CERAMIC ETHNOARCHAEOLOGY

EDITED BY WILLIAM A. LONGACRE

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Preface

This book grows out of an advanced seminar that was sponsored by the School of American Research, March 24–30, 1985. The seminar, "Social and Behavioral Sources of Ceramic Variability," had as participants ten scholars from the United States and England. The participants were William A. Longacre, chair, Department of Anthropology, University of Arizona; Warren DeBoer, Department of Anthropology, Queens College, City University of New York; Michael W. Graves, Department of Anthropology, University of Hawaii; Margaret Hardin, Department of Anthropology, Los Angeles County Museum of Natural History; Ian Hodder, Department of Archaeology, University of Cambridge; Carol Kramer, Department of Anthropology, University of Arizona; Gloria London, University of Washington; Ben A. Nelson, Department of Anthropology, State University of New York at Buffalo; Sander van der Leeuw, Department of Archaeology, University of Cambridge; Raymond H. Thompson, Arizona State Museum, University of Arizona.

All of the participants have undertaken field studies among living societies with a focus upon pottery. Ceramic ethnoarchaeology, then, was the focus of our seminar and is the theme of this book. We feel that identifying the sources of ceramic variation holds great promise for archaeological interpretation.

The mixed focuses of the chapters that follow point to the extraordinary diversity of ceramic variation and its causes. We can barely touch upon a small portion of this diversity. But we can reveal the richness of pottery as a source of archaeological inference, and it is the basic purpose of this volume to contribute to the strengthening of the process of archaeological interpretation.

We are grateful to the School of American Research, Douglas W. Schwartz, president, for supporting the advanced seminar in Santa Fe, a most stimulating week. The staff of the school provided support and assistance in all matters, great and small. We particularly thank Jonathan Haas, director of programs and research, and Jane Kepp, director of publications. As editor, I would also like to thank the anonymous outside reviewers for their helpful and constructive suggestions.

Although the advanced seminar was held in 1985, very little additional ceramic ethnoarchaeological fieldwork has been conducted since then. We hope the following chapters will stimulate a renewal of such research. The book evidences the great potential of such studies for the strengthening of archaeological inferences.

William A. Longacre

Ceramic Ethnoarchaeology

1

Ceramic Ethnoarchaeology: An Introduction

William A. Longacre

Studies of contemporary pottery-making and pottery-using societies by archaeologists were initiated about 1880 in the southwestern United States. Since about 1965 there has been a resurgence of fieldwork among living societies by archaeologists, generally referred to as ethnoarchaeology. The return of such field studies after a lapse of some fifty years calls for explanation. Likewise, the profusion of such research since 1975 and the growing number of publications reporting the results raise important methodological and theoretical issues.

My purpose here is to present a brief overview of ceramic ethnoarchaeological studies, placing current research into historical perspective and discussing certain problems of both method and theory. Additionally, I will point to some of the more important results of such research and identify areas of needed work.

Let us begin by defining the term "ethnoarchaeology." As far as I can find, the term was coined by J. W. Fewkes in 1900 when he referred to himself as an "ethno-archaeologist." Since then there have been a number of definitions offered and not a few synonyms, including "action archaeology" and "living archaeology." For me, ethnoarchaeology is the study *by archaeologists* of variability in material culture and its relation to human behavior and organization among extant societies, for use in archaeological interpretation.

Note that I emphasize that the research (fieldwork, analysis, and presentation of results) is undertaken by archaeologists. This is not to dismiss the contributions of ethnographers to material culture studies; just consider the major source of "ethnographic analogy" in archaeology since 1880. But I agree with Patty Jo Watson (1980) that, with certain notable exceptions (Balfet, Foster, and Pastron, among others) ethnographers tend not to collect the systematic and quantitative data necessary to archaeological interpretation.

But we should not expect ethnographers to collect such data for archaeologists, and not simply because they are not interested. Ethnographers are generally not trained in the analysis of material culture as archaeologists are. They are not, therefore, as sensitive to the subtleties of variability in material culture so important to the archaeologist.

We can trace the antecedents of anthropological archaeology in the United States to the last quarter of the nineteenth century, although its roots may have been much earlier. One of the hallmarks of this approach was a central concern with the behavior and organization of past societies. The goal was not only achieving the means for describing past behavior and organization but also developing an understanding that would permit the explanation of processes of change and stability in classical evolutionary perspective.

During the late nineteenth century, archaeology was viewed as a means for extending ethnology into the past. Most of the anthropological work of this era was conducted in the American Southwest and was focused upon various Puebloan peoples in the area. The aim of these early investigations was twofold: (1) to describe the organization and behavior of these contemporary Native American societies, and (2) to understand the historical development of the institutions and behavior of these peoples through the archaeological study of their past.

These early workers include Fewkes at Hopi (e.g., 1900) and Cushing at Zuni (e.g., 1886) and the Mindeleff brothers, Victor and Cosmos (1900), working in both areas. To solve questions about the nature of the development of "Puebloan society" in the past, workers such as these made simplifying assumptions about the relations between aspects of material culture (especially architectural patterns) and social institutions and behavior. They investigated these relationships among the contemporary societies and then used their observations as a means for interpreting the past (e.g., Mindeleff 1900). Both Cushing and Fewkes emphasized design symbolism in Zuni and Hopi pottery as an aid to archaeological inference.

These early workers were not academically trained in anthropology, and their pioneer attempts to infer aspects of organization and behavior from prehistoric material remains seem simplistic today. But the kinds of questions that concerned them did focus attention upon important nonmaterial aspects of past societies. To answer those questions, they pioneered the method of ethnoarchaeology and used the results to strengthen their inferences. Elsewhere in the world, similar approaches were being employed (e.g., Mitchell 1881).

With the appearance of the first anthropologically trained archaeologists after about 1910, there was a major shift in the direction of prehistoric investigations. Taylor (1954) describes the period from about 1910 to 1925 as the time-space revolution in the history of American archaeology. There was a new, systematic emphasis on defining prehistoric cultures and placing them in time and space that is best understood within the context of the post-1900 impact of Boas and the development of "historical particularism" in American anthropology (Darnell 1969).

For nearly fifty years, anthropological archaeology continued to be dominated by this theoretical stance, ignoring the exciting changes in American anthropology during the 1930s and 1940s. There is no discernible impact on archaeology of the rise of "structural-functionalism" or ecological studies that became increasingly important in anthropology during this era (e.g., Radcliff-Brown 1952; Steward 1937).

It is useful to note that during those fifty years archaeologists turned from the study of extant societies and relied upon ethnographers for ethnographic information. Their focus was upon "filling in the gaps" in our understanding of the historical development of prehistoric cultures all over the world. There are only one or two exceptions to note and, interestingly, most occurred in the Maya area (Dillon 1984:3; Wauchope 1938).

Over those decades, archaeology increasingly became out of step with the theoretical developments in anthropology, a situation leading to discomfort within the discipline. The scathing reviews of this situation by Kluckhohn (1940) and Taylor (1948) set the stage for major changes in direction for archaeology after 1950. The impact of such evolutionary theorists as Steward is discernible in the rise of "settlement archaeology" pioneered by Willey in the Viru Valley of Peru. The 1950s was a time of flux as archaeologists began to return to a concern with social institutions through settlement pattern studies (cf. Willey 1956) and other archaeological approaches (Martin and Rinaldo 1950:556–569). It comes as no surprise that it is in this context that we see a reemergence of ethnoarchaeology.

Insofar as I can find, the first urging of ceramic ethnoarchaeological research and the publication of some results in this period were by the English archaeologist Crawford (1953) on the basis of his experience in East Africa. This was followed by the well-known call for "action archaeology" by Kleindienst and Watson (1956). The first monograph reporting ceramic ethnoarchaeological research of this period was Thompson's study of modern Mayan pottery making (1958).

Concomitant with the rise of the "new archaeology" after 1960, the pace of ceramic ethnoarchaeological studies quickened. During the 1960s and 1970s, a number of well-known projects were initiated. These include David's work among the Fulani, Stanislawski's studies of Hopi-Tewa potters, Hardin's work with Tarascan Indian pottery in Mexico, White's research in New Guinea, Lathrap's study of Shipibo-Conibo potters, and DeBoer's work with the same group in Amazonia. My own research with the Kalinga in northern Luzon was begun in 1973. Hodder initiated work in East Africa along with a number of students in the 1970s, and Arnold was doing important work in Mexico and Peru.

By the 1980s, some of these projects were continuing, and many more had been initiated all over the world. Hardin was working with Zuni potters in New Mexico, and Kramer had launched a major ceramic ethnoarchaeological project in northern India. London was studying full-time pottery craftspeople in southeastern Luzon, and van der Leeuw had begun a similar project on Negros Island in the Philippines. Graves published an important study of designs on Kalinga pottery in 1981. Allen was studying a major ceramic exchange system in Papua New Guinea. Krause was working with potters in South Africa. Both Nelson and Deal were studying traditional Maya communities in Guatemala. This book presents the results of some of these projects developed in Santa Fe at an advanced seminar sponsored by the School of American Research. We focus on identifying social and behavioral sources of ceramic variation in societies all over the world.

It is perhaps time to examine the growing corpus of ethnoarchaeological work critically, applying the same standards that we use for modern archaeological research. Indeed, there are two aspects in the creation of a modern archaeological project that are deemed essential: a research design and a sampling design. Both of these are intertwined, of course, and are difficult to separate.

But we can examine ethnoarchaeological research from that perspective, and when we do, a number of interesting things emerge. This, in turn, allows us to classify such projects in instructive ways. Let us first examine the special aspects of developing a research design for ethnoarchaeological research.

Goodyear, Raab, and Klinger (1978:161) defined an archaeological research design as ". . . an explicit plan for solving a problem or set of problems. It is a plan that must contain theoretical goals in the form of a specific problem or hypothesis, relevant analytical variables, and specification of data that will allow empirical testing. To be complete, the design must lay out the methods and techniques for acquiring and analyzing the data and predict the expected outcomes of the analysis." Although they thought of this definition for archaeology, we can usefully adopt it as a means for assessing ethnoarchaeological research as well.

It seems to me that the most fundamental aspect of designing ethnoarchaeological research is the selection of a society to study. That selection must be guided by the nature of the problem or set of problems the archaeologist wishes to investigate. Obviously, the investigator must determine the most appropriate society with which to work, and the appropriateness must be gauged on the basis of the problem to be investigated.

Given this, there would seem to be three logical outcomes for ethnoarchaeology: (1) careful selection of what seems to be the most appropriate society to work with, given the research problem of interest; (2) selection of a society probably not appropriate to the particular problem; or (3) selection of a society that may or may not be appropriate. A variation of the latter type is the selection of a society first, followed by the formulation of suitable problems to be investigated.

In these last cases we have examples of what I call "fortuitous ethnoarchaeology." Let me emphasize immediately that it does not follow that such studies are necessarily weak or without value. But it obviously reduces the prior probabilities that such a fortuitous selection will target the most appropriate society with which to investigate a particular research problem. Many of the best-known examples of ethnoarchaeology in the literature involve archaeologists who were in an area conducting archaeological research and took advantage of the proximity of an extant society to undertake ethnoarchaeological research. Of course, one way to rationalize fortuitous selections of this sort is to appeal to the direct historical approach. Such arguments suggest that somehow the contemporary societies, as the end products of historical cultural development in the same area, will have more "relevance" to interpreting the region's prehistory.

This argument is at home in the notions of Boasian anthropology that guided American archaeology after about 1920 (e.g., Strong 1935). Gould makes the same argument by raising the distinctions between what he calls continuous and discontinuous models (1974:38–39). (For some telling criticisms of these arguments, see Binford [1983b:7–8].) He seems to have abandoned these notions (Gould 1978a), perhaps influenced by the arguments of Schiffer (1978) and others who see cross-cultural general principles as the most powerful outcomes of ethnoarchaeology for strengthening archaeological inference.

Intimately tied to the research design of contemporary archaeology and ethnoarchaeology is the development of an appropriate sampling strategy. For the ethnoarchaeologist, the development of an effective sampling design is doubly difficult, as we shall see. Since about 1970, there has been increasing concern with and action on sampling problems in archaeology. As prehistorians began to turn to powerful techniques of statistical inference, especially those which are computer assisted, they became ever more sensitive to the fundamental role that a proper strategy for sampling plays in all aspects of archaeological research. We gradually became aware that appropriate sampling, rooted in probability theory, is the sine qua non for quantitative analyses. Indeed, today we have numerous articles and not a few books devoted to exploring these issues in archaeology (e.g., Mueller 1975; Redman 1974).

For ethnoarchaeology, the situation is compounded because we are faced with two dimensions of variability that we must sample. On the one hand, there is variation in social organization and behavior that must be identified; such information forms the basis for designing a sample of the society itself. On the other hand, there is the variability in material culture that this behavior produces. It would be folly for the ethnoarchaeologist to ignore either of these critical dimensions of variability.

Yet to control them to the point where a reasonably effective sampling plan can be devised, a commitment to long-term fieldwork must be made. From my own experience among the Kalinga, I would submit that a minimum of one year is required. If we turn to the published accounts of ethnoarchaeological projects, several things are readily apparent. Unlike contemporary accounts of prehistoric research, there is virtually no discussion and, therefore, one can assume, no concern with probability sampling in either dimension.

One is also struck by the lack of quantified data that should be presented to support various inferences and conclusions in many reports. This situation may well be one outcome of "fortuitous ethnoarchaeology"; one cannot collect much data in the space of a few weekends of fieldwork. Since the problems of sampling seem largely to be ignored when amounts of quantified data are presented, one has to evaluate the data carefully to assess their dependability.

Even with all of these difficulties, there are some important and useful results of ceramic ethnoarchaeological studies that I can cite. These results seem to have cross-cultural validity, although more cases have to be examined to assess their strength.

Ceramic use-life is one example. We now have quantitative data from a number of societies. Although the actual use-life varies widely from group to group, ranging from a few months to a number of years, one generalization is clear: Of pots in regular use, the smaller the vessel, the shorter its use-life. This has obvious import for the archaeologist attempting to refine seriations of prehistoric ceramics.

The amount and variety of pottery in a household varies widely from case to case. The quantity of pottery does not seem to have much to do with the size of the domestic unit. There are some indications that wealth and status differences account for some of the variation; wealthier families on average have more pots. The number and kinds also seem linked to the technology of food preparation and cooking. As Nelson points out (see Chapter 8), the wet processing of corn among the Maya requires a number of different types of pots, in contrast with the dry grinding of corn among the Tarahumara, whose households have far fewer pots.

In a market system, the households in pottery-producing towns seem to have, on average, fewer pots than households in pottery-consuming villages. This is especially noticeable for those types of pots which have short use-lives.

Microtraditions of decoration reflecting learning frameworks among the Kalinga are only weakly evidenced. In his analysis, Graves (1981, 1985a) was able to document a much more pervasive pattern between design similarity and the birth cohort of the potter. In societies where teaching pottery making is a more formal enterprise, as at modern Zuni (see Chapter 3) and among the Conibo-Shipibo, learning frameworks are more strongly reflected in ceramic decoration.

Van der Leeuw argues (see Chapter 2) that the main focus of research should be the ancient potters, ancient pottery, and the behaviors of the users of that pottery. In a wide-ranging essay, historical and theoretical in nature, he explores both the positive and the negative aspects of major theoretical positions in archaeology and, in particular, in the study of pottery. He argues that exploring all the choices open to particular potters holds the greatest promise in trying to understand why particular choices were made.

Hardin's essay (Chapter 3) explores pottery making among the modern Zuni Indians of New Mexico. She became interested in just how the Zuni define "Zuni style" as she worked with a collection of Zuni pottery more than a century old. She identifies interesting insights into style as a by-product of her research among the contemporary Zuni. She also reports the obvious impact of the teacher/expert on the "student" in a formal learning tradition of pottery making.

Ian Hodder argues (see Chapter 4) that most approach the doing of ethnoarchaeology "from the outside" and, thus, arbitrarily search for cross-cultural correlates. He suggests that we situate ceramics within their own context of meaning. He evokes structural principles, such as power, as well as oppositions (male vs. female; dirty vs. clean) to explore the meaning of decoration. His structuralist-symbolic standpoint provides a very stimulating point of departure for viewing decorated containers in tribal societies in East Africa.

The chapters on Kalinga pottery from the Philippines (see Chapters 5 and 6) explore sources of ceramic variation at several levels. Variation in individual pots, some conspicuous and some subtle, is the focus of Chapter 5. In Chapter 6, Graves explores household assemblage variability in several Kalinga villages; this chapter can be compared with Nelson's discussion (see Chapter 8) of Maya pottery.

DeBoer (see Chapter 7) raises the intriguing issue of the pervasiveness of an art style and the implications for rates of change in that style. He notes that the Conibo-Shipibo style pervades much of their material culture, in contrast with the decorative styles of the Chachi. Among the latter, there are different styles of decoration for different media (ceramics vs. textiles, for example). He predicts a higher rate of stylistic change for the Chachi and explores the archaeological implications.

Two chapters focus on pottery in complex societies. London (see Chapter 9) demonstrates the feasibility of identifying individual potters among crafts specialists. She makes this argument from her ethnoarchaeological project in the Philippines and also applies the approach to prehistoric pottery (London 1985).

Kramer (see Chapter 10) explores ceramic variation in complex urban societies in India, reporting on fieldwork in two Indian cities. These two urban centers are different in size and function, and have different arrays of ceramics and supply source characterizations. Kramer argues that behaviorally significant differences between complex settlements of large but differing size may be archaeologically visible in ceramic analyses of prehistoric materials.

Thompson (see Chapter 11) explores the place of ethnoarchaeology in archaeological interpretation. He is especially concerned with ethnographic analogy, emphasizing the relative strength of differing kinds of analogy and suggesting that regional ethnoarchaeology may provide the strongest form of analogy for understanding the prehistory of a region. Unfortunately, for most archaeological regions of the world there are no extant appropriate societies to study.

Some archaeologists argue that the use of analogy is simplistic and is often incorrect. The authors of the following chapters agree largely with Watson (in Gould and Watson 1982) and especially with Wylie (1985), who show how analogical reasoning is fundamental to archaeological interpretation. We further argue that general analogies are more likely to be of broad use than is specific analogy. The focus of the chapters that follow reflects these beliefs.

This volume reports some of the results of ceramic ethnoarchaeological studies undertaken in a number of societies in various parts of the world. But we need more cases to strengthen our generalizations. And the number of pottery-making societies is declining rapidly. For example, in 1965 there were a number of such groups in the island Pacific; today only one group on Fiji continues to make pottery.

We can expect similar trends elsewhere in the world. Surely, in just a few more generations, we will lose all such societies throughout the world. If we and our students do not undertake ethnoarchaeological research soon, future archaeologists will wonder how we could have been so shortsighted. In that spirit, let me make a second call to action archaeology—a call with some urgency in the 1990s, because if we wait much longer, it will be too late!

2

Variation, Variability, and Explanation in Pottery Studies

S. E. van der Leeuw

"They Put 'Em Together, We Take 'Em Apart": An Introductory Story About Potters and Ceramicists

This chapter stems essentially from my own experience as a potter since about 1970, and from working with a number of potters (both Western and other). It is notably concerned with the observation that, from the very beginning, collaboration was complicated by a very serious difficulty in translating the language of the potters into the kind of terminology acceptable in scientific discourse, even when both the potter and I spoke the same native language.

A very simplified example (also discussed in van der Leeuw, in press) would go as follows. I would ask the potter, "Is this crack in the bottom of this pot due to lack of nonplastic material in the paste?" The answer would be an unconditional "Yes." A little later I would ask, "Is this crack in the bottom of this [identical] pot due to the technique used?" Again, an unqualified "Yes." Some time later, I would remark on another crack in the same place in the products of the same potter, and would tentatively attribute it to the vessel's shape. Again, the answer would be an unmitigated affirmative.

On a number of occasions I attempted to rewrite contributions of one of the potters with whom I had worked closely for several years. My results would in their eyes be too simplistic, not taking account of a possibly large number of variables (which they had not specified, and which not all could specify upon request).

After considerable doubts and soul-searching, I came to the conclusion that it was not my knowledge of possible variables that was lacking (all the suggestions proffered by the potters were as well known to me as they were to them), but that I had a general tendency to be too definite, too causal, too circumscript in my description of variables and their effects. The mention of an effect would, as it were, trigger a host of potentially associated variables in the mind of the potter, some of which were mentioned and some of which remained unspoken. The potter would not decide between any of these. He or she would not attribute specific causalities. Or, to put it in other words, the category "cause" remained open-ended in the potter's mind, whereas, because of my training, I tended to close that category by attributing effects to any (definite, but possibly large) number of variables. This conclusion has since been reinforced by some ethnographic fieldwork in other parts of the world, as well as in discussions with colleagues (van der Leeuw 1989) and by some forays into the literature.

The crucial point seems to be that potters are essentially concerned with creation and with actions, while scientists are more analytical, describing these actions in words and searching for their significance. As a result, these two groups look at pottery in different ways. Actions, unlike words, exist in many dimensions at the same time. They are poly-interpretable. The artifacts that result from these actions also exist in an infinite number of dimensions at the same time. Any artifact, in this perspective, exists because it has a positive existence in all the relevant dimensions at the same time. If that sounds abstract, an example may clarify. Pots materialize when it proves possible to articulate certain ideas (shape, function, "gestalt" if you wish) with certain substances (clay, temper, water), certain technologies (of shaping, finishing, drying, firing), and so on. Each of these may be seen as a separate dimension. In each dimension, certain things are possible (combinations of raw materials, for example, or certain sequences of manufacturing steps) and others are not. Only when all dimensions crosscut at a point where "things are possible" (i.e., where there is a positive existence) can the pot be made. Needless to say, the potter and/or user of the pottery may be unaware of some of these dimensions (aesthetic sense, for example). Creating a certain pot, therefore, is dependent on more dimensions than can be perceived with the analytic mind. Any analysis at most encompasses part of the reality of the pot, and you never entirely know which part. I will return to this aspect of the problem.

In thinking about these matters, awareness of another aspect of this difference between the potter's perception and the scientist's proved to be crucial. The potter's is directed toward creating objects, that is, toward thinking about the *future,* about results of actions to be undertaken, about possibilities. The researcher's perspective, on the other hand, is concerned with finding explanations for phenomena that have already occurred. It is directed toward the past, toward things definite. The former is trying to *predict,* while the latter is trying to *explain.* Although explanation and prediction may therefore seem functionally symmetrical, they will never achieve true symmetry. *Re-creating the past from the vantage point of the present is a paradox.*

Archaeologists and historians have generally ignored that paradox and the directionality of perception which is responsible for it. If they are to realize their avowed aim of reconstructing past decision making, they will have to stop *looking back* from their present position in time, trying to recognize in the past patterns that are observed in the present. *They will have to travel back* in time and *look forward* with those whom they study. Instead of reconstructing origins, they will have to re-create innovation (van der Leeuw 1989, 1990). The change required is a fundamental and encompassing one, involving their entire outlook—a paradigm shift not less in scope than that which followed the introduction of quantum mechanics in the sciences.

This chapter argues that this is a very fundamental change; rather than work with closed categories (types), we must learn to think in, and work with, open-ended, fuzzy categories (Zadeh et al. 1975); rather than use a determinist causal logic, we must develop a possibilist logic based on observed synchronicity or contingency (Monod 1970; Olsson 1979; McGlade and McGlade 1989); rather than basing our scientific procedure on abstracting from the data in successive steps that look for similarities between them, we must develop a "contrastive approach" that aims at seeing more and more dimensions of variability rather than fewer and fewer (cf. van der Leeuw 1987), and that may lead to proximal explanations involving individuals and individual phenomena rather than aggregates.

Two Modes of Perception

First, I would like to explore further some of the implications of the distinction between the two modes of perception I have just made, both to establish the distinction more firmly and to highlight some of its implications for archaeology. To facilitate that exploration, I have prepared a table of associated oppositions (Table 2.1). A discussion of some of these, but not nearly all, is all that the present format permits.

I hope it will become clear in the following pages that archaeology has relied almost exclusively on the analytical approach, and that for an optimal understanding of the past, a more consciously balanced use of both approaches is essential.

Reality, Models, and Epistemology

Implied by the (re-)creative mode is an alternative to the search for the (one) truth for which we have so long striven in (neo)positivist archaeology. Rather than replicate past reality as closely as possible, in the hope that it will therefore be able to explain "everything," the (re-)creative approach acknowledges that building a wide range of models of the behavior of, for example, ancient potters, ancient pottery, and the behavior of the users of that pottery is a more valuable focus.

These models may be known but the phenomena can never be known, if only because the vastness of the number of dimensions implies that all knowledge must remain incomplete. One could say that analytically most energy is spent in trying to assure an epistemologically sound status of the knowledge acquired and the explanation offered, while the (re-)creative position acknowledges fundamentally that all that energy is spent in vain, because the aim cannot be achieved. Thus, the focus is on generating multiple models that help an essentially intuitive capacity for insight to understand the phenomena studied.

Subject-Object Relationships

The (re-)creative mode also implies very different subject-object relationships (van der Leeuw 1982). Since it is acknowledged that the "real world" cannot be known, the object with which the archaeologist or ceramicist has to cope is no longer the real world but his/her own perception of that world. Thus, relationships are added to those among ceramicist, pots, and potters, that is, those between the ceramicist and his/her perceptions of, respectively, the pottery and its makers/users: the ceramicist's subjectivity is acknowledged and taken as the basis of all understanding, even if the methodology involved is a scientific one.

This change in perspective seems to be of crucial importance, because it loosens the (implicit and usually unconscious) tie between the models used and the observed real world. It brings the awareness that models are both more and less than the reality we strive to perceive. Clearly, we have to acquiesce in this because they are all we will ever be able to work with. Yet this opens up the potential to do much more with them than we have hitherto thought. One area in which this is extremely clear is experimental archaeology. Under the analytical approach, experimental archaeology essentially conducted what I would call replicating experiments, experiments directed at realizing in the present processes thought to have occurred in the past. The basic underlying assumptions are (a) that there is only one process which will arrive at exactly the same result as the one observed, and (b) that that process can be (and is) exactly known. Since these assumptions are not accepted in the (re-)creative approach, the aim of experiments in that epistemological context is, rather, to discover hitherto unknown variables, relationships, or values by deliberately not replicating but by studying what is different when different values are given to the known variables.

Atomism and Holism

That archaeology's early approach, dominated by defining individual entities such as types, cultures, and culture areas, was atomistic hardly needs any further comment. In my opinion, the subsequent stress on systems did not fundamentally change our position in this respect, it only made the entities larger and opened the way to description of what occurs within them in dynamic terms.

Recently we have become aware of problems with this approach. O'Shea, for example, aimed to define the concept "tribe" (another "atom") in a considerable number of dimensions. As the project got under way, it became increasingly clear that, although

TABLE 2.1. Modes of Perception

(Re-)creative Perception	*Analytical Perception*
simultaneous	sequential
matching phenomena by appearance	matching phenomena by function
nonverbal	verbal
spatial	temporal
analog	digital
"Gestalt"	logical
synthetic	analytical
intuitive grasp ("understanding")	rational grasp ("explanation")
multidimensional perception	unidimensional perception
possibilistic logic	causal logic
relates to material substrate (things)	relates to energetic substrate (words)
a priori approach	a posteriori approach
real-world phenomena are theoretically knowable, only models are knowable	real-world phenomena are theoretically knowable, and models are abstractions
holistic: whole universe is interconnected	atomistic: the universe is divisible into separate (sub)systems
concerns relations between (sub)systems	concerns (sub)systems independently
"change is"	"change transforms"
time is relative	time is absolute
developments diverge; complexity increases	developments converge; complexity remains the same or decreases
study of the creation of new relations and interactions; amplification network	study of established relations and interactions; genetic code, tradition
genesis is through slow process ("condensation theory," theory of self-structuring flows)	genesis is through sudden events ("big bang" theory, catastrophe theory)
information is (infinite amount of) potential meaning	information is (finite amount of) meaning
focus on rules to generate information	focus on stored information

TABLE 2.1. (continued)

(Re)creative Perception	*Analytical Perception*
focus on symbiosis and complementarity	focus on competition and similarity
categories are open, fuzzy	categories are closed, sharp
focus on decision-making behavior and prediction	focus on routine behavior and explanation
promotes expansion of the number of dimensions of perception	promotes reduction of the number of dimensions of perception
interaction pattern of detail explains structure	structure explains details

After Springer & Deutsch 1985, with additions by the present author.

it was eminently possible to define the concept in one dimension at a time, problems arose when attempts at definition were made in several dimensions at once (O'Shea, personal communication).[1] Feinman and Neitzel explicitly came to the conclusion that such definition is impossible (1984).

As a consequence, one is caught between two incompatible positions: *either* to operate simultaneously, in many dimensions, but to relinquish the clarity of categorizations and the need to know exactly what they measure, *or* to operate in one dimension and clearly perceive our categories and what they measure, but not be able to relate them to other dimensions of variation.

Faced with this dilemma, in archaeology we have simply followed the path of least resistance, reducing the number of dimensions in which we attempt to perceive phenomena. The parameters of our vision have become increasingly tied to our conceptual frameworks, eventually leading to a narrow functionalist interpretation of the past under the influence of a systems theory that distills a multitude of variables down to input and output of a black box which is controlled by a goal range (cf. Krupp, 1968).[2]

But rather than accept the very great distortion caused by our striving to create a coherent image of the past, we should accept that the best we can do in perceiving a coherent real world is to create a fragmented image. If we do, the incompatibility of the definitions arrived at in different dimensions need not present problems because we can assume that even where we do not see them, there are links which keep the real world together, if not the image we have of it.

In the (re-)creative approach, the situation is fundamentally different: the relationships are what counts, they are studied, and they make the system into what it seems to be. The components are, as it were, distinguished by their relationships instead of the other way around. As a result, the (re-)creative approach is not hierarchical: many networks of relationships, each a bit different, are interconnected at nodes (where dimensions crosscut).

Change and Time

Change also has a different meaning and a different status in both approaches. In the analytical approach, change does, or does not, manage to transform something preexistent into something new. Change is a transition between two stable states.

In the (re-)creative approach, on the other hand, change is presumed to be fundamental and never to cease (though the rate of change may be slow). This approaches the historical ideas of Braudel (e.g., 1949, 1979), who saw change as fundamental and relative, occurring at different rates (i.e., short-term, medium-term, and long-term), so that, compared with the speed of short-term change, long-term change may seem to equal stability. From that perspective, stability is a research device which does not occur in the real world. Making use of it is concomitant with using an absolute, nonexperiential time scale.

One's perception of time is necessarily relative, and is both dependent on the position of the observer and related to the rate of change. Both of these aspects are part of our everyday experience, summed up by the anomaly that when we are very busy, we seem to be able to fit more experiences (thoughts, emotions) into what at the time seems a period which goes very fast because we hardly stop to think. On the other hand, in a period when we have little to do, time seems to stretch endlessly. Yet, looking back on our lives, we seem to have been subject to a sort of Doppler effect because the periods in which much happened seem longer than those in which little occurred, even though, measured in days, months, and years, they are not. Thus, to construct a state of absolute stability, it is necessary to avail oneself of neutral time or absolute time, which is independent of our experience.

Revolution or Evolution?

Especially in archaeology, which has for so long been dominated by the search for "origins," it is important to see clearly that these approaches have different consequences for one's attitude to inception. In the analytical approach there is no place for the study of genesis of phenomena. Genesis is instantaneous. In astronomy, this has led to the big bang theory of the origins of the universe. In the (re-)creative approach, evolution is all there is, and it is the only subject of study. Genesis is seen as a process that goes now slower, now faster (cf. the condensation theory of the origins of the universe and the theories of self-production and structuration [Touraine 1974; Bourdieu 1979, respectively]).

Convergence and Divergence

The nature of change is—not surprisingly—different in the two approaches. In the analytical approach (when the situation is not one of oscillation within goal range) developments converge, so that heterogeneity is reduced and information is thought to disappear. In short, developments through time are thought to accord with the second law of thermodynamics. The approach is best suited to the study of nonliving phenomena in closed systems.

The (re-)creative approach, on the other hand, focuses on divergence, on growth. It is therefore best suited to research on change in an amplification network, such as the mutual amplification mechanisms that effect changes in ecosystems, whereas the analytical approach prevails in the study of the structure of established relationships, such as genetic codes. In archaeology, for example, the first approach is intimately tied to the study of information and communication networks in societies, whereas the second has contributed the study of the structure of cultural traditions. Fortunately, that situation is changing, so that we now see dynamic approaches to tradition, for example (e.g., Bourdieu 1977), but archaeology has a long way to go in this.

Information

Both approaches also differ in relation to their definition of the concept of information and to information processing. In the analytical approach, information has meaning. As such, there is a finite amount of it: at any point in time, the set of meaningful observations is limited and only such observations inform the person who receives them (cf. the earliest definitions of the concept, e.g., Weaver 1949). The focus of information studies is on information transmission and storage, or on the meaning of stored information. From the point of view of the (re-)creative approach, information is the (infinite) amount of potential meaning, and the focus is on how information is transformed into meaning, that is, on information-processing mechanisms and on the rules which generate symbols, contexts, and meanings.

Competition and Complementarity

Maruyama (1976) adduces examples from the Mandenka and the Japanese to illustrate the (re-)creative perspective in relation to competition and complementarity. The Mandenka say, "If you force individuals to be similar, the only way left to them to be different is to get on top of one another. This creates conflict" (Camara 1975, quoted in Maruyama 1976).

In Japanese negotiations, Maruyama asserts, dissimilarity is assumed and the negotiations explore how far such dissimilarities might yet lead to fruitful collaboration by exploring complementarities. In Western negotiations, on the other hand, similarity or unity is often assumed (and differences often overlooked, leading to later disappointments). Just as stability is artificial from the (re-)creative point of view, so is similarity, while differences and change seem natural. Thus, from the analytical perspective, the major explanatory concept behind change is competition. In the (re-)creative approach, on the other hand, developments diverge and the creative symbiosis and/or interference between various complementary relationships (possibly modeled in different dimensions) is studied.

Closed and Open Categories: Definition and Fuzziness

The distinction between "closed" and "open" categories is also a facet of comparing the two approaches. In the analytical approach, categories are so defined that one knows not only what belongs in them but also what does not. In the (re-)creative approach, on the other hand, decision-making proceeds on categories about which only "what might belong to them" is known. Elsewhere, I have explained the distinction between the two sets of categories and how they originate from different stages in the process of categorization (van der Leeuw 1989); here I would like to stress only one consequence. Because closed categories are the result of experience, the analytical approach can only serve to explain a posteriori. Prior to experience, categories are essentially open. As looking forward in time (prediction) essentially always contains the simulation of decisions that have nonroutine elements, prediction requires a logic based on open categories. Such a logic is essentially unavailable in the Western approach to science (cf. Wilden 1972; Olsson 1979; Schell 1984).[3]

The function of perceptual dimensions itself changes: they no longer serve to bound a phenomenon, to highlight it as clearly as possible by reducing the number of dimensions involved (which in turn is done by pronouncing the perceptions similar, as in the procedures involved in seriation or multidimensional scaling, etc.), but they do serve to expand the mind and to relate phenomena to one another. Human vision presents an example of what occurs when the (re-)creative approach is used. It is by looking at the contrasts observed when the same phenomenon is perceived in two dimensions (by two eyes) that a third dimension is generated (distance), and that our awareness thus grows.

Levels

The way in which the level of generalities and that of details relate to each other is quite revealing of the underlying approach chosen by a researcher. Due to its after-the-fact perspective, the analytical approach has more of a tendency to stress the generalities to explain the details. On the other hand, a perspective that is not sure of its perception of the phenomena as they present themselves, or even of the fact that it perceives them all, is less able to point to specific general elements but is more likely to see the result as the interaction of all (or most of) the perceived details involved.

Consequently, the (re-)creative approach would stress the uniqueness of each situation and the historical trajectory that has led to each situation, and, unlike the analytical approach, would deny the usefulness of universals or laws or lawlike generalizations.

In its best form, taking account of similarities as well as differences, explanation of social phenomena would be in terms of the patterns resulting from the interactions of individual decisions, their similarities and their differences, as well as their relationships to each other. Such explanations would necessarily be of a proximate nature. Thus, by changing the status of the knowledge we can have of the past, as in the (re-)creative approach, we open up the debate in other ways, among other things changing the character of the interaction between different observers.

Muddles in Ceramic Research

Now that we have had a look at some of the fundamentals, it is time to see how the double role played by the ceramic researcher, who at once performs a posteriori analysis and tries to re-create history, has affected ceramic research. Unawareness of that duality has resulted in considerable confusion between the two roles. I will illustrate that confusion by looking at the function of several of the core elements of ceramic research, such as typology, variation, variability, and experiment, and at the procedure we use to arrive at interpretations of ceramic data.

Typology

In much of the archaeological literature there has been considerable confusion in the use of terms such as type, group, class, and category. Awareness of this confusion is one of the important contributions of the 1970s, but it is less widespread than one would hope.

Types were (and are) inductively derived from the study of groups of artifacts, only to be used as deductively derived definitions for classes of artifacts (Clarke 1968; Dunnell 1972; van der Leeuw 1976), and were thus unconsciously transferred from the real to the ideal realm. As Clarke points out, such a transformation involves a vicious circle of argument, as (inductively) the definition results from assembling the (real) group of artifacts that is thought to belong together, whereas deductively one would have to define the parameters of the (ideal) class before assigning any members to it.

The consequences for our use of the concept are considerable. One implication is that, properly speaking, the inductive definition of a type (group of artifacts) changes as soon as any newly discovered artifacts are included in it. Yet in our deductive use of the concept, we rarely take this into account.

Moreover, the inductive way in which we arrive at our categorizations makes them dependent on the moment and locus of definition (the here and now of the group of artifacts that was categorized), and therefore, strictly speaking, useless in defining past units of time and space. Our ignoring that is one of the reasons for the typochronological muddle in which we have for so long found ourselves.

Third, the short-circuit involved has for a long time denied their proper place to dynamic models of the interaction between human beings in the past and their artifacts (van der Leeuw 1984a), the kind of models Binford (1968c) called for when stressing the need to view culture as something in which people participate in different ways.

Fourth, the short circuit has masked the fact that we have often looked at what happened in the past from our present-day vantage point, that is, a posteriori, rather than attempting to look at it through the eyes of the contemporary participants, who saw future become present and had to deal with their future rather than with their past.

Awareness of this particular problem has been growing, both theoretically (e.g., Hill & Evans 1972) and in the practical study of artifacts. But at the same time it turns out to be only one among many.

Variation and Variable

For example, we seem commonly to confuse variation and variable in a similar way. Etymologically speaking, as well as in current scientific usage in areas other than archaeology, "variation" means "that which changes," that which is different, whereas "variable" is defined as "that which is susceptible to change." The term "variation" thus uniquely applies to the realm of the real and relates to (phenomena perceived in) the study of the actual pots and/or sherds. Such variation may occur in any number of dimensions, such as color, shape, technique used, or size. Variations are always on a theme, that is, they can be distinguished only if an underlying similarity is observed at the same time. This similarity is, as it were, a context of the variation. Usually, there may be covariation in any number of the dimensions distinguished: black vessels may always be squat, and red ones always globular. Both red and black vessels may, moreover, be thin-walled, while buff ones are thick-walled. The number of positive or negative correlations and contrasts is virtually unlimited. The study of these correlations and contrasts is one of the major tools available for the reconstruction of the social, behavioral, technological, and other variables that are ultimately responsible for the pottery product as we find it.

The term "variable" applies in the ideal realm, where it denotes those parameters in a model which may assume different values and which therefore may conceivably be responsible for the variation observed: the nature of the clay, the qualities of the tools used in manufacture, properties of the firing routine and/or kiln used, the social and economic structure of the society, and so on. "Variability" and "dimension of variability" refer to the variables in the model used. A quick scan of the literature will show that, as such, the way variability is used here is representative of common usage. Let us look at some of the consequences.

Experiment

In light of the lack of penetration into the inside of pottery making, it is interesting to note that experiment has played an unnecessarily limited role in archaeology. It has generally been used to solve detailed problems of ancient technology. Experiment has notably provided a link between extant (physicochemical) generalizations and archaeological observations.

In the worst cases, the experimenter replicated by one means or another the manufacture of a pot, for example, without any analysis of the dimensions of variability involved or the effect they might have on variations in the observations made. The method employed would subsequently be proclaimed a reconstruction of the method used in the past. The experimenter would thus commit the same error as the archaeologist who sold (or bought) descriptions of variation as descriptions of variability.

But even at its best, experimental archaeology has essentially been analytical, leading to the observation of new combinations of known dimensions of variability but hardly generating new dimensions of understanding.

Experiments function in ceramic studies primarily as bridging arguments that allow us to move down from the general level in the ideal realm to the specific in the real. Experimental work that contributes to synthesis is missing in archaeology. Thus, experiment has hardly been used to contribute to our understanding at levels more general than those of the immediate archaeological observation. In view of the important contribution of experiment to comparison and synthesis in other disciplines, this gap is regrettable.

Dimensions and Levels

The confusion between variation and variability is responsible for a long-standing tendency in archaeology to define variables in the same dimensions as the observed variation to which they are supposed to relate. Pots and stone tools, for example, are measured and composite measurements (such as the range of height/diameter ratios) are given as a summary, not of the variation but of the variability of each category.

Variables of this kind are of course nothing but (descriptive) categories of variation; they cannot be used for the comparison of qualitatively different phenomena. Such variables are found to have no explanatory value; they merely explicate aspects of the variation found in the phenomena studied (cf. Binford 1965).

If, on the other hand, one would consistently work with variables defined at levels other than that of observation, and in dimensions that deliberately crosscut the dimensions of variation observed on the sherds or pots, one would not fall into the trap of confusing description and explanation. Variables that are thus defined offer new perspectives and are experienced as being of explanatory value. Indeed, they may deliberately be designed to allow for comparability of as many kinds of phenomena as possible.

With the introduction of the "explicitly" scientific approach in the 1960s and 1970s, and the concomitant stress on subsumption in explanations, it became clear that it was profitable to use crosscutting variables in moving down from the level of observation.[4] The confusion between the real and the ideal realms was partly resolved; real actions could be seen as resulting from a combination of ideal(ly) conceived variables. As a result, technological studies of subsistence, stone walls, and (to a lesser degree) ceramics flourished, as did analyses by means of high-tech science and (to a degree) experimental archaeology. Considerable advances have been made in ceramic studies at two levels:

1. In our detailed knowledge of specific instances of pottery production as a dynamic system, integrating to a degree the study of raw materials with that of the technology, form, and

design involved, so that in a number of cases we can now provide detailed descriptions of the sequences of actions involved in making a certain kind of vessel, and very educated guesses as to the material and technological reasons involved (e.g., Rye 1981; Rice 1987). Thus, at this level we can argue to a degree from the inside about the dynamics at issue (i.e., more or less use the [re-]creative perception as a specific flint knapper or potter would, describing the raw materials, the technology, the forms and their relations to one another before and after a change, and inferring the reasons for such a change).

2. In our knowledge of the social and economic context of production and use, integrating archaeological, ethnographic, and ethnoarchaeological studies, insights have notably been obtained in (aspects of) the functioning of specific pottery-making communities in their own natural and cultural context (e.g., Arnold 1985; Miller 1985; Foster 1948; Papousek 1981), describing the variables and dynamics of a specific socioeconomic system in which the artifacts are produced and the options open to that system, again more or less from a (re-)creative point of view.

But the confusion between ideal and real was resolved only for analysis, not for synthesis; we learned to move down to the level of detail, investigating problems posed by the specific set of phenomena with which the investigation began,[5] but we did not explore ways to move up to the more general level at which comparison between different specific sets of phenomena allows us insights of an encompassing nature.

Consequently, what presently (still) seems to be lacking are the conceptual framework, the techniques, and the knowledge needed to relate individual potters to pottery-making traditions from the inside, re-creating how decision making actually occurs routinely in pottery manufacture, or how decisions are made to change the production methods and/or the products. Yet, an answer to those questions is fundamental if we want to relate our detailed knowledge of pottery-making methods to wider issues and interpretations, or to study change.

Similarity

Perhaps the most important problem is the fact that archaeology evidences a stress on similarity which begins at the root of the chain of argument and continues up toward the most general level; our artifact typologies, our categorical definitions (e.g., oppida, tribes, chiefdoms, cultures), our dynamic laws, our dating methods such as seriation, our stress on replication in experiment rather than on analysis all testify to this.

This problem first surfaced in a debate in the 1950s (cf. Ford 1953, 1954; Spaulding 1953, 1954), but it has not been resolved; it has simply been forgotten. In stressing similarities, the processual archaeology of the 1970s essentially suppressed much of the information the archaeological record has to offer us, and in many cases retained only one dimension of variability, that of effective functioning (hardly the only one from the potter's or the user's point of view, important though it may be).

Contextual archaeologists' interpretations hinge on discovering similarities between the oppositions in different dimensions, thus equating the answers to "how?" and "why?," failing to distinguish between description and explanation, and in fact achieving the former but not the latter. That is notably evident at the most basic level, where the phenomena to be interpreted consist of real (e.g., artifactual or distributional) patterns of similarities between things that operate in different dimensions, such as design similarities among houses, graves, and pottery (Hodder 1986; see also Ch. 4 in this volume).

Neither approach escaped the main impact of the Newtonian background we all have to deal with, specifically, that phenomena are described in a clear-cut, definitive way *before they are studied,* compared, or related to other phenomena. This presupposes both that description is not affected by the observer's subjectivity and that it is immediately clear to the observer, without knowledge of the context, what are actually the boundaries of a phenomenon. That, for example, the town ends where there are no more buildings to be found; that the area in which buildings occur can be studied independently of the areas in which they do not occur; and that such a study will describe the town as well as explain why the town exists.

In many disciplines, among them some of the hard science bastions of the Newtonian tradition, it is now becoming clear that the *interaction between patterning and nonpatterning provides the basis for what we observe,* so that if we want to explain as well as describe, we had better study both together (Morin 1977, Ch. 1). What explains the existence of towns is not the interaction within them but the interaction between the interaction within and the noninteraction without. *In order to study phenomena, one needs to stress conjunction and disjunction, similarity and contrast, order and disorder, and the interactions between them at all levels of research.*

To a very limited degree, that has been done by Marxist approaches in the social sciences, which have been involved with disjunctions insofar as they have studied contrast rather than unity in social relations, change rather than stability, and have accepted the existence of sudden (revolutionary) changes (punctured equilibria). It is not surprising, therefore, that a very recent reaction in archaeology draws in part on Marxist ideas (as modified by Althusser [1969], Habermas [1972], Foucault [1970, 1980], and others), proposing to get as much information as possible out of the archaeological record by deliberately creating analytical contrasts at all levels including the most basic, thus generating as many dimensions of interpretation as possible (e.g., Thomas 1987; Edmonds 1987).

There are two important negative effects of the stress on similarity at the base, and together they are quite damning. First, this stress systematically and deliberately neglects the majority of the information which the archaeological record puts at our disposal (there are always more differences than there are similarities). By taking into account at a higher (interpretive) level that which is included in the definitions of our artifact categories (i.e., the characteristics that are shared by the phenomena at the level of classification), all the differences, all the variability, is deliberately ignored.

Second, the effect of this is warping of the truth, as becomes clear when one looks at the way in which the projection on a single dimension (e.g., time) of a variability that is the result of the interaction of many dimensions, warps distances between the units and even their sequence (see Figure 2.1).

Yet, despite all the changes in theory, we still look for similarities and categories accordingly!

Steps Toward an Encompassing Research Design

In view of the immense effort expended on ceramic studies in archaeology, it seems to be a major waste if we keep losing so much of the information available to us. What is needed is not

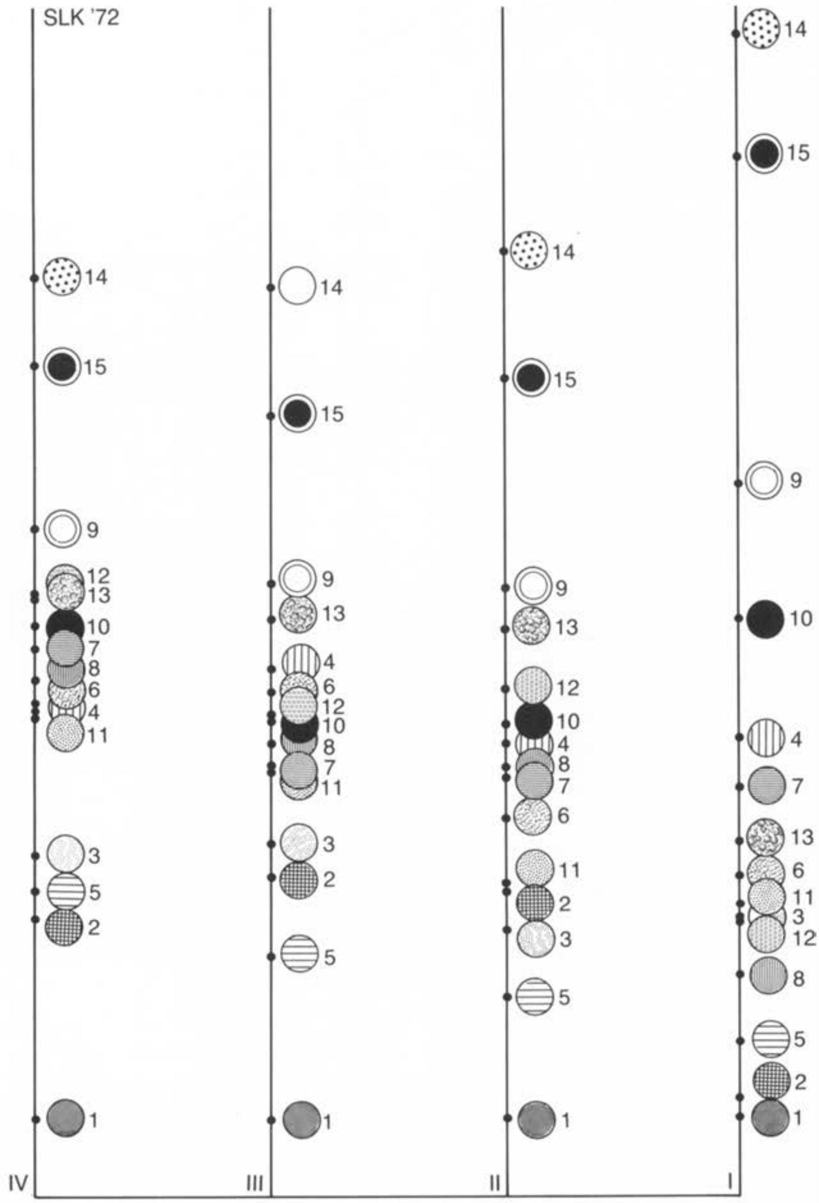

FIGURE 2.1. Projection on a decreasing number of dimensions of the variation encountered in a ceramic assemblage. Notice how, with reduction of the number of dimensions, not only the distance between various types decreases, but the actual sequence is modified. This has severe consequences for the validity, for example, of seriations which aim to reduce all variation to the temporal dimension.

more effort—perhaps even less—but a redirection of effort that makes it much more efficient.

