting from the pre-Susa A periods.

Since finds of complete vessels are relatively rare, I have attempted to structure the analysis so that large sherds could be used as well. The criterion for inclusion of a sherd in the analysis was that the full range of design found on the vessel be represented on the sherd—it must be evident, usually through the presence of an unpainted area on the lower portion of the sherd, that there were no further spatial divisions containing motifs on the vessel which were not extant on the sherd.

A motif is considered to be an element or combination of elements which occurs within a spatial division on a vessel and which comprises the full range of variation of element combinations in that spatial division. Differences of orientation alone are not considered to constitute different motifs. Where a motif consists of an element(s) that is repeated two or more times, variation in the exact number of such elements is not considered to define different motifs or more than one occurrence of the same motif. For example, one common motif in Susa A is a horizontal band of birds. This is always recorded as the same motif, whether the band consists of ten birds or fifteen. However, the occurrence of a motif

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[5] Painting is virtually the only form of decoration on Susiana period ceramics.

in different spatial divisions on the same vessel is counted as multiple occurrences of that motif. Thus two bands of birds are counted as two occurrences of the bird motif on that vessel. Spatial divisions may be vertical or horizontal and are marked by one or more painted lines or bands. This definition of a motif is of pragmatic value in that it allows easy identification of motifs and it can be applied uniformly to vessels of all periods. For other pottery assemblages, where spatial divisions are not so clearly demarcated, other defining criteria may have to be used. Fig. 10 illustrates two bowls and the motifs recognized on each.

Table 5 lists the number of vessels or sherds included in the analysis for each period, as well as the total number of motifs recognized. Clearly, the samples of sherds are not large, and no doubt rarer motifs and combinations are missing. When more samples of Susiana ceramics are available, it will be possible to further test the results presented here. It should be noted, however, that the information statistic H is not very sensitive to small changes in probabilities of occurrence of attributes (Quastler 1955:78) and thus the absence of some relatively uncommon motifs as well as some alteration in the frequency with which motifs or motif combinations are found should not substantially alter these results.

Some Expectations for Stylistic Change during the Susiana Sequence

On the basis of the proposition advanced earlier and the evidence presented for sociopolitical changes during the Susiana sequence, one can expect to observe the following changes in stylistic complexity during the Susiana sequence, as measured by redundancy and the information statistic H.

The high level of settlement integration and the presence of a clearly paramount center in Susa A as well as what we know of this period from excavations combine to indicate the existence of a distinctly stratified

TABLE 5
THE NUMBER OF ELEMENTS (MOTIFS), NUMBER OF VESSELS, TWO MEASURES OF REDUNDANCY, AND THE INFORMATION STATISTIC H FOR EACH PERIOD

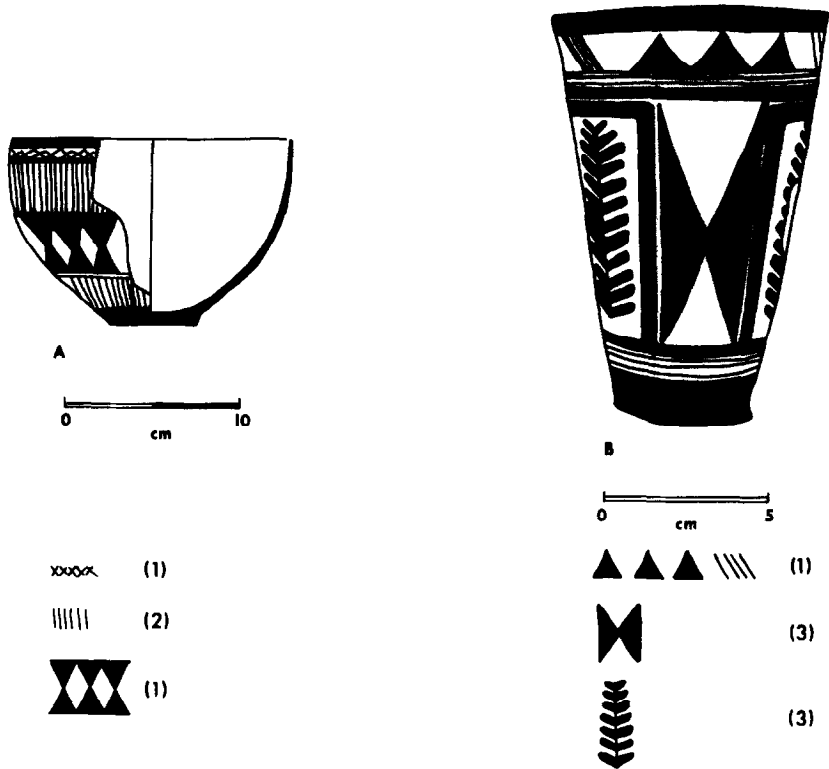| Period	Number of vessels/sherds	Number of motifs (k)	H	Redundancy (H-based)	Redundancy (Tainter's statistic)
Susiana a	81	43	5.15	0.216	0.453
Susiana c	56	37	5.35	0.289	0.528
Susiana d	84	70	5.93	0.256	0.508
Susa A					
Bowls	41	39	5.63	0.525	0.670
Goblets	64	61	6.17	0.785	0.808