The next pages will sketch the main lines of a research design that is firmly based on the (re-)creative approach. It will be evident, from the size of the undertaking to be presented, that this sketch can be only a bare and incomplete outline of a daunting task which I am dimly beginning to perceive.

The Field of Study

It follows from the ideas outlined in this chapter that the field of study should include all that could be done to a combination of clay(s), nonplastic material(s), and water which could be permanently transformed by fire. If we are ever to understand the "why?" of the decisions made by past makers and users of ceramics, we must, as has been argued, study those interactions between people and materials which came to something (i.e., resulted in pattern, in objects we have found or could find), as well as those interactions which did not (i.e., which remained or turned out to be chaos): the pots, the almost-pots or rejects, the "hardly pots" or failed pieces, and the "non-pots" or those combinations of materials and techniques which could not be realized and remained in the ideal realm.

As long as we study only the pottery we find in excavations, we will at most discover *how* it came into existence, because we essentially study only those options available to ancient potters that they realized, but not those they discarded for one reason or other. Yet the decisions involved can be reconstructed only when the researcher can (re-)create in his/her mind the choices the potter had at his/her disposal in solving a problem. In this sense the approach I will develop in these pages is deliberately holistic.

The Aims

It follows from my discussion of the ideal-real opposition that I do not believe one should focus on either of these but, rather, that the essential focus is the interaction between the two, between the conception and the meaning of artifacts, and the way they have been realized. The aim of research should therefore include both sides of the interaction of nature and culture. Pottery is undoubtedly the product of, among other things, materials that behave in ways adequately described by the laws of physics, chemistry, and mechanics, formulated in terms of positivist universals. But it is equally the product of decisions made in a context of ideas (whether technical, decorative, functional, ideological, or other) and meanings that are group-specific, that reproduce the material context of that group.

Indeed, the interest of ceramic studies lies in the fact that it aims to understand the interaction between the two. "Why?" is answered by studying which choices have been made among those potentially possible at any time in view of the area and its raw materials, and how the choices made have constrained later choices, such as the development of alternative resources, technologies, shapes, and uses. Yet most research to date uses sophisticated techniques to investigate the raw materials and the transformations they have undergone in the fire, only to group the pottery involved and, if possible, assign a source to each group.

The next step in the right direction would be to use that knowledge of the ancient materials to (re-)create the constraints these materials imposed on technical choices faced by the potter: tools, shapes, techniques, and so on (cf. Rye 1981). But that implies looking at the interaction between ideas and their realization in terms that only acknowledge the influence of physicochemical constraints on the realization of the idea, rather than also looking at the ways ideas and choices may influence "nature," that is, may lead to subsequent search for innovation in raw materials, tools, techniques, and such. I do not know of any research so far that has consistently used this—in itself quite evident—approach in the field of ceramic studies.

The Perspective

My perspective, as has been mentioned, deliberately includes (re-)creation, attempting to follow the history of the process of ideal and real creation. That implies acceptance of the positions summarized in the left-hand column of Table 2.1, but a few further specifications are in order. Culture is seen to exercise some of the options open to it within the realm of nature, but nature does not determine culture. Nature has infinite possibilities, requiring different kinds and amounts of knowledge and effort, and which of these are actually realized is essentially a question of decisions within a specific cultural context. Pottery is seen as the result of, as well as one of the actors in, what Rappaport (1976) called "the substantiation of form and the information of substance":[6] a feedback link between the ideal and the material worlds that simultaneously creates continuity and change in both realms.

I differ from some of those who have used the idea of such a feedback loop in that (a) I do not see the primacy of the ideal over the real, and (b) I want to study both the production and the use of artifacts from this perspective, while others have mainly stressed the use made of artifacts in the self-reproduction of society.

Universals Again

I would like to pick up very briefly the issue of universals and comparability. The aim of research is to understand what went on in another culture. This requires that we accept without guilt the need to translate phenomena observed in another culture into the universals of our own. This is easy for the physicochemical and mechanical aspects of pottery. It seems to be equally acceptable for those aspects of human behavior which are physiologically determined: muscle action, shape and structure of the body, and so on. Further toward the ideal side it becomes more difficult. I assume that there are aspects of perception and category formation which equally have a physiological basis and are the same for all people (cf. van der Leeuw 1989, 1990).

How these affect the process of decision making may also be the same for all, but the content and the effect of the decisions certainly are not. There, the specific cultural context is paramount. But that does not mean we must interpret this area in its own terms—the learning which underlies our research takes place within our own culture, and it is legitimate to discuss these topics from our perspective. But we must do so with great(er) care to avoid distortion. Parallels often may not be found at the level of qualitative or quantitative description of phenomena but at that of structure, process (i.e., change), or (often, I think) the way process changes.

Explanation

In this chapter, explanation is therefore not an absolute. It seems to me that what we call explanatory value in everyday parlance is in fact due to such a match between observed variation and defined variability that more of the former is found to fit into the conceptual framework of the researcher than was the case up to that point in time. Thus, whether a model or hypothesis explains certain phenomena not only is dependent upon the nature of the relationship between model/hypothesis and phenomena but also may be even more closely related to the context of the model/hypothesis: how well other models and other hypotheses organize the phenomena at hand.

Using Contrast

In many areas of archaeology, research used to begin with the definition of a research location for reasons that had little or nothing to do with the ceramics. Excavation and analysis of the ceramics followed. Such analysis first categorized the pottery; next, the spatiotemporal framework was created by assuming contiguousness of similar categories of pottery. As a consequence, a ceramic tradition was defined whenever more or less similar sherds occurred in more than one excavation. In Near Eastern archaeology, for example, this eventually led to a culture history that oversimplified what happened almost to the point of ridiculousness. People were no longer involved. Ceramic traditions stressed the unity of the pottery belonging with them, and glossed over differences or tried to solve observed contrasts by introducing alternative categorizations. The details of the articulation between individual potter(s) and individual pots were ignored, and essential information was deliberately discarded.

In research undertaken in the Euphrates basin by Franken and myself, the reverse was done (van der Leeuw 1976). We tried to delineate how different potters made different pots with the same clay. This was done by excavating settlements that were from different periods but were in the same area and used the same source of clay. Differences in treating the clay and in shaping the pottery were observed, and the picture that resulted from our research was based on criteria to distinguish categories, rather than on criteria to identify individual objects as members of one category or another. From the research we have learned much about the interface between potter and product. Notably, we have learned how to distinguish consistently a large number of the decisions undertaken in making the pottery, and why they were taken (van der Leeuw 1976).

Similarly, I have compared different traditions' means of coping with the same problem: making a round-based cooking pot (van der Leeuw, in press). Apart from the choice of clay and tools, the conceptual structure of the vessel in the potter's mind turned out to be different between the traditions. From that logical structure, it is possible to derive predictions concerning the potential for change in the different traditions.

Alternatively, one might work the other way round, that is, first construct dimensions of variability in the light of which one would like to study the phenomena to be perceived. One might then argue for the existence of certain patterns of contrast and interference and, as it were, deduce certain kinds of variation to be sought. Comparison of manufacture by means of a coiling technique, a hammer-and-anvil technique, manufacturing in a mold, and throwing, for example, leads to the conclusion that these techniques share the fact that they cope, in different ways, with the following problems:

1. The pull of gravity on the object under construction, which may cause the vessel to sag or to collapse during construction (while the paste is wet)
2. The access the potter must have to various parts of the vessel while it is being shaped
3. The composition of the raw materials at the potter's disposal
4. The speed with which the vessel may be made
5. Control over the shape
6. The range of shapes that the technique allows the potter.

These may then serve as dimensions of variability to assess the decisions made by potters working in different contexts with different techniques, a topic thus far not tackled in ceramic studies.

It is assumed that each potter, wittingly or unwittingly, has different ideas in making the pottery. These ideas might be technological, functional, social, behavioral, economic, or anything else. (Our modern, highly fragmented perception is probably the only one that distinguishes these areas.) Each of these ideas (about composition of the body, shape of the vessel, amount of raw materials and/or manufacturing time involved, and so on) may in itself be realized in a number of conceivable ways, each with certain other constraints of its own. Concerning the control required over the shapes to be produced, for example (molding produces much better control than coiling), or concerning the time required (throwing or molding costs much less time than coiling). Hence, if time is a constraint, the potter will find a way in which he/she may throw or mold the vessels. If the inclusion of large nonplastic particles is another necessity, he/she will choose molding if he/she has the choice. If not, he/she will coil (because throwing a thin-walled vessel with large nonplastic particles is impossible). Only by contrasting different approaches to pottery making can we hope to approach the "why?" of choices in ceramic manufacture.

Distinguishing Dimensions of Variability

DeBoer has demonstrated very effectively how to distinguish hitherto unsuspected dimensions of variability of an economic nature in a study of resource procurement among the Shipibo-Conibo in the Upper Amazon (1984). Zipf's "least-effort principle" (1949) explains about 65 percent of the variation in DeBoer's resource procurement data at first sight. In an attempt to find the variables that might account for the remaining 35 percent of variability, DeBoer first introduces settlement size as an additional variable. Done raw, this seemingly makes the model somewhat more effective; small settlements (under fifty inhabitants) seem more likely to meet least-effort expectations than larger ones.

But on second thought, raw settlement size is unsatisfactory. Other relevant variables include the quantities of raw materials needed for a vessel, the life expectancy of the vessels made with these resources, and the relative frequency of the vessels that incorporate a certain resource. Together, these variables determine the total quantity of raw materials needed. Introducing into the settlement-size data a weighting coefficient that takes these into account does, on the one hand, very effectively explain certain cases of nonuse of resources (these resources are six to eight times more energy-expensive than the next most energy-expensive resource, which is indeed used) but, on the other hand, it shows settlement size to be a contradictory variable. Overall, the large settlements seem to fit the least-effort principle better when judged by their locational advantage for procuring resources; at the same time, however, such settlements seem to exploit this advantage less effectively than do smaller ones.

This apparent contradiction introduces yet another variable. All settlements are located along rivers, and so are resources. Thus, all resources used are as accessible as the farthest one that is essential and cannot be substituted. Nearer ones are picked up along the way. When appropriately weighted, the least-effort principle may now explain 84 percent of all resource procurement decisions (DeBoer 1984:542).

In an attempt to explain the remaining 16 percent, DeBoer introduces yet another variable, embeddedness (following Binford 1979), and presents a lucid case in favor of the fact that many procurement decisions are not made in isolation but are part of a set of social decisions. People will procure resources on the way to and from friends and relatives, who live often at considerable distances. Because such procurement has effectively very little energy cost (the energy is expended on the visit, and the resource procurement is very little extra effort), such procurement decisions are entirely in keeping with the least-effort principle, provided one takes embeddedness into account.

Ultimately, therefore, all variation observed is accounted for, and in the process the model has been enriched by adding several dimensions of variability to it. This contrasts starkly with the usual situation in archaeology, where the set of variables that has been accepted as explanation relates to only a percentage of the variation observed. Leaving explanation at that is using data to confirm the explanatory status quo, and has led the study of ceramics into a cul-de-sac. *The model and the variables derived from it must, per definition, be such that they fit the regularities in the observed variation as well as the exceptions.*

Models and Analogy

By applying these principles, it seems to me, one would be able to weave around the data a web of interpretations in many dimensions, each coherently related to patterns in the data that are elicited from the perspective these dimensions offer. The models the ceramicist thus builds of different dimensions of the pottery will, however, never combine to form something all-inclusive that is *the* truth about the pottery.

As I have argued, the real world is not knowable in its entirety; on the other hand, combining the models would create undesirable diffuseness. The (partial) models created perhaps are best seen as the individual, slightly differing images received by each of the facets of an insect's eye. Combining the picture is an intuitive matter, demanding a creative jump. None of the models we might possibly adduce has prevalence over any other, mentioned or unmentioned. We should not use technological, or economic, or cognitive, or functional, or social, or cultural, or religious models in interpreting what we perceive, but more (or even all) of them at once![7] It is not possible to choose between models, and what becomes important are the interactions between models as reflected in the phenomena. When, moreover, the advantage of using a holistic epistemology is acknowledged, all models are seen to be part of one and the same universe. Then the relationships between models, rather than those between phenomena, become the subject of study. Such relationships between models may be conceptualized more or less along the following lines (cf. Maruyama 1976).

Research into the complexities of such relationships, and modeling of the various dimensions of variability that the potter may have had at his/her disposal, should start with baseline models which include as many conceivable options as possible. First, it must consistently identify preferred choices among potters who make a certain kind of ceramics. By relating such preferences, and the options that were not chosen, to the constraints which each of the alternatives inherently has, it is possible (by trial and error, using a wide range of alternative models of interpretation) to gain insight into the new dimensions opened by choosing the preferred options.

In attempting to build models of this kind, experiment and ethnographic analogy will continue to be important because they link the perceived phenomena and the models we attempt to construct. But the way in which they are to be used is different.

Both ethnographic analogy and experiment have usually been directed at logically demonstrating the link between two sets of perceptions: (1) the perception of pottery from an archaeological excavation or survey and (2) the perception of a set of actions undertaken by one or more potters in making certain kinds of pottery. The link between the two phenomena is provided by the pottery made by the native informant or by the Western potter/archaeologist. The thrust of the logic was directed at the comparison of the first and second, and the second and third, categories of phenomena. Notwithstanding the fact that methodologists have often argued for the necessity of studying both the positive and the negative analogues in a comparison (e.g., Apostel 1960), the stress has generally been on similarity (although there are noteworthy exceptions, such as Thompson [1958] and Ascher [1961b]).

In the approach proposed here, it is not the purpose of experiment and analogy to find similarities. Observed similarities may serve to illustrate the relevance of using a specific analogue, model, or experiment, but that is ancillary to the main purpose of comparison—to isolate variables relevant to the archaeological phenomena observed. Any variables that apply to ceramics, and that have been defined in accordance with the dimensions and definitions of the model being built, are per definition relevant.

The analogues adduced and the experiments undertaken are, as was to be expected, focused on contrast with the situation perceived. One attempts to find variation that contrasts with what was observed in the archaeological record, so that new dimensions of variability may be perceived. In the case of experiments, this entails deliberately not copying the perceived phenomena, and in the case of ethnographic analogy, searching for the "near misses" rather than "direct hits."

Concluding Remarks

If I have not provided a new *recipe* for ceramic analysis, and if I have mainly argued that a number of aspects of the present way of doing things are confusing or insufficient, that is primarily because what we need to do is explore uncharted territory, where we can only follow our hunches while we re-create the problems potters were faced with and the ways they may have tried to solve them. The essence of my argument is that there are no right or wrong interpretations, only satisfying ones or ones that are lacking in some way. It is not our destinations (our pictures of what might have happened) that matter, but the road we follow (the questions we ask, the things we discover as we move from one description to the next). The picture is never complete or accurate or both. It will always remain fragmented and inaccurate, but by tinkering with it, we learn. If anything, I think, ceramic analysis needs more questions to be asked, needs to become truly interactive, mediating between the real and the ideal realms by discovering problems and potential solutions, rather than finding answers.

Acknowledgments

I would like to acknowledge the fruitful discussions at the Santa Fe seminar, which have led to fundamental changes in this chapter. My heartfelt thanks go to Bill Longacre for the original invitation, the atmosphere he created during the session, and the gentle and wise way in which he allowed me to repay a debt of honor. And, finally, many thanks to Anick Coudart, Mark

Edmonds, Robin Torrence, and Todd Whitelaw, who read versions of the chapter and helped me cut the irrelevant.

Notes

1. Such an approach is a consequence of our perception that sees the model we use as our (artificial) reality and the phenomena as a representation of that reality, whereas in the approach I propose, the phenomena are seen as one and indivisible, and the models as projections from these phenomena in as many dimensions as possible.

2. Morphogenetic systems approaches sometimes attempt to avoid this problem by agreeing that phenomena are best defined in one dimension at a time when they are full-grown, or by stating rules of a generative nature (e.g., Flannery 1972, 1986; Renfrew 1972).

3. This does not imply that it cannot, or should not, be developed. For many reasons, not least among them the need, advocated by Schell (1984), to come to grips with a unique situation like today's armaments dilemma, developing such a logic seems to me to have a high priority.

4. As is clear from the discussions between Hempel and Oppenheim (1953), on the one hand, and Mandelbaum (1960), on the other, this tendency is inherent in the use of the Hempel/Oppenheim model of "explanation" (Watson, LeBlanc, and Redman 1971; van der Leeuw 1974).

5. In doing so, we remained near the technological and economic baseline of archaeological interpretation because we had, in that area, extant generalizations that could be called upon (with minor modifications, if necessary) in the form of the laws of science and economics, developed in other fields where comparative research (e.g., comparing the behavior of different chemical elements) eventually led to valid synthetic generalizations.

6. This seems to me to be merely another aspect of Giddens's concept "structuration" (1979), Touraine's "self-production of society" (1974), and Bourdieu's "theory of practice" (1977).

7. The incompatibility and incomparability of models from different perspectives played an implicit role in the typology discussions from the early 1950s up to and including the early 1970s. It led to Ford's "types of types," to the introduction of the "polythetic type" (Clarke 1968), and to Hill and Evans's (1972) explication of the problem. But even though more than a decade has passed since the last-named publication, we are still debating whether "climate" or "economy" or "social structure" was responsible, for example, for the introduction of early agriculture.

3

Sources of Ceramic Variability at Zuni Pueblo

Margaret Ann Hardin

The pueblo of Zuni is located on the banks of the Zuni River, near the center of the present-day Zuni reservation in western New Mexico (Figure 3.1). These Native American people have for centuries lived a settled life in towns with substantial architecture and well-developed arts, including ceramics. As in the past, Zuni communal life, based on complex networks of familial and religious obligations, revolves around an annual cycle of religious ceremonies.

At Zuni in the 1880s, vessels of clay were important visual art forms. Pottery was integrated into daily life through its use in a wide range of domestic and religious contexts. Over much of the twentieth century, Zuni ceramic production has diminished in both diversity and amount. Zuni ceramics have remained symbolically important, as potters continue to make vessels for a limited range of traditional purposes. Recent years have seen increased interest in and manufacture of pottery at Zuni—a revival within the Zuni ceramic tradition.

This chapter describes the ongoing Zuni revival, detailing how Zunis view their traditional pottery and the concepts around which their discussion of specific vessels from their past revolves. It argues that Zunis possess an indigenous theory of ceramic variability, according to which explicit notions of context and appropriate form determine what a potter makes. The Zuni approach provides an alternative to the various interpretations placed on the ethnography of Zuni pottery (Bunzel 1929) by archaeologists seeking to explain variability in material culture (Longacre 1970a:28; Watson 1979b:282–293; Muller 1979:159–172).

The discussion that follows begins with a history of the ethnography of Zuni ceramics, giving particular attention to the description of ceramic variability. It then traces the changing patterns of variability seen in Zuni pottery and its production since the beginning of research and collecting at the pueblo. Finally, the chapter examines the interpretations of Zuni ceramic variability offered by Zunis and considers their more general implications for understanding the long-term stylistic processes that pattern variability within the Zuni ceramic tradition.

History of Ethnography

The ethnography of Zuni ceramics began with the collecting activities of Smithsonian expeditions led by James Stevenson that visited Zuni during the field seasons of 1879, 1881, and 1884–1885. The collections made (Stevenson 1883, 1884) constitute an important baseline for the study of Zuni potters and their pottery not only because of their size but also because of their representative nature and the quality of their documentation. Subsequent ethnographic studies of Zuni ceramics (Cushing 1886, 1896; Stevenson 1904; Bunzel 1929; Hardin 1983b, 1989a, 1989b) are intricately related to these early collections.

Making collections was a major activity of all three Stevenson expeditions. The stated purpose of their collecting was to "illustrate the domestic life and art" of the peoples visited (Stevenson 1883:319). The collectors, who included Matilda Coxe Stevenson and Frank Hamilton Cushing, were both enthusiastic and indiscriminate in their collecting.

As a result of this process, the Stevenson expeditions assembled one of the largest and most representative museum collections available to researchers today. Catalog entries list about 5,000 pieces, of which 3,500 are represented, entirely or in part, in their collections today. The majority of these vessels were collected by the three expeditions led by James Stevenson.

The pottery collections were documented in the field and catalogs were published for materials acquired during the first two field seasons (Stevenson 1883, 1884); it is the second catalog that provides the better record of how Zunis of the 1880s viewed

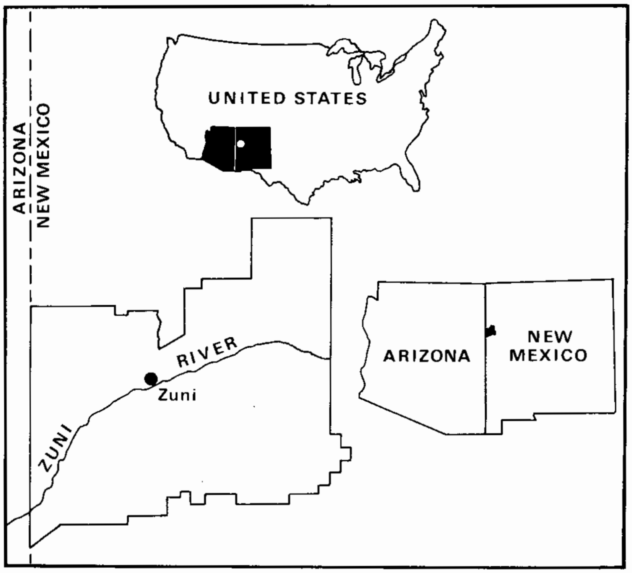

FIGURE 3.1. Maps showing the location of the Zuni Reservation within the United States and New Mexico and the location of Zuni Pueblo within the Zuni Reservation.

their pottery. James Stevenson gives an account of how the second collection was documented in a letter of December 10, 1881:

> Mr. Cushing did the cataloging and was assisted by one of the most intelligent Zunis of the village, a man who holds the position among his tribe as a designer and decorator and is therefore familiar with the designs on the pottery. (BAE letters received, Box 28, Folder 27, 823)

So it was that Cushing, with the help of an anonymous Zuni man, acquired the documentation for the collection made in 1881. He provides fragmentary texts, written in a combination of English and Zuni; however, equivalent information is not necessarily given in both languages.

Cushing's documentation focuses on Zuni vessel terms. These are based on the names of the containers and become more precise when modifiers indicating function and size are added (Stevenson 1884; Hardin 1983b). Jars and bowls are routinely distinguished by function and occasionally by salient decoration; for example, "66414. Olla or water jar decorated with emblems of gentile rattlesnake . . . " (Stevenson 1884:536). In the case of vessels with specialized functions, specific social and cultural contexts may be given: "67343. Ancient bowl . . . belonging to the hereditary line of House Caciques of Zuni . . . " (Stevenson 1884:550). In using Zuni categories to provide a vessel-by-vessel documentation of the collection, Cushing provided a detailed record of the general dimensions of ceramic variability recognized by Zunis of the 1880s and also associated a number of vessels with culturally specific, social contexts.

Ruth L. Bunzel's ethnographic study of Zuni pottery making played a key role in her monograph *The Pueblo Potter: A Study of Creative Imagination in Primitive Art.* Most of her fieldwork was conducted at Zuni during the summers of 1924 and 1925. For this reason, Zuni potters provided her most elaborately drawn example and the framework around which she organized comparative materials from other pueblos. Zuni potters also played a key role in Bunzel's arguments as the most extreme example of artists bound by the limits of their tradition (1929:5). Bunzel's main purpose in studying potters was to understand the nature of performance within the limits of a traditional stylistic system:

> This is a study especially of the manner in which an individual operates within the limits of an established style, or finding that impossible creates new values and wins for them social recognition. It is an attempt to enter fully into the mind of primitive artists. . . . (1929:1)

Bunzel's conclusions about how the Zuni style was maintained involve complex assumptions about the interrelationship of individual expression, design meaning, and style change. Drawing an analogy between languages and style, she argues that the factors governing the potter's painting operate unconsciously:

> As a matter of fact, however much she may rationalize, she has probably never thought about the design, its structure, or its elements at all. She has experienced it unanalytically as a configuration. . . . The various elements may later be abstracted, as words may be isolated from the sentences of a native speaker who for many years has been correctly speaking his native tongue, though innocent of the simplest rules of grammar. (1929:53)

Bunzel represents artists best when she assembles their comments in support of her own immediate conclusions. Thus, Zuni potters state:

> While I am making a jar, I think all the time I am working with the clay about what kind of design I am going to paint on it. When I am ready, I just sit and think what I shall paint. I do not look at anything but just think what I shall draw and then when the pot is dry, I draw it. . . . I think about designs all the time. . . . I always know just how it will look before I start to paint (Zuni).
>
> I always know the whole design before I start to paint (Zuni). (1929:49)

Bunzel concludes that ". . . the whole scheme of decoration is most carefully planned and is fixed in the mind of the artist before she begins any part of her design" (1929:49). She argues for the ". . . importance of the visual image in the creation of design" (1929:1–2).

Bunzel's study focuses on potters rather than on pottery. For this reason, she contrasts her ethnography with studies of museum collections (1929:1–2). Nevertheless, her work is importantly related to museum collections. Most of the Zuni pieces that illustrate *The Pueblo Potter* are Smithsonian vessels. Similarly, Smithsonian collections provided the baseline for Bunzel's discussion of change in Zuni ceramics (1929:76–78). She also used photographs of museum specimens to provide subjects for conversations with potters. Here, Zuni responses focus on differences between older vessel decorations and the canons of the 1920s, becoming critical when the latter are violated: "'The deer house is drawn wrong.' 'Someone did not know how to draw deer and put spirals there instead. This design should have deer.' 'Deer are not good on the inside of a bowl'" (1929:59).

For archaeologists seeking to understand the individual artist's role in creating stylistic variability, Bunzel's monograph has provided a text that may be read at two levels. Most commonly, archaeologists have approached *The Pueblo Potter* as an ethnographic description that has provided key analogies in the reconstruction of prehistoric social organization from the associations of pottery designs (Longacre 1970a:28; Hill 1970:57). Here Bunzel's observations about how young potters were taught have been important. Her insistence on the unconscious nature of the potter's creative processes has been crucial to arguments that require uniform mechanisms through which families maintain distinct styles over generations. Bunzel's interpretation also has been used by Muller, who stresses the unconscious operation of style in support of his linguistic analogy: "Bunzel showed that an aesthetician can no more expect a formal organized statement of a style from an artist than a linguist can expect a finished and explicit grammar from a native speaker of a language" (1979:159). By contrast, Watson (1979b:282–283) focuses on the potter's own statements, embedded as fragmentary texts in *The Pueblo Potter.* At this level of interpretation, the potter's stress on visualizing the entire design before painting it becomes important (Bunzel 1929:51). Watson suggests that the Zuni approach is a mental template process.

The discussion that follows is based on ethnography of Zuni ceramics, carried out at the pueblo largely between 1979 and 1985. While this study followed the rapid changes occurring in contemporary Zuni pottery and pottery making, its primary focus lay in exploring the contemporary Zuni view of traditional Zuni ceramics. Smithsonian vessels provided an essential frame of reference for the inquiry, which sought to place their fragmentary documentation in broader interpretive context.

Smithsonian specimens, together with their documentation, played various roles in discussion of ceramics at Zuni. Photographs of vessels provided the visual basis for structured questionnaires used to investigate a range of topics, including knowledge of vessel forms and functions and recognition of style boundaries (Hardin 1989a). Discussions of individual vessels occurred not only in informal contexts but also in planning specific projects mandated by expressed community needs. The latter included providing the high school art program with visual materials for pottery classes and working on an exhibit of traditional ceramics.

The Zuni viewpoint was articulated most clearly during the planning of the exhibit "Gifts of Mother Earth: Ceramics in the Zuni Tradition" (Hardin 1983b). This exhibit, based on Smithsonian collections, was planned at the pueblo with the active participation of a community committee. Zuni committee members contributed to the exhibit by providing what they felt were the key questions about their traditional ceramics. This chapter focuses on these questions and on how they place order on present and past Zuni ceramic variability.

Change in Zuni Ceramics Since the 1880s

Smithsonian collections show that Zuni potters of the 1880s worked within a tradition that was as highly patterned as it was richly varied. Two simple vessel shapes, bowl and jar, predominated. Bowls and jars also received the most complex painted designs. Much of the variability of the Zuni ceramic inventory lay in the elaborate patterns decorating these two forms. By contrast, other forms, some of them complex vessels, were relatively infrequent and more simply painted (Figures 3.2–3.3).[1]

The visible surfaces of Zuni vessels, other than cooking pots, were slipped and polished smooth. Since uneven surfaces could not be painted well, this treatment defined a vessel's decorative field, those portions of its surface which might be painted with designs. The slips provided a variety of background colors for the complexly developed Zuni motifs. White was the most common background, but several shades of red, orange, and buff also were used. By contrast, potters generally prepared a vessel's base less carefully and painted it red, brown, or black, darker than the rest of the vessel.

Zuni pottery painting of the 1880s divided a vessel's main decorative field—jar exterior or bowl interior—into two separate design fields. The line marking the boundary was the most consistently employed element in the late-nineteenth-century Zuni style. Usually elaborated as a double line, it was left open (Figure 3.4) because completion and closing were to be feared in the ceramic domain (Cushing 1886:510–515; Hardin 1983b:33). A number of options existed for further subdividing the decorative fields defined by the line (Figures 3.4–3.8). Zuni potters used the spaces defined to display a wide range of multilevel designs, varying greatly in size and complexity.

The most salient aspect of Zuni painted decoration was its exceptional degree of patterning. The choice of a particular motif committed the painter to the other motifs that went with it, as well as to associated patterns of spatial subdivision. While the Zuni style admitted a wide range of painted designs and offered a number of strategies for subdividing decorative space, their co-occurrence was strictly limited. As a result, Zuni painted decoration was of several distinct kinds, differing in size, color, and texture of painted design (Hardin 1983b:15–17). Smithsonian collections included five such substyles: (1) decorations employing isolated

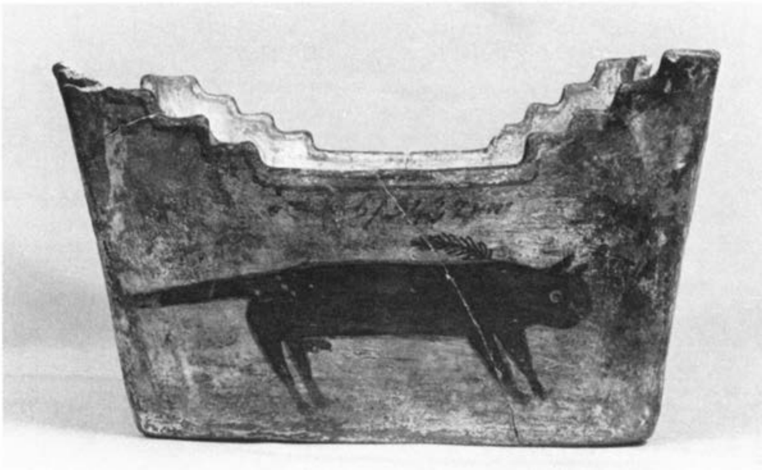

FIGURE 3.2. Zuni bowl illustrating use of isolated representational elements. Smithsonian Institution #67343.

FIGURE 3.3. Zuni canteen illustrating use of isolated representational elements. Smithsonian Institution #39913.

FIGURE 3.4. Zuni water jar with overall decorations of two colors and three textures. Vessel A in questionnaire. Smithsonian Institution #40310.

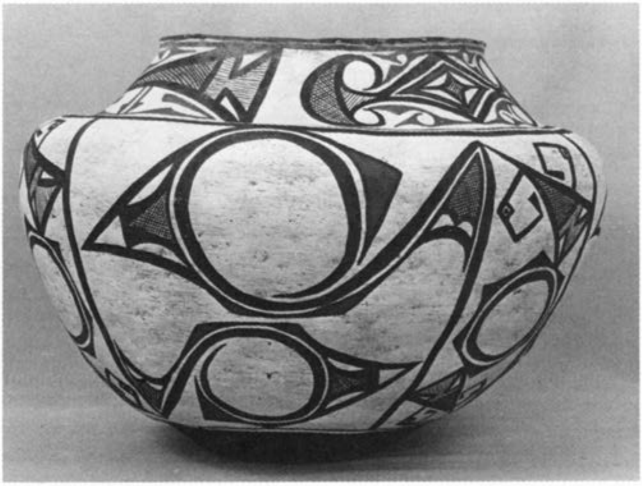

FIGURE 3.5. Zuni water jar with overall decorations of two colors and three textures. Vessel C in questionnaire. Smithsonian Institution #66430.

representational elements (Figures 3.2–3.3); (2) patterns that may incorporate representational elements into overall decorations employing two colors (red, black) and three textures (solid, hatching, and cross-hatching) (Figures 3.4–3.7); (3) patterns consisting of large hatched designs with heavy black borders (Figure 3.8); (4) patterns repeating small elements, either solid or hollow (Figure 3.9); and (5) decoration employing large, simple designs, commonly flowerlike or spiral forms (Figure 3.10).

Zuni pottery painting, thus, did not operate as a single integrated stylistic system. Rather, the substyles exhibited relatively little overlap not only in the selection of motifs but also in the principles governing the development of vessel decoration. Further, Zuni designs did not vary freely within the substylistic groupings. Vessel decorations were reiterated to produce sets of similar vessels; for example, the vessel decorations shown in Figures 3.4 and 3.8 are repeated on many other Zuni water jars. While some of these sets varied internally in details of design, other sets were composed of frozen forms.

Zuni pottery painting of the 1880s was a part of a larger system of stylistic contrasts, in terms of which Zuni vessels might be distinguished from those of all other pueblos. In some cases, the contrast was very general; for example, Zuni pottery with its various textures, colors, and painted patterns contrasted broadly with the black, unpainted pottery of Santa Clara Pueblo. More commonly, the contrast was a subtle one, best appreciated by the members of the pueblos involved. Zuni and Hopi ceramics of the 1880s stood in detailed contrast with each other even though they displayed exceptional similarities in color use, spatial organization, and decorative content (Figures 3.11–3.12). Here, the stylistic contrasts that marked boundaries between Pueblo cultures were subtle indeed. Differences in how potters from the two cultures developed what was essentially the same design signaled vessels' origins.

Zuni pottery and Zuni pottery making have undergone considerable change since the 1880s. The Zuni process has differed from that in other pueblos where pottery became a successful sales art. With the salient exception of owl figurines, Zuni potters were not notably successful in adapting their tradition to commercial requirements, nor did they create new wares appropriate for the developing Native American art market. Instead, Zunis sold wheat and jewelry (Hardin 1989b:152). Local traders may

FIGURE 3.6. Zuni water jar with overall decorations of two colors and three textures. Vessel D in questionnaire. Smithsonian Institution #66467.

FIGURE 3.7. Zuni water jar with overall decorations of two colors and three textures. Vessel E in questionnaire. Smithsonian Institution #44164.

FIGURE 3.8. Zuni water jar with large hatched designs. Vessel B in questionnaire. Smithsonian Institution #66472.

have been unwilling to handle pottery because it broke in transit (Batkin 1987:165).

Zunis' use of their traditional ceramics narrowed. Metal pots and skillets quickly replaced cooking wares. In the 1920s Bunzel observed: "The bowl is practically extinct at Zuni" (1929:20). Manufactured dishes had entirely replaced eating bowls in daily use, and metal dishpans were replacing bread-making bowls. Water jars could not be as simply replaced by containers of other materials, because the unglazed pottery kept water cool. Zunis continued to use water jars until the community acquired running water and refrigeration. While Zunis' daily domestic use of traditional ceramics became increasingly limited, they continued to use pottery in other contexts, associated with traditional religious practice. For example, "stew bowls," of intermediate size between the "bread bowls" and "eating bowls" of the nineteenth century, were used to carry food on ritual occasions.

The variability of Zuni painted decoration decreased as pottery production became more limited (Bunzel 1929:68). The most obvious mechanism involved the loss of designs that had been

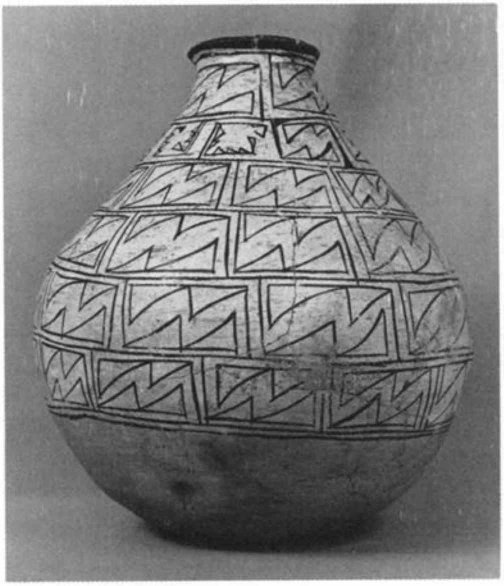

FIGURE 3.9. Zuni vessel with repeated small designs. Vessel G in questionnaire. Smithsonian Institution #11611.

FIGURE 3.10. Zuni bread bowl with large, simple design. Vessel F in questionnaire. Smithsonian Institution #40486.

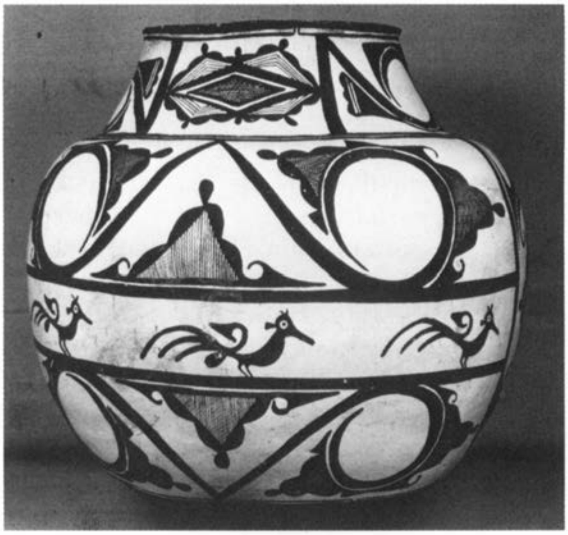

FIGURE 3.11. Zuni version of design shared with Hopi. Smithsonian Institution #CL 676.

FIGURE 3.12. Hopi version of design shared with Zuni. Smithsonian Institution #87536.

used on vessel forms no longer being made. At the same time, the decorations on water jars, which continued in daily use, became more standardized. By the 1920s, Bunzel noted, Zuni potters no longer employed a number of water jar patterns seen on Smithsonian vessels (1929:16).

It is difficult to assess the extent to which the decrease in decorative variability observed by Bunzel reflected a decrease in practicing potters. Bunzel, limited by her Zuni family's social network, was not sure how many potters were actually making pottery in 1924 (1929:62–63).

The organization of Zuni pottery manufacture changed considerably in the twentieth century (Hardin 1983b:36–40). Beginning with Catalina Zunie's classes in the 1930s, pottery making was taught in school as well as in the context of family manufacture. Today traditional ceramics is a major component of the Zuni High School art program, where two potters trained in the traditions of other pueblos have taught the making of Zuni pottery in recent years. The first of these was Daisy Hooee, who is from Hopi and a member of the Nampeyo family. She taught at the high school for a number of years until she relinquished her position in 1974 (Fowler 1977:69–74). In 1974, Jenny Laate, an Acoma woman married at Zuni, began teaching in the high school art program. Daisy Hooee continued to teach formal classes in her home. Older women, many of whom had learned to make pottery as girls, predominated in these classes (Bell 1976). Hooee's influence, however, is seen most clearly in the work of the few younger women she has taught. Pottery making also continued independently of formal classes in some Zuni families. One of these potters, Josephine Nahohai, began to teach in her home after being awarded a fellowship in 1985 by the School for American Research, Santa Fe.

Interest in pottery making has increased in the 1980s at Zuni. Potters have made greater use of older Zuni vessels, seeking visual models in the published literature as well as in museum collections. Since the Zuni revival is an ongoing process, its result is uncertain; however, increasing amounts of pottery have been available for sale (Rodee and Ostler 1986).

Recent developments in Zuni pottery making have worked to increase the variability of ceramics made in the pueblo. Sporadic production and rapid sales make it difficult to monitor the changing patterns that characterize the ongoing revival of ceramics at Zuni. Nevertheless, a few general observations are possible.

The teachers from Hopi and Acoma have essentially mastered the Zuni style. Still, their approaches and tastes are to some extent those of their earlier training. Consequently, differences appear in the ways their students make and decorate vessels.

Hopi, Acoma, and Zuni vessels are built according to the same general strategy, in which coils are usually added to a pinch-pot base. In addition, specifically Hopi and Acoma techniques have been introduced as alternative strategies. Potters learning from Jenny Laate may flatten a coil into a slab and then add it as a ring to the vessel. Daisy Hooee's students sometimes use an alternative method of construction in which the base is built up of tiny continuous coils. Thus, building strategies characteristic of other pueblos have become specifically associated with particular Zuni learning contexts.

Subtle stylistic differences mark decorations painted by students of the two teachers. For example, a single Smithsonian vessel (Figure 3.13) served as a model for young students of both teachers. The results were typical of present-day Hopi (Figure 3.14) and Acoma (Figure 3.15) influences on Zuni painted design. The two jars have essentially the same design, but it is rendered quite differently. While the variants of deer and birds are individual, other contrasts reflect differing aesthetics. Students of the Hopi school are cautioned to remain within Zuni style boundaries as their teacher defines them. Their concern is to produce delicate and detailed designs rather than to manage the decoration as a whole. They paint carefully—as one Acoma-influenced student remarked, "too carefully."

The student's remark reflects the essential stylistic and philosophical difference between the two teaching circumstances. Students of the Acoma school learn to paint in a bold, cursive style. Their teacher's concern focuses on providing them with a range of Zuni examples rather than on restricting them to those examples. As a result, they experiment with other pueblo styles and, particularly, with the overall patterns used in Acoma fine-line designs. They are encouraged to treat designs analytically and to adapt patterns to surfaces. They learn to reassemble designs from more than one vessel and, at times, from more than one pueblo.

The revival process itself has also been a factor in contempo-

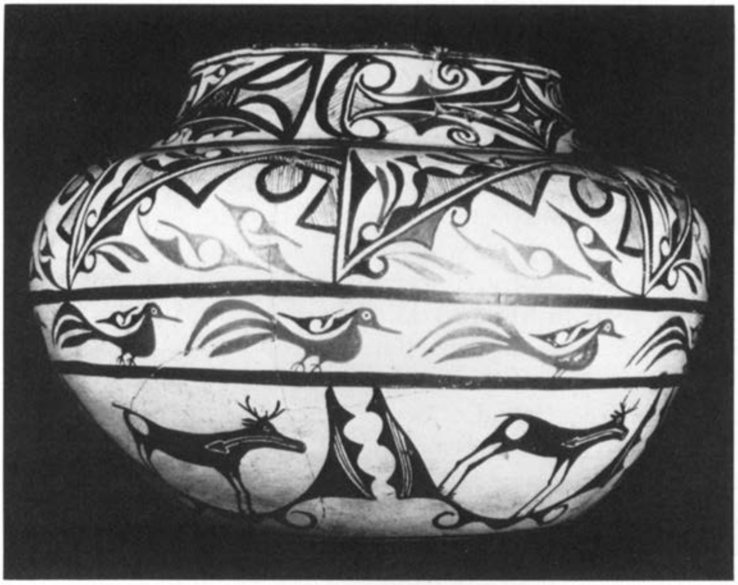

FIGURE 3.13. Old Zuni jar that served as model for contemporary vessels. Smithsonian Institution #66533.

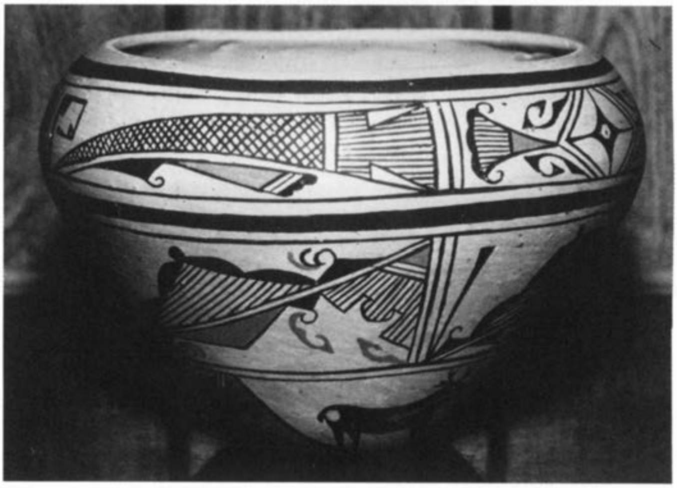

FIGURE 3.14. Zuni jar by Jean Lewis. Smithsonian Institution, not yet cataloged.

rary Zuni ceramic variability. The continuation of archaic designs is not a new process in the Zuni stylistic tradition; however, the current reintroduction of old designs has involved increasing use of new channels and a greater volume of information. Variability increases as contemporary potters learn rare older designs and choose models from different time periods. For example, Zuni High School students have favored models from the 1880s, while a member of the Nahohai family draws his inspiration in part from water jars dating to the early 1800s.

Reintroducing the past also influences the details of how motifs are rendered. The "deer house" as typically found on Smithsonian vessels provides a baseline (Figure 3.16a). This early version of the design is built on a shallow arc. The red fill meets the black outline completely, and three or more thin black lines separate the red fill from the black border. In the twentieth century, the deer house pattern became one of a few frequently used designs, and a number of variants developed. The plain red fill remained a constant, while its relationship to the boundary lines varied. Today some older Zuni painters leave a space between the red fill and its borders (Figure 3.16b). Such twentieth-century variants exist side by side with versions developed more directly from older models (Figure 3.16c). The Zuni High School variant

FIGURE 3.15. Zuni water jar by Bernadette Chavez. Smithsonian Institution #422879.

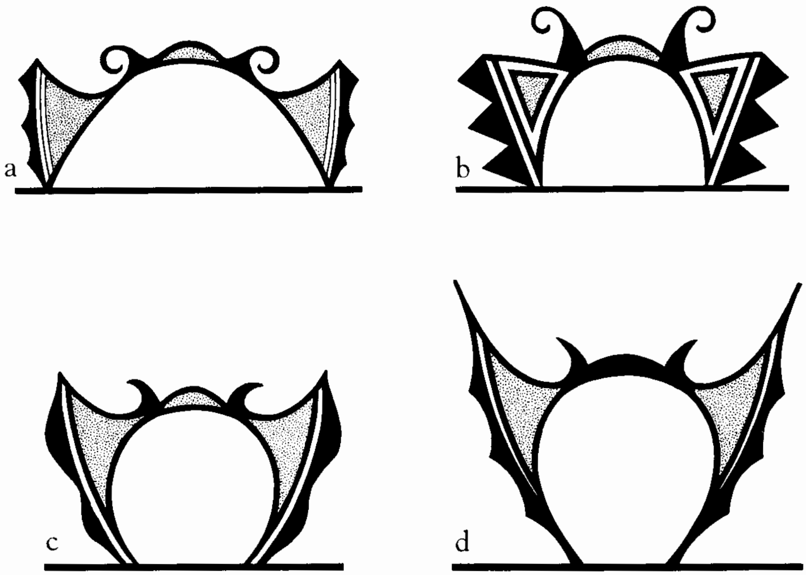

FIGURE 3.16. Variations of Zuni "deer house" motif. a. Motif as typically found on Stevenson collection vessels; b. Mid-twentieth-century variant; c. Zuni High School student variant; d. Zuni High School teacher's variant.

shown here is distinguished by its extreme bowed shape, as well as by its use of only two lines. The high school students' versions of this motif frequently share these attributes with their teacher's "deer house" (Figure 3.16d).

Stylistic differences between Zuni pottery and that of other pueblos have became more general since the 1880s. This process has worked largely through changes in the pottery of other pueblos. Contrasts have become more obvious as revivals in other pueblos, most notably Hopi and San Ildefonso, have resulted in wares not only with more distinctive decorations but also with saliently different color schemes. The subtle contrasts of the nineteenth century no longer serve to distinguish the pottery of the innovating pueblos, as their primary audience has shifted from members of other pueblo communities to non-Native American consumers. At Zuni there have been no abrupt changes of ware or painting, since the audience for this diminished tradition has remained significantly Zuni.

As the traditional use of Zuni pottery has narrowed, its symbolic context has shifted. Knowledge of kitchen and household forms of the 1880s has changed in detail or has been lost. By contrast, knowledgeable Zunis recognize other, relatively rare vessel forms that they associate with their traditional contexts of use. At a more general level, Zuni pottery has come to be associated with the past and with the continuation of traditional values in the present. This is most clearly seen in new cultural forms developed in the twentieth century. Olla Maidens are social dance groups that provide displays of Zuni aesthetic values as they parade, balancing water jars on their heads and dressed in elaborate traditional costumes. Images of Zuni pottery and pottery designs themselves figure prominently in contemporary Zuni painting. While Zuni painting and the Olla Maidens display pottery to outsiders, they clearly signal its Zuni context.

Old Vessels: Contemporary Interpretations

In the climate of ongoing revival of pottery manufacture at Zuni, potters and other community members have taken a lively interest in old Zuni vessels. From images of vessels in the Smithsonian collections, potters have taken details of vessel form and decoration as resources for renewal. Beyond this, the vessels taken from Zuni in the 1880s have provided occasion for interpretations of the Zuni ceramic tradition. Recognizing known patterns of form and decoration in old vessels has played an important role in discussions that have revealed Zunis' notions of ceramic variability together with their view of their ceramic past.

Zunis' assumptions about past ceramic variability were frequently expressed in the questions asked about individual vessels: "Is it Zuni?" "What was it for?" "Who had it?" "Is it Zuni?" asked whether a vessel fell within the boundaries of the Zuni stylistic community. The other two questions sought to place vessels within narrower contexts of Zuni use.

Zuni Style Boundaries

"Is it Zuni?" was a frequent first response to the Smithsonian pieces, many of which fell outside the rather narrow range of variation of contemporary Zuni ceramics. As a large and representative sample of Zuni ceramics of the 1880s, the Stevenson collection contains examples of vessel forms and painting styles that were rare even then. Some of these are older Zuni design types that had gone out of active use by the turn of the century. Others are best interpreted as exotic hybrids made from Zuni materials by visiting potters.

Because the potters with whom I talked wondered whether some Smithsonian vessels were "really Zuni," a questionnaire was developed to explore this issue. It consisted of photographs of eight vessels that people were given as an unordered set and then asked to rank from most to least Zuni. Vessels were chosen as examples of specific Zuni substyles and patterns of vessel decoration. With the exception of one vessel, which was slightly earlier, all of the vessels in the questionnaire were contemporaneous with the Stevenson collections. The designs on the vessels, however, differed in their histories.

Vessel A. The decoration on this water jar illustrates the substyle in most active use at Zuni in the 1880s. In the twentieth century this design became one of a few actively used water jar decorations. Today this design and its many active variants are the most common (see Figure 3.4).

Vessel B. This vessel decoration derives from nineteenth-century revivals of prehistoric wares (Dittert and Plog 1980:118). Today, as in the 1880s, it is in use as a set pattern displaying little variability (see Figure 3.8).

Vessel C. While this vessel's decoration falls within the most active Zuni substyle of the 1880s, it was not particularly common. At the time of Bunzel's study it was not in active use (1929:16, 78); however, it is occasionally used today. Most potters do not like to paint it because they find it difficult to reproduce (see Figure 3.5).

Vessel D. This is another example of a rare pattern of decoration within the most active substyle. Represented by one example in the Smithsonian collections, it was readily adopted by Zuni High School students and is again in active use (see Figure 3.6).

Vessel E. This water jar is somewhat earlier than the other questionnaire vessels. Its decoration is an unusually complex version of what later became a common Zuni design. It differs from later variants in the fineness of cross-hatching, the form of birds, the elaboration of medallions, and the simplicity of neck decorations (see Figure 3.7; compare Figure 3.11).

FIGURE 3.17. Water jar with Hopi designs but of Zuni materials. Vessel H in questionnaire. Smithsonian Institution #727.

Vessel F. The substyle seen on the inside of this bowl ceased to be in active use by the turn of the century. Pottery from Hawikuh (Smith, Woodbury, and Woodbury 1966:Fig. 74) shows that this scheme of bowl decoration was in use before the Pueblo Revolt of 1680 (see Figure 3.10).

Vessel G. While this painting style employing small, solid or hollow, stepped elements is not in active use at Zuni, older vessels using it are occasionally reproduced to fill specific traditional needs (see Figure 3.9).

Vessel H. This jar is Zuni in materials only. Hopi in form and style of decoration, it is best interpreted as an exotic hybrid made by a Hopi potter working at Zuni with Zuni clays and pigments (see Figure 3.17).

The original purpose of this questionnaire, created in the first season of fieldwork at Zuni, was to initiate conversations with potters. Potters' responses, it was expected, would vary because they had not seen some of the Smithsonian designs. Some insights about specific vessels were expected. Contrary to expectations, potters dealt uniformly with the questionnaire. With little difference between responses, they ranked the vessels the same way.

Most potters ranked the vessels in the order they are presented in the questionnaire. Vessel A was universally recognized as the "most Zuni." One person even said that this is the most typical and, therefore, the most ancient Zuni design. Vessel B was also recognized as Zuni, but ranked second. Vessels C and D were ranked third and fourth and recognized as Zuni. Vessel E presented problems for most people. Its fifth-place ranking and occasional rejection were due to the medallions, which were said not to be Zuni. In particular, the negatively defined petals were said to be Acoma. Vessel F was ranked sixth because of the large design on the interior. It was criticized as "lazy" and not considered to be attractive. Most people were not sure whether the bowl was Zuni, even though the design on its exterior was a recognized variant of a common design. Potters were uncertain about vessel G; those who thought it was not Zuni usually said it was from Acoma. Vessel H was rejected as not Zuni. Many people identified it as Hopi, and most ranked it last.

Small differences in people's responses underlie the particularistic and affective nature of the processes that form Zuni notions of what is Zuni. One young potter reversed vessels F and G because she remembered the design on G from her grandmother's house. Older potters who had recently worked with a Hopi teacher recognized that vessel H was Hopi, but politely moved it up one in rank.

In general, the Zuni pattern was to decide upon a vessel's decoration as a whole. If some aspect was considered to be non-Zuni, then the entire vessel was not considered to be Zuni. Rejected attributes were associated with other pueblos in a process akin to linguistic stereotyping of dialect differences. By contrast, three young adults who had received formal art training were much more analytical. They tended to focus on designs in isolation rather than on vessel decoration as a whole, recognizing vessels as Zuni when they considered some of their painted designs to be Zuni.

Zuni rankings in response to the questionnaire not only were remarkably uniform but also displayed another startling pattern. Contemporary Zuni perception of "Zuniness" in pottery decoration was inversely related to the length of time since the pattern had been in active use. Designs in use were ranked according to how actively or productively they were being used. Thus, the design on vessel A, which had more contemporary variants, was considered "more Zuni" than the design on vessel B, which was a set pattern. The designs on vessels C and D were marginally in use. Although the kinds of designs on vessel E were still in use, these particular variants had not been in use for more than a century. Vessels F and G represented Zuni painting substyles that have not been in active use since the 1880s. The decoration on vessel H was never a part of the Zuni stylistic tradition.

The coherence of the system of contrasts employed emerges not from the discussion of a single vessel but from its consistent application to many vessels. Although the Zuni judgments hinged on specific attributes, it was whole vessels that were considered to be either Zuni or non-Zuni. Reflected in the sequence of eight vessels is the changing content of the subtle contrasts that distinguished historic pottery styles of the various pueblos from one another. The sequence also reflected the twentieth-century decrease in Zuni ceramic variability, since discarded Zuni patterns were grouped with designs specifically associated with other pueblos. The pattern of Zuni responses is clear, producing a temporal sequence of inactive substyles, frozen vessel decorations, and discarded stylistic devices.

Form and Context in Zuni Ceramics

The questions "What was it for?" and "Who had it?" sought to place vessels more specifically within the Zuni community. While both questions addressed function and context of use, their emphases were quite different.

"What was it for?" asked how a piece was used. Zuni discussion of eating bowls, for example, focused on how everyone eating together once used bread to take stew from the same bowl. Similarly, the precise method of carrying the distinctive Zuni barrel-shaped canteen form—in a blanket roll over the small of the back—was detailed.

The question "Who had it?" was more complex and culturally specific. Although this question was most frequently associated with vessels decorated with isolated representational elements (Figures 3.2–3.3), it was also a common response to unfamiliar patterns of decoration and to unusual or complex vessel forms. It was assumed that vessels of this kind were associated with specifically defined traditional contexts. The question "Who had it?" referred to the culturally defined group that would have used that vessel form.

The documentation associated with the vessel shown in Figure 3.2 placed it in a specific social and religious context and stated its use (Stevenson 1884:550). While the details of group and use are not important for the purposes of this discussion, one potter's comments are. When she looked at a photograph of it, she said, "I made this last year." She did not mean that she had made the bowl in the photograph. That bowl, she was aware, was in the Smithsonian collections and had been in Washington, D.C., for a century. Rather, she had made a vessel of the same kind.

Potters talked about "having to make" particular vessels. This meant that a vessel had been ordered for a specific religious purpose. The potter was thought to benefit generally but received no compensation. The cultural mechanism for making a vessel anew was quite specific. The potter received instructions from the person who needed it. This information commonly included a detailed discussion of the vessel's size and form, together with an explanation of the necessary physical details of its use. In some cases, the motifs required and their location on the vessel were specified. In addition to detailed verbal instructions, potters at times received information in the form of the broken pieces of the vessel being replaced. While the potter was expected to work within the limits of the attributes specified, there was variation in actual practice. If the vessel did not meet the essential requirements, it was rejected by the person who had ordered it. Another potter might then be asked to make the vessel.

Potters and other community members familiar with the kinds of vessels used in religious contexts conceived of some Smithsonian vessels as tokens of existing types. In this interpretation a vessel's shape, size, and decoration were taken to indicate its intended context of use. Further, it was difficult logically to separate context and meaning. Unrecognized Smithsonian vessels drew comments wondering who had them and whether they had been lost. Zuni vessels were said to be lost when their type was no longer in active use. The meanings of vessels and designs were thought to be lost through the same process. For example, a twentieth-century engineering project obliterated a spring and was said to have resulted in the loss of vessels used to gather water on pilgrimages to that spring. In keeping with this line of reasoning, one Smithsonian vessel form, no longer actively used but still remembered, was deliberately included in the exhibit by Zuni committee members "so that it would not be lost" (Figure 3.3).

The manner of asking potters to make special vessels and of negotiating their form detailed here is not offered as a behavioral model that would by its direct operation account for Zuni patterns of ceramic variability. The practice is not applied to the full range of Zuni ceramics today; rather, it represents a special case in which the reiteration of established form was particularly important. Singling out visually analogous old vessels, Zunis used present practice to place order on past variability within their ceramic tradition.

Zuni Ceramic Variability: Present and Past Perspectives

Despite decades of diminished practice of pottery making, Zunis possess a detailed knowledge of their traditional ceramics. An important part of their knowledge, revealed in shared questions and implied answers, is an indigenous theory of ceramic variability. It is their shared assumptions about why vessels differ from one another that underlie Zunis' essentially uniform judgments of century-old vessels and their common approach to placing old vessels in specific interpretive contexts.

Zuni assumptions about ceramic variability operated at two social levels, leading to two distinct approaches to Smithsonian vessels. At the level of the community as a whole, interest focused on the boundary between the Zuni pottery tradition and that of other pueblos. In this contrastive system, vessels were accepted as Zuni or identified with another pueblo. Concern focused on the distinctiveness of Zuni ceramic decoration, and offending attributes were singled out. Within the Zuni community, the focus shifted to recognizing vessels as examples of specific types and placing them within their culturally defined contexts of use.

Zunis possess a notion of ideal type that informs their understanding of present and past ceramic variability. They find the core examples for their type concept in present-day procedures for making vessels anew for use in religious contexts. Recognized as similar cases, some Stevenson vessels were interpreted as tokens of ideal types, even when their contexts of use were unknown. Consistent with this type concept, Zuni discussions of Smithsonian vessels focused at the level of whole-vessel decoration. Lesser attributes of design became important only as they served to contrast Zuni and non-Zuni vessels or to connect specialized Zuni vessels to social and cultural contexts.

The view of historic ceramic variability developed here is a late-twentieth-century Zuni perspective that reflects the circumstances of a revival after decades of diminished practice. Given these intervening developments, one might expect the contemporary Zunis' view of their pottery to bear little resemblance to that of the Zuni man who helped Cushing or that of the potters who talked to Bunzel. Nevertheless, Cushing's and Bunzel's observations suggest that today's Zunis share their emphases on whole vessel decoration and the reiteration of types with Zunis of earlier times.

In his general ethnographic writing, Cushing addressed the propensity for the reiteration of forms in Zuni material culture, including the form and ornamentation of pottery vessels: "This tendency to persist in the making of well-tried forms, whether of utensil or domicile, is so great that some other than the reason usually assigned, namely, that of mere accustomedness, is necessary to account for it . . . (Cushing 1896:362). Cushing found his explanation in the 1880s Zuni concept of form, which closely tied function to form in both the animals and the material culture. The proper replication of form was of particular importance in those special articles used in religious contexts, for it ensured their proper functioning.

In their documentation of the 1881 Smithsonian collection, Cushing and his Zuni assistant placed certain vessels in specific, religious contexts of use, and interpreted them as instances of ideal types: "67514. Ancient form of sacred medicine bowl used by the order of the Rattlesnake . . . " (Stevenson 1884:577). Recognizing certain vessels as tokens of specific types, the 1881 documentation parallels contemporary Zuni interpretations of old vessels as well as contemporary practices for making certain vessels anew. The related process of reiterating vessels and their decorations is also captured in Cushing's documentation: "66464. Jar made in imitation of treasure jar, found in ruins of *Wi-mai-a* . . . " (Stevenson 1884:533).

In Zuni potters of the 1920s Bunzel saw artists bound by the constraints of a narrowing tradition. Her interest lay in the potters' artistic performance rather than in pottery or the pottery tradition. For this reason, her observations necessarily focused on how potters approached the tasks of painting a vessel or criticizing its decoration.

In Bunzel's account, a potter stated that she fixed a vessel's decoration in her mind before she began to paint: "I always know the whole design before I start to paint (Bunzel 1929:49). The potter, in other words, worked from a mental template that detailed the complete design (Deetz 1967:45–47; Watson 1979b:282–283).

Zuni potters of the 1920s also brought specific images of decoration to the criticism of the older Zuni vessels in Bunzel's photographs: "'The deer house is drawn wrong.' 'Someone did not know how to draw deer and put spirals there instead. This design should have deer.' 'Deer are not good on the inside of a bowl'" (Bunzel 1929:59). Potters recognized unfamiliar variants of known patterns in the greater diversity of earlier Zuni vessel decoration. In specifying how the older vessel decorations failed to match their own images of 1920s Zuni patterns, the potters treated them as poor examples of familiar types.

Bunzel emphasized the visual aspect of the Zuni potters' approach to painting as evidence that potters experienced designs unanalytically as complex patterns (1929:53). She interpreted the Zuni emphasis on whole-vessel decoration rather than on design elements as evidence of the unconscious nature of the potter's creative process (1929:1–2, 49, 51). Bunzel insisted on the unconscious nature of the pottery painter's creative process to provide a uniform mechanism through which a style might be maintained; however, it did not address the formal difficulties inherent in the organization of Zuni design or the particular processes that structure variability in Zuni ceramics.

Present and past Zuni approaches to pottery painting have emphasized whole-vessel decoration and the reiteration of ceramic forms. While these approaches remain as consistent mechanisms in Zuni pottery making today, they operate in different contexts that invite alternative interpretations.

Zuni potters have dealt with vessel decorations as wholes and planned them in detail before beginning to paint. While the Zuni emphasis on visualizing designs may represent the unconscious operation of style, it is equally usefully seen as a necessity in producing competent Zuni design. Visualizing the design in its entirety addresses the processual problems imposed by Zuni painting's combination of elaborate co-occurrence restrictions and intricate detail. For these reasons a Zuni High School pottery teacher made the template process explicit by creating a work sheet on which beginning students were expected to lay out their water jar designs before they began to paint. By contrast, Zuni decoration is not amenable to the procedural alternative of creating a design through successive decisions made during the painting process.

The reiteration of ceramic forms that intrigued Cushing was an infrequent, albeit important, theme in the documentation of the 1881 collections. Making vessels anew, as tokens of ideal types, may have taken on greater importance in Zuni discussions of traditional pottery conducted at the beginning of a period of revival in the ceramic tradition. At that time, Zuni pottery making had largely narrowed to serve a small range of its earlier uses that connected pottery with religious contexts and with the continuation of tradition. The association of special vessels with use in religious contexts provided a ready strategy for interpretation of both analogous forms and unfamiliar patterns of decoration seen in the Smithsonian collections. The parallel between the special vessels, made anew for religious contexts, and old vessels, copied in their entirety, is obvious. Despite some encouragement to approach unfamiliar designs more analytically, contemporary Zuni potters' usual strategy for reintroducing designs from old Zuni vessels remains copying the whole decoration (Figures 3.13–3.15).

As the documentation of the 1881 collection demonstrates, the Zuni practice of reintroducing past decorative forms through copying whole vessel decorations is not new. Consistent with the reiteration of forms and the copying of archaeological vessels are the frozen patterns of vessel decorations, archaic designs, sets of similar vessels, and clearly defined substyles that structure Zuni ceramic variability. The temporal dimension of Zuni stylistic variability, laid out in the discussion of the "Is it Zuni?" questionnaire, suggests that these processes have operated for some time as a part of Zuni ceramic tradition.

Summary and Conclusions

This chapter has examined Zuni ceramic variability from the perspectives afforded by more than a century of ethnographic collecting and description focused on the Zuni ceramic tradition. The contemporary revival of Zuni ceramics provided a basis for the discussion, in which the Smithsonian's collections of Zuni pottery played a dual role, serving both as a baseline for describing changes in Zuni pottery since the 1880s and as a source of vessels through which contemporary Zunis interpreted their ceramic past.

At Zuni the period since the 1880s has seen diminished practice of the ceramic arts followed by a revival. These processes may be tracked not only through the changing inventories of vessel forms and vessel decorations but also through the changing position of pottery within Zuni culture. Because of the present revival, Zuni ceramic variability is no longer decreasing. Although the sources of increasing variability in present-day Zuni ceramics are complexly interrelated, two mechanisms can be identified. First, contemporary Zunis learn to make and decorate pottery in distinct, multiple contexts, creating schools of pottery making. Potters learning or relearning their art bear the influences of their teachers and fellow students in their methods of vessel construction, overall approach to design, and details of motif construction. Second, the patterning of variability in contemporary Zuni pottery reflects Zuni approaches to vessel form and decoration. In the Zuni case, the intensified rediscovery of older designs continues and extends existing practices, which provide for the reiteration of specific vessel forms and decorations.

The manner in which contemporary Zunis dealt with Smithsonian vessels provided a special perspective on the processes of revival. The questions asked revealed the immediate concerns of the potters. In seeking to place the vessels in general or specific Zuni contexts, the Zunis reclaimed them as a part of their tradition. Zuni discussions of Smithsonian vessels revealed concepts of ceramic variability, particularly the reiteration of forms, that are consistent with the stylistic patterning of Zuni pottery painting and well suited to the needs of the revival. Several factors in the history of Zuni pottery examined in this chapter emphasize the reiteration of forms. These include the constraints placed on special objects made for religious contexts, leading, in the case of pottery, to the interpreting of some vessels as tokens of set types. In the twentieth century, diminished practice of the Zuni pottery tradition has led to the loss of stylistic alternatives and the creation of frozen forms. Finally, in the context of revival, the reiteration of forms modeled on old vessels becomes the reintroduction of the past. By contrast with the more universally applicable mechanism derived from studying Zuni potters' performances, the reiteration of forms is a particularly Zuni process.

Acknowledgments

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This chapter has been improved by the discussion of friends and colleagues. In particular, I would like to thank Charles Briggs, Barbara Mills, Warren DeBoer, and Raymond Thompson for their comments. I am grateful to Phyllis Chock and Bill Longacre for their encouragement. I would like to thank Terri Togiai for typing the manuscript.

I owe special thanks to Zuni friends and colleagues who helped with the exhibit and over the years listened to and commented on successive versions of this chapter. My greatest debt is to the men and women making pottery at Zuni today. I thank them for sharing their tradition.

Note

1. The reader seeking a more complete account of Zuni vessel forms and associated terminology is referred to Hardin 1983b:Ch. 4.

4

The Decoration of Containers: An Ethnographic and Historical Study

Ian Hodder

What is the relevance of a chapter about decorated calabashes (gourds) to a volume about ceramics? A characteristic of recent archaeology has been the widespread espousal of a systems theory framework. The various subsystems, such as ceramic production, are discussed in relation to other subsystems, such as exchange or social complexity. Yet, at the same time, the category "ceramics" is seen as universal, as something about which general statements can be made. In the making of such statements "ceramics" are taken out of their contexts and universal assumptions are applied.

In fact, however, archaeologists commonly make a number of decisions that hint at the arbitrariness of the procedures employed. For example, the category "ceramics" or "pottery" often refers only to ceramic containers rather than to items made of fired clay. Thus the Greek "Pre-Pottery Neolithic" contains fired clay figurines and a range of other ceramic materials. Equally, there are many categories other than "ceramics" to which an individual pot can be assigned. For example, it can be placed in the category "containers," in the category "all decorated (or undecorated) items," or "items used in food preparation," and so on. Any ceramic item is involved in overlapping sets of categories and in a network of meanings. The danger of arbitrarily choosing some universal category is apparent. If we want to understand pots, we must see them from many more angles.

Crudely, then, there are two ethnoarchaeological approaches to ceramics. The first involves defining an arbitrary category "from the outside" and searching for the cross-cultural correlates of that category. The second approach, to be followed in this chapter, is to situate ceramics as fully as possible into their own context of meanings. Such an approach involves discovering the multidimensional networks of meaning in which pots play their role. It involves looking for similarities and contrasts along varied dimensions of meaning (as outlined by van der Leeuw in Chapter 2 of this volume). It involves suggesting ways in which the dimensions of meaning are structured at various levels. But above all, it involves breaking down the notion that "ceramics" implies one category with a single meaning. Rather, if the pots being discussed are painted red, one can ask, "Where else in this culture does one find red?" Or, if the decorative motifs used on pots also occur on cloth, one can ask, "What happens if we place pots and cloth in the same category, and what does this association imply?"

This chapter is about calabashes. But the procedures employed in the analysis are relevant to any item of material culture. Pots are part of a system, but they take part at more than the systemic level.

Baringo Calabashes

In earlier work among the pastoralist, patrilineal, and virilocal Ilchamus (Njemps), I tried to explain why only the Ilchamus, who live in dispersed compounds to the south of Lake Baringo, Kenya, decorate calabashes in terms of information exchange and ethnic competition (Hodder 1982b, 1985). The ethnoarchaeological work involved was quick and "from the outside." Using the first approach outlined above, measurements of arbitrary categories such as "decorated calabashes" and "intergroup competition" were identified and compared.

In more recent work in Baringo (January–March 1983) an attempt was made to examine more fully the context of meanings within which the calabashes are situated. This is not to argue that the meaning of an object derives entirely from its environment. Certainly the object contributes to the environment. Ultimately there is a two-way dependency between most, if not all, objects in any cultural context. It is difficult to know how to break into this network of associations, contrasts, and meanings.

And once an entry has been made, the account will always be complex.

The Meaning Context

The first thing is to note how Ilchamus decorated calabashes are used. All decorated calabashes, and many undecorated ones, are used to contain and serve cattle and goat milk. They are made and decorated by women, and the insides are periodically cleaned by women. Small decorated calabashes are used to feed milk to young children, up to the age of seven or eight. Medium-sized and large calabashes are used for milking cows, an activity usually carried out by the women. The calabashes, full and empty, are kept in the hut by the woman's bed (*ruet*). They are also stored in the *iltorog*, a cupboard at the end of the woman's bed. Although cattle, and hence cattle milk, are generally owned by men, the care and distribution of the milk is largely in the hands of women. Women frequently lend and give calabashes to each other in the sharing and exchange of milk. Women without cattle may depend on the milk of neighbors to feed young children. A mother-in-law gives milk in a calabash to help a young family. Co-wives share the milk that each has taken from the family herd, dividing according to need. Calabashes without milk may also be given as gifts between women. In particular a young woman about to be married, or a young wife, may give a decorated calabash to her mother-in-law, who lives in and "controls" the compound in which she will now live. A mother-in-law will often give her son's new wife a decorated calabash as a sign of welcome and acceptance.

Not all calabashes are decorated with incised designs, and we shall see that the variability in the decoration of calabashes is of interest. But for the moment we can note that the associations of decorated calabashes lead us to consider three aspects of Ilchamus life: the milk that the calabashes contain; children, since the small calabashes used to feed milk to children are the most frequently decorated; women, since it is women who make and use and keep decorated calabashes.

Women use milk to feed children, on whom the continuity of the clan and society depends, and also to feed adults and to present to visitors. Women claim that they must always have milk stored, ready for unexpected visitors. They perceive it as their role to provide the husband with his share "without any inconvenience." The religious leader of the Ilchamus, the *laibon,* says, "Milk is part of Ilchamus life: it means happiness."

The importance of milk for the Ilchamus derives partly from the central importance of cattle as wealth and from the importance of cattle and milk as a primary resource. But the special significance attached to milk is clear from its frequent use in a wide range of ceremonies linked to fertility and reproduction. There are also instances in which other materials, white in color, are used as symbolic of milk. Milk and cattle themselves are both described as white, and other white things can stand for them.

In the circumcision ceremonies of both boys and girls, shaving the heads of initiates and elders (indicating renewal and a change of life) is preceded by washing with milk taken from the concave seat of four-legged stools. Also in the circumcision ceremony, the mother of the compound uses the *ilkidongoei* (a type of brush used to clean out calabashes) to sprinkle milk from a calabash over the faces of the initiates as a blessing. Women bring fresh milk to drink at marriage ceremonies, and in the same ceremony milk is used in blessing the married couple. Milk is drunk with ground millet and vegetables at a number of occasions that women attend—for example, at birth rituals—and it is brought for drinking at the rituals for preventing droughts and disease. Milk, together with tobacco and honey beer, is placed over the graves of distinguished elders, in the cattle compound, to remember and honor the family ancestors and to provide for the continuation of the clan. The *laibon* and the elders put milk in their mouths and spit it, bit by bit, over those to be blessed in ceremonies. When advising individuals on their social and personal problems, the *laibon* requires the subject to bring a calabash full of fresh milk, into which he looks and reads the future.

In the ceremony orchestrated by the *laibon* to prevent drought, a mixture of water, clay, thatching grass, and milk is used to bring rain, and a black heifer is fed milk. To prevent disease, a ram is slaughtered and its excretions are mixed with milk and fat from the same animal, kept in the animal's stomach, and then spread over the land surface. In the same ceremony, a mixture of white earth (symbolic of milk), milk, and water is marked as a cross on the stomach and under the breasts of women so that, according to the *laibon*, they will have many children. The relationship here between milk, white, and reproduction is widely recognized. The cross design is also important here and is one of the motifs incised on the milk calabashes.

A white, milk cross also occurs as part of the male circumcision ceremony, a long ritual with numerous stages. The circumcision operation (*barta*) itself takes place in the cattle compound, as the boy is held on a cow's skin brought from her house by his mother. On this plain circumcision skin (*nchooni le barta*), she makes a cross in milk fat, which signifies that she has granted her son permission to become adult—that is, to enter into the warrior or *moran* age grade. She also gives him a mixture of milk and water from a calabash, poured into his cupped hands four times and spread over his face. The mother then leaves and the boy is circumcised in the presence of men only. The father has put milk fat on the boy's head as a blessing and as an open acceptance of the coming-of-age of his son. The mother's cross is seen as an equivalent gesture and must, if possible, be done by the boy's birth mother; even if she is divorced and remarried, she is called back to paint the cross. Indeed, the ceremony has to await the woman's presence, and this presence is signified by the use of milk. When the father puts milk fat on the boy's head, it has been prepared by women. It is in milk, obtained by women, that the *laibon* reads the future. Although rituals are usually controlled by men, the importance of women *is* represented symbolically by milk. In practical terms, too, the frequent use of milk depends on women.

Material symbols come to have meaning through association and use, and in this way milk, and therefore milk calabashes, have numerous positive associations in Ilchamus society. Yet all symbols have their otherness, their contrasts, implied in them. To say something is similar is also to evoke the possibility of opposites. Thus, fully to understand the meaning of milk, we must also grasp that with which it is contrasted.

In many instances white milk, associated with reproduction and fertility inside the domestic context, is contrasted with red and with danger in the outside world. For example, at the *lerinyoren* ceremony for the promotion of *moran* to elders, a bull is slaughtered. But it is first given honey beer and milk "to make the bull happy" and to wish the new generation of elders many children and long lives. The bull is then killed, not in the usual way—by spearing or cutting the throat—but by suffocation, so that there is no sign of blood, since blood is always associated with danger.

Returning to the male circumcision operation, the boy's penis is washed with a cold mixture of fresh milk and water in order to clean away the blood, and it is then rubbed immediately with "whitewash" (soda ash) in order to stop the bleeding. Another example of the opposition of white (symbolic of milk) and red (symbolic of blood) is the collection of white soda ash from a mountain to the north of Baringo, Mount Paka. At an earlier stage in the male circumcision rituals the initiates journey to this mountain in the Pokot tribal area to collect the ash, which is seen as having been made by god (*ngai*) in active volcanoes. It is dug out by members of the Iltoijo clan, and "when it is dug by a non-member, the source changes to red, blood, instead of the normal white."

As another example, only women are allowed to remove ash, described as white, from the domestic hearth in the huts. But they are not allowed to throw the ash outside the compound with the other domestic rubbish (Hodder 1985). Rather, they have to throw it inside the compound fence. In explaining this, a woman said, "If you compare ash with red soil, you find it is different, because ash is white. So if you spread ash outside your compound, it might be spread everywhere by the wind and it would all become whitish." Here the world outside the compound is perceived as red, to be separated from the inside world associated with women and with white.

This outside world is often seen as male, dangerous, and wild. In the past, and still sometimes today, newly made pots and calabashes, termed "white," are hidden from view lest they be seen, and crack. *Moran*s who had been eating meat "in the bush," and men who had murdered or had killed lions or other wild animals, "hated newly made pots and calabashes and smashed them" when they came back to their village or compound. Individuals can provide examples of having had a murderer in a hut, and afterward a calabash broke. In explaining such events, individual elders frequently referred to the strength and power of wild animal blood or of the blood of the murder victim. The *laibon* made the opposition between wild blood and the domestic world with milk and cattle more clear:

> The blood out of the wild animals brings about all dislike; it is the blood from these wild animals that makes the *moran* hate the pot and calabashes. Even if lions are miles away, the cattle sense their presence through the air, and cattle disperse and run out of the cattle enclosure and grow wild.

It is particularly the young warriors, the *moran,* who are traditionally associated with wild strength in the outside world. The circumcision ceremony to become a *moran* involves journeys through, and long stays in, the wild, hunting and eating meat unsocially, away from the eyes of women.

We could, then, say that the Ilchamus calabashes are linked into a symbolic structure that opposes milk to blood, white to red, female to male, domestic to wild. In its simplest, it is women who milk cattle and men who bleed them. Both milk and blood are important resources. They are brought together in the drinking of *saroi,* a mixture of blood and milk. *Saroi* is associated with a scarcity of milk. Since milk is normally plentiful, *saroi* is associated with being away from home, with danger in the wild.

But we can already see with *saroi,* the milk and blood mixture, that no such simple structure exists. The structure may be called upon and may be created in social life, but it does not determine that life. And blood and red can have more than one connotation at the same time. They do not always mean danger and a threat to society. Indeed, blood is a basic resource on which the society depends. Both blood and milk occur in *saroi* because, in a sense, they are not opposed; they both give strength. The mixture is drunk by both boys and girls after circumcision so that they regain the strength lost with the blood in the operation. The color red itself also has such positive connotations. In the past, the hair of *moran,* kept long as a sign of the "wild" state, was coated with red ocher, and red ocher was smeared in a red "V" design on their chests. In circumcision ceremonies, red ocher and fat from a ram are rubbed on shaven heads to promote change to a new stage of life and to encourage the hair to grow again. Similarly, red ocher is smeared on the head after shaving at the death of a family member, in order to encourage renewal.

The color red, then, is not always opposed to milk, since both red blood and white milk symbolize, and in practice provide, strength and renewal. Also, red, outside, is not always contrasted with female and the inside world. Women, for example, decorate themselves with red ocher on their ears and ear decoration, and also use it on beaded skins (*lekisana* and *lekichopo*) used continuously in the past and today used in ceremonies. Many women daily wear clothes colored with a light red dye.

Behind the *leatwa* cage of her *ruet* bed in the hut, the woman gives birth and menstruates. The loss of blood at birth is said to make a woman weak and dirty. During the seclusion after birth she cannot wash, clean utensils or calabashes, or prepare food. Menstruation taboos are relatively limited in Ilchamus society, but once again the loss of blood is seen as being potentially dangerous and dirty. To wash would be to "wash away the blood to have children." Here blood, associated with women inside the compound, has dangerous, negative qualities, threatening the continuity of society. The danger of red blood here is equivalent to the wild, outside danger of the red-painted *moran*.

Thus, there is no overall structure. White milk can be opposed to red blood, but it can also be associated with it, providing strength. The white inside can be opposed to the red outside, but the inside also can be seen as red and dangerous. Women have both white and red qualities.

In this complex of meanings are the calabashes. They contain white milk and are made and used by women in the domestic context. It might be thought, then, that they fit nicely on the side of white, inside, female as opposed to red, outside, male. New calabashes are often described as white. But there are also opposing qualities here. In time the calabashes are often polished and become reddish. But, more specifically, the designs used refer to other contexts, in which red is used. For example, the red skins worn by women have the same double "V" and zigzag designs found on the calabashes. Red ocher generally is closely linked to ear and other body decorations.

The cross design on the calabashes evokes the white cross painted on the circumcision skin, but the main motifs used refer most directly to men, particularly to young *moran*, the unmarried warriors traditionally associated with the wild outside world. When asked for the ultimate origin of the double "V" design on calabashes and on women's skins, women always immediately referred to the red "V" painted on the chests of *moran*.

We have seen over and over again that white and red, milk and blood, are brought together in Ilchamus life. They are contrasted, yet the same. White milk washes away red blood in ceremonies, while domestic ash is contrasted with red outside soil, and milk products and red ocher are put on the head at different times in order to encourage strength and renewal. The calabashes take part in their meaning structure. Once again they bring together milk and blood, white and red. Inside they contain, store, and protect white milk. Outside they are decorated in designs that refer to *moran* warriors, to the use of red ocher in decoration.

Thus, to explain why the Ilchamus calabashes are decorated, we need to interpret the complex structures of meaning within which they are formed. The calabashes are decorated, and they are decorated in a particular way, because the Ilchamus have a particular set of perspectives that separates and brings together milk and blood, white and red, female and male. Decorating calabashes is one way in which this meaning "game" is played out.

But is it enough simply to refer to a structured set of symbolic similarities and differences? Have we adequately understood the meaning structures behind the calabashes in this way? It is possible to demonstrate the limitations of the account so far by asking two further questions. Why are other Ilchamus food and drink containers not decorated? Why do other Baringo groups not decorate calabashes?

Milk calabashes are the only containers that the Ilchamus decorate. Beer calabashes, for example, contain beer, which is often made and cared for by women, and served to men, but they are not decorated. Equally, pots and basket eating containers are not decorated, yet they are made by women and some types are used to cook and serve agricultural products to men and children. Many of the agricultural tasks are carried out by women, and women care for the grain that is stored in the huts for domestic use. Why are these containers not involved in the same oppositions as those described above? Why are grain and baskets for service of cereal foods not associated with milk, inside, white, and surrounded by the type of decoration found on the milk calabashes?

This question is particularly relevant for pots. Like the calabashes, the pots are made and largely used by women. The pots are used in the domestic context to feed men, women, and children. Women are as central to the production of grain as they are to the distribution of milk. Men depend on women working in the fields, caring for grain in the stores in the hut, and preparing it for consumption. The parallels with the calabashes are clear, but the pots are not decorated. Yet the pots do have symbolic qualities that could be linked to white, milk, and reproduction. Clay is used at several points in rituals to encourage fertility, strength of women, and reproduction. Clay has reproductive qualities that could have been emphasized by women in pot decoration.

The lack of decoration on pots, baskets, and metal containers used to hold grain and cereal products evokes the fact that while agriculture is essential for the production of Ilchamus society, it is perceived as having a low value. This is partly a historical question. In the nineteenth century, the Ilchamus lived in large villages, without cattle, dependent on irrigation agriculture. But originally, before the nineteenth century, they had been pastoralists, and even in the nineteenth-century villages they retained an intention to return to cattle, because cattle were equated with wealth. Thus, as soon as conditions permitted, around 1900, the Ilchamus dispersed and gave up most of their agriculture except insofar as it allowed them to build up cattle stocks. Marriage payments and wealth are counted in terms of cattle. Everything to do with cattle, in particular the blood and the milk, is central to Ilchamus life. Everything to do with cattle is beautiful. Agriculture, and everything to do with agriculture, has low value.

Thus, we could say that the Ilchamus decorate milk calabashes but not grain pots because milk has a higher value than grain. Yet it could be argued that this just pushes the problem back in time, back to the question of why the Ilchamus value cattle. I think it *is* necessary to explain the present by reference to the historical tradition that forms individuals' view of the world. We *do* need to look back, searching for origins, doing culture history, to disentangle the frames of meaning. People grow up to live in a society that is already structured. To some extent the structure is taken for granted, retained via subjective dispositions. Thus, the most common Ilchamus reply to my questions about the meaning of the calabash decoration was simply that it is meaningless; the decoration is just beautiful. Our discussion must give some credence to this frequent statement. On one level, for the Ilchamus, it is natural to decorate calabashes because everything to do with cattle and milk is beautiful and is celebrated. For the Ilchamus there is a real sense of beauty, emotional peace, and aesthetic joy in the whole area of activity. In this sense, then, the decoration has no cause. It simply exists as part of Ilchamus culture. It is irreducible. To probe such orientations, we need culture history, studies of diffusion and origin, but there is never a "cause."

The same point can be made regarding the second question. Why do only the Ilchamus decorate calabashes? The Ilchamus could highly value milk and cattle without decorating calabashes. They could play on the oppositions between milk and blood, red and white, without decorating calabashes. In all neighboring groups in Baringo, cattle are important and milk is used by women to care for children in the domestic context. Why do they not decorate calabashes as the Ilchamus do? Why do the Ilchamus decorate calabashes? It is difficult to find any contemporary social and economic reason for these differences, despite attempts I have made to do so (Hodder 1982b).

The reasons, again, are largely historical. The Ilchamus derive from the Masai group, and they speak Masai. The other Baringo tribes, Tugen and Pokot, are Kalenjin. Many of the decorative traits and motifs used by the Ilchamus (such as the "V" designs on male bodies and on the ceremonial skins) have a widespread distribution among Masai-related groups. Yet there is a more specific historical context for the Ilchamus decoration.

The "V" decoration on skins is made in colored beads, and the leather caps of the calabashes and the straps around them are usually beaded. Beads and other types of decoration are closely associated. Beads and decoration also have a special meaning, to do with being social. There is an Ilchamus song and dance called *Loodo*. The steps in the dance involve *moran* surrounding a group of women and then mixing with them, separating and mixing again. It is this mixing of men and women that, in the words of the song, "produce[s] beautiful coloring" and gives the song its name, "Beautiful Coloring." The men and women are traditionally dressed in red ocher and beads. A proverb states that a man without beads, with an undecorated skin like the scales on a fish, wants to be alone. For men, wearing beads and other decoration is particularly associated with the period after circumcision when full social relations begin; *moran* are able to marry and control resources and move toward elderhood.

La Seranka ("the decorated one" or "the one with decorated cloth") is the name given to *Lekodom*, the father figure and heroic ancestor of all Ilchamus, who, although not a *laibon*, had miraculous spiritual powers used for communal social good. He lived sometime in the early nineteenth century and wore a black cloth (for the Ilchamus, black is the color of our blue sky) that had beads attached to long strips of leather. "*Lekodom* was the cloth, and his good deeds were the decoration." He was called the decorated one "because he came from god, who decorates the sky with rainbow colors."

Whatever the details of this historical information, it is clear that decoration is closely linked to historical notions of being Ilchamus, of beauty, and of sociability. Decoration happens to be one of the ways the Ilchamus celebrate things they value and play upon things they think important. Here there is, again, an irreducible set of subjective dispositions that can be unraveled only historically.

But there is a danger here that we may relapse into a normative and idealist stance in which we are content to decode the structure and peel back the history. How is this set of meanings involved in social action? How does change occur? And if decoration is linked to sociability, how does this occur?

Social Action

We need now to examine more of the social context of the calabash decoration. In particular we have seen that the calabashes used by women to feed children are the most frequently decorated. Thus we need to consider the social context of women and children.

On a day-to-day basis, it is women who are more frequently found in and around the domestic compound. Men are more frequently away in meetings, visiting, working outside the region. The work of women in the home centers on the care of children and milk, but also involves other essential tasks, such as the collection of firewood to be stored in the hut, the collection of water, and the maintenance of fire in the hearth. They also repair the mud hut walls and the roofing thatch. Women and children also do the major share of tending cattle while they are being grazed near the compound.

Perhaps more important, however, is the role of women in agriculture. The Ilchamus today depend on dry and irrigation agriculture in order to make up for losses of cattle; however, work in the fields has a low status for Ilchamus men, and a majority of the tedious, daily tasks are carried out by women. And in the home each wife controls the grain that is to be used in the feeding of her family.

In all these ways women make a real contribution to the Il-chamus economy. Still more important is the role of women in caring for children. A primary male concern is to have many children, and elder men closely link the reproduction of cattle and children. The main concern of the patriclans is to increase in size and wealth through increasing cattle stocks. Male children are thus necessary for the expansion of the clan and the building up of clan-owned cattle stocks. Daughters are necessary because their marriage into other clans, in exchange for cattle, is a prime way of increasing cattle wealth.

Thus, all men say they wish to have many wives and many children. The importance of children is represented by numerous rituals and practices. Given this social context, coupled with the inherited high historical value of milk, cattle, and decoration, the decoration of calabashes, particularly those used for children, has clear strategic value. The decoration surrounds the involvement by women in a valued resource—the milk of cattle. It involves female use of milk and milk symbolism in relation to men and children. It involves the varied attempts of women to find a way of working within the interstices of male power, via milk and children.

We can see these varied strategies in the variability of the calabash decoration. It obviously is dangerously subjective to claim that a certain design is poorly executed, yet many of the designs are clearly intended to be regular but are not. Often only one side of the calabash is well or fully decorated, or decorated at all. The provision of dots or hatching infill of triangles, for example, may stop or tail off along a band of decoration. The decoration often appears halfhearted when looked at in detail, the women not having bothered to fill in all the triangle designs. There is often overlapping as new designs are added (Fig. 4.1). While some of the variation is due to incomplete calabashes, the difference between compounds with many well-decorated calabashes and those with few, badly decorated calabashes and those with no decorated calabashes is stark.

What is the strategy, then, of those who decorate calabashes well? Within the male, dominant view, to decorate calabashes well shows that a woman cares. It shows she cares about the do-

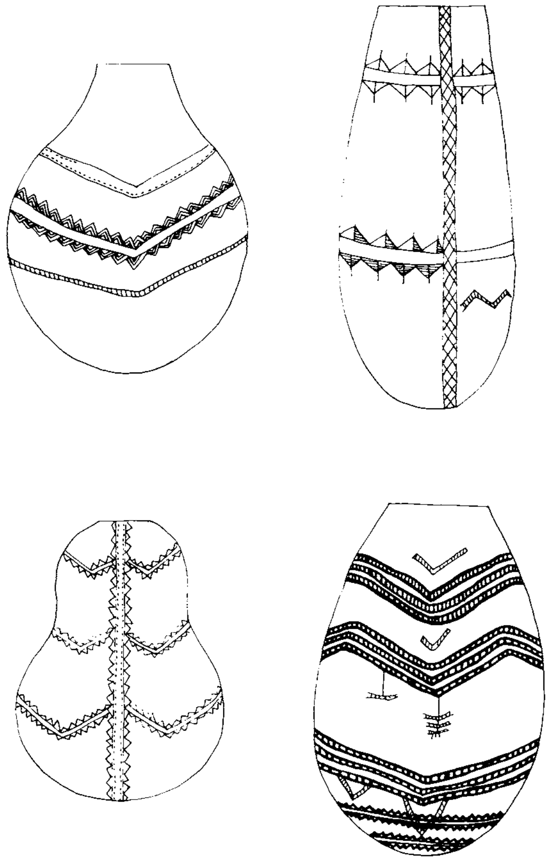

FIGURE 4.1. Some examples of incised calabashes made by the Ilchamus, Baringo, Kenya.

mestic context on which male interests, in relation to cattle and children, depend. A woman who does not have the time or interest to decorate her calabashes, or to decorate them well, is described as "careless." A man says "She is a very clean woman; look at her calabashes," which are carefully decorated and highly polished. An older woman bemoans the recent decline in calabash decoration "because it was beautiful," and women recognize that their husbands like to see them decorate calabashes. "The decorated calabashes are part of how to decorate the house."

It is expected by the husband that the wife will provide "good calabashes with good milk." That the decoration of calabashes is connected with expectations about the role of women in caring for milk, cattle, and children is often acknowledged. A woman would often explain that she had no calabashes because she had no cows (they had been lost in droughts, e.g.). A man: "My wife has no decorated calabashes because we have little milk now and it is unthinkable to have empty decorated calabashes." In some cases women in a family without cows *do* decorate calabashes carefully, since they are dependent on loans of milk from neighbors, and it is important in such a situation to show other women that one cares about one's children and domestic duties, deserves help, and will repay.

The quantitative information (Tables 4.1–4.7) shows that there is indeed a correlation between the number of cattle owned by a compound and the percentage of the calabashes that are decorated. Generally, it is the large, rich families, with many cattle, with many wives and children, and with middle-aged husbands trying to build up their family size, that have a larger proportion of decorated calabashes. It is in these compounds that men are most concerned to generate the spiral of greater wealth and political importance through the reproduction of cattle and children. This social strategy depends also on women and domestic care. Such a man would want and choose a wife who supported his strategy. One of the ways in which women express this support is via calabash decoration. A woman who decorates calabashes well is aiming at gaining power through her domestic contribution and through her children. As she reaches elderhood, she obtains a certain control of resources, and as a "good wife" she is liable to be supported by the community in complaints (which can be formally made and tried) against the husband. As her sons grow

TABLE 4.1. Proportion of All Calabashes That Are Decorated in Compounds Owning Different Numbers of Cattle

	Number of Cattle					
	0–5	*6–10*	*11–20*	*21–50*	*51–100*	*>100*
Decorated	48	24	30	18	12	5
Undecorated	207	71	73	53	13	10
% Decorated	19	25	29	25	48	33

TABLE 4.2. Proportion of Decorated Calabashes in Regions Around Baringo, Correlated with Numbers of Cattle

Region	*% Decorated Calabashes (total sample)*	*Average Herd Size per Family*	*Range of Herd Size*	*No. of Cattle*	*% Total Baringo Cattle*
Langarwa, Sintaan, Njambo	25(318)	18	0–171	4250	34
Salabari	33(64)	17	0–83	3116	25
Eldume	25(71)	15	0–88	1808	14
Mukutani	16(38)	9	0–60	936	7
Loiminang and Logumukum	23(78)	9	0–50	1782	14

TABLE 4.3. Decorated Calabashes in Compounds of Different Ilchamus Clans

	Calabashes		
Clan	*Number Decorated*	*Number Undecorated*	*% Decorated*
Sakaam	26	57	31
Persaina	2	28	7
Il Kapis	19	86	18
Loiborkichu	10	23	30
Il Murbanat	16	46	26
Loimisi	19	29	24
Il Kunguan	11	28	28
Il Toimal	12	49	20

older, she will probably move to live with them and be supported by them in conflicts against the husband.

As a young child becomes more and more aware of the world around it, one of the earliest impressions is of the mother's milk provided in a decorated container. Most of the other things people eat or drink from seem to be dull, black, and plain. Even at eight years old, the child recognizes his or her own calabash from its

TABLE 4.4. Decorated Calabashes in Compounds with Male Heads of Different Generations

	Calabashes		
Age-Set	*Number Decorated*	*Number Undecorated*	*% Decorated*
Ririmpot (older)	4	30	12
Ilnapunye	10	31	24
Il Paremo	12	38	24
Il Moricho	18	57	24
Il Medoti	17	42	29
Il Kiapu (younger)	28	119	19

TABLE 4.5. Decorated Calabashes in Compounds Containing One–Five Co-wives

	Number of Co-wives			
Calabashes	*5*	*3–4*	*2*	*1*
Decorated	8	30	37	28
Undecorated	19	78	115	101
% Decorated	30	28	24	22

TABLE 4.6. Decorated Calabashes Owned by Women Aged 20–40

	Ages of Women		
Calabashes	*20*	*21–30*	*31–40*
Decorated	35	41	12
Undecorated	79	142	52
% Decorated	31	22	19

TABLE 4.7. Decorated Calabashes Owned by Women with One–Five Children Under the Age of Ten

	Number of Children		
Calabashes	*1–2*	*3–4*	*5*
Decorated	11	18	31
Undecorated	40	60	68
% Decorated	22	23	31

decoration. The calabash is closely associated with the mother. In this way the importance of milk and of the mother in providing it are emphasized (by the decoration) at an early stage. Children, the basis of male power, are in this way closely tied to women.