FIG. 10. An illustration of two Susiana vessels and the motifs distinguished on each. Vessel A is a Susa A bowl (966.27) from Jaffarabad (redrawn after Dollfus 1971:Fig. 11). Vessel B is a Susa A goblet (12535) from the Susa Nécropole (redrawn after Pottier et al. 1912:Pl. VII).

society in Susa A. On this basis, we can expect to find a category of prestige-related vessels which will exhibit a high level of redundancy in their painted designs. The situation in Susiana b/c is problematic because of the conflation of periods in the settlement analysis but not in the ceramics analysis. However, the maximum degree of sociopolitical complexity reached during this period of time was probably achieved in Susiana c, given the full occupation of the main center of Chogha Mish at this time (Kantor 1976:177). One might therefore expect to find a category of high prestige vessels with a relatively high level of redundancy in design, although somewhat lower than in Susa A. Susiana a and d are expected to have low levels of redundancy relative to Susiana c and Susa A.

Based on the increase in horizontal complexity from Susiana a to b/c, the value of the information statistic is expected to increase. There should

be a further increase in Susiana d because of the increase in horizontal units as indicated by the large-scale expansion in settlement. Finally, the value of H in Susa A should be lower than that for Susiana d due to the decrease in horizontal complexity.

Results of the Stylistic Analysis

Table 5 presents the values of the H statistics and two measures of redundancy for the samples from each period. First let us consider the changes in redundancy.

Although the difference in magnitude of the two measures of redundancy is striking, we can, for present purposes, ignore these absolute differences. Both measures indicate a major increase in Susa A relative to all previous periods. The high level of redundancy in the Susa A ceramic sample is suggestive of the existence of distinct categories of sumptuary and "ordinary" vessels, as discussed previously. This is supported by the existence of two distinct shape categories of Susa A bowls with exterior painting. One type is deep and hemispherical (with rim diameter to height ratios greater than 1:1), while the other, usually called goblets, includes taller and more nearly cylindrical pieces (with rim diameter to height ratios less than, or equal to, 1:1). These forms occur in different contexts archaeologically. Nearly all (91%) of the goblets in the sample used in this study are from the high-status Nécropole burials, while relatively few of the bowls are (24%). Painted goblets are also found at Sharafabad and Jaffarabad and in other contexts at Susa but in relatively small quantities (9% in Acropole I, 6% at Sharafabad). They are thus not burial specific,[6] but they do appear to be high-status related.

Susa A bowls do not appear to be primarily prestige-related items. They have a markedly lower degree of redundancy than Susa A goblets. Furthermore, goblet and bowl designs have only nine motifs in common, while the other 82 Susa A motifs occur with one class of vessels or the other. Thus, Susa A goblets and bowls fulfill the expectations for prestige and "ordinary" goods, respectively. The relatively high level of redundancy of Susa A bowls with respect to bowls of other periods may indicate that there is a further division between vessels associated with higher and lower prestige within that category. However, this possibility cannot be adequately evaluated with the available (rather small) sample of bowls.