As a girl grows up, she tries her hand at decorating calabashes and produces poor, crude copies of those made by her mother. She tries out this particular social strategy and finds her way in the world of women. She may find, through the decoration, that she wants to participate in this strategy, or she may reject it altogether. Women who are "stylish," who produce "good" or even different or eye-catching calabashes, will follow one strategy. Those who do not, are often concerned to follow different strategies, including not cooperating with the demands of husbands.

But even within those strategies which are based on decorating calabashes well, we can see a negative component emerging. The designs not only support male interests, they also mark out an area in which men are dependent on women and which women in practice control. The decoration draws attention to and marks out an area of limited female control—the care of milk and children. The designs used are elsewhere closely associated with women. The use of these female-linked designs on the calabashes unmistakably draws a boundary around an area of activity, marking it as female. Why should this active marking out be socially necessary?

We have seen that women do contribute in a variety of ways to obtaining essential resources in the environment. But this contribution gives them little social and political influence in Ilchamus society. Women largely control the domestic context, in practice, but even here men see themselves as in ultimate control. They frequently beat women openly and cruelly. Men frequently talk of "selling" women in exchange for cattle, and of "buying" a new wife "just like buying a new set of clothes." This denigration of women simply as exchange goods and as instruments of reproduction is also seen in field labor and in looking after cattle. "If you want to be a rich man, you need to have cheap labor from your wives." "I would like to have four wives, one at business in my shop (*duka*), one looking after the animals, and two working in the fields."

Women never really own and control cattle. Also, women are given little overt political power. All decision making is by discussions at which women can rarely be present and rarely speak.

Women are not allowed to speak in front of men in many situations. The formal meetings, without women, take place away from domestic compounds, under trees in the outside world dominated by men. When I asked elder men what the view of women might be on a particular topic involving cattle, resources, or social rules, they would frequently remark, "It is not for women to have a say." A man told me that few women, only elder ones, understood the meanings of rituals, "because women are unable to speak. They are cowards and fear that what they say may turn out to be lies later on and they will be blamed for it."

But by listening to female songs and proverbs, and by using female research assistants, I began to get a very different view. It became clear that women do not accept this situation passively. They are continually using myriad meanings to assert their independence, claim certain rights, discuss their fear and hatred of the elders, and so on. Yet this other point of view can never be expressed overtly. It is expressed among themselves and tangentially, obscurely in songs and proverbs.

The decoration of the calabashes can be seen in a similar light. Women are clearly aware of the dependence of male interests on children and the domestic context, and this importance is expressed in the symbolic importance of milk, calabashes, and children in rituals. But overtly it is men who control even the domestic domain. Women can control it only in practice. By drawing female-linked designs on calabashes, women exert a practical ownership of an important area of activity. They negotiate a silent, covert, and practical control in a world where the dominant modes of discourse are denied to them. Women who decorate calabashes well are thus making their play in a social game. They achieve power through the control of children, in support of, but also in reaction against, the elders.

These (from the elder male point of view) negative connotations of the calabash decoration are further emphasized by the nature and designs of the decoration itself. We have already seen how the designs link to red and danger, to the wild outside, and to the threat of female sexuality. We have seen how women primarily link the "V" design used on the calabashes to the red "V" on the chests of the warrior *moran*. Here women are reinforcing their links to the *moran*, links that are seen in many symbols and songs. Women and *moran*, particularly mothers and their *moran* sons, often cooperate with each other in opposition to the elders.

The division between elder and *moran* is as strong as that between male and female in Ilchamus society, and involves the elders' attempts to control the unruly, unsocial activities of the *moran*. There are also sexual liaisons between *moran* and young women that threaten the rights of the elders to marry young women. In a highly polygamous society, the elders need to prevent young men from marrying the potential pool of young women. The "V" designs on the calabashes refer to the sexual attractions and relationships between women and *moran*.

Here the two sides of the meaning context—milk/blood, white/red, inside/outside—are brought together in an active social context. Women emphasize the importance of milk and children, but they associate these positive qualities with the more ambiguous, dangerous world of red, *moran*s, and the wild. Underlying this structure and this strategy is a set of values and dispositions about the beauty and worth of cattle and the beauty and sociability of decoration. It is these values which make calabash decoration appropriate in Ilchamus society. But the structures that are developed are integrally linked to an active social context. Decoration in this context plays on the cultural assumptions surrounding cattle and children to create social power and influence.

Yet we have seen that some women follow a rather different path. The refusal of many to invest effort in calabash decoration annoys men and may lead to a different strategy. In some families the result of a general refusal to be caring and productive in the domestic context is continual stress and failure of either husband or wife to achieve influence and power. In other families, however, the refusal to decorate calabashes can be a highly successful strategy involving changes of attitude by both husband and wife. For example, some women align the nondecoration of traditional calabashes with an overall move away from traditional artifacts and traditional female roles, toward modern material goods and a modern life-style. They become educated and have few children. They emphasize the contribution and importance of women in agriculture and treat directly with outside development agencies. The whole house becomes reorganized to be open to visitors and to express material success in the modern world.

The current changes in Ilchamus life are massive, and I cannot discuss them here. But the traditional assumptions sometimes remain as the media of these changes. Tables 4.8 and 4.9

TABLE 4.8. Decorated Calabashes in Compounds Described as "Traditional" or "Modern" on the Basis of Dress and Hut Type and Decor

	Dress		*Hut*	
Calabashes	*Traditional*	*Modern*	*Traditional*	*Modern*
Decorated	84	34	88	19
Undecorated	260	77	260	56
% Decorated	24	25	25	26

TABLE 4.9. Decorated Calabashes in Compounds of Young (Il Kiapu) Men Described as "Traditional" or "Modern" on the Basis of Dress and Hut Type and Decor

	Dress		*Hut*	
Calabashes	*Traditional*	*Modern*	*Traditional*	*Modern*
Decorated	14	11	13	5
Undecorated	62	47	51	19
% Decorated	18	19	20	21

show that although many women following a "modernizing" strategy do not decorate calabashes, such women often have a higher proportion of decorated calabashes in their huts than do "traditional" women. This is largely because "modernizing" families have replaced most calabashes with metal and plastic containers. The calabashes that are retained are those used to serve milk and to feed children, and these continue to be decorated. In this way the traditional demands and expectations of men can be met (women show this concern for children and the home) even while changes are taking place. Indeed, "modernizing" women not only may continue to decorate calabashes but also may extend the same principles to other spheres. Recently a number of Ilchamus huts have appeared with internal wall decoration reminiscent of that used on the calabashes and female skins: triangles, "V"s, and zigzags. Here women, dressed in modern style, use the old symbolic connotations to mark out the whole of the house, not just milk and children, as their own. These old ideas and practices are used to exert a new social influence. Again, only the Ilchamus, not the neighboring tribes, decorate hut interiors. The historical tradition is continued in the new Ilchamus context on the basis of old values about the "sociability" and beauty of decoration.

In the contemporary context, many Ilchamus men live for long periods outside the Baringo area as wage earners. Their wives often take on a larger responsibility for the maintenance of the domestic resources in the husband's absence. Rather than being confined to the back area of the hut, women extend their influence and may in practice control the entire domestic domain. To extend the calabash decoration, with its (from the elder male point of view) positive and negative connotations, to cover the interior of the house is an acceptable yet active strategy contributing to and objectifying the woman's new role.

Conclusion

The analysis described in this chapter has involved following the contextual threads that together make up the network of decorated calabash meanings. By asking questions such as "Why are other containers not decorated?" "Where else do the same designs occur?" and "What are the calabashes used for?" a complex set of dimensions has been discovered.

It has not been enough to examine such dimensions at the "surface" systemic level. Rather, it has been found necessary to refer to levels of meaning that might be termed structural. For example, there is a paradigmatic structure in Ilchamus society that contrasts milk with blood, inside with outside, and women with (young) men. The calabashes, through their uses and decoration, partake in this structure, associating and contrasting its major elements. Alongside this symbolic structure is the structured set of social relations by which elder males maintain dominance through the control of cattle and the exchange of women. Indeed, the symbolic structure appears to support the male-dominated social structure. Young men, competing with the elders for access to wives, are described as dangerous and "outside." Women, born "on the outside" and marrying into the patriclans, are symbolically made "inside," reproducing for the clan.

The decorated calabashes do not create this world on their own. But they play their part. Indeed, the symbolic and social structures do not exist except through activities of various kinds. It would be possible to interpret the decorated calabash as reflecting the dominant social and symbolic structures still further. The inside of the calabash is like the inside of the hut. It is dark, contains milk used to feed children, and is cleaned by taking a burning stick from the domestic hearth and rubbing the stick round the interior of the calabash. The insides are then brushed out with the *ilkidongoei,* but the milk stored in a calabash always tastes of ash and burning. Ash itself is closely associated with women and the domestic, inside world around the hearth (Hodder 1986b). It might even be possible to suggest that the gourd represents the vagina and/or the womb, and I have certainly heard Ilchamus men talk of having intercourse with a calabash. The outside of the calabash refers to the "outside" world, to the warrior *moran,* to red and danger. The inside/outside structure is expressed.

However, it is not argued here that all members of Ilchamus society see such structures from the same point of view, or that they would accept my rendering of them. Clearly some individuals, such as the *laibon,* do have analytical accounts that can be made explicit. But for many, one is only talking of partial and/or nondiscursive knowledge. Social life involves drawing on the structures to varying degrees and with varying success.

Thus the structures are not determining or fixed. They exist only in the practices of daily life. Individual calabashes may be "better" or "worse" examples. Individual women may choose a variety of paths, using calabashes in different ways. In a society such as that of the Ilchamus, the structures are only provisional and are continually being negotiated. The calabashes play an active role in re-creating and transforming society. As each mark is incised on the calabash wall, the individual is making choices, creating strategies; but this ability to act, like our ability to speak, does not necessarily entail a discursive knowledge about structure or grammar.

Rather than talk of "systems of interrelationships," the concern here has been to examine the interdependence between structure and process. Such a direction may involve breaking down well-established dichotomies in archaeology, but it has the potential of introducing a wider discussion, more dimensions of variability, and a greater flexibility of approach. In this chapter it has been necessary to consider structure, history, and the individual. It has been necessary to consider calabashes as containers, decorated, red, female, domestic, and so on; to place them into an internal framework of meaning from which wider, external generalizations can ultimately be made. They are not just pots or ceramics.

5

Sources of Ceramic Variability Among the Kalinga of Northern Luzon

William A. Longacre

This chapter explores some of the sources of variability in the pottery produced by the Kalinga, a "tribal" society living in the rugged mountains of north-central Luzon in the Philippines. Potentially, identifying sources of variability in material culture appears to be among the most significant contributions of ethnoarchaeological studies among extant societies. This observation has been emphasized by a number of scholars and is the theme of an ethnoarchaeological monograph by Hayden and Cannon (1984a).

Undertaking fieldwork among a living society permits the study of both sides of the coin, so to speak. On the one hand, we can observe organization and behavior, and on the other, material culture produced and used in systemic context. Exploring that interface holds the key, I argue, for identifying sources of variability in material culture of great interest to archaeologists who have only the surviving material culture upon which to base their inferences.

Such studies have often been termed examples of ethnoarchaeology. Obviously, if we can identify cross-cultural generalizations as a result of numerous ethnoarchaeological studies, we can make significant contributions to the strengthening of archaeological inferences.

Toward that end, I decided to undertake field studies among a society that makes and uses pottery on a household basis. Among other things, I wanted to assess how stylistic variability reflected the ways in which pottery making was learned within

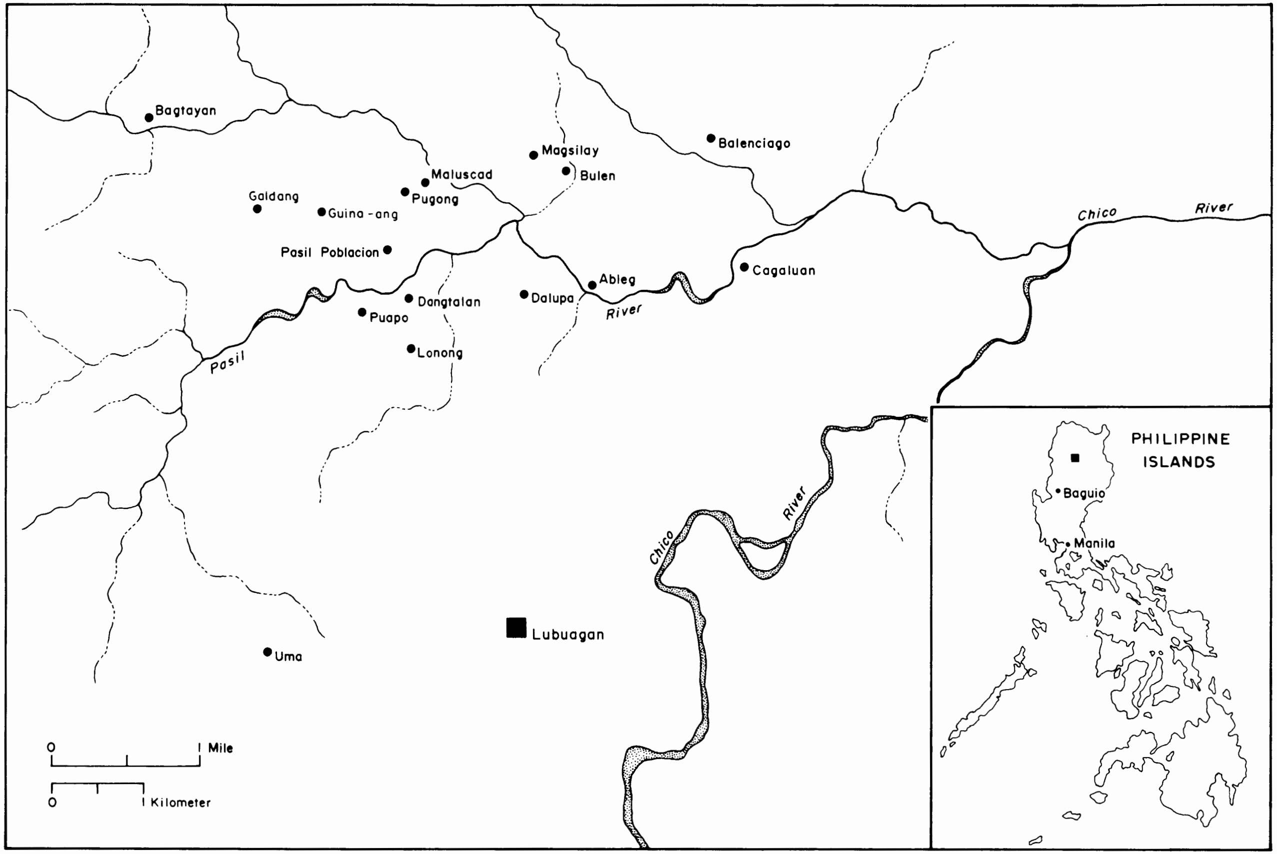

FIGURE 5.1. The Pasil River valley, showing the villages studied in Kalinga-Apayao Province, northern Luzon.

the nuclear family. Details of the development of my research design have been published (Longacre 1974).

In brief, I identified the Kalinga as potentially an ideal society for my project. To see if such were the case and, if so, to seek their permission to undertake a long-term field study, I made a brief visit to the Kalinga villages in the Pasil River valley of northern Luzon during the summer of 1973. The Pasil Kalinga were producing pottery on a household basis and agreed to let me undertake a long-term research project. I returned in 1975 and spent twelve months conducting fieldwork, centering my study in the village of Dangtalan (Figure 5.1).

The Kalinga live in compact villages in the rugged mountain valleys of north-central Luzon. The village of Dangtalan is located on a Late Pleistocene terrace overlooking the Pasil River, a major tributary of the Chico River. There are about 270 people living in some 55 households in the community, and virtually all households produce pottery.

The Kalinga are a sedentary agricultural people raising rice in irrigated, terraced fields. They have long attracted the attention of anthropologists because they reckon descent bilaterally, practice the blood feud, and have an interesting system of custom law including the institution of the peace pact (Barton 1949; Dozier 1966; Takaki 1977, 1984).

My own interest in the Kalinga focused upon them as a pottery-producing and pottery-using society. Pottery in the Pasil villages is conspicuous and abundant in everyday use. They use ceramic vessels to cook rice and meat and vegetables, to store and transport water, and to ferment *basi*, a sugarcane wine.

Details of the ceramic technology are published (Longacre 1981). Pottery made at Dangtalan is produced with clay from a deposit adjacent to the village, and all potters have equal access to the clay. No tempering material is added because the clay contains abundant sand as a natural inclusion in the deposit. Pottery is built using the coiling technique. Short, cigar-shaped coils are added to a hand-modeled base.

The upper portion of the pot is thinned and shaped by scraping. The base of the vessel is thinned and shaped by using the paddle-and-anvil technique. The pottery is decorated by incising and stamping designs in bands just below the rim of the vessel and by applying red paint. The pottery is fired in open fires, and after the firing a pine resin is applied to seal the vessel walls while the pots are still very hot.

There appears to be very little variability among the pots produced by the potters of Dangtalan that could be described as technological in nature. Since all potters make pottery with clay derived from a single deposit, there is no selection of clay for particular types of pots. I did not sample the clay deposit to assess the extent of geological variation in its nature. Since the clay is derived from a single stratum of rock, I assume it is reasonably homogeneous in its mineralogical composition.

The inclusion in the clay deposit of an abundant sand component means the potters do not need to add a tempering agent to the clay. Thus, there is no selection of temper for the production of different types of pots. I suspect that this is relatively unusual in the production of pottery throughout the world, and the archaeological study of pottery should include the study of varying tempering agents in terms of their role in affecting the technical outcome of the final product. Various types of temper can have a profound effect upon vessel porosity, vessel strength, and resistance to thermal shock (e.g., Braun 1983; Bronitsky 1982; Steponaitis 1981).

Among the Pasil Kalinga, the stages of manufacturing pottery do not vary by the type or size of the container. All pots are built and shaped in the same way. Thus, no matter the size and type of pot, the potter builds the vessel by using a combination of hand modeling and coiling, and achieves the final shape through scraping and the use of the paddle and anvil. Some observable attributes survive in the finished product that might permit the identification of these processes of ceramic production.

These include striations resulting from the sand temper being dragged across the surface in the scraping process and "dimpling" at the interior base of the pot as a result of the use of an anvil. Distinctive patterns of polishing striations are readily observable on the exteriors of all vessels and might be useful in identifying individual potters, an experiment not yet carried out with the collection of pottery from Dangtalan available at the Arizona State Museum in Tucson.

The Kalinga system of classification focuses upon the design of the pot in terms of its prospective use. Thus, they differentiate between rice cooking and vegetable/meat cooking containers,

Table 5.1. Kalinga Pottery Classification

	Small Size for 1 or 2 People	*Regular Size for 4 to 6 People*	*Large Size for a Number of People*
Rice Cooking	Oggatit Ittoyom	Ittoyom	Lallangan Ittoyom
Vegetable/ Meat Cooking	Oggatit Oppaya	Oppaya	Lallangan (oggan) Oppaya
Water Jar		Immosso	
Special Categories	Im-immosso—a small version of the water jar, used by young girls to learn to carry water jars balanced on their heads Amuto—wine jar, conical in shape, large Volnay—smaller wine jar, more globular in shape Pannogan—water basin Chong-chong—large pot cover Su-kong—pot cover		

and they recognize several sizes of each category (Table 5.1). Water jars also form a distinctive type.

Each of the native types has a number of attributes that differentiate it from all others. The most important of these include aspects of vessel morphology such as shape, size, height, width of the orifice, and angle of the rim. Rice cooking vessels appear relatively tall compared with their width and have a small aperture and acute rim angle. Meat/vegetable cooking pots appear squat and have a large orifice and an obtuse rim angle. These differences are maintained through all size categories.

Ceramic containers used to hold water are the only ones that combine distinctive size and shape features with a distinctive decoration. All of the visible surfaces of the water jars, the *im-immosso,* and the water basins are covered with red paint. Although, on average, the larger vessels have more extensive fields of decoration, the use of red paint as a stylistic signal for pots designed to hold water is the only example among the Kalinga of decorative symbolism for a functional class of containers.

Thus, among the Kalinga, one important dimension of ceramic variability involves the purposeful design of the container with respect to its intended use. This reiterates the importance of viewing pots as tools (Braun 1983) in approaching the analyses of archaeological collections of pottery.

The Kalinga native types of pots can be described and even identified through a variety of metrical observations (Longacre 1981:54). These include height/width ratios, rim angle measurements, aperture/height ratios, and vessel volume. But the types also are easily identified visually. Once one learns the native classification and the distinctive features that signal each functional type, one can readily identify Kalinga pottery types.

The information necessary to make these distinctions is widely shared among the Kalinga. Both men and women can easily recognize the various types of Kalinga pottery. Even fairly young children recognize the types and know the appropriate terms for them.

The system of classification employed by the people of Dangtalan is widespread in the Kalinga area. The same named types are present at Uma (Takaki, personal communication) and in the communities along the Tanudan River (Longacre, Kalinga project field notes). The native types are recognized over a wide area and probably have been present among the Kalinga over considerable time. On the basis of the analysis of sherd material from the midden at Puapo (see below), they have been present at Dangtalan for well over a century.

When these types of pots are used in systemic context, they are employed in different environments within the household and are subjected to differing sources of surface alteration. Thus, another dimension of ceramic variability of Kalinga pottery involves the post-production surface alteration of pots as a result of their use. The longer the pottery is used, the more pronounced the surface alteration becomes.

The analysis of use modification of pottery would seem to hold great promise as a source of strong archaeological inference of vessel use. This should be in conjunction with other features, such as vessel size, shape, and orifice size. Such analyses might well provide important information for reconstructing aspects of past cultural systems. Yet there has been almost no attempt by archaeologists to explore this possibility in ceramic analysis of prehistoric pottery (cf. Bray 1982; Griffiths 1978; Hally 1983b).

The most conspicuous surface modification in Kalinga pottery is the presence of accumulations of soot (apparently solid carbon and by-product resins) on the exteriors of vessels used over a fire. The thickness of these deposits is in direct relation to the intensity of use. The presence of exterior sooting differentiates all of the types of Kalinga pottery used for cooking from those not designed for use over a fire.

Various patterns of surface abrasion (use-wear) are present on both the exterior and the interior surfaces of Kalinga pottery. These attributes of surface alteration are of great potential for the archaeologist attempting to infer use. On vessel exteriors, there are three zones of abrasion with different intensities. The most conspicuous of these is a band of abrasion about two-thirds the distance down from the rim.

This results from the use of three ceramic (contra Dozier 1966:63) firedogs in the hearth to support the pot over the open fire. The three pot supports abrade the exterior surface at the point of contact, and the abrasion is exacerbated by vessel movement during stirring, lifting, and such. A lighter pattern of abrasion seen on the vessel base results from placing the pot on the floor of the hearth after cooking and spooning out the contents for serving. An even lighter pattern of abrasion, just below the rim, results from a braided strip of rattan slipped over the pot to enable the cook to remove the hot pot from the fire.

Interior patterns of abrasion might permit the differentiation of rice cooking pottery from pots used to cook vegetables and meat. Since the rice pots are covered during cooking, a pattern of surface abrasion on the lip of the pot gradually occurs. When rice is cooked, the interior of the vessel is covered with green leaves to keep the rice from sticking (Longacre 1983: slides 30, 31). This also protects the vessel wall from abrasion when the cooked rice is spooned out for serving. Also, during rice cooking, the contents of the pot are not stirred. Vegetable/meat cooking pots are not so protected, and stirring during cooking is commonplace. This results in a pattern of random scratches on the interiors of such vessels. To some degree, the resin coating of these pots protects them from abrasion, but pots used over a long time exhibit surface alterations related to use.

Water jars, of course, lack the deposits of soot that characterize all types of cooking pottery. Abrasion at the bottom of the pot is common, and interior scratches result from dipping a cup into the jar to remove water.

These observations of surface alteration resulting from use are based on a small and nonrandom sample of Kalinga used pottery. To quantify these observations, what is called for is a large sample of used pottery of various types and various ages. When the military situation in the Kalinga area permits my return, I hope to obtain a suitable collection of pottery for such a study.

Another potential area of study that I have not yet undertaken is the chemical analysis of residues in the vessel interiors. Identification of lipids and varying densities of amino acids might assist in inferring vessel use to an as yet unknown degree of specificity. Such research to date, although not common, shows considerable promise (e.g., Condamin et al. 1976).

There is still another dimension of ceramic variability present among the Kalinga that is recognized by only about half of the population. This is a much more subtle variation that occurs within vessels of the same type. The source of this variation is twofold. On the one hand, it results from deliberate choices made by the potter at the time she is making the pot. It is she who decides the nature of the stamped and incised decoration of each pot she makes. She selects which design elements, if any, to use and the number of bands of elements, from zero to three, to arrange just below the rim of the vessel.

There is also a great deal of individual variation in the finished product that does not result from the deliberate choices of the potter. This variability reflects different degrees of skill and individual motor habits in the processes of building, shaping, thinning, and polishing the pot prior to firing it.

These differences among individual potters result in subtle variation within types of pots. The general symmetry of the vessel, the size of the orifice in relation to the size of the vessel, the angle and thickness of the rim, the roundness of the base of the pot, and the thickness and evenness of the vessel wall, especially at the base, all vary.

The adult females of Dangtalan are quite aware of this variability. They discuss one another's work in terms of this kind of subtle variation. Certain individuals are recognized as particularly skillful potters, and their pots are admired for their symmetry and other features. The potters of Dangtalan use this variation, along with the zone of decoration below the rim, to identify the maker of a particular pot. After closely examining a vessel, they are able to identify the potter with unerring accuracy. Elsewhere, I have described the experiments I conducted in

Dangtalan to test their accuracy in identifying the maker of a particular pot (Longacre 1981:62). The result was an amazing 100 percent.

The information encoded in the pottery as a result of individual variation is subtle, but nonetheless visible to the adult female potters of Dangtalan. This information is completely invisible to the males of the village. Not only were men unaware of this subtle variability in Kalinga pottery, they were unaware that their wives and mothers could distinguish one another's work.

Shortly after I had initiated fieldwork in Dangtalan, I made a public appearance and spoke to the entire community, explaining my research objectives. I went into some detail about my plans to assess subtle variation in Kalinga pottery in relation to learning frameworks and other things. Not long afterward I was visited by a very concerned delegation of men who were worried that I might be wasting my time in terms of my explicit research plan. They wanted me to understand that Kalinga pottery did not vary in the subtle ways that I expected. In effect, what they were saying was "Once you've seen one water jar, you've seen them all!" I bet them a bottle of gin that they were wrong and was quickly able to convince them with the help of several potters. Both to celebrate and to thank them for their concern, I shared that bottle of gin with them that same evening.

The female-specific awareness and use of subtle individual variability in Kalinga pottery calls for explanation. In part, I suspect it reflects pride in their work and encourages the development of skill in the making of pottery. It also serves to build cohesion—social solidarity, if you will—among the subpopulation of female potters in the community. But what about the decorative variability in design elements and bands of decoration, a matter of deliberate choice?

What factors influence the potter in selecting the design elements and in designing the field of decoration? Are there subtle decorative microtraditions that reflect pottery learning frameworks, as the hypothesis first developed by Deetz (1965) suggested? A detailed exploration of sources of decorative variability in Kalinga pottery was the topic of the doctoral dissertation of Michael W. Graves (1981). For his analysis he had a sample of over 1,000 Kalinga pots, and he focused upon the stamped and incised decoration (*gili*) located just below the rim.

Graves examined design elements, design complexity (number of bands), and band symmetry patterns. He used multiway contingency table analyses to assess the association between Kalinga ceramic designs and a variety of behavioral and organizational aspects of Kalinga society.

He explored the possibility that microtraditions reflecting the learning frameworks might be present. To do this, he focused upon "kin groups," three-generational groups of female potters tracing their ancestry from a common female through the female line. Since pottery making is taught by mothers to daughters, such a kin group might well be isomorphic with a learning framework. Groups of women so defined would include an older female, her daughters, and her daughters' daughters. Since the Kalinga reckon their descent bilaterally, such groups are defined for analytical purposes and have no social reality in Kalinga society.

The Kalinga organize themselves informally into work groups for the making of pottery, so Graves also examined work group composition and design variability. For example, there are seven work groups organized on the basis of residential proximity, and not kinship, in Dangtalan.

Additionally, he examined decorative variability in terms of the vessel's size, the date the pot was made, and the birth cohort of the potter (in ten-year intervals). He also examined designs utilized in two Kalinga "endogamous regions" to assess interregional variability.

The only strong association that Graves discovered was between the birth cohort of the potter and the number of bands of decoration. Holding vessel size constant, the younger potters employ less complex designs (fewer bands), on average, than older potters. There was no clear association between work group membership and decorative features, and the kin groups were only weakly associated with the use of certain design attributes.

As Graves put it (1981:293), ". . . kin groups at the level established here have less impact than the pervasive set of effects associated with birth cohorts. These two factors, however, appear to play the predominant role (controlling for vessel size) in structuring intra-settlement design variability." He also was able to determine regional patterns of decoration (1981:279).

Graves questions the use of design variability among the Kalinga as a means for transmitting information about significant social boundaries (1981:309–310). He notes that the incised decoration in Kalinga pottery is not clearly visible at any distance and, thus, could not be used as a symbolic device to signal social boundaries and thus reduce stressful encounters (1981:314).

I would add that stressful encounters are bound to involve males, and to males this kind of decorative variability is invisible. But there is another aspect of ceramic variability among the Kalinga that does seem to be actively employed as a marker of important social boundaries. This is vessel shape or profile, and it does seem to vary at the regional level.

As Takaki points out (1984:59–60), the region is the maximal social group of critical importance for the Kalinga and is the group that contracts peace pacts with other regions. It also tends to be endogamous, and its territorial domain recognized and defended. Regional boundaries are the most significant social boundaries in Kalinga life because of the blood feud. As Takaki puts it (1984:62), "Individuals asked to identify themselves in Kalinga-speaking contexts outside their home region typically respond by stating the name of their region. . . . If queried further, they specify their status by offering the name of their settlement. Their life or death can depend on the *names* with which they identify themselves" (italics in original).

Dangtalan and the settlements of Puapo and Lonong form a peace-pact region. Kalinga oral tradition holds that these settlements were founded during the first half of the nineteenth century, with Puapo being the oldest. To explore the nature of ceramic change among the Kalinga, I excavated several test trenches in the midden at Puapo, in some cases to a depth of over two meters. There is no midden accumulation at Dangtalan; refuse goes over the sheer cliff on the north side of the settlement.

Teague (1984) undertook an analysis of the non-Kalinga ceramics and bottle glass from the Puapo midden. The datable materials (especially glass bottles) agreed with the age estimates of the oral tradition. There were bottle fragments dating to the first half of the nineteenth century, but nothing earlier. He was able to demonstrate that the midden has been churned and exhibits reverse stratification; some of the earliest materials come from the higher levels. This churning is due to the activities of domestic animals kept by the Kalinga, especially the pigs.

Although the sherds of Kalinga pottery from the Puapo dump cannot be arranged into proper, relative chronological order based upon stratigraphy, the sample of pottery in total reflects more than a century of Kalinga pottery making in the region.

There does seem to be considerable variability in design elements and numbers of bands of decoration. But I was struck with the consistency of the named Kalinga types of vessels throughout the deposits and the general spherical shape of the vessels, the distinctive Dangtalan globular style.

The potters of Dangtalan and I had little difficulty recognizing the Kalinga native types when sherds were large enough to discern the important size and shape features of the pots. There was only one vessel type from the midden that did raise problems. This appeared to me to be a small bowl, about the size and shape of a Chinese rice bowl, with a ring-style base. There was one fairly complete example recovered from the Puapo midden and a number of fragments.

The potters agreed that this form was unlike anything they were familiar with today, and were puzzled. When I told them it looked like an eating bowl, the ceramic equivalent of bowls in Dangtalan made of a half a coconut husk, they said it could not be: "We don't make eating bowls out of pottery." They decided it must be an old form of pot cover (*su-kong*) no longer made in Dangtalan. This form did not exhibit the kind of use-wear I would have expected had it been a pot cover, so I was left to wonder if it were a serving bowl.

The fact that the distinctive globular shape of all the vessels and the named, native types have persisted over at least a century suggests that these aspects of Kalinga ceramics probably do have important adaptive advantages. This observation is confirmed when we examine a second Kalinga endogamous region, a group of settlements located in the Tanudan River valley (Figure 5.2) about seven miles south and east of the Pasil villages. Like Dangtalan, the Tanudan villages produce pottery and share the same native types and names. Unlike Dangtalan, they continue to make a small serving bowl similar to the ones I recovered in the Puapo midden.

I did not visit the Tanudan pottery-making settlements, but I did interview students from Tanudan in Baguio City and examined pottery from those settlements. The Tanudan pottery is identical to Dangtalan pottery in terms of the features that define the native types. There is, however, a dramatically important distinction. All Tanudan pottery has a pronounced shoulder below the rim. It is quite distinctive and is present on all types of pots (Figure 5.3).

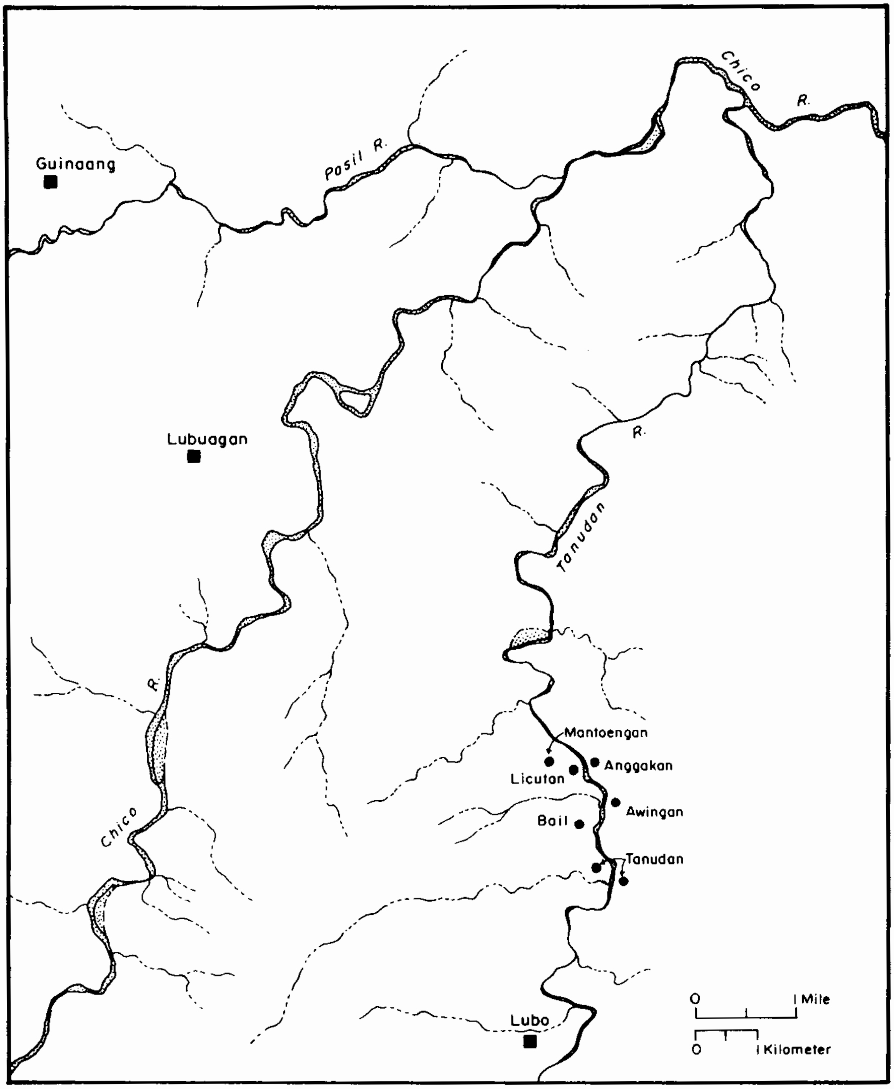

FIGURE 5.2. The Tanudan River valley and villages in relation to the Pasil River valley.

FIGURE 5.3. Two Kalinga rice cooking pots (*ittoyom*). Pot on left from Dangtalan in the Pasil River valley. Pot on right from the Tanudan River valley. (Height is 18.2 cm.)

This distinctive shouldered profile is highly visible, and Tanudan pottery thus is recognizable at considerable distance. The difference between Dangtalan-style and Tanudan-style vessel profiles is well recognized by the people of Dangtalan. Both men and women were easily able to recognize a Tanudan pot because of its distinctive shape. This is a clear and important stylistic signal in pottery of regional boundaries. Clearly, this stylistic signal is deliberately and actively employed (*sensu* Hodder 1982b). The next step in exploring this phenomenon among the Kalinga will be to undertake fieldwork in the Tanudan pottery-making settlements, which I would hope can be done in the near future.

Thus far we have been examining sources of ceramic variability that are identifiable in individual Kalinga vessels. But there is another dimension of variability that is also important: the distribution of the pottery (and, thus, ceramic variability) throughout the households of Dangtalan. This dimension includes the quantities of the different sizes and types of pots as well as the distribution of more subtle forms of ceramic variability.

All of the Dangtalan households that were available for study (forty-nine) had pottery in use. The number of pots varied from a low of six (one case) or seven pots (five cases) to a high of twenty-nine (one case) or thirty vessels (one case). The mean number of pots per household was about ten in 1975. Every house but one had at least one water jar, and the mean was just about two per household. The most frequent pots were the regular-size rice cooking vessels (115) and vegetable/meat cooking pots (137).

Does the number of pots have any relationship to the number of people living in the household? One might assume that larger families might need more pots than smaller ones. If so, one would be surprised to learn that there is no correlation with family size ($r = 0.1456$). If one looks only at cooking pots, a similar lack of correlation is produced. Nor is there a relationship between volume of pots and household size. These data agree with the findings Nelson (1981) reports for his study among the Maya.

If the number of pots has little to do with the size of the domestic unit, then what does number of pots reflect? For the Kalinga, there is no simple, single answer. There is a slight relationship between number of pots (especially the large cooking vessels) and the wealth of the household. Assessing wealth cannot be done with certainty, given the problem of incomplete data. I did map all of the rice fields in the Dangtalan "sustaining region" and recorded rice yields for four harvests.

These rice figures can be related to the households that own the fields. But some families own fields at other locations that were not mapped. Also, I did not record livestock ownership, which I should have done, to assess household wealth. Thus, relative wealth can be only crudely reckoned with my data.

That economic matters may have some impact upon the number of pots in a house is suggested by the changes in frequencies of vessels in use in Dangtalan between 1975 and 1980. I have discussed these changes elsewhere (Longacre 1985), but I would point to the tripling of the larger vessels needed for feasting, which can be directly related to an increase in wage labor availability to the men of the community.

Another important factor affecting the distribution of pottery among the Kalinga is the process of "balanced exchange" or *qalos*, so well documented for Uma by Takaki (1977). This involves exchanges between households and does not imply any social obligation. Gifting usually involves relatives and tends to reinforce kinship ties. These two processes, bartering and gift giving, affect the distribution of pottery in the Kalinga community.

About 40 percent of the households in Dangtalan have obtained more than half their pots through bartering or gifting.

That means, of course, that those households have a significant amount of pottery produced by someone other than the potter(s) living in the house. There is a general tendency for the "poorer" households to have fewer pots not produced by the resident potter and for "wealthier" families to have more nondomestically made pots. Pottery is often bartered for rice, which points to the importance of balanced exchange in redistributing food within the community.

I recorded data on approximately 1,000 pots that were exchanged by some potters in Dangtalan during 1976, 1977, and 1979–1980. More than 80 percent of these exchanges involved households in other villages in the Pasil region. Most of these pots were regular-size cooking vessels and were bartered in such communities as Galdang, Pugong, Balenciago, and even as far as Uma. Most were exchanged for rice, but commodities such as beans, coffee, sugar, salt, fruit, and even red hematite for paint to be applied in pottery making were also obtained.

Bartering pottery for food and other commodities is clearly an important process operative in the Pasil area. It is slightly less important within the village of Dangtalan itself. But a large number of vessels shows up in the household inventories as a result of exchange and gifting, a distribution that should be of interest to the archaeologist.

Indeed, what are the archaeological implications of the sources of variability that have been identified in Kalinga pottery and the distribution of that pottery in Dangtalan and environs? Clearly, functional variability in terms of the use of the pot is recoverable. If the right attributes are the focus of the typological approach of the analyst, augmented by creative chemical analyses, the kinds of activities involving pots as tools might well be inferred.

Identifying the work of individual potters would seem to me to be a real possibility (cf. Hardin 1977). If we were able to do this with a prehistoric community, a multitude of hypotheses regarding organization and behavior in the past would be testable. The exciting findings of Graves (1981) suggest new avenues for exploring decorative variability and, indeed, new ways of studying stylistic change over time.

And, finally, highly visible ceramic variation, of whatever kind, may hold important information about significant social and political boundaries.

The ethnoarchaeological project undertaken among the Kalinga has identified a complex array of sources of ceramic variation. Additionally, the processes of gifting and exchange make the distribution of that variability in a community even more complex. Unraveling and understanding that complexity is not an impossible task. It will require particularly creative approaches by the archaeologist who perceives such variability as important to solving the questions that guide his research. In any case, the potential of ceramic variability as a means for strengthening archaeological inference appears immense and hardly tapped to date by archaeologists who could well exploit it. If this chapter stimulates such endeavors, then its purpose is fulfilled.

Acknowledgments

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6

Pottery Production and Distribution Among the Kalinga: A Study of Household and Regional Organization and Differentiation

Michael W. Graves

Introduction

It is not particularly noteworthy to observe that the role of pottery within subsistence economies is often complex and highly varied. Ceramic vessels may be decorated in ways that reflect, as well as affect, social relations on a number of different levels. At the same time, pottery is manufactured for use as a kind of container, and the uses to which it is put can affect the manner in which it is made and decorated, its constituent components (primarily clay and tempering materials), and the organization of household or domestic activities. Ceramics can also play an economic role, especially when the production and distribution of pottery involves exchange transactions. In each of these domains—placing decoration on a pot, manufacturing pottery, and the distribution of ceramic vessels—we believe there is some kind of systematic articulation between a segment of human organization and the variability we observe in the pottery assemblage.

However, in this chapter I want to explore a somewhat more complex ethnoarchaeological issue: the interaction between two ceramic domains, production and exchange, and their associated contexts of human organization. I will demonstrate how similar social processes can produce quite different patterns of ceramic variability across these two domains for the Kalinga of northern Luzon, the Philippines. These differences can be explained by the different roles that production and distribution of pottery assume among the Kalinga and other societies. And while the study I describe adds complexity to our ethnoarchaeological analyses, it also introduces organizational richness and a more realistic view of the way in which human relationships are structured, both today and in the past.

Perhaps more significantly for prehistorians, the model I develop concerning the relationship between ceramic production and exchange and social differentiation can be tested as an alternative to those models currently in vogue in much of the archaeological literature.

The Ethnoarchaeology of Kalinga Ceramic Production

In 1975–1976, William Longacre spent a year collecting information on pottery making among the Kalinga in four settlements on the middle Pasil River, northern Luzon (see Figure 5.1). In each of these villages, most adult women make vessels of varying sizes for a number of domestic purposes, including water storage, rice cooking, and meat and vegetable cooking. As the final step in the manufacturing process, one or more bands of impressed decoration may be placed on the upper shoulder of a pot. A stylus made of bamboo is used to produce the design or *gili,* and a particular design is repeated around the vessel for each band. When a second or third band of design is made, a different stylus is generally employed. In addition to using different tools to make various banded designs, the potters alternate the symmetry relations of the designs to create additional distinctions. Thus, the first or uppermost band of design on virtually all Kalinga pots is characterized by translation symmetry; the stylus is oriented at the same angle around the vessel. Bands placed lower on the vessel shoulder generally employ more complex design symmetry, in which the angle of the stylus is rotated in mirror image, either once or twice on the axis of the band. Other design alternatives are found as well, including the shape of the stylus point, the number of impressions created for each band, and the various combinations of different types of bands on the vessel shoulder. Despite the number of design classes I have described here, the number of alternative attributes for any class is relatively low, and overall the Kalinga pottery design system is relatively simple, as measured by the diversity, not the quality, of designs.

During Longacre's fieldwork with the Kalinga, he concentrated his collection efforts among the potters of the village of

Dangtalan, located south of the Pasil River. There he recorded metrical data on vessel morphology and decorative information for approximately 250 pots manufactured during 1975 and 1976. At the same time, each house in Dangtalan, in addition to the houses of Puapo, Lonong, and Dalupa, were visited and an inventory of household goods was recorded. This inventory included pottery vessels that were currently in use or temporarily in storage. Each pot was identified by (1) the household within which it was found, (2) the potter (if known) from whom the pot was acquired, (3) the date of manufacture (if known), (4) its use and size category, and (5) a drawing of the band of design (if any) on the vessel shoulder. Over 1,000 vessels were recorded during the household inventory in 1975. A second inventory was completed for the same houses in the four settlements in 1980, although this information has not been fully analyzed. Data comparable with what was noted during the household inventory were available on the sample of pots made for Longacre in 1975–1976. Thus, from the 1975 household inventory and the 1975–1976 pottery-making cycle, we have recorded information on over 1,200 vessels. Once the 1980 data are added to this sample, the number will probably exceed 2,000.

For each potter whose products are represented in the sample, we have gathered information on her (1) place or region of birth, (2) approximate year of birth, (3) current house and village of residence, (4) pottery-making work group, and (5) maternal kin group. We reconstructed the maternal kin group for each potter because women typically learn to make pottery from their mother or grandmother. While this group has no formal recognition within Kalinga culture, the maternal lineage represents the genealogical line within which a woman was most likely influenced as she gained the skills, including decorative ones, to become a proficient potter.

With the data compiled on ceramic vessels from the four Kalinga settlements, a number of computer-based analyses were undertaken. The first stage of work involved the decoration placed on pots made by women who lived in the village of Dangtalan. This was where Longacre concentrated his fieldwork activity, and thus collected the most data. The second stage of analysis concerned intervillage and interregional comparisons of ceramic decoration. Three settlements (Dangtalan, Puapo, and Lonong) belong to a separately named region (known as Dangtalan), and the village of Dalupa is affiliated with another region (known as Dalupa-Ableg). Within the village of Dangtalan I wanted to know which factors affected the use of designs on pottery vessels. Because a wide range of information had been recorded on the potters (e.g., age, kin group, work group) and the pots (e.g., date of manufacture, size, functional class), a number of plausible hypotheses were developed to account for variation in intracommunity ceramic decoration.

I have elsewhere (Graves 1981, 1985a) described these analyses in more detail, and for the purposes of this discussion it is sufficient to note that the size of the vessel and the age of the potter affected design variability across most of the classes distinguished for this analysis. Somewhat less frequently, the date of vessel manufacture influenced the kinds of designs placed on pottery. However, given the relatively short span of time within which most of the pottery in this collection was made, it is not surprising to find less obtrusive temporal effects, although I did describe (Graves 1985a) how the potter birth cohorts would ultimately lead to a gradual change in potter design repertoires. The relatively large number of kin and work groups made it difficult to systematically examine their effect on pottery design when other variables (e.g., vessel size) were controlled. Nonetheless, it seems fairly clear that neither work group or kin group affiliation is the major source of ceramic variability within the settlement of Dangtalan.

Much more obvious were the differences in pottery design between Dangtalan and Dalupa-Ableg. The proportion of design categories used by potters from each region was dissimilar for every design class examined in this analysis. Comparatively, there is greater difference between the designs placed on vessels made by potters from different regions than between the designs used by potters of different ages on different sizes of pots within the same region (Graves 1982, 1985b). Similarly, there was less variability in decorative classes along the temporal dimension for the sample of pottery than there was among potters residing in the two regions. In other words, interregional design variation is greater than intraregional design variation. This should come as no surprise to archaeologists, inasmuch as we often make this kind of inference. Nevertheless, it is comforting to see it demonstrated for a set of controlled ethnographic data.

What is of somewhat more interest and, to some, greater surprise is the fact that there is very little overlap in the variation of ceramic design between the two regions compared with intra-regional variability in decoration. This means, of course, that not only is there greater difference in designs as distance increases, but there is also a scalar effect. The two regions are more dissimilar than we might expect, especially given the fact that they are contiguous, the maximum distance between settlements is less than 5 km, they generally have friendly social relations, and both regions have a common recent history in terms of their development.

To understand why such abrupt design boundaries characterize Kalinga regions, it is necessary to examine the organization of these units in more detail. First of all, the region is a spatial unit that encompasses at least one settlement (and sometimes as many as nine or ten settlements) and all its members, and the surrounding territory under the control of the local population. Regions operate politically to establish and enforce peace pacts (*bodong*) with more distant corresponding regions. Peace pacts are negotiated on a dyadic basis, that is, between two regions which agree to forgo or limit antagonistic relations; in the case of unsanctioned interregional violence, the individuals responsible or the offending region may be punished or fined.

For peace pacts and regions to originate and endure over any length of time, at least two conditions must obtain: (1) there must be sufficient personnel to support the economic, legal, and social obligations that are entailed under interregional agreements, and (2) the regional population must be organized "to act as a collective body in taking defensive or offensive measures against other regions" (Takaki 1977:35). The minimum population size necessary to sustain such regional systems is uncertain, although the region of Dangtalan, with between 340 and 390 members, is among the smallest thus far enumerated. Regions with relatively small total populations can more easily build and retain cohesive social and economic relations, both within the region and with other regions. However, because regional autonomy is a function of population size, smaller regions must more often rely (on a proportional basis) upon immigration to equalize the stochastic effects of population fluctuation in the ratio of adult males to adult females.

The maximum population of a region appears to be between 3,000 and 4,000 members (see Table 6.1), a maximum that may

TABLE 6.1. Kalinga Regions: Population, Territory, and Population Density

Region	*Population (est.)*	*Territory Size (km²)*	*Population Density (persons/km²)*
Uma	1,194–1,217	25	47.76–48.68
Lubuagan	2,993–3,616	23–30	99.77–157.22
Dangtalan	340–336	3–4	85.00–128.67
Dalupa-Ableg	579–731	4–5	115.80–182.75
Guinaang	2,025	22–25	81.00–92.05

SOURCES: Uma data derived from Takaki (1977:Table 1; 1984:60); Lubuagan data derived from Takaki (1977:Table 1, Map 4; 1984:60) and Dozier (1966:Table 1); Dangtalan data derived from Takaki (1984:60) and Longacre's 1975 census; Dalupa-Ableg data derived from Takaki (1977:Table 1, Map 4); Guinaang data derived from Takaki (1977:Table 1, Map 4) and Dozier (1966:Table 1).

have been somewhat smaller prior to the development of regional centers by the Philippine national government. The physical sizes of regions vary as well, and in general, those regions which are large in area are also larger in terms of population size. Population density among the regions, however, shows much less diversity. All of the regions included in Table 6.1 have a density between roughly 45 and 185 persons per km^2. All of these regions are located in the vicinity of the Pasil and Chico rivers, and most were colonized during the nineteenth century. An upper limit on total population size may characterize Kalinga regional organization due to the collective manner in which regions are constituted for political action. The obligation to act together as a distinct entity is grounded in the mutual and crosscutting kinship ties produced by bilateral kinship reckoning and regional marital endogamy. Under this arrangement, most individuals within a given region can identify a common ancestor no more than four or five generations back through either parent. Conversely, as the total population grows, and as more settlements are established at some distance from one another, kinship ties between villages within the same region are attenuated. This condition, in addition to increasing land scarcity, usually signals the process of regional segmentation or colonization of new land.

Thus, among the Kalinga there is a territorial institution, the region, that functions as a corporate social group (Takaki 1977:73) and serves as the primary basis for both social group identity and affiliation (Takaki 1977:56). Each region is signified by a label and is associated with a definable area whose boundaries are known (although not always honored). As a result of traditional marital endogamy (see Table 6.2), Kalinga men and women are likely to spend much of their lifetime within the boundaries of their respective political territories, and even today will often retain their affiliation with their natal region despite subsequent emigration. Kalinga regions, then, represent distinct *societies*, as that term is generally used. At the same time, they exemplify dynamic properties of population growth (and, less often, decline) and segmentation or "budding off" (cf. Binford 1968b; Birdsell 1957), and, less occasionally, coalescence.

Because, in general, the Kalinga population has grown, the number of distinct regions has increased over time, while the mean area of regions has declined. Similarly, the mean population density of the Chico River and Pasil River area has increased, and land suitable for irrigated rice agriculture is becoming scarce. As a consequence, the organization of regional relations encourages population expansion and regional marital endogamy in order to build a viable territorial unit. Some form of agriculture is necessary both to demonstrate land usufruct rights and to support greater population densities. Yet the land available for rice terraces is limited. Under these circumstances, members of a named territory place high value on regional identity and allegiance. At the same time, regional marital endogamy limits the extent to which design information from outside the locality is introduced on a long-term basis. Ceramic design, although it is not highly visible, is noticeable to most of the local population of a settlement with which a woman interacts and within which she resides. By limiting her design repertoire on pottery to those designs which are customary to her region, a woman both reflects the marital system in terms of information exchange and expresses her affiliation with the political unit and its members.

I have thus demonstrated a strong isomorphism between the regional political unit of the Kalinga and the production of distinctive pottery designs within each region. Potters within the two regions produce decoration on pots that is rarely overlapping in terms of its range of variation. Put differently, there is little ambiguity as to the region of origin for particular pieces of pottery. Such differences, I argue, are not the material manifestations of individuals exchanging information, as might be

TABLE 6.2. Region of Birth for Adult Males and Females in Two Kalinga Regions

Region of Birth	*Females*	*Males*	*Total*
	Uma[a]		
Uma	278 (93%)	284 (87%)	562
Elsewhere	22 (7%)	42 (13%)	64
	300	326	626
	Dangtalan[b]		
Dangtalan	57 (89%)	45 (79%)	102
Elsewhere	7 (11%)	12 (21%)	19
	64	57	121

[a]The sex distribution for the regional population, estimated to be 0.5128 : 0.4872 males to females, is based on data from one settlement (Takaki 1977:Table 6). Proportion of adult population, estimated as 0.4741 of total population of Uma, is based on statistics from one settlement (Takaki 1977:Table 6). Data on region of birth for Uma adults derived from Takaki (1977:Table 4).

[b]Data on Dangtalan region apply to major settlement of Dangtalan. This village accounts for nearly 90 percent of the regional population.

suggested by archaeological work of the last decade or so (cf. Plog 1980; Wobst 1977); rather, they serve as subtle icons for individuals linked to a common polity.

The Ethnoarchaeology of Kalinga Ceramic Distribution

When pottery is produced by an individual and used by that individual and her family, the economic role of the commodity is basically limited to decisions regarding the time and labor the potter must devote to making the vessel in relation to alternative activities that could be pursued. Under this system, the distribution of pottery would be largely isomorphic with its production, and the job of archaeologists would be much easier. However, things are rarely quite that simple or neat. For pottery shares with other kinds of consumable goods the quality that it can form one component of economic transactions between individuals. By "transaction," I mean that the commodity, in this case the pot, may be physically moved from its locus of production (e.g., a household) to another place, and at the same time ownership of the vessel may be transferred to another individual or household. Under this circumstance, the distribution of pottery would no longer be isomorphic with its production.

Among the means by which Kalinga potters alter the original location of pots they produce are (1) gift giving and (2) balanced exchange. Both of these transactions involve the transfer of ownership as well as other considerations. Giving a gift of a ceramic vessel to another woman is considered an appropriate gesture on a number of ceremonial or life crisis occasions. Yet in comparison with balanced exchange its occurrence is relatively uncommon as a means of transferring ownership of pottery among Kalinga women from the Dangtalan region. Balanced exchange, in this context, refers to the "contractually reciprocal title transfer based on advance agreement between two transacting parties on the kinds and amounts of goods to be exchanged" (Takaki 1977:332). Most of these transactions are direct, involving the nearly simultaneous exchange of goods, in this case pots for other commodities.

During a balanced exchange transaction in which pottery or rice is to be exchanged, both parties employ customary equivalents (Takaki 1977:355) as a means to determine the actual exchange values. For commodities that are widely exchanged, such as rice and pots, these equivalents are "widely known and generally accepted as appropriate" (Takaki 1977:355). Under such conditions, the actual price of a pot will vary little from these equivalents. Table 6.3 shows average actual prices in terms of pounded rice, beans, and cash for ceramic vessels of different sizes and functions. These data were derived from a record of transactions involving a number of potters and maintained over a period of four years. In general, the exchange values are consistent across similar functional classes of varying size. In addition, it appears that rice cooking vessels obtain a higher price than meat and vegetable cooking pots of the same size. In all but two cases, the exchange value for beans is equal to or slightly less than the exchange value associated with pounded rice for vessels of the same size and functional class. Although there is some variation in the actual exchange price received for vessels of the same size and functional class, this generally amounted to less than one-third of the average exchange price. The quality of the vessel, the demand for pottery, the supply of equivalent goods, and the social relationship between the two transacting parties probably contribute to the observed variability.

Balanced exchange of pottery occurs between Kalinga households within villages where ceramics are produced. Similar exchange transactions also occur between a potter and households in other settlements and other regions. In all these cases, the outcome of the exchange process is to distribute the pottery of a single potter or settlement more widely than it would have been otherwise. Women of Dangtalan who make pottery engage in these exchange transactions with other households in the village and with other villages in more remote regions. During the inventory of household pottery holdings in the settlement of Dangtalan in 1980, out of 216 vessels that had been acquired through balanced exchange or as gifts, 194 (90%) were made by close or distant relatives of the families that owned the pots. Kalinga women who exchange or give gifts of pottery, then, make use of established genealogical relationships. Naturally, within any region most women will be able to identify some type of kinship link with virtually any family. Nevertheless, this type of economic transaction, when it occurs within a settlement, appears to be tempered by genealogical concerns.

The exchange of pottery outside a woman's village, especially when it occurs in another region, involves other considerations. First, because the potter quite often must initiate these transactions, she is required to travel to a settlement that might be some distance away. In the rugged mountains of northern Luzon, virtually all villages more than 5 km away are "distant," inasmuch as they can usually be reached only by foot trails. Second, outside of her home region, a woman must rely on negotiated peace pacts or long-term friendly relationships, and the influence of her clientele to secure her safety. As a result, women tend to exchange with villages with which their region has reliable peace pacts or a common historical origin.

Once a potter arrives in a village, there is no guarantee that there will be a demand for, or an adequate return on, her output. The occurrence of interregional pottery exchange is decidedly nonuniform throughout the year (see Table 6.4). Two periods, from February to May and from August to November, account for virtually all of the exchange outside of a woman's region of residence. Moreover, the first of these two periods accounts for

TABLE 6.3. Exchange Values for Ceramic Vessels of Different Size and Function Made by Dangtalan Potters

	Vessel Functional Classes[a]						
Commodity Equivalents[b]	*Oggatit Ittoyom*	*Oggatit Oppaya*	*Ittoyom*	*Oppaya*	*Immosso*	*Lallangan Ittoyom*	*Lallangan Oppaya*
Rice[c]	2.44	2.10	3.54	3.30	15.00	12.05	5.00
	(0.88)	(0.64)	(0.56)	(1.47)	—	(3.60)	(1.58)
Beans[c]	2.33	3.05	3.38	3.08)	13.00	10.00	10.17
	—	—	(0.44)	(1.26)	—	—	—
Cash	—	—	—	2.00	10.00	10.00	3.50
	—	—	—	—	—	—	—

[a]Oggatit Ittoyom = small rice cooking vessel; Oggatit Oppaya = small meat and vegetable cooking vessel; Ittoyom = rice cooking vessel; Oppaya = meat/vegetable cooking vessel; Immosso = water storage jar; Lallangan Ittoyom = large rice cooking vessel; Lallangan Oppaya = large meat and vegetable cooking vessel.

[b]Rice and beans measured as threshed or pounded *chupas*. One *chupas* of *oyak* variety rice is equivalent to 300 g. Cash equivalent is Philippine peso.

[c]Numbers in parentheses refer to standard deviation of average actual exchange values.

TABLE 6.4. Monthly Occurrence of Pottery Exchange Transactions for Dangtalan Potters

	Jan.	*Feb.*	*Mar.*	*Apr.*	*May*	*Jun.*	*Jul.*	*Aug.*	*Sep.*	*Oct.*	*Nov.*	*Dec.*
Number of Transactions	—	4	20	21	2	—	—	12	8	1	3	—

twice as many transactions as the second. In both cases, however, the bulk of interregional exchange coincides with the time just prior to the rice harvest. Stores of grain are at their lowest, and prior to the harvest there is less work to do in the fields. The relatively greater emphasis on exchange of pottery from February to May takes advantage of the dry season, when large numbers of vessels are manufactured and intervillage movement is easier.

The Kalinga of Dangtalan thus engage in balanced exchange of pottery on a local and regional level. These transactions involve women dealing with other women. Yet to what extent does pottery change hands through gift giving and exchange? This, in turn, leads to questions regarding the relative importance of local versus regional pottery exchange and the possibility of craft specialization and social differentiation among the Kalinga. And, finally, what are the distributional and material characteristics of this economic system?

Two sources of information were used to provide estimates of the extent to which potters in Dangtalan exchanged pottery: (1) the household inventory records from 1975 and 1980, and (2) pottery exchange records from 1976–1977 and 1979–1980. The 1980 household inventory, as well as the pottery exchange records, were recorded after Longacre's departure from the field by Christina Tima, who has lived in Dangtalan since 1976. The 1975 and 1980 inventories include a list of pottery in each house and the potter responsible for making the pot. Where the pot was not made by the resident potter, I assumed it had been acquired through exchange or as a gift (which often entails subsequent gift giving on the part of the recipient). These inventories provide a reliable estimate of the extent of pottery exchange within the village of Dangtalan for the year of the inventory and, at minimum, the year prior to the inventory. Due to breakage of medium-sized cooking vessels, a substantial proportion of the vessels made more than two years prior to the inventory had probably been discarded. Nonetheless, I aggregated the intraregional exchange and gift data into two five-year periods, 1971–1975 and 1976–1980 (since some information was available on the earlier years for each period). The household inventories of Puapo, Lonong, and Dalupa were inspected for vessels made by potters from Dangtalan.

The pottery exchange record compiled by Christina Tima covering 1976–1977 and 1979–1980, applies primarily to interregional transactions. The data recorded here are probably minimum estimates of the magnitude to which pottery moved out of Dangtalan through balanced exchange during those intervals. These records provide reliable estimates of the relative emphasis different potters placed on interregional exchange. They may not, however, accurately reflect the total exchange system, since it is unlikely that every interregional exchange transaction was recorded. Again, what we have are minimum exchange estimates.

I analyzed the data on intraregional exchange by potters from the settlement of Dangtalan first. For each household the numbers of vegetable and meat cooking pots (*oppaya*), rice cooking pots (*ittoyom*), and large water jars and cooking vessels (*immosso* and *lallangan*) that were exchanged for the five-year periods 1971–1975 and 1976–1980 were counted (Table 6.5). Thirty-two households participated in the exchange of pottery within the region during at least one of the five-year intervals. The largest number of vessels produced for exchange or gift giving by a single household within a five-year period was forty-eight. A total of 124 vessels were exchanged between 1971 and 1975, and another 392 were exchanged between 1976 and 1980 within the Dangtalan region. Thus we see an increase in the level of exchange by approximately 216 percent between the two time intervals. This increase occurred across all three types of vessels, although at somewhat different rates. Exchange of vegetable and meat cooking pots increased by nearly 400 percent, while rice-cooking and large cooking or water storage vessels increased between 235 percent and 262 percent. Similarly, the average number of vessels exchanged by each household increased over this five-year interval from approximately 4.5 pots per house to over 15.5 vessels per household. At the same time, the number of households participating in the intraregional exchange of pottery decreased (see Table 6.6) from twenty-eight to twenty-five. Fewer households exchanged vessels in low numbers, and a proportionately greater share of the households exchanged greater numbers of pots. Thus, there was an expansion of the local exchange system.

This trend was matched by an increase in the total number of ceramic vessels in use within Dangtalan across this same time period (see Longacre 1985). The pottery assemblage of the settlement increased by approximately 150 percent between 1975 and

1980. Note, however, that the change in the rate of exchange increased by an even greater percentage rate. Not only did the total number of vessels increase, but the exchange of vessels increased even more rapidly. In other words, there was proportionately more local economic activity involving pottery in 1980 compared with 1975. Among the different types of vessels, the proportion of vegetable and meat cooking pots stayed approximately the same between 1975 and 1980, while the proportion of these vessels that were exchanged increased by nearly 10 percent. Large vessels, on the other hand, increased from approximately 38 percent of the total assemblage in 1975 to almost 50 percent in 1980. The proportion of large vessels exchanged, however, decreased over this time interval. Thus, while the total number of vessels—including large pots—increased between 1975 and 1980, the exchange of pots was not uniformly allocated across different functional and size classes.

Longacre (1985) attributes the increase in the number of vessels and the increase in the per household pot inventory between 1975 and 1980 to the effects of wage labor on Dangtalan. With the opening of a gold mine that employed men from the region, there was an increase in local economic activity, including land purchases and supra-household feasting. Large vessels are utilized for food preparation during these important events, and Longacre (1985:334) suggests Dangtalan households anticipated this and stockpiled appropriately sized pots. The exchange data provide additional insight into this situation. It appears that as families add to their holdings of large pots, quite often they do so by making these vessels themselves. At the same time, they increase the number of meat and vegetable cooking pots they purchase, despite the fact that proportionately these vessels do not increase among the household assemblage. They do this, I argue, as a cost-saving measure. Large vessels can be quite expensive to purchase (see Table 6.3), whereas smaller cooking pots are less costly and are more abundant, making it somewhat easier to bargain for these vessels.

This analysis suggests that an increase in the number of pottery vessels in use within a village cannot simply be interpreted as reflecting an increase in population. Methodologically, it suggests that attempts to estimate prehistoric population densities on the basis of pottery density (see Sanders et al. 1979:38–40) may involve monitoring variables other than or in addition to

TABLE 6.5. Number of Vessels Exchanged by Dangtalan Households with Other Households in the Region, 1971–1975 and 1976–1980

	1971–1975				*1976–1980*			
Household	*Oppaya*	*Ittoyom*	*Lallangan Immosso*	*Total*	*Oppaya*	*Ittoyom*	*Lallangan Immosso*	*Total*
2	3	6	3	12	4	2	8	14
4	5	4	4	13	4	6	8	33[a]
6	—	—	1	1	—	1	1	2
7	—	—	2	2	—	—	—	0
9	—	2	2	4	7	5	9	21
11	3	4	6	13	8	7	7	22
13	5	2	—	7	—	—	—	0
14	—	—	—	0	7	1	2	10
15	—	—	—	0	2	5	—	7
17	1	—	—	1	—	—	—	0
18	—	—	2	2	—	—	—	0
19	2	3	—	5	—	—	3	3
20	—	—	—	0	1	—	—	1
21	1	—	—	1	1	—	—	1
22	1	—	—	1	—	—	—	0

23	1	2	3	6	15	6	12	33
24	—	1	—	1	5	1	—	6
25	1	1	2	4	—	—	—	0
27A	—	3	1	4	11	8	7	26
28	5	1	2	8	6	4	1	11
29	1	—	6	7	4	3	10	17
32	1	—	2	3	1	—	3	4
42	7	1	1	9	26	6	16	48
43	2	1	—	3	16	10	8	34
45	1	—	—	1	6	—	—	6
46	—	—	—	0	—	—	1	1
48	—	1	1	2	5	1	—	6
49	1	1	—	2	9	2	3	14
50	1	—	—	1	11	3	6	20
51	1	—	1	2	29	8	5	42
52	1	—	—	1	—	—	—	0
53	4	2	2	8	6	4	—	10
Total	48	35	41	124	184	83	110	392
Mean	2.14	2.06	2.10	4.43	8.00	4.37	5.79	15.68

[a]This total includes fifteen vessels that were not identified by vessel class.

TABLE 6.6. Frequency Distribution of Intraregional and Interregional Exchange Rates

Number of Vessels Exchanged	*Number of Households* 1971–1975	*Number of Households* 1976–1980
	Intraregional Exchange	
1–5	19 (68%)	6 (24%)
6–10	6 (21%)	6 (24%)
11–15	3 (11%)	3 (12%)
>15	0 (0%)	10 (40%)
	Interregional Exchange	
	1976–1977	*1979–1980*
1–5	0 (0%)	6 (33%)
6–10	1 (5%)	0 (0%)
11–15	2 (10%)	0 (0%)
>15	17 (85%)	12 (67%)

population size. Furthermore, it is possible to separate Dangtalan households by the extent to which resident females make pottery for the family (see Table 6.7). Again, these data show an increase in the mean number of vessels between 1975 and 1980, and also illustrate variation in the number of pots within households. Where a woman is a resident potter and makes most of her family's vessels, the household is characterized by more pots, on average, than households where there is no resident potter. Females who make less than 75 percent of the pots used by their household generally fall between these two extremes in terms of the household pottery assemblage. Thus, one of the primary dimensions of variation in the number of pots associated with a household is the degree to which resident females are active potters. Extrapolating to communities that lack any resident potters and must import ceramic vessels, we would expect to find fewer vessels per household. These villages would have lower pottery densities than communities within which pottery was locally produced. Again, sherd or vessel densities cannot be assumed to be a simple function of population size or density, especially when the production of pottery is spatially limited and exchange serves to distribute this commodity more widely.

Of the thirty-one households that in 1975 made most of their own pottery for domestic use, fourteen also engaged in substantial intraregional pottery exchange (see Table 6.8). Of the remaining nineteen households that made a smaller proportion of their own pottery, only one participated in the local exchange of ceramics. Thus, certain households contain larger pottery assemblages in part because they exchange pots within the region at a greater rate and more often than do other households. Additional household vessels, in this instance, may serve as the inventory a woman will use when pots are bartered for other commodities or when a ceramic vessel might be suitable as a gift. Interestingly, not only do households that exchange pots have a larger number of vessels at any one point in time than other households, their assemblage also is more homogeneous. Since virtually all of the vessels from these households were made by a single person, they should show much less design and morphological variation than the collection of pots from various potters in households that do not produce most of their own vessels. Thus, the relative homogeneity of household assemblages may provide another index of production and distribution of pottery within and between villages.

As I stated previously, pottery is exchanged with other households outside the Dangtalan region, and over two two-year time intervals a minimum (estimate) of 1,037 vessels were exchanged with villages lying outside the region. Again, it was possible to identify the extent to which various Dangtalan households participated in interregional exchange in these periods of time, and the number of vessels of different size or function they made for

TABLE 6.7. Mean Number of Vessels for Dangtalan Households, 1975 and 1980 Censuses

	Mean Number of Vessels	
Households Where	*1975*	*1980*
Potter Makes >75% of Household Vessels	11.58 n = 31, s = 4.62	18.25 n = 24, s = 6.17
Potter Makes <75% of Household Vessels	7.75 n = 12, s = 2.42	13.05 n = 19, s = 4.95
No Potter Resident in Household	6.00 n = 7, s = 3.10	10.85 n = 7, s = 7.24

TABLE 6.8. Household Inventory of Vessels for Dangtalan Potters Who Exchanged Relatively Large Numbers of Vessels within the Region

	Number of Vessels	
Household	*1975 Inventory*[a]	*1971–1980 Intraregional Exchange*
2	18	26
4	17	46
9	19	25
11	20	26
23	14	39
27A	16	30
28	8	19
29	9	20
42	15	57
43	12	37
49	12	16
50	8	21
51	7	44
53	10	18
Mean	13.21	30.29

[a]All households but fifty-three make more than 75% of family's pottery.

this purpose (see Table 6.9). In general, there is a positive correlation between the number of vessels a household exchanged within the region and the number of pots bartered to other households outside the Dangtalan region (Figure 6.1), although not all Dangtalan households that participated in the interregional exchange also participated in the intraregional exchange network.

The number of pots exchanged during any one of these two-year intervals ranged from one to seventy. Overall, the maximum traded by a household was 133 vessels. The number of vessels exchanged out of the Dangtalan region during 1976–1977 was estimated to be 655; during 1979–1980 this number dropped to 382. The decrease represented here is approximately 40 percent. Because of the large number of unidentified vessels exchanged during the 1976–1977 period, I have extrapolated from the percentage distribution of the known vessels in order to calculate the number of unidentified vessels attributable to each class (see Table 6.9). Although all three classes of vessels were exchanged at proportionately lower rates in 1979–1980, from the extrapolated numbers, larger vessels show the greatest drop in numbers—nearly 68 percent fewer water jars and large cooking vessels were exchanged in 1979–1980 compared with 1976–1977. This drop occurred at approximately the same time that the local production and exchange of large vessels increased dramatically (see Table 6.5). While there was only a small decrease in the number of households engaged in the exchange of pottery during this interval (Table 6.6), there were seven fewer households that made more than ten pots during 1979–1980 compared with 1976–1977. Of the remaining households making pottery for interregional exchange, the level of distribution was approximately the same as before: on average 31.25 pots were exchanged per potter (compared with 32.75 pots per potter for 1976–1977).

Why did the level of interregional exchange decline over the period represented here? If additional cash from wage labor had entered the local economy of Dangtalan during the latter part of 1976–1980, then there may have been less reason to engage in exchange over relatively long distances, especially if the local market expanded to make up the difference. Of the 392 vessels exchanged within the Dangtalan region during 1976–1980, at least 80 percent (approximately 314) were made between 1978 and 1980. When these are added to the 382 pots exchanged outside Dangtalan, almost 700 vessels circulated through economic transactions. Probably no more than 800 vessels were exchanged on both an interregional and an intraregional basis during the interval 1976–1978. Thus, it appears that the overall economic system, insofar as it applies to pottery exchange, remained more or less stable over this five-year time period.

Other considerations that may have influenced Kalinga potters' decisions to barter locally instead of regionally include the greater distance (and thus energy expenditure for transportation) potters must travel to exchange ceramics, and the uncertain political relations that have developed among regions. To a large extent the Philippine national government has withdrawn its political control of the Pasil River, and traditional enmities have been reestablished in the area. Under such conditions, potters may feel less secure traveling to regions where their safety cannot always be guaranteed.

TABLE 6.9. Number of Vessels Exchanged by Dangtalan Potters with Households in Another Region

	1976–1977					1979–1980			
Household	*Oppaya*	*Ittoyom*	*Lallangan Immosso*	*Unknown*	*Total*	*Oppaya*	*Ittoyom*	*Lallangan Immosso*	*Total*
2	14	8	22	26	70	46	13	4	63
3	—	—	—	14	14	14	13	1	28
4	12	4	13	22	51	23	4	6	33
6	10	6	—	—	16	—	—	—	0
7	—	—	—	16	16	1	—	—	1
9	3	2	3	15	23	—	—	—	0
11	7	4	5	16	32	11	5	2	18
14	16	16	2	25	59	—	—	—	0
15	—	—	—	—	0	13	2	2	17
19	—	—	—	14	14	1	—	—	1
23	—	—	—	—	0	17	8	3	28
24	—	—	—	—	0	7	7	6	20
27A	3	8	3	31	45	—	—	2	2

28	3	5	7	18	33	—	—	—	0
29	8	—	—	17	25	1	—	—	1
38	—	—	—	24	24	—	—	—	0
42	16	2	1	22	41	20	7	5	32
43	13	4	—	20	37	20	9	5	34
45	—	—	—	—	0	1	—	—	1
46	21	15	13	15	64	—	—	—	0
47	2	6	2	14	24	—	—	—	0
48	4	1	—	25	30	—	—	—	0
49	—	—	6	—	6	20	15	—	35
50	—	—	—	—	0	22	8	5	35
51	5	5	1	20	31	13	9	10	32
52	—	—	—	—	0	—	—	1	1
Total	137	86	78	354	655	230	100	52	382
	298[a]	187[a]	170[a]						
Mean					32.75	14.38	8.33	4.00	21.22

[a]Values represent extrapolated totals, based on the percentage of each class multiplied by the unknown vessel total and added to the known class total.

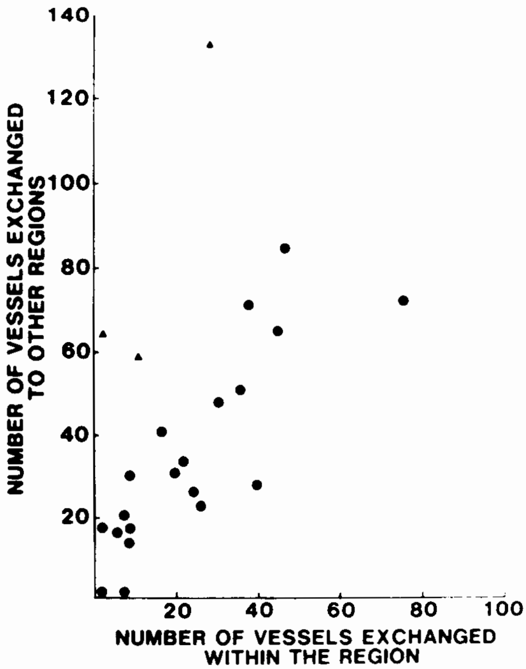


FIGURE 6.1. Relationship between number of vessels a potter exchanged within a region and number of vessels exchanged outside the region.

We cannot help but notice from this example that economic transactions involving pottery exchange are influenced by other economic activities and political relations within an area. Substantively, this analysis suggests that pottery exchange among subsistence agriculturalists is closely attuned to local economic conditions, and that production of pottery for exchange decreases during intervals when the local economy is expanding. Variability in the distribution of pottery through exchange to other settlements also illustrates the role of political and historical relationships. Thirteen settlements outside the Dangtalan region received pottery through exchange (Table 6.10). The number of pots each settlement acquired varied from a low of 1 (Ableg and Cagaluan) to a high of 199 (Maluscad).

As was documented in Table 6.9, the number of vessels exchanged dropped by nearly 50 percent in the second time interval for which there is information, and this decrease is widely represented among the settlements outside of Dangtalan. Throughout 1979–1980 there were fewer pots exchanged with settlements to the south of Dangtalan and the Pasil River than might be expected. Overall these settlements accounted for only 13 percent of the total number of interregional exchanges, despite the fact that they represent nearly 50 percent of the villages with which the Dangtalan potters exchange. This disparity in the rates of pottery exchange between the two sets of settlements cannot be attributed to the exchange of fewer vessels per transaction. Rather, it reflects the number of potters who have established exchange relationships with a given village. There is a positive relationship between the number of vessels exchanged with a settlement and the number of potters who barter with households in that settle-

TABLE 6.10. Documented Interregional Exchange Between Dangtalan and Outlying Kalinga Settlements, 1976–1977 and 1979–1980

	Number of Vessels Exchanged		
Settlement	*1976–1977*	*1979–1980*	*Total*
Bagtayan	9	19	28
Galdang	129	55	184
Pugong	66	13	79
Maluscad	164	35	199
Guinaang	119	69	188
Magislay	36	32	68
Balenciago	37	27	64
Balatoc	0	16	16
Ableg	1	0	1
Cagaluan	0	1	1
Uma	0	27	27
Lubuagan	73	3	76
Amdalao	5	0	5
Total	639	297	936
	Unknown place of exchange		101
	Total interregional exchange		1,037

ment (see Figure 6.2). Thus, the explanation for variation in the rate of exchange among the settlements must have something to do with interaction networks. However, factors in addition to distance play a role in determining interaction rates for pottery exchange among the Kalinga.

In the settlements of Ableg and Cagaluan, households have closer access to the pottery produced in Dalupa, and also share more kinship relations with the population of Dalupa. Balatoc, Uma, and Lubuagan are farther from Dangtalan than many of the other villages, and they also represent regions with which Dangtalan has had confrontations in the past (see Takaki 1984:64–65). The populations of the settlements to the north of the Pasil River, on the other hand, share historical and kinship relations with Dangtalan. Thus, the distribution of pottery on a regional scale through exchange transactions reflects long-term alliances among the people of various settlements. By differentially exchanging pots and other commodities with these villages, the population of Dangtalan actively supports these alliances.

One question that archaeologists might legitimately ask is how the pattern of exchange described here is detectable in material terms. Would it be necessary to source the clay and temper materials in order to resolve the question of pottery production and exchange among the Kalinga if we lacked the ethnographic data included here? Longacre (1985) alludes to the difficulty a purely materials approach to the Kalinga data would encounter. The clay the Kalinga of Dangtalan use to make pottery is obtained from residual deposits above the Pasil River. Sand occurs as a natural tempering material within these deposits of clay, and apparently similar deposits of clay can be found throughout much of the region. None of the clay, nor any of the sand temper, is geologically distinctive to the Kalinga locality within which pottery is made. Thus, attempts to identify source areas by fine-grained analysis of the clay or temper used to make Kalinga pots would be unlikely to succeed.

There is, however, at least one alternative, and that is to model the kind of ceramic variability that should be present in communities which produce their own pottery and those which largely import pottery for use. I have already described the Dangtalan case. If we assume that pottery variability will increase as the products of greater numbers of potters are represented in a collection, then in Dangtalan, where the majority of

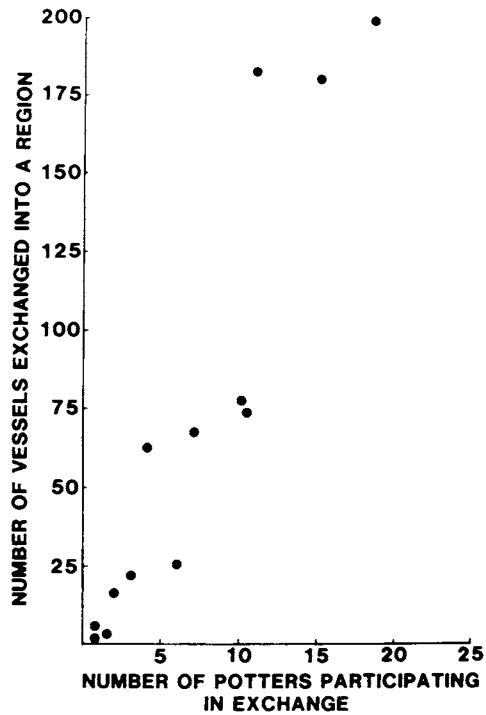


FIGURE 6.2. Relationship between number of vessels exchanged with a region and number of potters involved in exchange relations with that region.

households make over 75 percent of their own pottery, and where only 10 percent of the households lack a resident potter, household ceramic variability would be relatively low. Alternatively put, most households would be homogeneous in terms of the ceramic assemblage. Across the entire settlement, however, there would be a moderate amount of ceramic diversity, equivalent to that expressed by the entire set of potters working within the region.

An importing settlement, in contrast, would be characterized by fairly diverse ceramic assemblages on the household level, since each household might obtain the ceramic output of a variety of potters (see Takaki's ethnographic description [1977:423]). Since the number of pots represented in such a village increases as the number of different potters who exchange with the village increases, heterogeneity would increase largely as a function of pottery assemblage size in these settlements. Moreover, since settlements that import vessels are likely to draw them from a variety of sources, village-wide ceramic diversity will also be high, especially in contrast with production areas. Both Dalupa and Dangtalan exemplify this observation: imported vessels constitute less than 1 percent of the ceramic assemblage in each village.

Settlements that receive pots through exchange are likely to exhibit size or volume sorting of vessels. For the Kalinga this is expressed by lower-than-expected proportions of large vessels among importing settlements. I would also predict that the average number of pots within households of villages that exchange for pottery would be significantly lower than among households that produce ceramics. Consequently, I suggest we need not be completely at the mercy of expensive "high tech" analyses, although I certainly do not mean to discourage their application. Patterns of variability in the archaeological assemblages we collect should be similar to those I have just discussed, when similar economic transactions characterized the past.

The Relationship Between Pottery Exchange and Agricultural Production

I have thus far described a system of pottery exchange in which Kalinga women from the settlement of Dangtalan willingly participate and from which they gain some benefit. Yet, it is appropriate to ask why these women go through the effort of making pottery and then bartering it for other consumables, especially food. Wouldn't it be much easier (not to mention more predictable) for households to grow their own food? To answer this question, it is necessary to describe briefly some aspects of the Kalinga agricultural system. I hypothesize that women engage in excess pottery production for the purpose of exchange because they have insufficient access to agricultural resources to support their families.

The most important food crop among the Kalinga of the Pasil and Chico rivers is rice. It is grown primarily in irrigated fields situated in stone-faced terraces above the major tributaries of the two rivers. By building these fields, the Kalinga have expanded their agricultural system, and with rice as the staple crop most fields can be double-cropped within a year. As discussed earlier, for regional political units to survive, there must be sufficient population for defense and negotiation of peace pacts. This context, in turn, has placed a premium on population growth within regions, and from the available evidence it appears that most populations in the Pasil River and Chico River drainages have been expanding at approximately 2 percent per year. Ultimately, however, land suited for building rice terraces is limited to slopes with adequate and predictable water runoff from rainfall. And throughout much of Dangtalan, the most productive land for building terraces has been developed. More recent additions to the agricultural system are small or less reliable in terms of double-cropping.

Patterns of inheritance and stochastic events (fines, debts, etc.) within this type of agricultural system also result in a somewhat uneven distribution of land for farming. Yet, if families are to survive, they must have some means of getting food. The alternatives available to a household in negotiating its management of resources include swidden farming, tenant farming, tending livestock, and the production of crafts. In Dangtalan, I argue, pottery making has emerged as one means to gain access to food resources among those households which lack adequate or reliable agricultural lands.

To test this hypothesis I identified eighteen households from Dangtalan that had produced more than thirty-five pots for exchange on either an intraregional or an interregional basis. These households were collectively responsible for 38 percent of the total number of pots produced in Dangtalan for exchange. I next calculated the estimated production of the rice fields owned by these families, drawing on data collected by Longacre in 1975–1976 and using a system of equivalents devised by Takaki (1977) for Kalinga agriculturalists in the Uma region. From Takaki's work I was able to estimate the total productivity of household rice fields in kilograms and compare this with anticipated rice requirements for the eighteen Dangtalan households that exchanged pots in relatively large numbers (see Table 6.11). Although not every household showed a deficit in terms of rice production compared with rice requirements, two-thirds of them did. Collectively, the total rice deficit was almost 7,200 kg of rice on a yearly basis.

TABLE 6.11. Dangtalan Households That Emphasize Pottery Exchange and Their Yearly Rice Requirements and Rice Production

Household	*Number of Vessels Exchanged*	*Yearly Rice Requirements (kg)*	*Yearly Rice Production (kg)*	*Surplus/ Deficit*
2	160	1,314.00	575.33	− 738.67
3	42	438.00	529.60	+ 91.60
4	130	1,095.00	892.65	− 202.35
9	48	930.75	251.40	− 679.35
11	89	2,244.75	1,126.43	−1,118.32
14	69	1,095.00	539.48	− 555.52
15	38	382.25	479.40	+ 97.15
23	67	1,095.00	1,216.80	+ 121.80
27A	76	1,368.75	1,271.10	− 97.65
28	52	930.75	964.13	+ 33.38
29	51	1,040.25	1,901.70	+ 861.45
42	130	711.75	37.05	− 674.70
43	108	1,533.00	915.16	− 617.84
46	65	1,806.75	623.29	−1,183.46
48	38	1,149.75	162.75	− 987.00
49	60	1,533.00	815.10	− 717.90
50	56	1,697.25	—[a]	—
51	107	1,314.00	413.70	− 900.30
			Total Deficit	−7,267.68

[a]Estimates of yearly rice production for this family are not possible to ascertain because they own land in the Dalupa-Ableg region.

Obviously, many of these households must have access to additional resources if they are to survive. Pottery production is unlikely to completely make up the deficit between rice production and rice requirements for any but the most industrious households. Nonetheless, it does represent one tactic a household can exploit in order to supplement family members' diet. The resource for making pottery is free, labor and time for pottery making can be scheduled to coincide with the low-activity dry season, and the vessels can be stockpiled for exchange. The record of pottery exchange transactions, of course, suggested that most exchanges occurred just prior to harvests, when rice reserves would be low. Thus, the significance of pottery exchange may take on added value for these households when the overall availability of rice is taken into consideration.

How persistent is this relationship between pottery production for exchange and insufficient agricultural resources? I lack adequate long-term data to answer this question conclusively. The average resident family size of the eighteen households is 4.83, which is virtually indistinguishable from the settlement mean. All eighteen households, therefore, are not necessarily forced to produce pottery for exchange by the size of the family. Nonetheless, I should point out that all of the eight households whose family size is greater than four persons have higher rice requirements than they have rice production. And the three households with three or fewer members all produce slightly more rice than they require. These households are all headed by females who are over fifty years of age and whose children have established their own households and can be called upon for assistance. Two other households are headed by widows with young children. Thus, there may be a domestic economic cycle in which pottery is produced for exchange by mature females—most past the age of thirty—who have more dependents than their rice fields can support. It will be intriguing to follow the careers of some of these households to see if the offspring are more likely to make pottery under the same conditions.

Conclusions

It is difficult not to generalize from a single case, such as the Kalinga, and apply the relationships established here between pottery decoration and exchange, and between political and social organization, to a host of prehistoric societies. But I will avoid the temptation. I will offer the Kalinga as an alternative to the anthropological model which implies that relatively large-scale and intricate exchange relationships among subsistence agriculturalists must entail some form of institutionalized and elite status hierarchy (see Cordell and Plog 1979; Upham 1982; Upham et al. 1981). The Kalinga illustrate that the balanced exchange of widely used domestic commodities can occur without chiefly intervention or supervision. Even more surprisingly, the individuals responsible for this system are females drawn from relatively poorer households—those lacking adequate agricultural resources for their families. While this observation has been made before (see Binford 1983b:222), this is one of the first times it has been documented quantitatively.

I have shown that, at minimum, the women from Dangtalan village were responsible for the exchange, both within the region and to other regions, of over 350 vessels per year. Presumably potters in Puapo, Lonong, and Dalupa also engage in exchange. As many as 500 to 1,000 vessels may thus have been exchanged yearly within an area of approximately 75 km^2. Given that most archaeological time scales operate in units of at least 100-year intervals, as many as 100,000 vessels would be produced by the Kalinga of Dangtalan and Dalupa over such a period of time. Recall, as well, that this applies only to a limited set of vessel functions. If the Kalinga utilized food storage, serving, and display vessels, the total number of pots in use would have been even greater. Both the scale of exchange (especially as measured in travel time) and the number of vessels produced are within the parameters of most prehistoric reconstructions of ceramic distribution systems among nonmarket societies. Thus, I have yet to read a convincing archaeological demonstration from a Neolithic context that is not compatible with the Kalinga model. That is not to say there is none—just that none has yet been adequately demonstrated.

In the same vein, the Kalinga illustrate how very sharp regional boundaries can occur at one level (through production) and be very much obliterated at another level (through exchange). Both patterns, I suggest, are the outcome of the same process: competition for adequate agricultural land within populations growing at a moderate rate. Under these conditions, it is selectively advantageous to maintain a certain amount of regional conformity and interregional distinctiveness. This is accomplished at the level of production. Yet, it is also important to have friends in other regions with which a settlement can build alliances, in order to promote the integrity of the regional unit.

The limitations placed on the expansion of agricultural land once more play a role in this process. For the uneven distribution of resources encourages some households to manage their few resources in alternative ways. One of these ways is to exchange the pottery with other households both within and outside the region. By going outside the region, these households can tap a larger potential market while reinforcing the historical and fictive ties that bind people together wherever transactions are concluded. It is unlikely that these potters use the opportunity for interregional exchange as a means to negotiate their identity or reinforce their regional boundaries. All of that is established long before pottery decoration can be viewed or interpreted. Instead, distinctive and low-visibility designs serve as subtle clues regarding a group's interaction with another group and, as a consequence, their *potential* allegiance to that group. Within the dynamic context of most human relations, this is probably the best one can hope to achieve. And it is largely compatible with most ethnographic cases in which supraregional authority is absent or only weakly developed. Its application to the archaeological record has been woefully underrealized.

7

The Decorative Burden: Design, Medium, and Change

Warren R. DeBoer

In a paper with the less-than-prophetic title "The Last Pottery Show" (DeBoer 1984), I expressed misgivings about the archaeological obsession with ceramics—those relatively nonbiodegradable, and therefore common, residues of the past. Yet how to escape "potsherd prison" was left, and remains, unresolved. In this chapter questions are raised that may point to escape routes. Following the old rule that if a category proves difficult or intractable, one solution is to dissolve it, I focus on decoration as applied across artifactual media. As artifacts, ceramics are but an incidental inclusion within a larger crosscutting decorative field. Not wishing to be disloyal to a volume with a ceramic theme, however, I begin with pots (though I hope to end in a different place).

An initial and basic question is why so much pottery is plain and why some pottery is decorated. The first part of this question would appear to be unneeded, or "unmarked" in the linguistic sense. After all, if pots are above all "tools" (Braun 1983), they can do their utilitarian jobs as containers without decorative elaboration. The second part of this opening question then becomes more quizzical, more "marked" and in need of explanation. In those few cases where we have some quantified information on decorative investment in ceramic production (e.g., DeBoer and Lathrap 1979; Guthe 1925), 20 to 30 percent of total production time can be devoted to the application of painted decoration. That is, decoration can represent a substantial investment of energy.

At this juncture, many archaeologists might cite the classic article by Wobst (1977) and suggest that, regardless of production cost, decorated artifacts subsequently pay their dues by being a relatively cheap and durable means of transmitting information within and across varying social contexts. This view, however productive as a stimulus to further thinking, has had only partial success when evaluated against an expanded number of ethnographic or archaeological cases (see, e.g., DeBoer and Moore 1982; David, Sterner, and Gavua 1988). Clearly, part of the story is missing, and the relationship between energy and informational assessments of cultural phenomena, including decoration or its absence, continues to be puzzling (e.g., van der Leeuw 1981b; see also Odum 1988).

I am also puzzled. In over fifteen years of teaching undergraduate classes, I have observed student behavior during my lectures with interest and dismay. Doodling on notebooks, as well as erotica or political slogans drawn or engraved on institutional desk tops, suggests a kind of decorative behavior that dissipates the burden of boredom. In the government-sponsored schools, Shipibo children of the Peruvian Amazon do the same thing—but their doodles are of *quenea,* that is, Shipibo-specific designs. These personal observations are of interest in that they suggest that decoration, however measurable in terms of energy costs, can also be viewed as a "safety valve" when energy has no other place to go. The "decorative burden," energetically conceived, then becomes a kind of "imperative" when informationally conceived. But still, much is missing, particularly with reference to the matter of plain versus decorated pottery.

In an attempt to make the very plainness of so much pottery more provocative, one might ask, "Why worry about plain pottery at all?" The resounding answer would appear to be "Because it's there in great abundance." There is no doubt that the ubiquity of plain sherds carries some weight. These sherds can be counted and typed, and the resultant tabulations are undoubtedly useful space-time indices. In terms of much smaller samples, following the "pots as tools" theme, these plain sherds may be subjected to a battery of emergent technological tests that potentially inform us about various performance characteristics, such as cooling and heating effectiveness, portability, resistance to impact stress, thermal shock, abrasion, and so forth (e.g., Schiffer and Skibo 1987). I would suggest, however, that the fact that something exists in abundance does not guarantee the asking of interesting

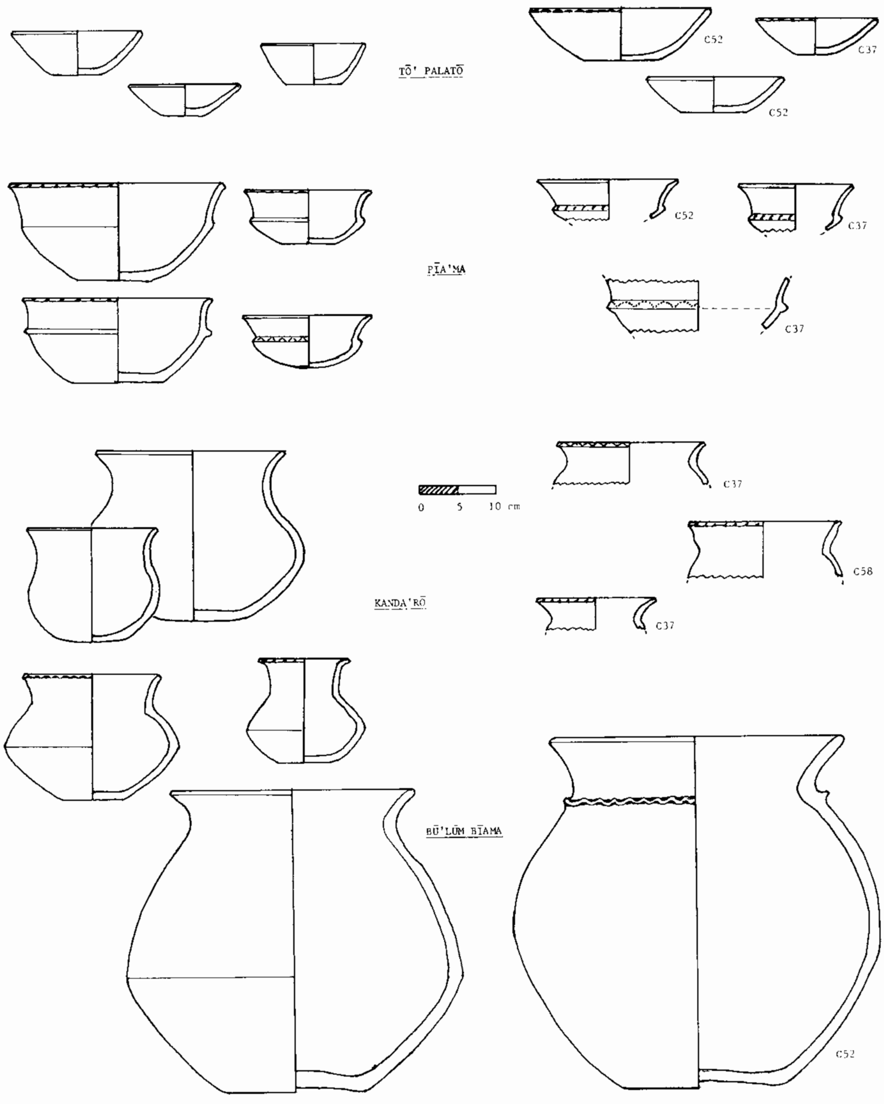


FIGURE 7.1. Chachi ceramics. Left column shows ceramics collected by Barrett in 1908–1910 and now housed in the Museum of the American Indian, New York. Right column shows ceramics collected from Chachi archaeological sites during the 1986 University of Montreal Santiago-Cayapas Project. C37, C52, and C58 refer to site numbers in the Cayapas drainage. Underlined Chachi terms for vessel forms are taken from Barrett 1925, 1:173–181.

scientific questions, a point made long ago in Jonathan Swift's devastatingly perceptive satires.