The Susiana a, c, and d samples exhibit low measures of redundancy

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[6] It is notable, however, that many of the adult burials in Nécropole were apparently secondary interments, with the long bones being placed in a goblet (Mecquenem 1928:100;1943:5).

relative to the Susa A sample. There is evidence for a goblet–bowl dis-
tinction beginning in Susiana c, but a large proportion of the painted
examples have the same, very simple motif consisting of parallel vertical
lines (Dollfus, personal communication; see also Dollfus n.d.). Thus,
there is no evidence that the goblet represented a separate, prestige-
related form prior to Susa A. Of the three samples, Susiana c does exhibit
the highest degree of redundancy, as expected. However, given the evi-
dence for a degree of sociopolitical organization only somewhat less com-
plex than in Susa A, it is surprising that the values for redundancy in
Susiana c are not higher and that there is little evidence for a separate
class of prestige-related vessels. This may be in part a sampling
problem—many of the illustrated sherds with what appear to be more
complex designs are too fragmentary to be included in the analysis (see
Dollfus n.d.). This has been much less of a problem in the other periods
for which many more complete or nearly complete vessels are reported.

Let us now consider the H statistics for the bowls of each period. Susa
A bowls may be compared with Susiana a, c, and d bowls, but Susa A
goblets cannot, because they represent a distinct level of symbolic com-
munication which is not directly comparable with other levels.

Susiana d bowls have the highest value of H. Susa A bowls have the
next highest value, followed by Susiana c and, last, Susiana a. On the
basis of previous arguments, the higher H in Susiana d should indicate
the existence of more horizontally differentiated units in this period than
in the other periods. The results of the analyses of the settlement pattern
data support this interpretation for Susiana d. The decline in Susa A is
also expected on the basis of the settlement pattern analysis as is the low
value for Susiana a. The value of H for Susiana c is perhaps somewhat
lower than expected, relative to Susa A, but, once again, the combination
of Susiana b and c for the settlement pattern analyses has doubtless
inflated the measure of horizontal complexity for that period.

CONCLUSIONS

In this research, I have tried, following Wobst, to demonstrate that it
is useful to treat style as a mode of communicating social messages. When
viewed from this perspective, style is susceptible to study in much the
same framework as other material manifestations of human social be-
havior, rather than being relegated to the position of some largely inexpli-
cable, randomly varying phenomenon. Based on the relationship be-
tween stylistic communication and processes of boundary maintenance
among social groups and identification with these groups, a general re-
lationship between stylistic and sociopolitical complexity has been pos-

ited. I have argued that, in general, the complexity of stylistic messaging will increase as sociopolitical complexity is augmented. In addition, I have proposed that the way in which stylistic complexity changes will depend on whether the sociopolitical change represents a change in vertically or horizontally related units.

I have attempted to test this proposition using painted pottery bowls from Susiana sequence sites. Problems relating to inadequacies in the available data have made evaluation of the test results from the Susiana b and c periods difficult. However, the analysis provides some support for the proposition that in a more vertically complex sociopolitical organization, there will be an increase in the redundancy of stylistic embellishment on some items. Specifically, I have proposed that the florescence of painted goblets in Susa A is related to the presence of a distinctly stratified society at that time whose elite could support the costly production of fancy pottery which symbolically reinforced their high-status positions through the stylistic messages it conveyed. The lack of evidence of a class of prestige-related vessels in Susiana c and the somewhat lower-than-expected level of redundancy may be due to sampling problems. The proposition that changes in horizontal complexity of sociopolitical organization will produce concomitant changes in the information content of stylistic messages has also received some support.

It is clear that there are a variety of weaknesses in the data set on which this analysis has been based, and it is perhaps best to view the results as illustrative rather than as a definitive test. Nonetheless, the Susiana sequence provides, if not a unique, at least an unusual source of data for this kind of study. As additional excavation and survey material is published, in particular the excavations at Chogha Mish, which span the entire Susiana sequence, it will be possible to supplement both the sociopolitical and ceramic data to permit a more conclusive evaluation of the propositions put forth in this paper.

ACKNOWLEDGMENTS

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