A third question follows. Anyone who has done ethnography—or any archaeologist who has done ethnoarchaeology among ceramic-producing peoples—knows that pottery is a small part of life, even a small part of the material inventory. Pottery is always but one of a number of container technologies that include vessels of wood, stone, skin, aluminum, and plastic. By focusing on pottery alone, the archaeologist is always looking through a small window. Recognition of this obvious fact immediately forces other considerations pertinent to our theme of the bland and the adorned.

One fundamental consideration involves the necessity of distinguishing artifactual categories, including ceramics, from decoration, since decoration may be applied differentially within and across artifactual media. In this sense, a decorated pot is a nexus between logically separate dimensions—the pot and the applied decoration. Similarly, an undecorated pot becomes a choice rather than an impoverished category. As a consequence, plain or decorated ceramics are not meaningful foci of analysis in any a priori sense, since they are always linked to more expansive material domains. This fairly obvious point can be illustrated nicely with two examples from the lowland humid tropics of South America, where both ethnographic and archaeological evidence is at hand. The two cases are contrastive, almost warranting ideal polarities that I have glossed as "pervasive" versus "partitive" decorative organizations.

The Shipibo: A Case of Pervasive Decorative Organization

To begin, I return to the Shipibo because I know a little bit about them. They, along with their linguistic and cultural brethren, the Conibo, are a numerous people occupying the tropical forests of the central Ucayali Basin in the Peruvian Amazon. Their flamboyant, polychrome decorative style is anthropologically famous.[1] It has amassed a large technical literature, is well represented in museums, and, more recently, has become quite a vogue in the international "primitive art" market. One remarkable feature of this complex art style is the extent to which it is applied to a total artifactual environment. *Quenea,* the Shipibo term for their highly distinctive designs, adorns pottery, textiles (and hence clothing), human skin in the form of face and body painting, calabashes, turtle carapaces, house posts, canoes and canoe paddles, and spindle whorls, and is also sketched as sand markings and the "doodles" alluded to before. Only a few material domains remain free of this decorative imperative. For the Shipibo, basketry remains a relatively desultory craft: fancier baskets are obtained from neighboring backwoods groups (Tessmann 1928: 110; Roe 1982:77). Similarly, tattooing, a form of scarification common among backwoods neighbors (DeBoer 1986) is undeveloped among the Shipibo. Despite these occasional exceptions, the distinctive Shipibo decorative style is remarkable in the extent to which it crosscuts, even supersedes, multiple artifactual categories. In this sense, it is a *pervasive* mode of decorative organization. Years ago, Gordon Willey (1949:149) clearly had the Shipibo in mind when he wrote, "There are many instances when it is clear that the designs executed in paint or by incision on pottery are duplications of designs made on wood, stone, bone, shell, textiles, or even directly upon the human body."

The Chachi: A Case of Partitive Decoration

Like the Shipibo, the Chachi are situated in a lowland tropical forest and their basic orientation is riverine. Unlike the Shipibo, they are situated on the Pacific side of the Andes, and the organization of their decorative technology could hardly be more different.

The Chachi, numbering about 3,000 individuals, inhabit the central and upper Cayapas River as well as a few scattered enclaves in Esmeraldas Province, on the northernmost coast of Ecuador. In the core area on the Cayapas, rivers are swift-flowing between hilly interfluves covered by dense tropical forest. In present times, the subsistence staple of the Chachi is the plantain, supplemented by corn for beer and a range of root and fruit crops. Hunting and fishing continue to be important, although there are increasing complaints about the declining yields of these activities. The Chachi live in single-house settlements dispersed along the Cayapas and its major tributaries. An interesting feature of this settlement pattern is the presence of several ceremonial centers, abandoned through most of the year, where the Chachi gather at Christmas and Easter. The following survey of

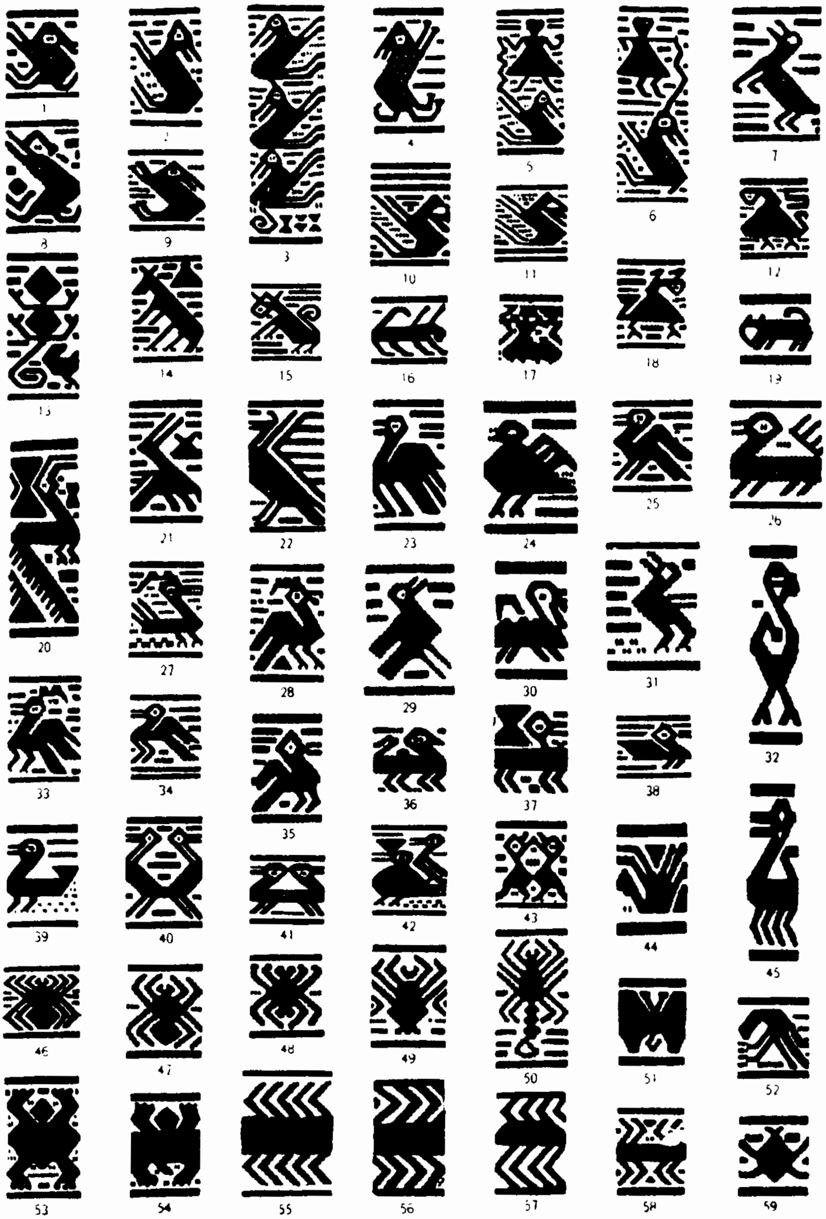


FIGURE 7.2. Chachi textile designs (taken from Barrett 1925, 2:Pl. CXXIV).

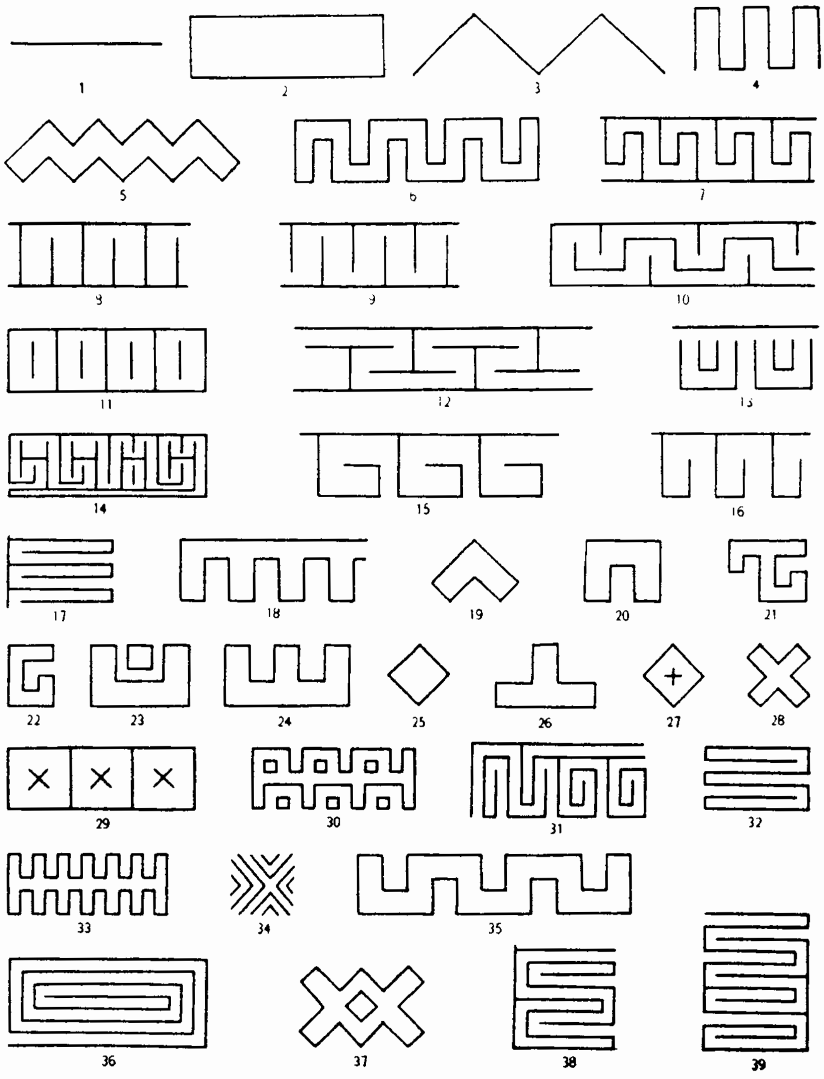


FIGURE 7.3. Chachi fan and mat designs (taken from Barrett 1925, 2:Pl. CV).

Chachi decoration leans upon the full ethnography of Barrett (1925; fieldwork 1908–1910), some more contemporary literature (Altschuler 1964; Santiana and Carluci 1962; Carasco 1983; Einzmann 1985), and personal observations made while a guest of the Chachi during August–December 1986 and July–August 1988.

The Chachi do not have a uniform and distinctive decorative style. Rather, they have a number of separate decorative modes, each of which tends to be confined to a particular material medium. In this sense, the Chachi decorative organization can be said to be *partitive,* that is, partitioned according to medium. In order to illustrate this contrast, let us consider the following artifact categories and their associated designs.

Pottery

The Chachi no longer make pottery. This craft apparently was abandoned during the 1950s with the introduction of aluminum containers, outboard motors, and Protestant missionaries (Altschuler 1964:19–20). We do know quite a bit about the traditional ceramic industry, however, on the basis of Barrett's description (1925, 1:173–181) and collections now housed in the Museum of the American Indian in New York. In addition, hundreds of sherds from Chachi archaeological sites were recovered during the 1986 University of Montreal Santiago-Cayapas Project (Tolstoy and DeBoer 1989). In decorative terms, Chachi ceramics are obdurately simple. Most vessels are plain. Decoration is limited to occasional nicking of the rim or, even more rarely, incised zigzags or rocked shell-stamping on the carination of bowls (Figure 7.1). Slipping and painting are absent.

Textiles

In Barrett's day, loom-woven textiles of cotton (or of wool imported from the sierra) were common. Decoration, carried by the warp, included a large array of bird, spider, and other zoomorphic designs, as well as geometric forms (Figure 7.2). By 1960, weaving was said to be essentially extinct (Altschuler 1964:15), although this claim was evidently premature. Today, according to Einzmann (1985:42), at least seven Chachi women continue to weave, although spinning has ceased, store-bought Orlon or cotton has replaced home-grown cotton, and native dyes have been replaced by gaudy synthetics. Links with traditional weaving practice are now tenuous, and attempts to revive the craft have a doubtful future.

Fire Fans and Baskets

These two categories have linked decorative histories. Today's Chachi are known for their decorated basketry, which, in addition to being used domestically, is an important export item. The manufacturing technology detailed by Barrett (1925, 1:184–237) remains intact today, but twilled decoration has become amplified. The source of contemporary basketry designs appears to be, in part, fire fans and mats (Figure 7.3) and, to a lesser extent, earlier woven textiles. In other words, basketry has "picked up," so to speak, the decoration formerly confined to fire fans or carried by the now practically defunct textile arts.

Canoes

The Chachi are a riverine people, and dugout canoes are central to their life. In addition to being the basic means of transportation, canoes are an important item of sale, and exported Chachi dugouts ply the waters of the Guayas far to the south. Canoes are painted with distinctive geometric designs, *ku'm bilya* in Chachi (Barrett 1925, 1:143). The paint consists of brea, or beeswax, and is applied by the men with the aid of carved balsa stamps. Although the diversity of canoe designs illustrated by Barrett (Figure 7.4) has declined during the twentieth century, most canoes still bear some decoration, except those manufactured for sale. Barrett (1925, 1:141–143) also noted the relative lack of decorative investment in canoes made for sale, with the interesting exception of zoomorphic designs, which were applied only to such canoes.

Calabashes

Throughout the humid tropics, calabashes and bottle gourds provide multiuse containers that are light, portable, and fairly durable. According to Barrett, the Chachi claim to have adopted the use of calabash containers after entering the coastal forests of Esmeraldas. In their former homeland, which legends place in the Andes near Ibarra, greater reliance was placed upon ceramics.[2] Calabashes are most commonly incised with grotesque anthropomorphic and zoomorphic designs that, except for occasional

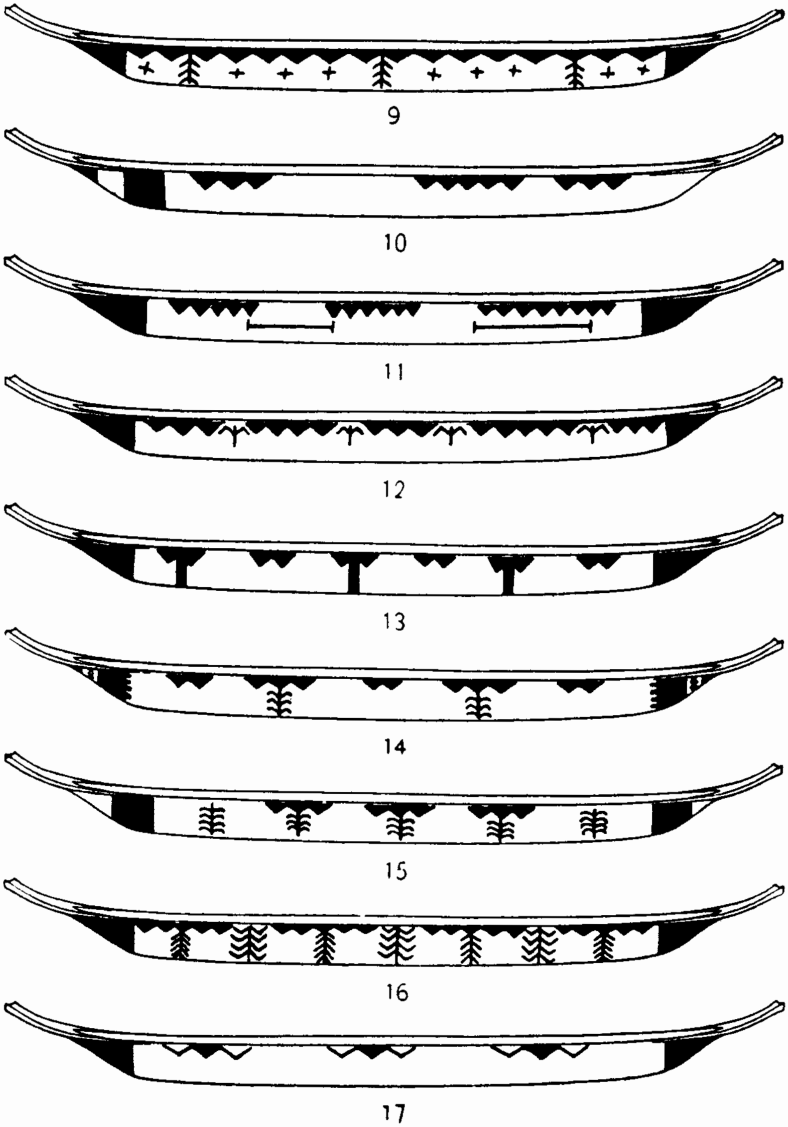


FIGURE 7.4. Chachi canoe designs (taken from Barrett 1925, 1:Pl. LXXIII).

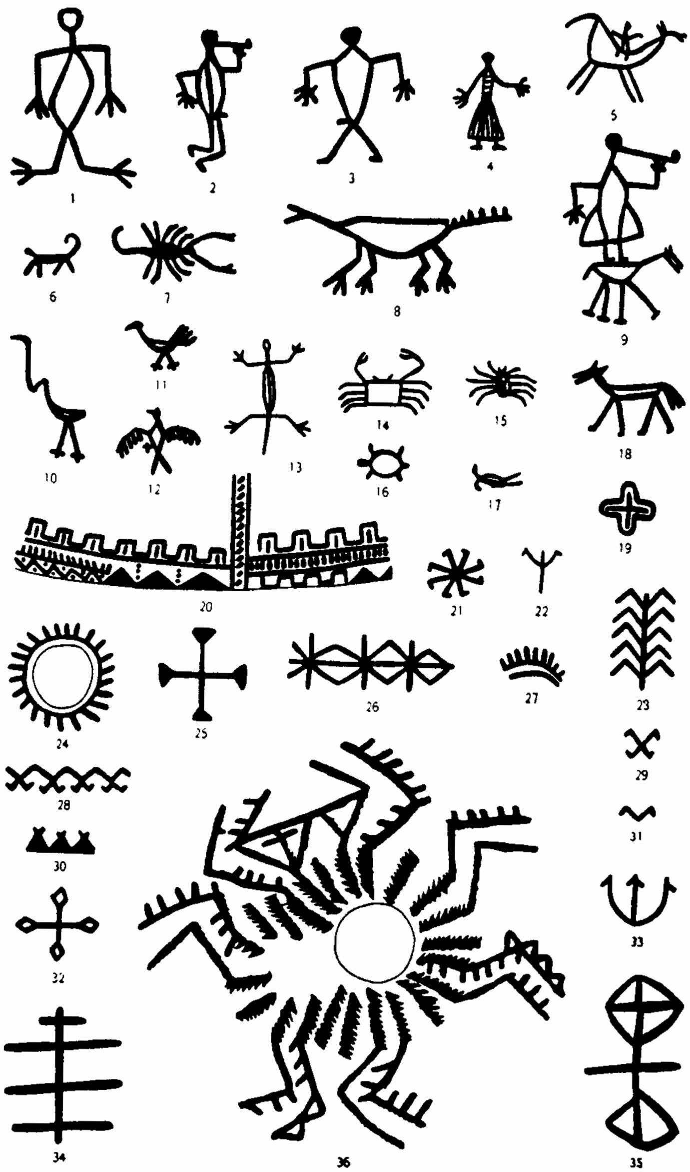


FIGURE 7.5. Chachi calabash designs (taken from Barrett 1925, 1:Pl. LXXXVI).

geometric motifs also painted on canoes, appear unique to the medium (Figure 7.5:top). In the summer of 1988, I observed calabash bowls, used in serving corn beer, decorated with a form of scalloped rocker-engraving, a decorative device formerly associated with ceramics (Figure 7.5:bottom; compare the *pia'ma* of Figure 7.1).

Body Painting

Barrett illustrated a large selection of painted face and body designs (Figure 7.6). Once again, these geometric designs, painted with *achiote* and other organic dyes, have a distinctive style not found in any other medium. Body painting is rarer today than during Barrett's visit. In 1960, Santiana and Carluci (1962:665) found the practice to be "on the way out." Einzmann (1985:22) found the practice exceedingly rare and restricted to the facial cheeks of older women.

Tattooing

Tattooing was not reported by Barrett and, given the thoroughness of his ethnography, presumably was genuinely absent. In 1959, however, Altschuler (1964:11) noted that a few men had tattooed arms. The following year, Santiana and Carluci (1962: 668) recorded a number of tattooed designs. These tattoos form a unique and amusing set emphasizing airplanes, personal names, and such mysterious emblems as "E = BOZO" (Figure 7.7). The content of these designs, although doubtfully the practice of tattooing itself, could well have been provoked by the arrival of Protestant schools and airstrips during the 1950s. As an active practice, tattooing was no longer present during our visits in 1986 and 1988.

In summary, Chachi decorative organization displays two interesting features. First, it is partitioned according to artifactual media in a way totally foreign to the pervasive style of the Shipibo. Second, the partitive decoration of the Chachi has experienced major and often sudden changes since about 1900. In contrast, the pervasive Shipibo style as found today was essentially the same in the early years of this century (Tessmann 1928; fieldwork 1923, 1925). These observations, I believe, are related, and direct us toward the nexus between organization and change.

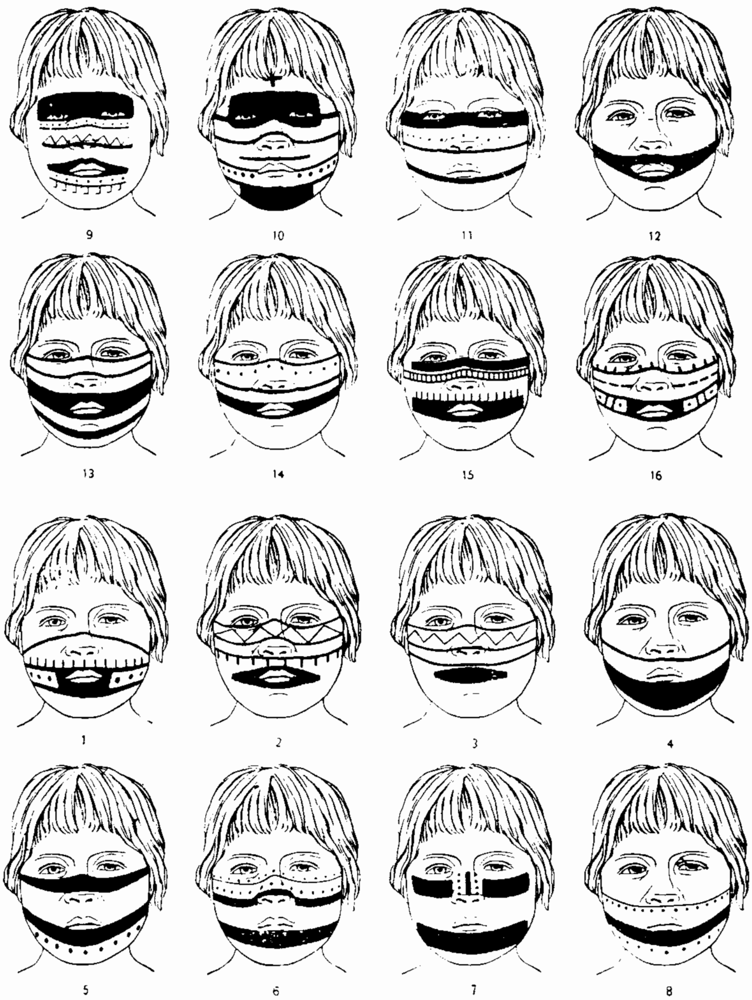


FIGURE 7.6. Chachi face paintings (taken from Barrett 1925, 1:Pls. XL–XLI).

Implications for Change

Addressing rates of decorative change requires a calendar and a measure of change. The calendar is more easily provided. In the case of the Chachi, our comparison is between the time of

Barrett's visit (1908–1910) and observations beginning in 1959 (Altschuler) and extending to the present, a period of fifty to eighty years. In the Shipibo case, we can use the datum of Tessmann's fieldwork (1923) and my own observations of the 1970s, spanning about half a century. In Table 7.1, these reference dates are recorded as T1 and T2, respectively. Finding suitable measures of decorative change is more problematic. In an attempt to monitor the gist of change, I have used a rough ordinal scale. As seen in the table, this scale assesses two separate dimensions: the total number of letters is my subjective assessment of the degree of decorative elaboration, while different letters represent distinct decorative styles. Change thus becomes a composite measure of diminished or amplified elaboration coupled with the replacement of decorative styles. So far, this is just a notational summary of the preceding text: Shipibo decoration is more elaborate than Chachi decoration; Shipibo decorative organization is pervasive, while that of the Chachi is partitive; and, of greater interest, Chachi decoration has experienced a much higher rate of change.

I would argue that the lability of Chachi decoration is directly related to its partitive organization. Because Chachi decorative organization displays weak linkages across various artifactual media, any one medium is freer to change without threatening massive, across-the-board readjustments. In this sense, partitive decorative organization would seem to be a special case of a general syndrome that Simon (1973:17) dubs "loose horizontal coupling." To paraphrase Simon's discussion, loose horizontal coupling permits subsystemic change without forcing synchronous changes throughout the system at large (perhaps precisely because there is no "system at large"). Contrast the pervasive character of Shipibo decoration: here any change in one medium is immediately routed on a decorative highway, contagiously infecting myriad material domains. Such pervasive systems might be subject to catastrophic genesis or demise, but are likely to display tenacious resistance to change during their life spans.[3]

By pointing out the contrasting potential for change in pervasive versus partitive decorative organization, I do not mean to commit myself totally to a systems view of things, nor do I wish to ignore other critically important variables, such as the sexual division of labor as it is mobilized in decoration, or the meaning

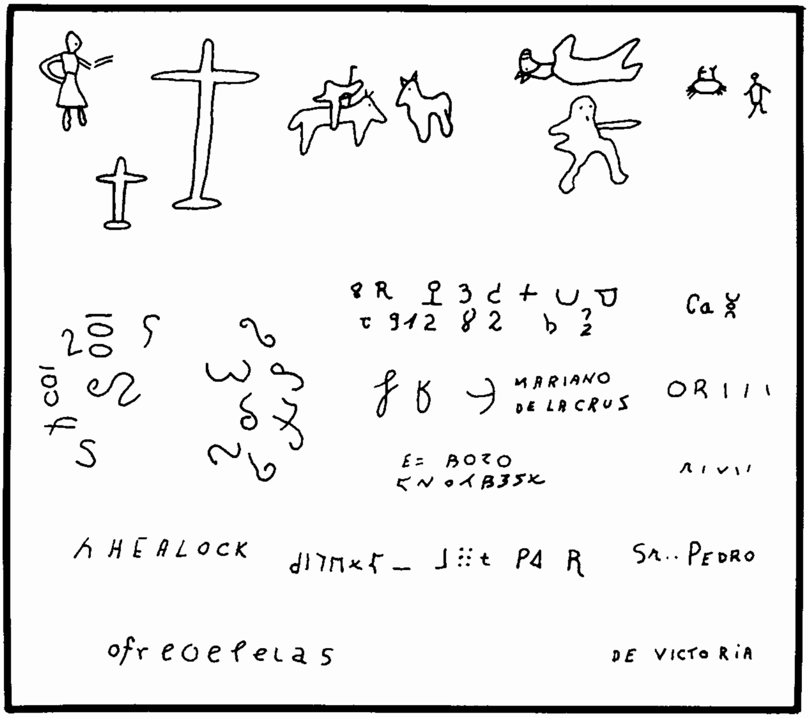


FIGURE 7.7. Chachi tattoos (based on Santiana and Carluci 1962: Fig. 4).

invested in decoration by its makers. In this regard, one need only compare Gebhart-Sayer's (1984, 1985) poetically moving accounts of the profound meaning that the Shipibo attach to their beautiful designs (and how these designs permeate even the nook-and-cranny of social life) with my less expertly informed impression of Chachi attitudes toward decoration: these attitudes can be described as pragmatic, even indifferent. Returning to original questions, however, I do wish to underscore the small and incomplete rendition of reality that a focus on pottery, plain or decorated, engenders.

Nor do I think that the surfeit of sherds presented by the archaeological record forces this narrow focus. Even in the rain-drenched forests of the Cayapas, where preservation of baskets, textiles, and skin is improbable, the records of weaving-associated spindle whorls and wood-carving stone adzes complement deco-

TABLE 7.1. Decorative Shifts Within and Across Media: The Chachi and Shipibo Cases

	Pottery	*Textiles*	*Fire Fans*	*Baskets*	*Canoes*	*Calabashes*	*Body Painting*	*Tattooing*	*T*	*N*	*C*
Chachi-T2	B[a]	D[a]	E	EEC	G	H	I	J	10	8	13
Chachi-T1	A	CC	E	F	GG	GH	II	—	11	7	
Shipibo-T2	aaaa	aaaa	aa	—	a	a	aa	—	14	1	2
Shipibo-T1	aaaa	aaaa	aa	—	aa	aa	aa	—	16	1	

T = total elaboration (number of letters).
N = number of distinct decorative styles (number of different letters).
C = amount of change from T1 to T2 (number of letters deleted or added).
[a]Bought from merchants.

TABLE 7.2. Changes in Ceramic Pigmentation, Spindle Whorls, and Stone Adzes in Three Sequent Phases

Phase	*% Ceramic Pigmentation*	*Number of Spindle Whorls*	*Number of Stone Adzes*
Tumbavido	1	7	11
Herradura	32 (C-55)	10	8
	30 (R-2)		
Guadual	64 (C-36)	0	1
	46 (R-10)		

Notes: The earliest Guadual phase has a radiocarbon age of A.D. 100–500. C refers to sites in the Cayapas Basin; R, to sites in the Santiago Basin. The measures for Tumbavido represent a composite from several sites.

rated ceramics as powerful clues to the media-shifting burden of decoration. As shown in Table 7.2, there is a progressive decline in the percentage of slipped or painted pottery from the Guadual phase (ca. A.D. 100–500) through the subsequent Herradura and Tumbavido phases. This trend toward decorative impoverishment of ceramics is not matched, however, by the changing frequencies of spindle whorls (a clue to the importance of spinning and, by extension, weaving) or of wood-working adzes. Admittedly, these data are only suggestive to the thesis at hand, but they do underscore the point that "good gray cultures" such as Tumbavido are more likely to be purely ceramic constructs rather than accurate aesthetic profiles.

In areas such as coastal Peru or the North American Southwest, where arid conditions enrich the archaeological record, opportunities for studying the linked changes in various decorative media are, of course, greatly improved. It is hoped that such comparative studies will be more forcefully pursued than they have been.[4] For as long as archaeologists focus upon potsherds, lithics, or other decay-defying residues as the only acceptable "hard stuff" for building a view of the past, we will indeed pass in the dark the relational nature of the perversely complex phenomena that we wish to understand.

Acknowledgments

Numerous individuals helped. I would like to thank Paul Tolstoy for inviting me to participate in the University of Montreal Santiago-Cayapas Project, thereby enabling me to learn about the Chachi. In New York, Roland Force, president of the Museum of the American Indian, graciously allowed the reproduction of plates from Barrett's original monograph, and Nancy Rosoff, assistant curator in the same institution, facilitated access to Barrett's ceramic collections. Along the way, Lynne Goldstein, Gregory Johnson, Carol Kramer, William Longacre, Charles Redman, and Arleyn Simon indicated that the paper was of some interest and ought to be finished. In Ecuador, Jorge Marcos made fieldwork possible. Finally, this chapter must be dedicated to our wonderful and patient hosts, the Chachi of the Rio Cayapas.

Notes

1. See, for instance, Tessmann (1928), Vossen (1969), DeBoer and Lathrap (1979), Roe (1980), Lathrap (1983), Gebhart-Sayer (1984), and DeBoer (1984). A good overview of recent Shipibo studies is provided by Kensinger (1985).

2. There is continuing debate about the historicity of Chachi origin legends. Contrast the positions taken by Palop (1986) and by DeBoer (1987).

3. Despite considerable archaeological work in the Ucayali Basin, disagreement remains about the time depth at which the modern Shipibo decorative style first crystallized. See the exchanges among Lathrap, Gebhart-Sayer, and Mester (1985), DeBoer and Raymond (1987), and Lathrap et al. (1987).

4. Kelley Hayes of the University of Arizona has embarked on precisely the kind of work that is needed. For her dissertation, Hayes is augmenting the much-worked corpus of decorated Anasazi ceramics with a study of correlative decorative changes in textiles, baskets, and other media.

8

Ceramic Frequency and Use-Life: A Highland Mayan Case in Cross-Cultural Perspective

Ben A. Nelson

In this chapter I discuss sources of variation in the frequencies and use-lives of handmade ceramic vessels in a Highland Mayan community. The term "frequency" refers to the numbers of vessels in households, and the term "use-life" connotes the length of time that a vessel remains usable either for its original purpose or for some other; that is, from manufacture to irreparable breakage.

Interest in this sort of study stems from the recognition of our ignorance about the roles of pottery in technologies of the past. Gone is the time when we would make simplistic assumptions, such as the equation of pottery use with sedentism. The ethnographic record clearly refutes this and other assumptions, and hints at the conditions that cause variation in pottery use. Pottery is not used at all by some groups; to others, it is virtually essential. We should be able to learn what conditions distinguish pottery users from non-pottery users and, further, to identify uniformities among the groups who use pottery.

My observations of this Highland Mayan case are grouped around three questions that focus on dynamic relationships of importance to the formation processes of the archaeological record. At the same time I suggest that attention be given to regional culinary traditions and their associated food-processing technologies.

The variation discussed here appears to conform to principles that are observable in other communities where handmade pottery is used. These principles explain the *relative* frequencies and use-lives of different kinds of vessels within single communities. On the other hand, there are great differences among the documented cases in terms of the *absolute* frequencies and use-lives of vessels. I believe that we can begin to perceive cross-cultural patterning of the latter sort, even though the worldwide sample of communities is small.

Both kinds of patterning, of course, have important implications for our understanding of the archaeological record. Ceramic frequencies are used almost universally for seriating archaeological deposits. Yet David (1972) indicates that the relative frequencies of sherds change as deposits accumulate. Longacre (1985) suggests that, because small vessels tend to have shorter use-lives than large ones, seriations based on small vessels may yield the most sensitive estimates of age. *How widely do use-lives of different classes of vessels vary?*

Baumhoff and Heizer (1959) and Foster (1960a) call attention to the interrelationships among site occupation spans, vessel use-life, and household vessel frequency. As they point out, we could often make approximate inferences of site occupation span if reasonable estimates of use-life and frequency were available. These inferences would in turn be invaluable to the analysis of settlement systems. Knowledge of absolute frequencies and use-lives is desirable, although not indispensable, in this kind of inference; sometimes we may be content to infer relative occupation spans. To do so, however, we need to make assumptions about vessel use-life and frequency. *To what extent do use-life and frequency covary?*

The increasing focus upon assemblage composition as a basis for functional inferences, rather than chronological ones, underscores the importance of vessel frequency data. For example, Nelson and LeBlanc (1986) treat the contents of rooms of a Southwestern pueblo as if they represented intact household assemblages. This treatment seems justified by the fact that the number of pots per room is similar to that of the nearest ethnographically documented households (Pastron 1974a). Yet the ethnographic sample also contains cases, located farther away, that have nearly ten times as many pots per household as the nearby case (Foster 1960a; Nelson 1981). Obviously, geographic proximity alone is not always a satisfactory basis for analogy. *Are there predictable regularities in the frequencies of vessels in households?*

The above questions present compelling reasons for archaeologists to be concerned with what David and David-Hennig (1972) have called the ethnography of pottery consumption. There is a substantial literature, written by both archaeologists and ethnographers, about the production of pottery. Only a handful of studies, however, tell us about the variables of acquisition, use, reuse, and disposal; within that small sample there is considerable variation in the kinds of information presented. The rarity of ethnographically documented ceramic assemblages makes each one valuable.

The case discussed in this chapter includes inventories of pottery in fifty-one households in the community of San Mateo Ixtatan, Huehuetenango, Guatemala. The inventories were made in conjunction with interviews that produced information about a variety of conditions in each household. This case is important not only because of the quantity and the quality of data, but also because the frequencies and use-lives of the vessels differ significantly from most other reported cases.

I first describe the ethnographic setting and the recording procedures by which the data were collected. I then discuss the frequencies and use-lives and the apparent sources of variation within the sample. In the process of accounting for these observations, I comment on some possible sources of cross-cultural variation in vessel frequency and use-life. Finally, I consider the archaeological implications of my findings.

Ethnographic Setting and Recording Procedures

The data discussed in this chapter were collected by the Coxoh Ethnoarchaeology Project under the direction of Brian Hayden. Previous publications have described the setting of the project, its overall objectives, and its data-collection strategies (Hayden and Cannon 1982, 1983, 1984a; Hayden and Nelson 1981; Nelson 1981). Fieldwork for the Coxoh Ethnoarchaeology Project took place in 1979 in three communities in Chiapas, Mexico, and the province of Huehuetenango, Guatemala. The communities were selected because of their traditional Mayan ways, a quality thought to lend itself to learning about continuities from the prehistoric past (Hayden and Cannon 1984a).

My study is based primarily on the community of San Mateo Ixtatan, Huehuetenango, Guatemala. Deal (1983) describes his observations of pottery in the other two communities. San Mateo Ixtatan lies at an elevation of approximately 2,800 m in the Cuchumatanes mountain range north of the city of Huehuetenango.

The community contains approximately 5,300 residents in 760 households.

The high elevation and low latitude combine to produce a very cool, wet climate with relatively little distinction among seasons. Swidden agriculture is practiced on the steep slopes in and around the community. Virtually every household is involved in subsistence farming; some also produce small amounts of grain for sale and a few derive income from seasonal wage work in the lowlands. Most people seem to know how to make the implements they need, but some economic specialization is evident. Economic specialties observed in our study include the production of pottery, salt, liquor, embroidered blouses, utilitarian wooden objects, and stone grinding tools (the latter not in San Mateo Ixtatan, however—see Hayden and Nelson 1981). Two households specialize in the procurement of game animals. A few families sell such items as soft drinks and tobacco, and others operate gasoline-powered corn grinders. The majority of cash transactions can be measured in cents rather than in dollars.

Despite the presence of a government school and clinic, as well as Catholic and Evangelical missionary units, the people of San Mateo Ixtatan still retain many elements of Mayan tradition. In contrast with the prehistoric Maya, however, there is essentially no class-based status hierarchy. The cargo system (Cancian 1965) provides a basis for ordering social relationships and ritual obligations. Offerings of incense and other items are made to traditional deities. Traditional clothing, including brightly colored blouses for women and black woolen ponchos for men, is a definitive marker of social identity.

Households in San Mateo Ixtatan consist of nuclear and extended families. They live in compounds, most of which consist of a single structure, an outdoor work area, and a garden, all usually surrounded by a low fence of shrubs. Some households have separate kitchen structures; in a few cases more than one household is included in the fenced area.

Most households acquire their pottery in the market rather than make it themselves. Only about one-tenth of the households have potters who produce regularly; none has a full-time specialist. Those who do make pottery tend to specialize in one or two forms. The narrow-necked, pointed-bottomed *tinaja* or water-carrying jar, which is the most difficult form to make, is not produced in San Mateo Ixtatan. It is imported from another community where many potters specialize in its manufacture. Two other villages, located about forty-five minutes from San Mateo by footpath, supply the majority of the pottery used in the community.

All households use pottery on a daily basis. Pots are used for preparing, transporting, serving, and storing a variety of foods and liquids. Approximately twenty different types of pots are used, but ten types account for more than 90 percent of the observed vessels. Most food items are boiled at some stage in their preparation. The dietary staples are corn, beans, and eggs. Meat and fish are eaten irregularly in most households, as are greens and fruits. Coffee and hot chocolate are popular drinks.

Information about each household was gathered by standardized recording techniques that included interviewing, inventorying, mapping, and a limited amount of participant observation. Two interviewers, assisted by an interpreter, worked from a standard form while two other team members inventoried the household contents and mapped the location of each item.

Data on the frequencies of vessels were gathered by direct observation. Data recorded about each pot include its emic classification, present function, formal attributes (e.g., height and number of handles), location within the compound, and repair status (type of damage, method of repair). Vessels damaged beyond repair, but still retained in the compound, were included in the inventory.

Use-life data were collected by interviewing the senior female in each household. Each informant was asked how long, in her experience, pots of each type would last. The question was repeated for each type recognized in the native taxonomy. In addition, she was asked about the age of the oldest pot in her possession. Responses to the latter question were checked against major events in the informant's life, such as the date of her marriage.

We also asked how often new vessels of each type were acquired and the amount of money spent annually by the household in the acquisition of new pottery. The informant was asked to state how many vessels per year of a given type she bought or made for use in the household. These variables are theoretically independent of use-life but can be used to evaluate the use-life data.

Such interview data are susceptible to problems owing to error in the perception of informants. The long and careful nature of our questioning, however, made most informants realize that we were seriously interested in obtaining correct answers. I believe that we obtained very accurate information about how long people *think* pottery lasts. Better characterization of use-life can be obtained by longitudinal studies of individual pots, as Longacre (1985) has done for the Kalinga. Alternatively, the informants can be asked to give the ages of individual pots (David 1972; DeBoer 1974). Neither of these alternatives was feasible in this study because of time limitations and data-collection priorities. Also, in view of the quantities of vessels, it is doubtful that informants could accurately report the ages of individual pots.

Frequency

The frequencies of vessels observed in my sample and seven others are shown in Table 8.1. These values include only handmade clay pottery of the traditional variety.

The first question that naturally arises in viewing these data is why so many pots are needed. The sampled households in San Mateo Ixtatan have an average of fifty-seven traditional clay vessels. This number is far above the average of other ethnographically documented cases, and is certainly higher than the number

TABLE 8.1. Vessel Frequencies

Group	*Mean No. of Vessels per Household*	*No. of Households Surveyed*	*Reference*
Amahuaca	21	3	DeBoer 1974
Fulani	21	15	David and David-Hennig 1972
Kalinga	8	93	Longacre 1985
San Mateo Ixtatan (Maya)	57	51	Nelson 1981
Shipibo-Conibo	16	17	DeBoer and Lathrap 1979
Tarahumara	~13	10	Pastron 1974a
Tunebo	24	5	Osborn 1979
Tzintzuntzan (Tarascan)	62	3	Foster 1960a

of vessels that we normally encounter in archaeological household contexts.

No doubt the large number of vessels is the result of a group of conditions rather than any single cause. Among the possible determining conditions that I consider here are food-processing technology, household size, and the life cycles of vessels (especially stockpiling and dead storage). These are conditions that relate to the community as a whole, for which there are typical values that can be compared with those of other communities.

Food-processing technology is obviously a source of cross-cultural variation in pottery frequencies. Braun (1983) has suggested that reliance on seed foods affects the need for durable containers for boiling; he interprets certain technological changes in Illinois Woodland pottery as responses to such a need. Foods differ in the amount of boiling they require and in the number of other processing steps that accompany the boiling. I suggest that these differences will often be manifested in pottery frequencies.

In San Mateo Ixtatan and throughout the Mayan Highlands, the diet is dominated by corn. Among all dietary items, corn requires the most time and effort in preparation, and correspondingly involves the greatest amount and variety of pottery. Eleven different vessel types are used in corn processing, not including the water-carrying and storage vessels. Some of these vessel types, of course, are also used in the preparation of other food items.

The dominance of corn in the diet may be a major factor in the unusually high frequencies of vessels in these Mayan households. The processing requirements of corn are different from those of the staple items in some of the other areas for which we have vessel counts. For example, the diet of the Kalinga recorded by Longacre is dominated by rice and fish; that of DeBoer's Shipibo-Conibo by manioc, bananas, and fish; and that of David and David-Hennig's Fulani by sorghum, groundnuts, and fish. These items may be prepared by techniques that are less demanding of ceramics than is corn.

Yet the dominance of corn does not account for all of the frequencies known; the Tarahumara are heavily dependent on corn and have, in Pastron's sample, no more than 19 pots per household. This value compares with a mean of 57 and a maximum of 121 in our sample from San Mateo Ixtatan.

I emphasize, however, that we should consider the food-processing technology and not just the dietary items. The Tarahumara area and the Mayan Highlands are especially interesting to compare because their inhabitants have very similar diets and yet differ significantly in processing techniques. It is the method of getting corn to a digestible state that sets them apart. In the Tarahumara area, much of the corn is parched, ground dry, and then boiled. This processing technique is not used in San Mateo Ixtatan; however, the main technique of the Mayan Highlands is sometimes used in the Tarahumara area. In the Mayan Highlands, the corn is soaked in a lime solution, boiled, ground (wet), and boiled again. In both areas the resulting mush may be consumed as porridge or processed further into tortillas.

The vessel assemblages associated with these two technologies are distinct; the wet-grinding (Mayan Highlands) technology is far more pottery-intensive. The wet-grinding assemblage includes the soaking vessel, the colander for rinsing, several types of boiling vessels, and a vessel for adding water to the boiling mixture. The ceramic counterpart of all of these pots in the predominantly dry-grinding (Tarahumara) technology is simply the boiling pot. When wet grinding is done in the Tarahumara area, the rinsing is performed in a basket (Kennedy 1978).

These brief observations support the notion that food-processing technology has important effects on the frequencies of vessels in households. With data on more pottery-using peoples, we could find ways of identifying the principal technologies and their characteristic vessel assemblages. Such insights would be valuable for predicting rates of sherd generation in the archaeological record and for many other purposes as well.

I now turn to a very different determinant of pottery frequencies. Household size is a logical determinant because it affects the amount of food that is regularly prepared and served. Presumably it has similar effects on some other activities in which pottery is used. If pottery frequency is determined in part by household size, then household size in our small worldwide sample might be expected to vary considerably. That does not appear to be the case.

We collected data on household size in San Mateo Ixtatan by asking how many individuals regularly sleep in the household. We also asked the name and age of each individual, and specifically asked about relatives who could have been inadvertently omitted from the list. In our sample household, size ranges from

2 to 17 residents, with a mean of 6.5 and a standard deviation of 3.3. This information was collected from January through April 1979.

Strictly comparable census data are not available for all the other cases for which vessel counts have been published. Ethnographies describing some of the same ethnic groups, however, provide useful data (Table 8.2). In three cases other than my own (the Fulani, Shipibo-Conibo, and Tzintzuntzan), the pottery counts and the census data relate to the same communities as the vessel counts. In other cases the two kinds of data were taken from different communities and at different times. It should be noted that the Fulani are a diverse group including both mobile pastoralists and sedentary agriculturalists. Both the census data and the pottery data are from the latter.

Despite these difficulties, there is little room for the interpretation that household size explains variation in pottery frequencies in this sample. Instead, we see pronounced and seemingly unpatterned variation in vessel frequency as household size varies within a narrow range. Interestingly, polygynous households are recorded in two cases, the Amahuaca and the Fulani.

TABLE 8.2. Household Size

Group	*Mean No. of Residents per Household*	*No. of Households Surveyed*	*References*
Amahuaca	—[a]	—	Huxley and Capa 1964
Fulani	4.3	36	David 1971
Kalinga	4.9[b]	—	Dozier 1967
San Mateo Ixtatan (Maya)	6.5	51	Nelson 1981
Shipibo-Conibo	5.6	17	DeBoer and Lathrap 1979
Tarahumara	4.0 (approx.)	93	Champion 1962
Tunebo	6.4	5	Osborn 1979
Tzintzuntzan (Tarascan)	5.9	32	Foster 1979

[a]Exact data on household size are not available, but marriage pattern is described as polygynous.

[b]Figure given is an average for three areas reported by Dozier.

One might expect that extra pottery would be needed for such household organization, yet the counts for these groups are not particularly high.

The case for household size cannot be closed without a larger sample of cases from more diverse conditions, especially in terms of household size. To explain the variation in our present cross-cultural sample, however, we must look to other variables.

Two other important variables, for which there are few comparative data, are stockpiling and dead storage. By "stockpiling" I mean the accumulation of new vessels for eventual use, and by "dead storage" I mean the retention of old vessels after their useful life is basically exhausted. The people of San Mateo Ixtatan seem to be high on the scales of both of these phenomena. Nearly every household has large numbers of pots that are not used every day. Some are around the peripheries of the cooking area; others are along the inside walls, in the rafters, or outdoors. Most are partially filled with odds and ends. Those in the rafters are blackened from exposure to the smoke of the domestic hearth.

Field records indicate that 27 percent of the observed vessels were serving functions other than those for which they were originally made. This figure probably understates the actual percentage considerably. The observations of use status were made cursorily and without asking the informants about each pot.

The stockpiling of pottery in San Mateo Ixtatan may be understandable in terms of the relatively short use-lives of the vessels. The higher the failure rate of vessels, the greater the need to have ready replacements. In this community most households do not have their own potters, and may not be able to replace a broken pot at will. To get a new pot, one usually must have cash, a market day, and a potter present with the right product. The probability of these conditions occurring simultaneously is somewhat low, since market days are infrequent, cash is scarce, and pottery is made seasonally even by specialists. Also, cooking pots must be seasoned before use, so that even if pots could be acquired instantly, there would still be some "downtime" after each failure.

The dead storage of expended vessels is not as easy to explain as the stockpiling. One of the main uses of expended vessels is as containers for other objects that have no apparent use. House interiors in this community are generally quite cluttered, and it appears that the dead storage of pottery is part of a larger pattern. We found this tendency in other artifacts, such as metal axes. Expended metal axes were found fairly frequently, usually underneath beds. When asked what they would do with such objects, informants said they did not know.

Up to this point I have discussed conditions that might affect the total number of vessels in households. There are also a few conditions that affect only one type. These conditions are interesting because archaeologists tend to attribute the appearance or disappearance of pottery types to the passage of time. In the present sample we can see the operation of nonchronological selective factors upon presence and absence.

One such factor is economic specialization. San Mateo Ixtatan is adjacent to a salt spring, which apparently has been used since prehistoric times. Hayden and Cannon (1984a) suggest that control of the salt resource allowed the local Classic Mayan center to grow disproportionately large in relation to its agricultural potential. Until quite recently, access to the salt spring was restricted to the civic and ceremonial leaders of the community. Although access today is limited only by a fee system, the methods of salt production are apparently the same as in the past.

Salt is produced by boiling water from the springs in special pots. The boiling is done inside the house of the salter and requires some twelve hours of intense heat. Salt water is added gradually as the boiling goes on, until the vessel is filled with a cake of salt. The vessel is then broken away, destroying it.

The salt pots are crude, moderate-sized, open bowls with flat bottoms. Their form and capacity (about six l) are highly standardized. To my knowledge, San Mateo Ixtatan is the only community in the area in which these pots are made and used. The vessels are very distinctive and could not be mistaken for any other type, even as sherds. There is no attempt to smooth the exterior surface, as there is with other bowls; and because this is the only bowl form used on the fire, it is the only bowl form made with calcitic temper.

Pottery making is another specialization that affects the frequency of a single type of vessel. Most potters use a mold to form the bases of their vessels. This vessel form is not as regular a correlate of pottery production as the salt pot is of salt production. Instead of the specially made mold, some potters use the base of a broken vessel, others use a wooden mold, and some use no mold at all. Assuming similar techniques of production, however, this form should be relatively common in prehistoric communities and households specializing in pottery manufacture.

Nearness to a source of drinking water affects the presence of another distinctive type of vessel, the water-carrying jar. Almost all households in San Mateo Ixtatan have this narrow-necked, sharp-shouldered, pointed-bottomed pot with handles that are used to carry the pot with a tumpline. Like the salt pot, it is unmistakable. In my visits to the community of Yolakitak, however, I noted that almost no one owned a pot of this type even though pottery making is a specialty of most households. When asked why, the informants pointed to a small stream that runs through the village and said there was little need to carry water. David and David-Hennig (1972) note a similar correspondence between nearness to water and lack of water-carrying vessels.

A final condition affecting the frequency of a single type is one that I can describe only as aesthetic taste. An infrequently encountered type of cooking vessel is the asymmetric duck-effigy form. Five of the fifty-one households in our sample had one or more of these pots. It would not be surprising to see this type of vessel described as "ceremonial" in an archaeological report, and the author might go on to speculate that the contexts in which it was found had some special religious functions. Yet in San Mateo Ixtatan, this type of vessel is used for utterly ordinary purposes and has, so far as we were able to discover, no association with ritual. People simply like this type of decorated vessel and sometimes substitute it for their small utilitarian cooking pots.

Use-Life

Selected use-life data from San Mateo Ixtatan are given in Table 8.3 along with the available cross-cultural data. As is the case with the frequencies, some use-life comparisons are prohibited by unevenness in reporting. Nevertheless, certain patterns of variation are apparent. These patterns include previously recognized relationships among use-life and vessel size, portability, and incidence of use. In addition, there is a relationship between use-life and the frequency of vessels in households. This latter relationship has important archaeological implications, as I discuss below.

Vessels in San Mateo Ixtatan appear to be short-lived in comparison with those in other parts of the world. Longacre (1985)

TABLE 8.3. Vessel Use-Life (years)

Group	*Small and Medium Cooking*	*Large Cooking*	*Large Liquid Storage*
Fulani	2.6	10.2	12.5
Kalinga	4.5	13.0	7.6
San Mateo Ixtatan (Maya)	0.4	1.5	4.7
Tarahumara	1.5	4.0	4.0
Tzintzuntzan (Tarascan)	1.0	19.3	26.3

Note: References are the same as for Table 8.1. Reporting techniques varied widely, and some values had to be estimated. The Amahuaca case is omitted for lack of data, and the Shipibo-Conibo and Tunebo cases for lack of comparability in the way pots are categorized.

expresses surprise at the report by Irwin (1977:291) that Papauan pottery lasts only three months; in San Mateo Ixtatan we find several classes of vessels with average use-lives in the range of three to six months.

The vessels with the shortest reported use-lives—three to six months—are the "average-sized," everyday cooking pots, as has been noted by several other investigators (David 1971; David and David-Hennig 1972; Longacre 1985; Pastron 1974a). In San Mateo Ixtatan, everyday cooking pots are of three principal types: the olla-shaped jar, the pitcher-shaped jar, and the flat ceramic griddle. These vessels are most commonly broken by thermal shock. Both jar forms are used to boil corn gruel as well as beans, other vegetables, eggs, and coffee (usually a given vessel is used for only one of these purposes). The griddle is used to heat cornmeal cakes, the staple item in the diet. Also included in the category of everyday cooking pots, even though it is not found in all households, is the duck-effigy pot discussed above. Its average use-life is almost identical to that of the jar and pitcher forms.

Intermediate in use-life, reportedly lasting from seven to seventeen months, are vessels that are used often (every day or every few days) but not placed on the hearth. These include the water-carrying jar, the small pitcher used to move water about the kitchen, two bowl forms used for mixing and washing, and the large colander used to rinse corn after it has been soaked in lime.

These types are not subjected to thermal shock; their breakage is usually brought about by other factors. The pots may, for instance, be dropped or may be broken by dogs.

The longest-lived types, as might be expected, are those which are used least frequently. These types are said to last from eighteen months to five years. Here I must qualify the term "use," because what I really mean is "subjected to the risk of thermal or kinetic shock." Among the long-lived pots is the water-storage jar, which is used every day but rarely experiences any form of shock because it is kept stationary and never heated. Others are the meat-frying pot, the fiesta pot used to cook highly refined corn gruel for festive occasions, and the strainer used in that same process. The fiesta pot has a long use-life in terms of its absolute temporal span, but a surprisingly short life as a function of the number of use episodes. Though it is not used often, it may break after only about half a dozen festive occasions. Apparently this failure rate is due to deficiencies in the local raw materials and the difficulties of making large forms. Another long-lived form is the potter's mold.

I have left out three forms that are somewhat aberrant and make up a small percentage of the observed vessels. One is the incense burner, which is said to last about six months. This rare form apparently is used very regularly by the few people who do use it. The other two forms are glazed vessels, one a serving bowl and the other a small cooking jar. These imported vessels are used for special occasions, such as visits from relatives, and fall into the long-lived category.

These data tell us that vessel use-life in San Mateo Ixtatan, as elsewhere, is conditioned by vessel use. In general, use-life is directly related to vessel size, incidence of use, and movement of the pottery. Exposure to fire is also a significant determinant of use-life; all but one of the categories of vessels lasting less than one year are regularly exposed to fire. In addition, the vessels in the short-lived and intermediate categories are, by far, the most common in household assemblages. Together these vessels make up 79 percent of the 2,907 pots observed in this study.

Possibly the most striking aspect of this case is the short use-life of pottery in general. This property of the data raises questions about the validity of interview techniques as a means of finding out about use-life. We are relying completely on how long people think pottery lasts, as opposed to how long it truly lasts. It could be more than coincidental that the shortest reported use-lives come from cases in which interview techniques were used instead of census techniques.

Longacre's (1985) study of Kalinga pottery use-life provides one means of assessing the degree to which people err in their estimates of pottery longevity. He asked informants to estimate use-life and then compared the results with actual observations of individual vessels. The Kalinga informants told Longacre that cooking pots usually last about 2 or 3 years; in fact they last about 4.5 years, on the average. The informants said that water jars last about 10 years, an estimate that appears to be closer to reality.

Longacre's data indicate that people may indeed underestimate the longevity of their pottery. Yet, even allowing for an underestimation factor of 60 percent, as is suggested by the Kalinga case, the cross-cultural differences in use-life are dramatic. Pottery having a single function lasts on the order of a few months in my case, and on the order of a few years in Longacre's.

At present I am unsure how to account for this radical variation in use-life. One source of variation may be the substitution of other containers, such as gourds, baskets, and industrially made vessels, for traditional ceramics.

Some other obvious possibilities are the physical properties of clay and temper, the techniques of production, and the atmospheric conditions in which firing takes place. Clay and temper characteristics are measurable, and it is possible to observe production techniques in great detail (Rye 1981). I raise the question of atmospheric conditions because San Mateo Ixtatan may be a poor environment for pottery manufacture. Potters in many cultures state that they prefer to make pottery during the dry season because the results are better (David and David-Hennig 1972; DeBoer and Lathrap 1979; Fontana et al. 1962; Foster 1960a; Pastron 1974a; Rye and Evans 1976). Potters in San Mateo Ixtatan also make this statement. However, the "dry season" in the Mayan Highlands is cold and damp in comparison with many areas. Potters told me that narrow-necked forms must be dried for several months in the house rafters (in the rising heat of the hearth); otherwise they crack during firing.

Another important condition affecting pottery longevity may be the role of pottery in the food-processing technology. As suggested above, some food-processing technologies may be harder on pottery than others. The extent to which boiling is used, and the length of boiling time for different food items, may be significant variables. Also, boiling time must be increased at high elevations to compensate for lower atmospheric pressure. San Mateo Ixtatan's elevation of 2,800 m (9,200 ft) may be partially responsible for the short life of vessels there.

Replacement

Ultimately of interest to the archaeologist is the rate at which vessels enter the archaeological record. Discard rates were not measured in San Mateo Ixtatan owing to the short length of the field session (three months). As noted above, however, several interview questions focused on the rates at which vessels are replaced. The responses to these questions are, of course, to be regarded with some caution.

Replacement rates provide a rough approximation of long-term discard rates as well as an interesting backdrop for the use-life data. Table 8.4 gives the replacement rates for the three categories of vessels discussed above. These categories do not represent all vessels; I discuss the question of total replacements below. Also in Table 8.4 are data necessary to evaluate replacement rates against reported use-life.

These data reveal a somewhat complex relationship among vessel frequency, use-life, and replacement rates. I believe that most of the complexity is linked to stockpiling and dead storage. Everyday cooking vessels, for example, are said to last only 0.4

TABLE 8.4. Replacement Rates for Selected Vessels in San Mateo Ixtatan

Vessel Category	*Mean No. Bought or Made per Year for Own Use*	*Mean No. Observed in Households*	*Implied Use-Life (years)*	*Reported Use-Life (mean years)*
Small and medium cooking	12.1	32.2	2.7	0.4
Large cooking	1.8	2.9	1.6	1.5
Water storage	0.5	1.0	2.0	4.7

years; by that figure households should be replacing about 80 cooking vessels per year instead of the reported 12. But the high figure assumes that all cooking vessels are in regular use. Approaching the values from another direction, we may ask how many vessels, with an average life span of 0.4 years, would have to be in regular use to require replacement of 12 vessels per year. The answer, approximately six vessels, is much more in accord with the needs of households than the average of thirty-two vessels observed to be present. This finding reinforces the conclusion that stockpiling and dead storage greatly inflate the frequencies of vessels in this case.

The reported replacement rates for large cooking vessels and water-storage jars are in better agreement with the data about use-life. This finding is consistent with the notion that stockpiling is most prevalent for the categories of vessels that have high failure rates.

Replacement rates for all vessels combined can be estimated roughly by summing the reported replacement rates. According to our interview data, an "average" household in San Mateo Ixtatan replaces about forty-seven vessels per year. Even though this figure is considerably lower than one might expect on the basis of the frequency and use-life data, it is significantly higher than in any other recorded case. The annual rates reported by or calculable from the other ethnographies are 3.1 pots per household for the Fulani, 15.0 for the Shipibo-Conibo, 31.0 for the Tunebo, and 2.5 for the Tarahumara (David and David-Hennig 1972; DeBoer and Lathrap 1979; Osborn 1979; Pastron 1974a). Osborn's (1979) calculation for the Tunebo, twice the number of stockpiled pots, seems error-prone. I was unable to infer replacement rates for the remaining groups.

Archaeological Implications

I began this chapter by raising questions about uniformities in vessel frequency and use-life and by emphasizing the distinction between relative and absolute measures of those variables. Those questions provide a framework for summarizing the patterning that has been discussed. They also provide a basis for noting, in the concluding section, some other questions that remain unanswered.

First, *how widely do use-lives of different classes of vessels vary?*

It is clear that they vary tremendously, in both relative and absolute terms. However, the relative variation is quite systematic and occurs irrespective of variation in absolute use-life from one geographic area to another. The short-lived vessels tend to be small, everyday cooking pots, and the long-lived ones tend to be water-storage vessels and fiesta pots. Of intermediate use-life are various small and medium-sized vessels that are not used on the cooking fire. DeBoer (1985) shows that such determinants as vessel size and frequency of movement can vary independently, sometimes masking each other's effects on use-life.

David (1971:142) concludes that relative variation in use-life leads to a situation in which "pots in use or in the archaeological record will diverge progressively from the original sample even without the intervention of culture change." By this account, the accumulation of sherds in an archaeological deposit seems similar to the phenomenon of compounding interest. Such a pattern would have consequences for measuring the relative ages of deposits, as well as the functions they reflect, by the relative frequencies of sherds.

But the only factor in David's simulation that causes this divergence is the inclusion of the original, ethnographically observed assemblage in the equation. Otherwise, archaeological pottery counts are simple products of frequencies and use-lives. The model implicitly calls for each household to discard its entire use assemblage at once, and then to go about discarding vessels as they break in later years. The model is unsound; rarely is usable pottery discarded, even when sites are abandoned. As DeBoer (1974) points out, the initial term in David's equation becomes increasingly insignificant with longer intervals of accumulation. I suggest that we are safe in continuing to treat the accumulation of sherds as an arithmetic phenomenon. This is not to say, of course, that discard rates can be expected to remain constant (Longacre 1985; see also Ch. 5, this volume).

Relative variation implies, as Longacre (1985) has noted, that some vessels are more sensitive chronological indicators than others. Longacre suggests that we focus on small vessels for maximal sensitivity. This suggestion is supported by the data from San Mateo Ixtatan, with the exception that one small form is among the longest-lived. This form, a relatively rare type, is the strainer used in the preparation of corn gruel for feasts.

The absolute variation in use-life poses some difficulties for measuring site occupation spans by numbers of sherds. Vessels of the same functional type may last as much as ten times as long in one geographic area as in another. It appears, however, that the variation is more radical among the short-lived types than among the long-lived types. Again comparing my case with the Kalinga, cooking pots differ in use-life by a factor of about ten, while water jars differ much less (approximately six years vs. ten years). Fiesta pots are similarly close. I reiterate that Longacre's data are based on observation, while mine are based on interviews; with further study we may find that the use-lives of water jars and fiesta pots are highly uniform. At present it can at least be suggested that very large jars are the most stable indicators of occupation span. Water jars have the unique advantage of occurring with uniform frequency (one or two per household, in general).

To what extent do use-life and frequency covary? It appears that they vary inversely with some regularity. The shorter the use-life, the higher the frequency. This generalization applies both when comparing communities and when comparing functional classes within a community. As suggested above, this relationship may be related to the stockpiling phenomenon; stockpiling will increase with the number of anticipated failures. Archaeologically, this relationship means that whole assemblages of pottery will be very different in areas where average use-life is short and where it is long.

Finally, *are there regularities in the frequencies of vessels?* We occasionally encounter situations where structures are burned (Hally 1983a) or hastily abandoned (Nelson 1985a; Nelson and LeBlanc 1985b). The pottery assemblage in such an archaeological context is a potentially invaluable baseline. But how do we know when an assemblage is essentially complete? One possible measure of completeness is quantity. Yet the data in this chapter show that there is great variation from one culture to another in what constitutes a complete assemblage.

My guess is that vessel frequencies are relatively constant in "complete" assemblages within certain cultural or geographic boundaries. The tremendous variation that we see in the present worldwide ethnographic sample is, I suspect, representative of a variety of conditions that vary systematically from one area to the next. As more cases are accumulated, those conditions should become more apparent and the ethnographic data should provide a basis for evaluating the completeness of assemblages.

Conclusion

Some archaeologists may be disheartened by the wide variation in vessel frequency and use-life discussed in this chapter. To me, recognition of this variation is an important part of becoming familiar with the workings of pottery in cultural systems. The value of such efforts is not diminished by the fact that most modern pottery users have access to market economies and implements of metal, glass, and plastic. Pottery users today are still responding to many of the same conditions and constraints that were operative in the past.

Much remains to be done in order to achieve a full understanding of the sources of variation in vessel frequency and use-life. One of the highest priorities is to understand the effects of changing organizational contexts on pottery production and consumption (David and David-Hennig 1972; van der Leeuw 1983; Longacre 1985). With regard to the more tangible variables discussed in this chapter, the representativeness of the present cross-cultural sample is difficult to evaluate. Not only is the sample too small, but some of the likely sources of variation are inadequately represented. There are also inconsistencies in the kinds of data gathered and presented by the ethnoarchaeologists. Almost nothing is known about the physical properties of the pottery for which we have data about frequency and use-life. And the food-processing technologies, which are major sources of stress that lead to the failure of vessels and their introduction into the archaeological record, are not well documented. Future studies, I hope, will seek to fill in these gaps and to make appropriate changes in the generalizations discussed here.

Acknowledgments

I am very grateful to Michael Blake, Brian Hayden, and especially Warren DeBoer for their insightful criticism of a draft of this chapter. Field data were collected by the Coxoh Ethnoarchaeological Project, Simon Fraser University, under the skillful direction of Brian Hayden. Financial support for the project was supplied by Canada Council. Extremely valuable logistical support was given by Thomas Lee and Gareth Lowe of the New World Archaeological Foundation, Brigham Young University.

9

Standardization and Variation in the Work of Craft Specialists

Gloria Anne London

Introduction

Archaeologists usually associate craft specialization with standardized production, in contrast with the more variable work of domestic potters. It is assumed that market-oriented wares are more uniform than pots made and used on the domestic level because the former are produced by full-time potters who become routinized in their work. Second, standardized sizes are said to facilitate stacking and transporting.

To investigate standardization and sources of variation in the work of craft specialists, I carried out an ethnoarchaeological project among a community of Filipino potters whose wares are sold in the local and regional markets of southeastern Luzon. Relatively little attention has been directed toward ethnoarchaeological research in complex societies despite its relevance for archaeological questions (see Chapters 2 and 10 in this volume).

Johnson (1973:129) suggested that the work of craft specialists can be identified archaeologically by standardized shapes and sizes. He measured various vessel features and volumes, and concluded that the third millennium B.C. beveled-rim bowls were produced in standardized sizes for distribution by a central authority coincident with the rise of complex society in Mesopotamia. This example illustrates the tendency to equate standardization with craft specialization (Adams 1979:729; Balfet 1965:170; Connor and Rathje 1973:6, 10; Nicholson and Patterson

1985a:57; Rathje 1975:430; Rice 1977:230; Rice 1981:222; Stark and Hepworth 1982:4), although this has not been demonstrated quantitatively among extant potters.

The question of standardization can be approached on two levels: the communal and the individual. How uniform is the work of a community of craft specialists versus domestic potters, and how uniform is the work of each potter within each community? My primary goal during a two-month study period was to measure variation in the work of individual potters and to learn how the wares of each potter can be differentiated. Only with a larger sample than obtained initially can the more general question of standardization of pottery produced by craft specialists be addressed. Nevertheless, several sources of variation in clay selection, manufacture, and decoration were recorded, and help to clarify the issue of standardization and its implication for archaeological ceramics.

The Selection of Paradijon, Gubat, Sorsogon

The Filipino community of Paradijon, identified by Longacre in 1976, provides an appropriate locale to test hypotheses concerning craft specialists. In many parts of the Philippines, traditional industries persist alongside more modern enterprises and tourist businesses. On the basis of work done in 1968, Scheans (1977) recorded forty-five market-oriented traditional production centers throughout the islands, to which the small community of Paradijon can be added.

Approximately half of the fifty-seven potters interviewed work full-time all year. Although production decreases during the winter months because of the rain and cooler temperatures, the potters obtain most, if not all, of their income by selling pottery. Of the fifty-seven potters present during the two-month study period, half were women with young children who work part-time. Additional income for some families is earned by men who engage in temporary and seasonal jobs in agriculture or other industries.

Men usually dig and prepare the clay and fire the finished pieces, but in a predominantly female industry, five men work as part-time potters. Four are brothers and nephews; the fifth is a former *barangay* (barrio) captain. The repertoires vary, but in addition to flowerpots, stoves, and cooking pots, the men make unusual pieces, such as animal figures, miniature pots for children, and flowerpots with relief decoration.

The potters are craft specialists in that they comprise a small percentage of the Gubat population, they are not involved in subsistence work on a regular basis, and they supply a large non-pottery-producing clientele. All wares are destined for local or regional distribution rather than the tourist trade. Potters sell their work in bulk to shopkeepers in Gubat, Bulusan, and especially in the provincial capital, Sorsogon, Sorsogon. Traveling merchants and retail sales account for a fraction of the sales. The Paradijon wares reach a maximum distance estimated to be 160 km (based on discussions with shopkeepers and traveling salesmen). Flowerpots and cooking ware carried by Gubat residents to Manila or elsewhere are not included in this estimate.

The Community of Paradijon

Paradijon, a small neighborhood in the town of Gubat (pop. 15,000), lies near the southeastern tip of the Bikol district of Sorsogon Province (see Figure 9.1). The term "Bikol" refers to a cultural-linguistic group distinct from central Luzon, with which contact has always been restricted. The Bikol area comprises the peninsula of southern Luzon, which is indented by innumerable bays and gulfs.

High volcanic cones include the active Mayon volcano (2,421 m) in Albay and Bulusan volcano (1,560 m) south of Gubat (see Figure 9.1). Soil suitable for agriculture abounds, and the annual precipitation exceeds 200 cm (Wernstedt and Spencer 1967:412). Hot, humid summer weather contrasts with the drier months of February through April and the cold, rainy winter.

The recent history of pottery making in Paradijon began with the Spanish era; many terms associated with pottery production are borrowed from Spanish. According to the oral history, potters came from nearby Albay following a devastating eruption of Mayon volcano, perhaps that of 1814, when an entire town was buried. In the Gubat cemetery, tombstones of the grandparents of current Paradijon residents bear mid-nineteenth-century dates. Church records of the same era examined by Father Sebastian of Sorsogon, Sorsogon, list potters among the local population.

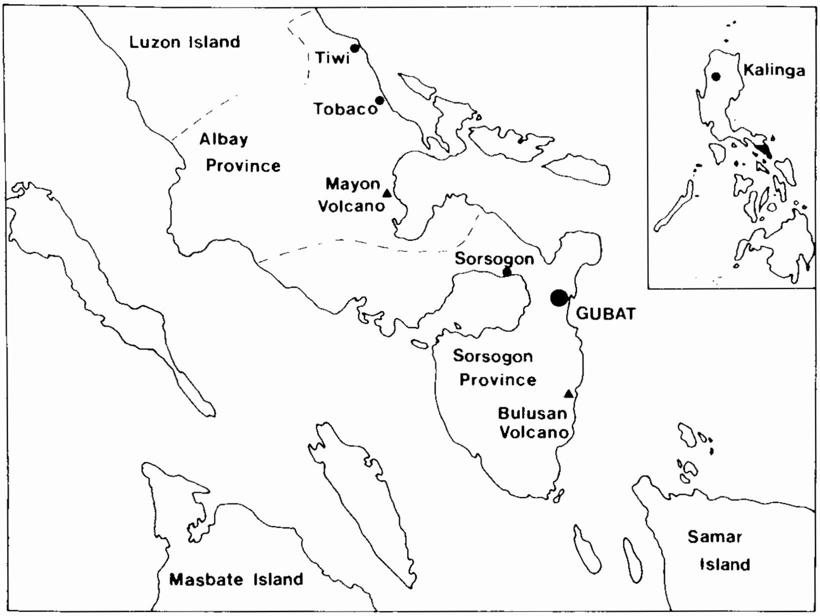


FIGURE 9.1. Map of the study area. Bikol is the darkened region of the inset.

In Gubat, the small neighborhood of Paradijon is unique in that it is the sole concentration of craft workers; all potters reside in Paradijon, whereas bamboo cottage industries are dispersed throughout the town. Along with the fishing community on the coast, it is one of the poorest neighborhoods in Gubat and has acquired the nickname "Paradise."

The Sampling Strategy

Rigorous testing requires accurate measurements of adequate numbers of each pottery type made by a well-selected sample of potters. Four criteria guided the selection of potters and their wares: age, experience, familial relationships, and the location of their work areas.

The sample of sixteen includes individuals ranging in age (twenty-two to sixty-seven), experience (less than one year to fifty years of work), and familial relations (spouses, siblings, and

TABLE 9.1. Sample of Potters

Potter	*Age*	*Experience*
1	46	7 years
2	22	Under 1 year; daughter of potter 1
3	50	30 years
4	53	15 years
5	40–45	No data
6	56	42 years; sister of potter 14
7	31	Under 1 year; daughter of potter 9
8	30–35	7 years
9	55	30 years
10	50–60	20 years plus
11	65	50 years
12	48	31 years
13	50	Started under 1 year ago after a 30-year lapse after working 6–7 years
14	65	51 years
15	67	15 years
16	52	Husband of potter 13; involved with finishing and decorating work

mother-and-daughter sets; see Table 9.1). Nearly half of the women are not native to Paradijon but originated in nearby districts.

With the help of interpreters, I interviewed sixty people, but spent most of the time observing the potters and measuring pots. The ability to observe patterns of behavior and work habits, supplemented by interviews, is one of the strengths of ethnoarchaeology (Schiffer 1978:236).

Potters work outside in a small clearing, on a porch, or inside their homes, which are clustered behind two main roads (see Figure 9.2). I watched the work, and everyone saw what I was doing. To avoid disruption of the work cycle, most measurements were taken of unfired wares. After the late Friday afternoon firings, the pots, still hot, were stacked and wrapped in banana shoots to cushion the predawn transport by car to the regional market in Sorsogon. In July and August 1981, finished pieces were sold within two weeks, but in 1983 Longacre (personal communication 1983) found that the potters had organized a cooperative and now stockpile finished wares in a new system of marketing and sales distribution.

Another reason to work with the fragile, unfired wares was because the work of as many as five potters might be fired together (see Figure 9.3). A single firing of 70–150 pieces could include the work of the potter responsible for the fire; work commissioned from potters too poor to buy clay; work purchased in the dry state from potters in need of immediate cash; and a few of the neighbors' pieces. As few as 14 pieces or as many as 250 were fired together in the 34 firings I recorded; most often 50–80 pieces were fired.

To avoid misidentification of the fired wares of each potter, I measured the unfired pots whose manufacture I had observed from start to finish. Pots were rarely completed in a single day, especially on rainy days. To observe each stage of the manufacture of individual pots required three to seven days, which contributed to an unbalanced sample of pots and potters, but resulted in a more accurate assessment of the organization of the work and the variation both in the work of individuals and throughout the community.

Sources of Variation in the Work of Craft Specialists

Variation in the wares of craft specialists appears in all stages of pottery production, from clay selection and method of manufacture to surface finishing and decoration.

The Clays

In 1981, 22 men dug clays from a fallow rice field in Kalutan, 1.5 km from Paradijon. In former times the clay was transported on the backs of carabao, but today the heavy sacks are carried by men. The clay field owner offers seasonal work in his rice fields and receives one of every ten pots fired. The potters and those who fire, not the digger, pay for the clay.

To dig clay, the first task on many mornings involves bailing out rainwater—a job requiring more than one person. Five or six men work together in one of the many holes in a section of the rice field used since 1972.

Suitable clay lies 15–30 cm below the surface soil (*ing'ode*); sticky red and white firing clays (*hemolot*) are above the leaner,

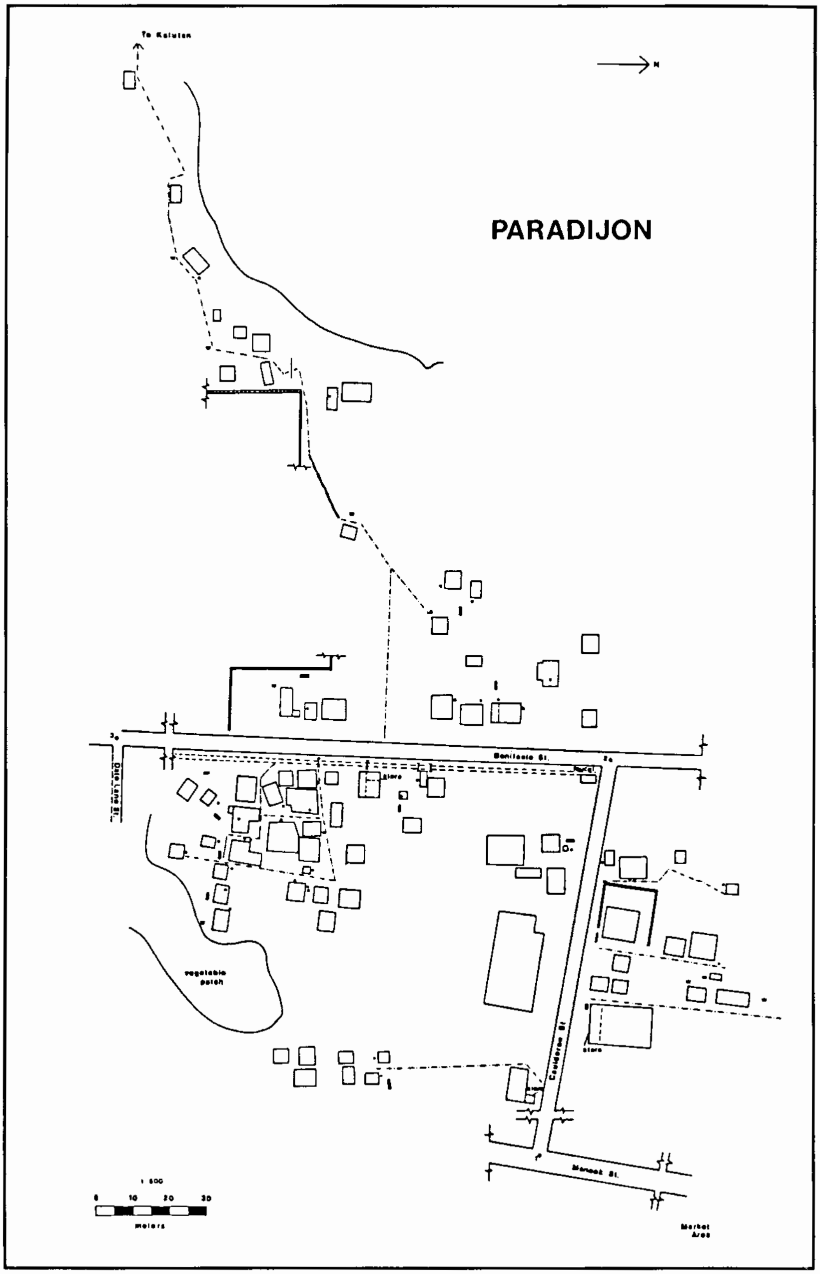


FIGURE 9.2. Plan of the Paradijon neighborhood in Gubat. Drawn with the assistance of Mr. J. Engay. Homes of potters are drawn but not other buildings.

FIGURE 9.3. Pots made by three women are stacked for firing on a frame of coconut fronds, bamboo poles, and coconut husks. The stoves are placed on the bottom, then cooking pots and flowerpots; all are inverted.

less sticky gray clay (*baras*) containing abundant nonplastics. A third clay is a mixture (*salado*) of the two. Each is dug separately.

Clay (*lapok*) for shaping pots is made by pounding (*dusang*) together two or three clays that individually are unusable.[1] To pound clay, a lightweight tree trunk less than 2 m long is repeatedly dropped on the clay as the pounder walks around the wooden pounding board (*dusangan*). It takes approximately four hours to lay and pound the clay. The men sprinkle water on the pile during the process and manually extract large stones and organic material indigenous to the clay, but add no tempering materials. A pounder prepares clay for approximately 100 pots at least once or twice weekly.

Most pounders (*parakalot*) and potters (*parakoron*) work with all three clay types, although the sticky white *hemolot*, said to be buried deeper and to be difficult to dig, was rarely used. Some potters prefer it for cooking pots, which are always made with the paddle-and-anvil technique. Sticky, fat clay is more amenable to paddle work than to coiling; whereas two lumps of a fat clay will slide over each other, two pieces of a lean clay will adhere and are better suited for coil work. This implies a correlation between clay selection, cooking pots, and manufacture, but the infrequent use of the white *hemolot* limited quantitative data to support this association.

Another special use of white clay is by one of the male potters, the former *barangay* captain, who prefers white clay for all vessels. He does not dig the clay but hires someone to do it.

Manufacturing Techniques

There is a close association between vessel type and method of manufacture. Most pottery-making traditions include more than one technique, and in Paradijon pots (*koron*) are made by paddle-and-anvil and/or by coiling, depending on vessel form and the potter's skill. Cooking pots (*koron*) are always paddled (*pok pok*) with wooden tools (see Figure 9.4) and a rounded stone anvil (*batô*) held inside the pot. All stoves (*kalan*) are coiled, but flowerpots (*masetera*) and jars (*bisô*) are made by either technique.

One method to shape *masetera* begins by centering several handfuls of clay on the turntable (*bayangan*), which consists of a removable wooden disk that rotates above a block of wood fitted with ball bearings. With one hand at all times on the *bayangan* to rotate it, the other hand opens and stretches the clay to form a low, thick-based, open shape (*binayang;* see Figure 9.5A) that is dried slightly on a wooden board, banana leaf, or plastic sheet for one hour to overnight, depending on the weather and work load. Normally potters shape eleven to thirty-three *binayang* at one sitting and pile them up under plastic for several days if they cannot begin the paddling work immediately.

When sufficiently dry, the clay of the thick base is paddled and stretched by using the paddles and stone anvil. The unfinished form acquires the name of the paddle used (*binikal, heninag,* and *liminos*).

To form *masetera* by coiling, the potter rotates a small lump of clay on the turntable to create a *binayang* whose base and wall thickness are equal (see Figure 9.5B). After a drying period between less than one hour and overnight, the *binayang* is recen-

FIGURE 9.4. Wooden paddles, (A) *bikal*, (B) *henag*, and (C) *limos*, for the different stages of paddle-and-anvil work.

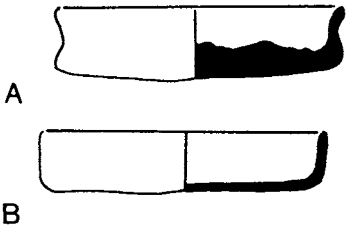
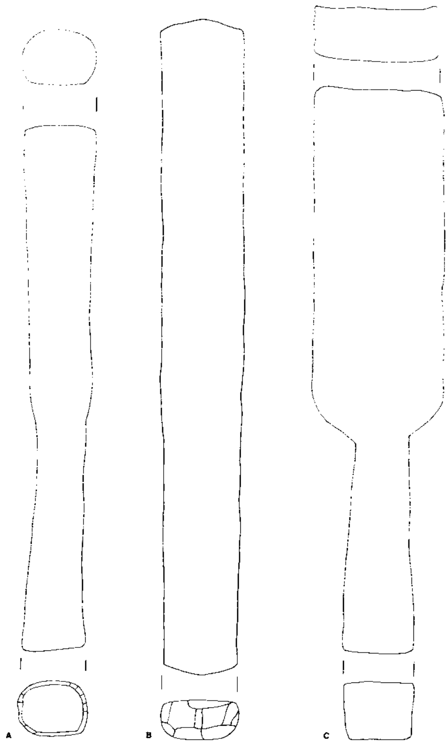


FIGURE 9.5. *Binayang* of flowerpot to be paddled (A) and (B) to be coiled.



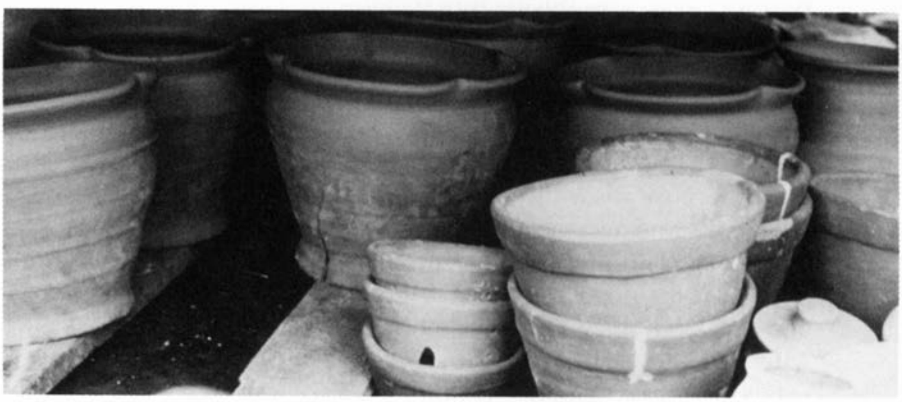


FIGURE 9.6. Storage area below a house with stacked *palmera* flowerpots with flattened rims indicative of paddle-and-anvil manufacture (right), and scalloped rims indicative of coil construction (left).

tered on the *bayangan* to receive as many as five coils (*sinangkann*), depending on the desired size. After each coil is added, there is a brief drying period.

An important distinction between coiled and paddled flowerpots is rim form: paddled *masetera* invariably have flattened, beltlike (*depaja*) rims, whereas coiled pieces have scalloped (*gerittinggetting*) rims (see Figure 9.6). For certain *masetera*, manufacture technique corresponds to pot size: all large flowerpots (*palmera*) are coil-built, but smaller versions (*saday saday, natural,* and *media*) are made either by coiling or by paddling.

These data reveal that within the Paradijon industry, vessel form and size determine the manufacture technique selected. Variations detected in flowerpot rim forms reflect coil or paddle manufacture. In a nearby pottery-making center where a clay different from that in Paradijon is used, flowerpots are moldmade and have a variety of relief patterns. Rims are scalloped, but the indentations are shallow and much more numerous than in Paradijon. These three manufacturing techniques result in three distinct and identifiable flowerpots.

Surface Finishing Techniques and Decoration

Following the primary coiling and paddling work come the secondary shaping and surface-finishing techniques, such as cutting holes into stove and flowerpot walls, applying red slip (*porog*) to flowerpots, and burnishing (*bolalohon*) cooking pots. Surface-finishing techniques and decoration coincide closely with vessel type and require less skill than the primary forming work.

At any one time, most potters have many pots in various stages of manufacture. When too many pots require immediate attention, the potters enlist the help of their spouses and children, because once the clay becomes too dry, it cannot be paddled, coils and accessories will not adhere, and surfaces cannot be burnished. Family members might cut holes into *masetera* and *kalan,* burnish cooking pots, or apply red slip to flowerpots. On one occasion, the husband of a potter shaped the *binayang* for his wife to paddle later, the only instance of a nonprofessional involved with the primary forming work.

Craft specialists elsewhere are assisted by family members who render the decoration and other tasks (Agogino and Bennett 1980:86; Hardin 1970:335; Lackey 1982:111; Nicholson and Patterson 1985a:57; Papousek 1981:18; and my own observations in

Jerusalem tourist-oriented workshops during 1978–1984). The participation of non-potters in the manufacturing process creates a significant source of variation in the Paradijon products, as is demonstrated by the quantitative analyses of cooking pots and stoves.

To finish the charcoal-burning stoves (*kalan sa oring* or *onogan*), holes are cut into the upper base through which the ashes fall to the bottom (see Figure 9.7). The stoves made by a potter whose husband sometimes cuts the holes reveal the work of two people. The potter cuts an average of thirteen holes (N = 13, SD 1.22), but her husband cuts eleven holes (N = 14). In addition to cutting different numbers of holes, they arranged the holes in two distinct patterns, thereby revealing the work of two people.

Cooking pots are made by the most skilled potters, but they, too, must cope with the vagaries of the weather and the market schedule. Once cooking pots reach the leather-hard state, rims and exteriors are burnished with the eye of a tiger cowrie shell, a metal spoon, or an empty bottle (see Figure 9.8). Shells from the island of Samar, southeast of Luzon, were formerly more common when pottery and vegetables were traded between the islands.

Cooking pots are easily burnished in an open or tight zigzag pattern (see Figure 9.9). One criterion to differentiate the work of individual potters in Paradijon is the proximity of burnish strokes on cooking pots. I purchased cooking pots and asked people to identify the makers. Those who gave correct answers relied on a variety of vessel features in addition to burnish pattern, such as rim, wall, and base thicknesses; overall vessel proportions; rim angle; symmetry and evenness of the orifice; rim form (concave or flat); interior rim/neck join (sharp or rounded); steepness of the shoulder; curvature of the base; presence/absence of anvil marks on the interior; and the use of paint.

To differentiate the wares of individuals, the Kalinga domestic potters use many of the same features (Longacre 1981:62). Each person interviewed by Longacre identified the potter responsible for each cooking pot. When I posed this same question to ten Paradijon residents, only 50 percent attributed one of the four pots to its maker, yet of the twenty-six full-time potters, only sixteen make cooking pots. The work of each Paradijon potter is not always easily identified because of the contradictory information presented by the overall vessel proportions and form rendered by the potter versus the surface finishing work of the non-

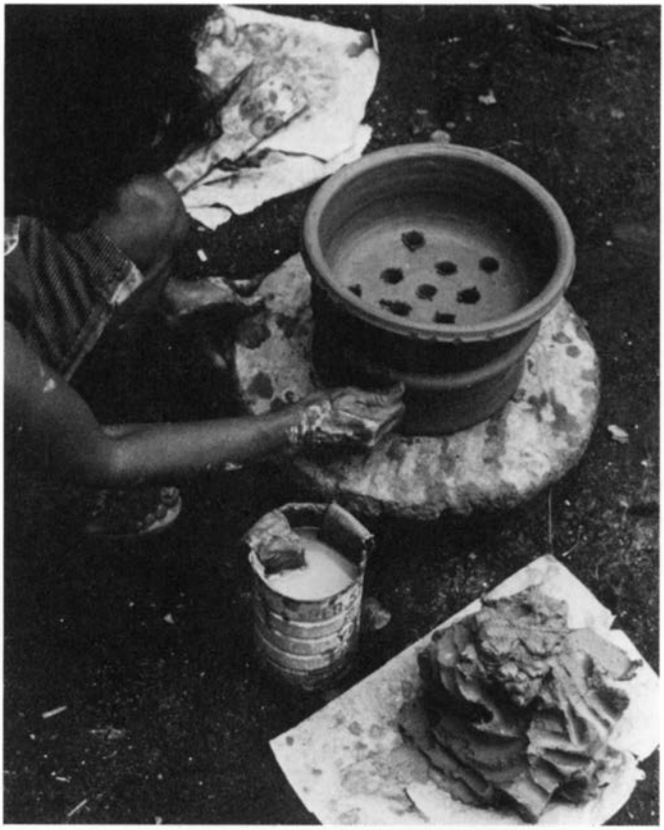
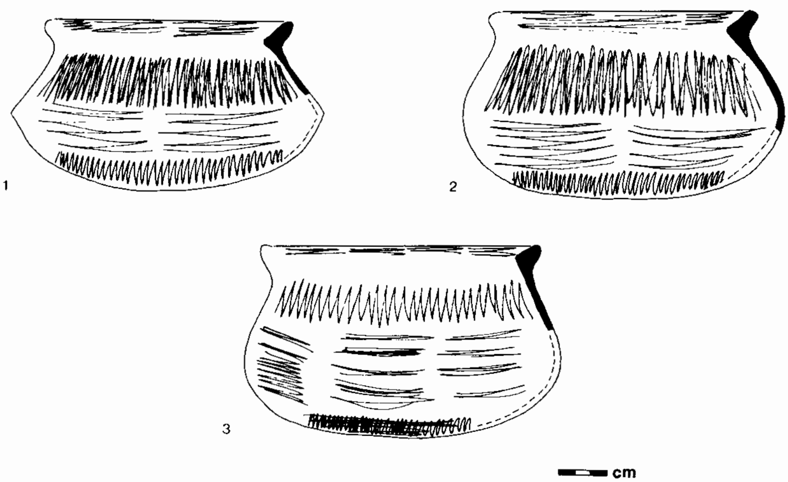


FIGURE 9.7. Potter indents a raised band joining upper and lower halves of a charcoal-burning stove (*kalan sa oring*). Ashes fall through the holes in the upper half and are removed from the lower half through an opening. Pot rests will be added to the rim, on which a grouped pattern of seven sets of three plus one indentation is visible. This is the pattern used by the potter's daughter who made the primary forms.

FIGURE 9.8. A boy uses an empty bottle to burnish a cooking pot made by his mother.

FIGURE 9.9. Upper two cooking pots have a tighter zigzag burnish pattern than the lower pot. Other differences include the size and number of horizontal strokes on the lower body and the one versus two directional strokes on the base. Cooking pots 1 and 2 are made by one potter and pot 3 is the work of another woman.


1
2
3
cm

professional. This results in an element of variation in the work of craft specialists not previously described or taken into consideration when dealing with archaeological wares presumed to be the work of professional potters.

On the communal level, however, the burnish pattern distinguishes Gubat pottery from that of nearby communities. A striped pattern, *carabasa* (a striped squash), and a horizontal pattern characterize cooking pots from two pottery-making centers less than 100 km from Gubat (see Figure 9.10). These regional or community differences coincide with the "emblemic style" as defined by Wiessner (1983:257).

On the level of individual stylistic preference, or the "assertive style" (Wiessner 1983:256), the burnish pattern is one example, but the involvement of nonprofessionals blurs the picture. A better illustration of individual style is the thumb-indented (*samberi*) pattern on stoves, which is always rendered by the potter while the clay is soft and pliable. This surface treatment differs from others requiring drier clay that can be carried out by potters and/or helpers. Variation in the pattern and number of thumb indentations cannot be attributed to the nonprofessionals; rather, it represents the individual or "assertive" style, and allows one to separate the work of each potter.

Of the ten Paradijon potters observed, each adhered to either the continuous or the grouped patterns (see Figure 9.11). Two sisters (potters 6 and 14) use the continuous pattern on two stove types. Two other potters use the continuous pattern. All four women are over fifty years of age. This suggests that the continuous pattern is an older style gradually being replaced by the grouped pattern, and reveals yet another source of variation attributable to potters' age.

Further differentiation within the continuous pattern is the number of indentations: the two sisters each average eighteen indentations on *kalan sa oring* (N = 6 and 11), while a third potter averages forty-eight (N = 12). For the *kalan sa kahoy* (woodburning stove), the average number of indentations for each potter is nineteen, nineteen, and forty-eight (N = 6, 26, and 22).

The grouped pattern also varies from potter to potter, although duplications occur (see Table 9.2). This might obscure identifying the stoves made by each potter, but the problem is resolved by considering the number of holes cut into the upper and lower halves as well as the base (see Table 9.3). For each pot-

FIGURE 9.10. Flowerpots for sale in Tabaco, near the Tiwi pottery center, differ from those of Paradijon in overall form and in the oblique slashes on the thick, flat rims. Cooking pot rims also appear thicker and more rounded than those of Paradijon.

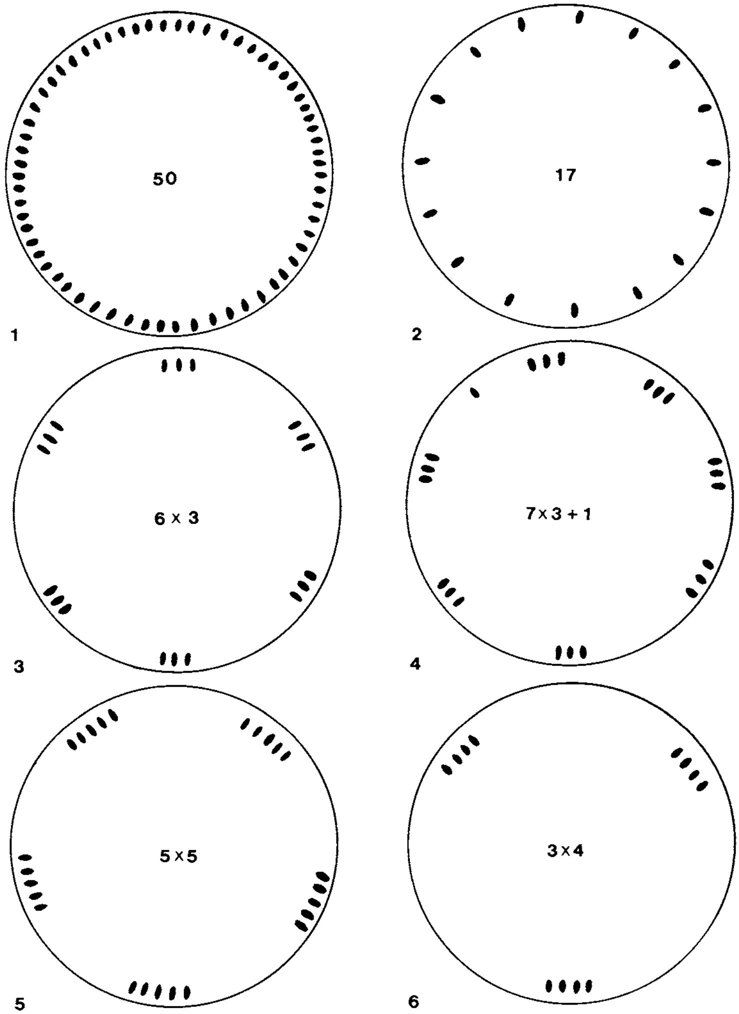


FIGURE 9.11. Thumb-indented patterns (*samberi*), continuous (1, 2) and grouped (3–6), on *kalan sa oring*.

ter, the number of holes in the walls and base differ: potter 3, 3 or 6 : 3 : ?; potter 5, 3 : 2 : 13/14; potter 9, 6 : 5 : 11. With these combined data, the stoves of potters 3, 5, and 9 can be distinguished even though each has six sets of three indentations on the rim. Data that would provide a similar solution for the potters who create seven sets of three indentations are unavailable.

TABLE 9.2. Thumb Indentations (*Samberi*) on Rims of *Kalan sa Oring*

Potter	*Experience*	*Sample*	*Mode*
		Grouped Patterns	
1	7 years	25	3 × 4
2	Beginner	5	3 × 5
3	30 years	6	7 × 3 or 6 × 3
4	15 years	2	7 × 3
5	No data	2	6 × 3
7	Beginner	11	7 × 3 plus 1
9	30 years	26	6 × 3
14	51 years	2	5 × 5
		Continuous Pattern	
6	42 years	11	17
13	See Table 9.1	12	48

TABLE 9.3. Holes Cut into Walls and Base of *Kalan sa Oring*

Potter	*Experience*	*Sample*	*Upper body*	*Lower body*	*Base*
1	7 years	4	3	3	12
2	under 1 year	5	3	?	?
3	30 years	2	3 or 6	3	?
5	no data	2	3	2	13, 14
6	42	11	3	5	?
7	under 1 year	11	?	?	11
8	7 years	8	6	5	15
9	30 years	24	6	5	11
13	see Table 9.1	13	3	3	13
16	see Table 9.1	14	3	3	11

Another feature specific to each potter is the indentations on the raised band around the join of the upper and lower halves of *kalan sa oring*. Continuous indentations characterize this band, but their number varies, and thus aids in separating the work of each potter (Table 9.4).

Finally, the work of mother-and-daughter pairs reveals interesting similarities and differences. In one instance, the mother's

TABLE 9.4. Indentations on the Central Band of *Kalan sa Oring*

Potter	*Experience*	*Sample*	$\bar{x}$	*SD*	*Coef. of Var.*	*Mode*
1	7 years	13	26.8	1.59	5.93	26
6	42 years	11	16.7	1.38	8.17	18
9	30 years	26	22.7	1.52	6.70	23
13	see Table 1	12	42.5	2.58	6.10	44

pattern of rim indentations is three sets of four versus the daughter's pattern of three sets of five (potters 1 and 2). In another pair (potters 9 and 7), the mother uses six sets of three, while the daughter uses seven sets of three plus one extra indentation (Table 9.2). In each situation, the potters work independently but in the same work area. Both daughters were taught to make pottery by their mothers, and the similarities as well as the differences or individuality of the offspring are obvious.

Data on vessel dimensions are not available, but might help to separate the work of individuals. Graves (1981) and Longacre (1981:62) emphasize the importance of overall vessel proportions in addition to decoration for identifying the work of Kalinga potters.

Archaeological Implications

The Paradijon study provides a new perspective on the issue of standardization by focusing on the complexity and variability of the work of craft specialists. Among the factors influencing standardization are market demands, involvement of nonprofessionals, individual style and preference, manufacturing technique, and age of the potter.

Market demands and the need to finish and fire by Friday afternoon encourage the participation of nonprofessionals, who introduce variation in the finished product, especially the decoration. Only once was a non-potter involved with the primary forming work. Normally, skilled potters rendered all work on wet, plastic clay, both primary and secondary forming and decoration. Surface treatments rendered on drier clay are carried out by the potter, her spouse, or her children.

This situation implies that communal standardization is best assessed by concentrating on vessel measurements, overall proportions (i.e., the results of primary forming and shaping work), and any surface treatment rendered in wet clay. For market-oriented wares, decoration and surface treatment applied to a dry or leather-hard clay could have been the work of nonprofessionals and might show greater variability than would vessel measurements. In contrast, surfaces with incised, impressed, stamped, indented, or rouletted designs would show less variation if they were rendered in wet clay by skilled potters. It would appear that the first task in assessing any ancient pottery is to determine the manufacturing technique and order of work before recording measurements and variation in the design.

On the individual level, personal styles exist in both the Kalinga and Paradijon communities, but it is more difficult to identify the work of specific Paradijon potters because two people often work on each pot. With quantitative data it will be possible to determine whether the work of each Kalinga potter is more uniform than the wares of each potter in Paradijon. If it is, this has important implications for archaeological wares.

It cannot be by chance that both the Kalinga and the Paradijon potters identified the same criteria for distinguishing the work of individuals. The cross-cultural significance of these findings is further suggested by my study of the late third millennium B.C. pottery from Jebel Qaʿaqir in Israel (London 1985). By measuring vessel dimensions and nuances in the decoration and manufacturing technique of vessels I assumed to be domestically produced, I was able to segregate domestic and funerary wares according to groups of "analytical individuals," a term proposed by Redman (1977:44) to describe the smallest unit discernible archaeologically.

As noted above, other factors contributing to variation in the work of craft specialists include age and experience. Potters over age fifty tend to use the continuous thumb-indented pattern on stoves, while younger potters use the grouped pattern. Potters working less than one year showed greater variation in their work (primary forming and decoration) than did potters with more experience. Potters over fifty displayed slightly higher variation than younger potters, but a larger sample is needed to confirm this observation.

Also associated with age and experience is the variation detected on flowerpot rims. The manufacturing technique determines if flowerpot rims are flat (paddle-and-anvil) or scalloped (coil work). Younger and less experienced potters prefer coiling, which again reveals that age and experience contribute to variation in the work of the Paradijon potters.

These findings suggest numerous sources of variation in the work of craft specialists. This contradicts the assumption that their wares will always be more highly standardized than those of domestic producers, past and present. One source explored here in detail is the expression of individuality of each potter despite the anonymity of the clientele in a market-oriented industry.

Contributions of non-potters in the finishing work of pottery, especially surface treatment, enable the craft specialist to use cheap labor efficiently. As a consequence, elaborate or time-consuming surface treatments do not always reflect high cost. It has been proposed that labor-intensive surface finishes and decoration on ceramics are indicative of production costs and that elaborate decoration coincides with high cost (Feinman et al. 1981; Hagstrum 1985; Upham and Plog 1986:234). However, when non-potters rather than skilled workers finish vessels by painting or burnishing the surface, the cost per pot might not necessarily increase. Surface treatment, more than any aspect of pottery manufacture, is easily rendered by non-potters. The involvement of family members allows the craft specialist to concentrate on the tasks requiring his or her skills while producing the largest number of pots and earning more money with the least expenditure. In Paradijon, the burnished cooking pot sells for a lower price than all other pots, including those without a special surface treatment. Increased profits result from the large numbers sold rather than the cost per piece.

The work of nonprofessionals in the industry can be inferred by an assessment of subtle changes in the surface treatment of archaeological pottery and distribution of the wares (London 1986b). Chronologically later pieces might display repetitive, busy patterns rendered with small strokes or a few broad bands, in contrast with the delicate, thinner, finer, and longer lines of earlier pieces. Changes in the decorative patterns coincide with the increased distribution to a wider geographic area than earlier material. Abundant filler patterns reveal the inexperience of the painter while disguising the use of cheap labor to render the surface treatment.

Elaborate painted patterns might reduce rather than increase costs and sale value in another way. Painted designs are one of the most efficient methods to hide the inclusions and rough surfaces. To burnish a pot, the surface should be relatively free of inclusions, or covered with a slip to prevent drag marks made as the burnish tool displaces the inclusions. The use of a poor, unrefined clay to make pots that are then painted with an elaborate, complicated pattern by an unskilled laborer results in a double saving. The simultaneous stylistic modifications in the decoration and the wider distribution of a ware beyond its initial geographic dispersal imply that an increased production either benefited from or necessitated the employment of unskilled laborers as pottery painters.

Conclusion

Paradijon pottery represents one level of bulk production for local use and is appropriate to investigate the nature of standardization among full-time potters. Comparable archaeological situations could well have existed during the rise of early civilizations.

Elsewhere professional potters produce on a larger scale, use different methods of manufacture and decoration, and have different distribution systems. How standardized are their wares? How do wheel-throwing and assembly-line production affect standardization? These questions can be addressed wherever such industries persist. A future goal of the Paradijon project involves a regional study of the diverse pottery-making communities in the Bikol area.

At present the Paradijon data relate to the question of uniformity in the work of individual craft specialists. The next step is to collect quantitative data to assess the degree of communal uniformity (Longacre et al. 1988). Other sources of variation in the industry, such as seasonality of production rates, vessel types, and decoration, require a long-term field project to determine their impact on the finished products.

Dramatic changes in the industry have occurred since the 1981 field study. Aided by the local government, in 1983 the potters organized a cooperative in an attempt to increase their earnings. How this will alter the organization of the industry and its impact on the pots and potters is an intriguing question.

Acknowledgments

My work in Paradijon benefited from the cooperation and interest of the potters and many others. The potters cannot be thanked adequately for allowing me to observe their work and for their unlimited patience in answering my questions.

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In Gubat, I was afforded the assistance of Mayor Angel Pura and his staff, and Mr. Tiodor Anonuevo, *barangay* captain of Paradijon. I enjoyed the hospitality of the Bañares and Enteria families, who opened their homes to me and made me feel welcome.

I would also like to thank the participants of the advanced seminar, especially M. Graves, R. Thompson, S. van der Leeuw, and its organizer, W. A. Longacre, who not only introduced me to ethnoarchaeology but also enabled me to experience it for myself.

Notes

1. The following five recipes were recorded:

	Hemolot	*Baras*	*Salado*
Red clay	2 sacks	1 sack	
	4 sacks	1 sack	1 sack
	5 sacks	2 sacks	
White clay	5 sacks	3 sacks	
Salado		1 sack	4 sacks (mildly *salado*)

Variations often reflect different quantities of clay to be prepared.

10

Ceramics in Two Indian Cities

Carol Kramer

The following comments are based on fieldwork among potters and vendors of utilitarian earthenwares in Rajasthan, India, and focus on selected differences between two urban centers. The research drawn on here was designed primarily to establish numbers and types of vessels, and spatial distributions of potters and shops, within two cities of differing size; to explore relationships among potters and vendors both within and outside these cities; and to identify ceramic differences between settlements of varying size insofar as these might ultimately be reflected in the archaeological record. In both centers numerous and often very complex social and economic relationships between urban potters and vendors were documented; sometimes intricately ramifying kinship links between potters in outlying villages and urban members of the same caste were recorded; and sources of substantial quantities of pottery imported from surrounding regions were identified. In the preliminary account that follows, pottery, shops, and ceramic "catchments" are considered in relation to these two centers, and it is suggested that some of the differences between them might eventually be observable archaeologically.

The Ethnographic Setting: The Craft

The capital of Rajasthan is Jaipur, its largest city (977,165 in 1981; Srivastava 1982). Like India's other states, Rajasthan is subdivided into a number of administrative districts; both Jodhpur and Udaipur, the subjects of this discussion, are district

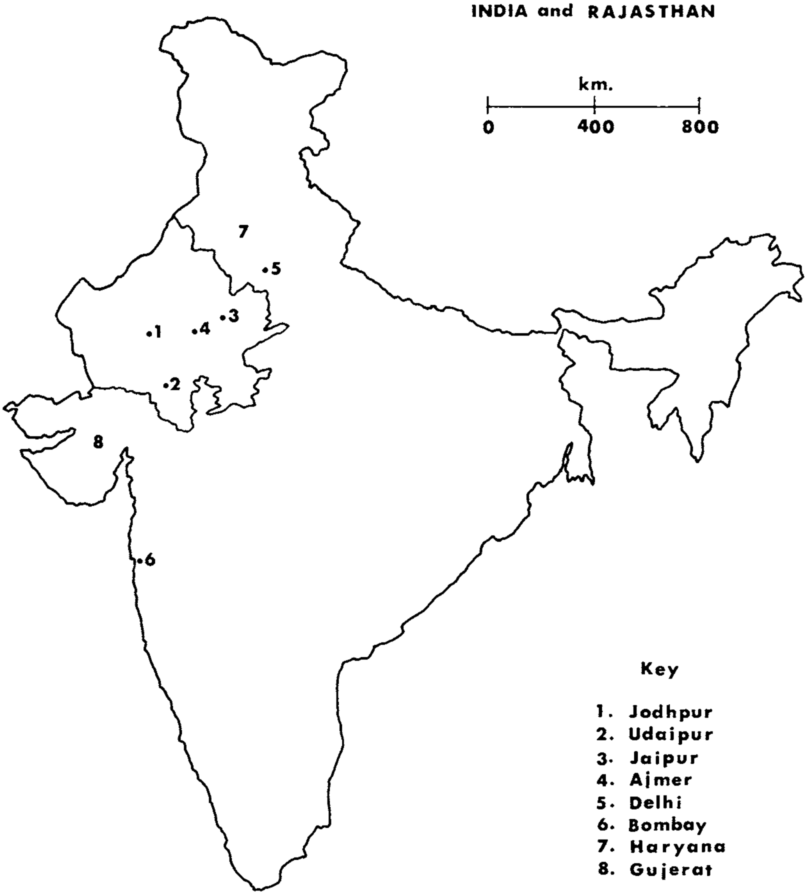

FIGURE 10.1. Rajasthan.

capitals (Figure 10.1). Both cities, and their hinterlands, boast many potters. Archaeological and documentary materials from Rajasthan indicate that pottery making has a long history in the region, and many technological and stylistic attributes of contemporary ceramics can be traced into the prehistoric past. Ahar, a suburb of Udaipur and a focus of archaeological investigation, has produced abundant ceramics manufactured over a long time span; such Harappan sites as Kalibangan have yielded decorated earthenwares that may well have been the work of specialized artisans.

Most—but by no means all—of India's potters are members of the Hindu potter caste. In north India, the caste is endogamous, patrilineal, and virilocal (cf. Behura 1978; Kramer 1985, n.d.; Miller 1985; Saraswati 1979; Saraswati and Behura 1966). Its Hindi (and Rajasthani) name is commonly transliterated in Latin script as *kumhar* or *kumbhar,* but Rajasthani potters often refer to themselves with the somewhat more honorific appellation *prajapat*(*-i*), sometimes including this in their proper names. Female caste members, also referred to as *kumhar,* do not normally form vessels, but they do participate in other essential activities, such as attaching handles, modifying rims, scraping bases, assisting with setting and firing, and distributing and selling pots. In some areas of northern India, including parts of Rajasthan, it is said that women caste members are actively prohibited from touching the wheel; nonetheless, although most vessels are wheel-thrown—by men—women occasionally give explicit and detailed verbal instruction to boys learning the use of the wheel (see Roux 1989).

Potters supply essential vessels for preparing, serving, and storing food and liquids. They provide vessels used in numerous ceremonies centering on birth, marriage, and death, and they produce earthenwares used in a number of regional and national festivals, such as Divali (the Festival of Lights, during which billions of disposable earthenware lamps are used throughout the country). As elsewhere, traditional earthenware forms are gradually being replaced by vessels of other materials. While it is probably fair to say that virtually all households have at least one earthenware *matka* (water storage jar), other vessel types are being replaced by containers of glass, metal, porcelain, plastic, and rubber; such replacements may well be related to a decline in the number of practicing artisans. On the other hand, caste prohibitions and prescriptions relating to containers, people's (often stated) preference for the flavor of foods prepared in earthenware, and the almost mandatory short use-life of some vessel types (e.g., teacups and yogurt or fast-food bowls) will probably guarantee the continuity of the craft in the foreseeable future, even if in altered and attenuated form. The potter's wheel and particular vessel forms figure prominently and positively in a range of ritual activities, popular tales, and aphorisms. Nonetheless, some potters say that because they are (universally) associated with dirt (i.e., clay) and sometimes with donkey dung (used frequently as fuel, and sometimes also as temper), they are not as highly esteemed by members of other castes as they might be (see Miller 1982).

Some Rajasthani *kumhar*s engage in more lucrative activities; the period of financial marginality for an apprentice potter is described as substantially longer than it is for novices in other occupations. (A tailor, for example, may become financially independent after two or three years, whereas it may be eight or ten before a young man can develop the skill necessary to earn enough from the pottery craft to support himself and his family.) Potters elsewhere have formed cooperatives, some of them eligible for low-interest government loans. Access to such assistance may affect potters' career decisions. The possibility of such financial support, along with negative effects of deforestation and intensified agriculture on access to fuels and clays, may have long-term impacts on the structure and organization of the craft.

"Gateway to the Desert" and "Venice of the East"

Of Rajasthan's twenty-six districts, Jodhpur and Udaipur are often described as particularly important because their capitals play a very active role in the larger state context. Jodhpur is the seat of several arms of the central government (based in Delhi), including the only branch of the State Supreme Court beyond Jaipur. Like Udaipur, it is home to several widely recognized and respected educational, cultural, and research institutions. Both cities lie on the heavily traveled domestic airline route linking Bombay, Jaipur, and Delhi, and both attract many visitors, native and foreign.

Founded in A.D. 1459, Jodhpur, the center of the pre-Independence princely Rajput state of Marwar, lies at the edge of the Thar ("Great Indian") Desert (Figure 10.2). A century later, Udaipur (Figure 10.3) was established as the capital of the princely state of Mewar, a sometime political rival of Marwar. Udaipur is set amid a group of lakes, in the heart of the comparatively lush Aravalli Mountains, some 300 km southeast of Jodhpur.

The potters of Jodhpur and Udaipur are unrelated, and represent different subcastes. Potters in both cities live and work in their oldest, most densely populated, and still most medieval quarters and—in smaller numbers—in more recently established

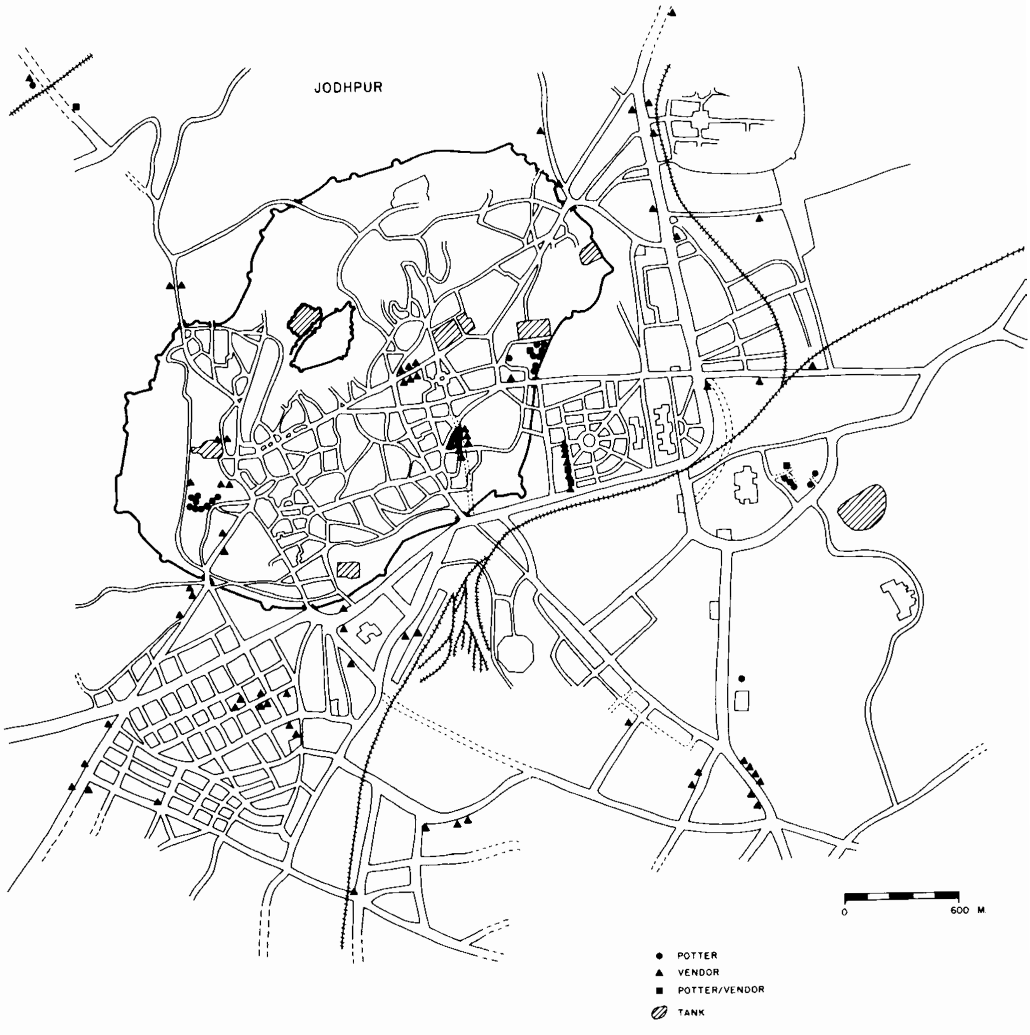

FIGURE 10.2. Distribution of potters and vendors in Jodhpur city, 1982.

fringe neighborhoods and suburbs. All urban potters in both centers are members of the Hindu *kumhar* caste; many, but not all, vendors of earthenwares are members of this caste; and some rural Muslim potters near Jodhpur are sometimes referred to as *kumhar*s but are said (by themselves and by Hindus) to constitute

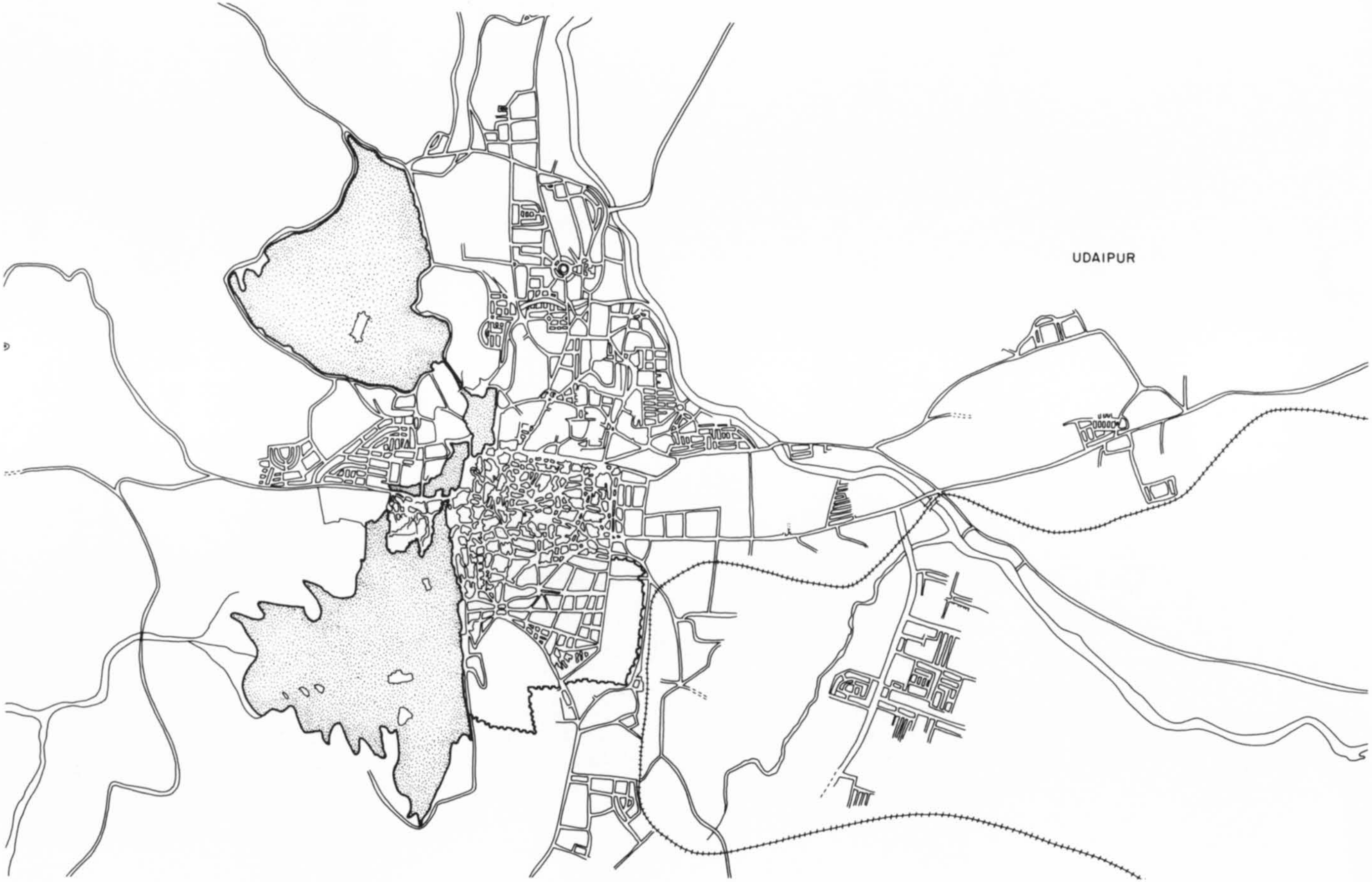

FIGURE 10.3. Udaipur city.

a sort of "semi" caste. Rajasthani is spoken in both cities, but clear dialectical differences exist. Marwari and Mewari terms for the same vessel form (with comparable functions in both places) sometimes differ, as do some terms for potters' implements and materials; some forms are found in one city and not in the other; and there are substantial differences in the appearance of some key vessel types (e.g., surface treatment of various types of water jars). Nonetheless, in many respects the two assemblages—like the organization of the craft—are comparable. In both cities earthenwares are used by most if not all citizens, for a great variety of purposes, and in any number of spatial and social contexts. Both Jodhpur and Udaipur have numerous neighborhoods in which pottery is produced and sold, with members of different subcastes often found in different neighborhoods (Figures 10.4, 10.5).

In 1981, the year of the most recent census (see Table 10.1), Jodhpur had a population exceeding half a million (Srivastava 1982; according to Verma n.d., the 1971 population was 317,600). A city map was included in the 1971 census, and the city was also mapped in 1972 as part of a town planning project (Anon. 1977). At that time, approximately 13 percent of its total area was classified as "developed" (of which approximately half was deemed "residential"). An unpublished map associated with the 1981 census reveals that the municipality's boundaries were exactly as they had been a decade earlier, and my own travels in and around the city in 1982 indicated that its configuration then was essentially unchanged, although some border neighborhoods and suburbs appeared to have become more densely settled since 1971.

In 1981, Udaipur had a population just under half that of Jodhpur. At the 1971 census, the city had a population of 161,278 (Verma n.d.). An ambitious town plan for the remainder of the twentieth century contains a map, evidently prepared in 1976, indicating that the municipal boundaries had not changed. Again, travel in Udaipur during 1983 revealed no significant alterations since the 1971 census, although, as in Jodhpur, there seemed to have been an increase in density in residential, industrial, and commercial areas in a few neighborhoods near the municipal borders. On-the-ground observations suggest that, as in Jodhpur, a small proportion of the city's total area is densely settled and classifiable as "developed," but figures comparable with those in Jodhpur's town plan are not yet available for Udaipur. It can, however, be noted that although Udaipur has a population almost half the size of Jodhpur's, its total area is only about one-quarter that of the larger city.

In administrative terms, Jodhpur is (arguably, if only by virtue of the presence of the State Supreme Court) larger than Udaipur, and a variety of other measures can be adduced to argue that Jodhpur is also functionally the larger of the two.[1] Jodhpur's greater size—areal, demographic, administrative, and functional —would lead one to expect it to have more potters, more shops, more pots, a more diverse ceramic assemblage, and, perhaps, more external suppliers providing vessels from a larger catchment area (cf. Bonine 1980; Crumley 1978; C. Smith 1974). Most of these expectations are supported by my research, which has revealed some additional differences in scale and diversity in these two centers.

Potters and Vendors

The number of active *kumhar*s in Jodhpur is substantially less than it is in Udaipur (see Table 10.1), for reasons that are not entirely clear.[2] Unfortunately, the often richly detailed census publications are not very useful sources regarding caste numbers, distributions, and real occupations; today, many Rajasthani *kumhar*s are employed as unskilled laborers, masons, merchants, tailors, educators, and civil servants. What, then, is a "potter"?

A Rajasthani potter is, invariably, a man and, as was noted above, most likely a Hindu. More problematical, perhaps, is the distinction between "full-time" and "part-time" craftsmen. For example, some rural potters (Muslims among them) who own arable land work on a highly seasonal basis, fitting their craft activities into the agricultural calendar. Other potters produce earthenwares on an even more limited basis. In Rajasthan, many *kumhar*s normally engaged in other work feel constrained, for social reasons, to produce vessels during a few days each year (for example, at Divali, when many Indians leave their jobs to return home for several days; production in such cases is usually limited to one of the simplest forms, a shallow conical lamp). *Kumhar*s employed by the Department of Public Works, the Water Department, the Forestry Department, or the national railroad system sometimes commission kin to produce vessels for the agencies

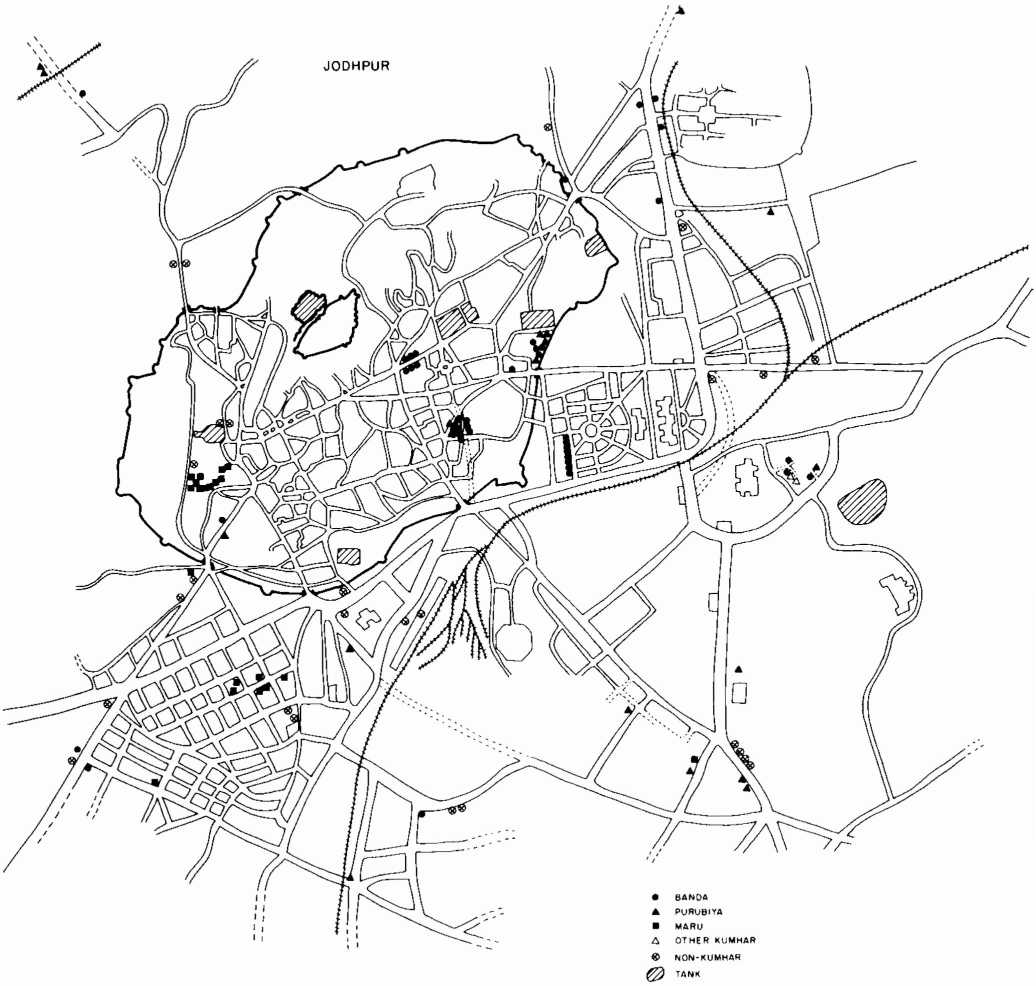

FIGURE 10.4. Distribution of potter subcastes, Jodhpur.

with which they work (e.g., flowerpots for Forestry Department seedlings). During holiday leave, these same men sometimes "drop in" and help with ceramic production while kin and neighbors work to meet deadlines. They may form simple vessels, but they are not necessarily knowledgeable about clay processing or vessel firing. These individuals sometimes speak explicitly of

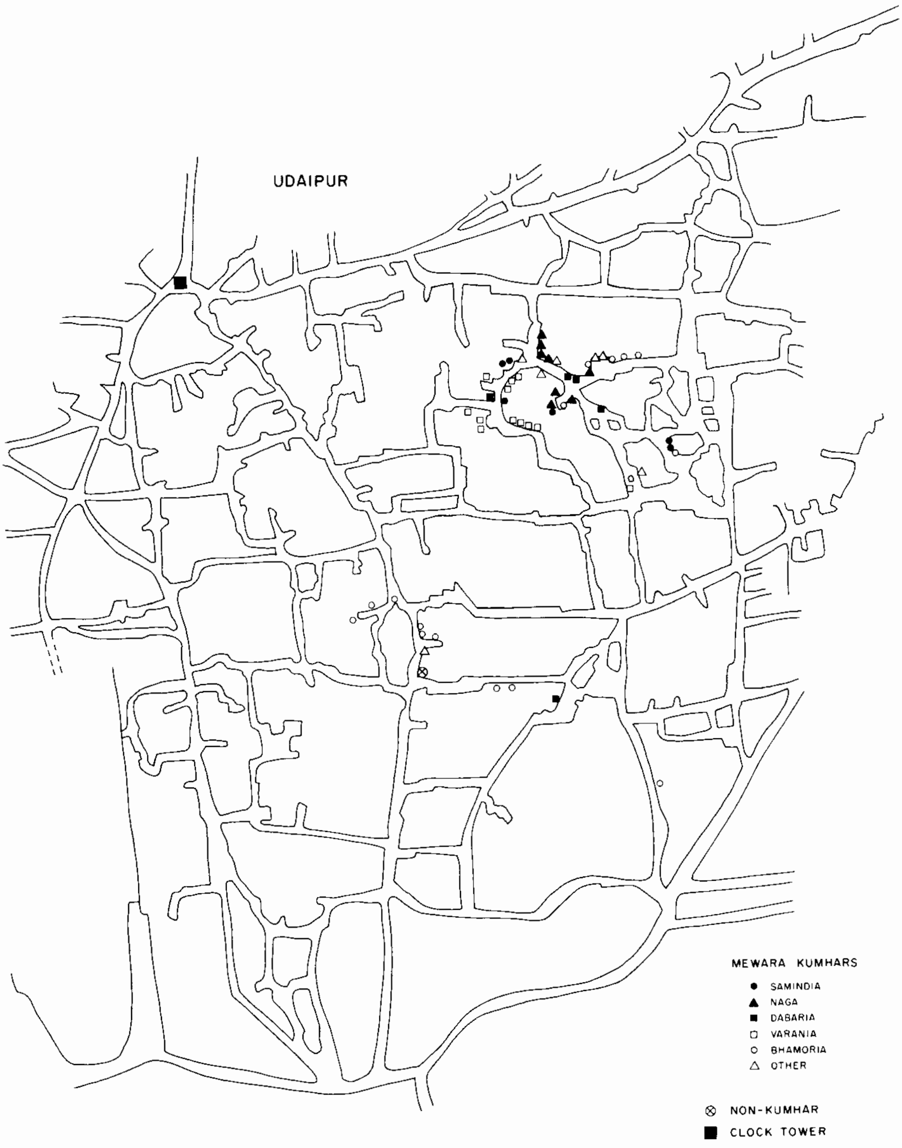

FIGURE 10.5. Distribution of potter subcastes in one Udaipur neighborhood, 1983.

TABLE 10.1. Selected Statistics, Jodhpur and Udaipur

	Jodhpur	*Udaipur*
Population (1981)	506,435	232,588
Area (sq km)	231	59
Distance from Delhi (km)	625	750
Distance from Jaipur (km)	557	648
Active potters	39	63
Potter neighborhoods	9	10
Pottery shops	91	64
Shop neighborhoods	29	23
Vendor castes*	13	6
Shops with other goods	40	16
Σ vessels, autumn shop census	69,923	15,870
Range (N), vessels per shop	10–7,774	24–3,397
$\bar{X}$ vessels per shop [median]	739 [405]	378 [188]
Σ types (N), all shops	37	25
$\bar{X}$ types per shop [median]	13.7 [13]	8.2 [8.5]
Shops (N) with >1,000 vessels	19	4
Shops (N) with >10 types	59	15
$\bar{X}$ *matka*s per shop [median]	306 [119]	76 [50]
Σ external sources (N)	35	26
$\bar{X}$ (N) external sources per shop	3.7	1.4
$\bar{X}$ distance (km), external sources	72	64

*Muslims and Bhils are included; *kumhars* of all subcastes are tabulated as one caste.

wishing to maintain their "roots" and caste traditions, even if in the most tenuous fashion.

In interviewing and classifying respondents, I recorded as "potters" those individuals who devote substantial parts of their working time to the manufacture of traditional earthenwares. Men who visit and make a few vessels on rare occasions were not included, nor were adolescents who are at least part-time students and express an intention to enter another occupation (even in cases where they make a few forms intermittently once or twice during the year). Potters, however, are not the primary subject of this review. Vendors, shops, and sources of the cities' earthenwares can now be considered.

Some potters sell their own wares directly, either from their workshops (almost invariably attached to their homes) or through a close relative (e.g., uncle, daughter, wife, mother-in-law) renting or "squatting" at a sales location elsewhere in the city. Some of these potters also market their wares through more distant kin (e.g., cousins) or through non-kin of the same or some other caste. In both Jodhpur and Udaipur there are a few "shops" consisting of pots piled at the roadside, sometimes for only a day or two. Most such short-lived shops belong to out-of-town members of the *kumhar* caste, some of them active potters, who come into town once or twice a year. There are other such itinerant vendors who sell on a highly seasonal basis. They, and many full-time local vendors, reportedly stockpile vessels made during cooler months to sell at higher prices in the summer; and they, as well as potters, said that there were more such temporary shops during the hot weather. One implication of these assertions is that a shop census made during the pre-monsoon months May–July might well yield higher figures (both for number of shops and for total number of vessels in each city) than those obtained in the November–December censuses reflected in Table 10.1. Although it is not always feasible, repeated censusing throughout a calendar year is probably the best way to monitor seasonal variations within settlements.

In contrast with roadside piles, most shops are enclosed structures built of various materials, or unroofed courtyards attached to vendors' dwellings. Some shops can be closed off or locked up; many cannot, and a number of these are left untended at night. Most vendors were amused when queried about theft, but those who were not included a group of *kumhars* at Jodhpur's stadium. These vulnerable shops opposite the city zoo form a tight linear cluster on a barren tract which is also a major bus stop for out-of-town villagers. These vendors (all of whom live elsewhere) wall up their inventory each night behind low enclosures made of (mostly damaged) vessels. These shops are permanent, unlike the temporary roadside stands referred to above, but they are not associated with built structures. An even more insubstantial, truly ephemeral, shop type consists of vessels occasionally piled on carts by vendors with sales establishments elsewhere and pushed by them throughout the city.

Regardless of the type of sales establishment, goods other than earthenwares may be sold. In each city, a number of shops offer other goods, generally but not invariably on a permanent basis. Such goods include fodder, charcoal, and firewood; reed mats, brushes, and brooms; oils, grains, and a wide variety of kitchen supplies; small household objects such as mortars and pestles, wooden breadboards, rolling pins, metal spoons, and plastic containers; such hardware as piping, nails, tiles, and lime; notions; tea, fast food, cigarettes, and sweets. Many of these diversified shops are owned by members of non-*kumhar* castes, which are markedly more numerous among Jodhpur's pottery vendors (Table 10.1).

Shops' pottery comes from a variety of sources besides shop-owner/potters and their close kin. Some vendors have good working relationships with one or two potters, consider their wares sound and their word reliable, and enjoy smooth and amicable dealings with respect to credit and payment. Others are actively nurturing such relationships, and have comparatively exclusive merchandising agreements with struggling but competent and conscientious young potters. Some vendors place long-term, sometimes standing, orders with out-of-town potters (some kin, some not). The seasonal out-of-towners sometimes bring wares into the cities, and after a day or two at one location—which they reportedly use each time they visit the city—sell leftovers to other vendors when higher priorities require their return home. Such sequential "down-the-line" exchanges also occur when permanent resident vendors buy up vessel lots from potters and resell them to other shopkeepers. In such circumstances, the second and third vendors often do not know the ultimate source(s) of their inventory. Finally, on occasions when specific forms are in great demand (such as lamps at Divali), individuals who normally have nothing whatever to do with pottery making or selling, but who have some free time and extra cash, buy a cartload of pots and push their wares through the cities and their suburbs.

Rajasthani vendors of earthenwares obtain their merchandise by a few additional means. Some of them hire potters: they pay for raw materials, provide the potter with a daily wage and such perquisites as tea and smoking materials, and supply the wheel, work space, and firing area. Others visit local fairs in the expectation of acquiring vessels made by out-of-towners selling large inventories once a year in well-known and repeatedly used locations (e.g., at a particular temple complex that is the site of an annual religious celebration). Some buy vessels in small quantities from village potters who bring in donkeys or bullock carts on an unpredictable basis once or twice each year and walk from shop to shop until their inventory is sold. Finally, a few vendors obtain pots from resident but nonindigenous potters: since the mid-1970s, three households of potters from the neighboring state of Haryana have been coming to Jodhpur and residing there for four to six months, using local clays and alien clay-preparation methods to produce distinctive nonlocal types with a unique technology employing intricately carved molds. The Haryana potters usually sell to particular vendors, who then resell both to other vendors and to consumers. Many of the secondary vendors do not know where their merchandise comes from: when queried, some named the primary Jodhpur merchant from whom their stock had been acquired; some said "Haryana," the state from which the potters originate; a few named "Delhi" (where one can indeed find similar vessels, only some of them made by Haryana immigrants living in Delhi); and one insisted on an origin in Udaipur (where no such vessels are produced and where, in fact, the Haryana types are virtually nonexistent).[3]

Vendors' ignorance and indifference about sources of their inventory can affect the precision with which they specify pottery sources both within and beyond a city. For example, some Jodhpur vendors identified their wares as originating in a neighborhood widely known as the seat of a number of active potters, but they could be no more specific. Some vendors who had acquired vessels from out-of-town potters walking a donkeyload through town tended to confuse or conflate villages with Muslim potters, and rarely knew potters' names. Vendors' responses in such cases are perhaps attributable to indifference, but they may also reflect (Hindu) urbanites' unfamiliarity with surrounding villages (and, perhaps, an underlying "they all look alike" attitude toward villagers and/or Muslims). Few vendors keep detailed quantified and dated records; one, with an enormous and diverse inventory, maintains an account book with order and delivery dates, quantities, vessel types and prices, potters' names, and outstanding credits and debits, but he is unique.

Pots, Targets, and Sources

Most pots made in Jodhpur and Udaipur are used there, by members of all castes, in houses as well as in commercial, industrial, educational, and religious establishments. Some vessels are made on consignment and exported (for example, one Udaipur potter delivers 1,000–2,000 flowerpots annually to a location at a distance of about 50 km; a Jodhpur potter provides "typical" water jars to local greengrocers who use them to pack and ship tomatoes as far as Delhi). Available data suggest that very few potters in either city are involved in large-scale exportation; rather, it appears that most potters who produce large batches do so on one-time consignments from local institutions (e.g., city hospitals, pilgrimage guest hostels, and restaurants or snack shops). Asked whether their vessels leave town, some potters recalled that tourists from Delhi and Bombay had purchased a few vessels. Such vessels are transported by bus, private automobile, or train; in Jodhpur and other north Indian cities, pottery shops are often found at train stations. Perhaps because it is a relatively commonplace and/or small-scale practice, no potter mentioned that villagers visiting the cities on other business purchase one or two vessels and carry them home on foot, by bicycle, or by bus. Some customers encountered and interviewed during such pot-buying transactions lived in villages at distances of 30 km and more. However, all indications are that the scale of such ceramic export is minimal compared with that at which pottery is sold within the two cities.[4]

Most earthenwares are sold on an impersonal basis directly from potters' quarters or vendors' shops, in exchange for cash, but within both centers some vessels move in accordance with rules embedded in the traditional *jajmani* system (see Miller 1986). Sometimes described as a form of patron-client relationship, this complex system of mutual obligations involves the exchange of goods and services between members of different castes and, more specifically, between members of particular families within each caste. Currency played little or no role in the *jajmani* interchanges observed in Jodhpur and Udaipur. For example, at Divali, potters are expected to provide particular vessels to families (sometimes numbering several hundred) with which their own families have traditional ties; in exchange, they receive from each "patron" *jaggery* (a sweet) and an insignificant quantity of cereal grain. For *jajmans'* marriages, potters provide distinctive vessels for the betrothal and wedding ceremonies, and families of the betrothed honor the potter's wheel, its turning stick, and the pots themselves (in Udaipur, for example, these are garlanded and, like the wheel, decorated with a painted swastika, which

Hindus consider an auspicious symbol). They may also give the potter ghee (clarified butter), coconut, grain, cloth, and a few rupees. On numerous other occasions, such as births, infants' first haircuts, deaths, and such regional and national holidays as Holi and Divali, members of particular castes expect to be provided with particular vessels.

Many urban potters appear to have mixed feelings about their traditional *jajmani* obligations; most interviewed claimed either that they were no longer involved in such relationships or that they now maintained them on a limited basis (e.g., providing pots on only one occasion each year, or buying pots from other potters to provide their patrons in accordance with traditional expectations). Most, but not all, of the *jajmani* relationships I encountered are set in an urban context; however, some city potters provide villagers with pots (e.g., for waterwheels), and with special objects of unbaked clay (e.g., elephants) on particular ritual occasions. It is possible that degree of adherence to and participation in traditional *jajmani* relationships vary from one *kumhar* subcaste to another; my data do not permit me to do more than suggest that this is a strong possibility. They are rather more conclusive with regard to rural potters, who are, in both regions, still more active participants in the traditional system than are their urban counterparts. The foregoing, and observations made elsewhere in north India (Miller 1981), should underscore the point that even in one place, ceramic vessels can be distributed under many circumstances, in association with a variety of social and economic behaviors involving both market and nonmarket contexts, cash exchange and noncash reciprocity, and personal as well as utterly impersonal relationships.

While most of the pottery made in Jodhpur and Udaipur evidently is consumed locally, the likelihood that there are not enough potters to satisfy local demand is suggested by the fact that both cities import earthenwares on a large scale and by a variety of mechanisms. My operating assumptions are that while most of the pottery made in Jodhpur and Udaipur is consumed locally, there are not (or were not, in the early 1980s) enough potters in either place to satisfy local demand, and that both urban dwellers (vendors and customers alike) and rural providers (members of the *kumhar* caste) find economic and social rewards in maintaining a system in which centers are provisioned with a fragile and often unwieldy commodity, in bulk, from external sources and over sometimes considerable distances. The profit margin is remarkably slim for most potters (and virtually nil for some), but it may be worth their while to bring occasional loads of pottery to town when they have errands to attend to, both for the slight profit they might make and for the pleasure and utility of visiting relatives and obtaining and exchanging information.

It might also be noted that non-*kumhar* customers display preferences for particular vessel types from particular sources, so that there is some consumer demand for specific "exotic" earthenwares. In some cases, this demand has inspired potters to imitate vessel types made elsewhere (e.g., Mokalsar-style *matka*s are made in Pachpadra), and shopkeepers to dissemble (claiming, for example, that black vessels made in Bedla were produced in Gogunda). My data on source settlements may be incomplete, since village potters occasionally bring small loads into the cities. However, because there is no basis for arguing that such situations arise more frequently in one city than the other, it seems most parsimonious to assume that a comparable margin of error applies to both centers. It is important to note that a wide range of vendors repeatedly and independently cited the same external sources (see Figure 10.6) as regular "donors." However, vessel quantities and frequency of importation from each of these settlements vary, partly with potters' obligations to communities other than the cities and partly with road conditions, availability of transport, and, perhaps, seasonal fluctuations in urban demand. Thus, for example, a truckload of several hundred pots from Salumbar is said to arrive in Udaipur on a regular but infrequent basis—reportedly, about once a year—whereas donkeyloads (of twenty to sixty vessels) from the much closer (and smaller) villages of Merta and Chandera are brought to the city several times each year. The total number of vessels introduced from each external source is best reconstructed with a monitoring program spanning an entire calendar year. Regardless, available data suggest that a consideration of distance decay and catchment areas, even if exploratory and tentative, may point to some patterning of potential interest to archaeologists.

Inspection of data on donor settlements reveals that Jodhpur, the larger city, imports vessels from more settlements and that a larger percentage of its sources are situated at comparatively greater distances. These observations suggest a contrast with rural settlements' "catchments": rural potters consistently reported

FIGURE 10.6. Sources of vessels imported to Jodhpur and Udaipur cities.

that they routinely take a load of pots to settlements within a 10- or 15-km radius of their homes, and indicated that for them a trip to the city is the exception rather than the norm. Some out-of-towners are related to urban vendors; one village potter about 12 km from Jodhpur, for example, sells almost exclusively to his uncle, proprietor of the city's largest shop. Banda and Purubiya *kumhars* of the much more distant village of Pachpadra sell to Jodhpuri members of the same sub-caste, some of whom occasionally travel the more than 100 km to the village to place orders, and at the same time visit with kin. Rural Muslim potters in Jodhpur's hinterland have no shop-owning relatives, and tend to bring donkey- or cartloads of pots to urban sales localities nearest their own settlements (villagers to the south of Jodhpur tend to peddle their wares to shopkeepers at the south end of town, for example), and some of them explicitly commented on the desirability of avoiding competition with other villages. This is probably a factor in another pattern observed in both cities: some of the settlements from which vessels are imported appear to be exporting a limited repertoire to the cities, such that particular forms are imported from particular settlements, each of which actually makes a much wider range of vessels, many of them never seen in the two cities. Specialization for distribution to selected markets has also been reported in Morocco (Balfet 1981; Vossen 1984), Egypt (Nicholson and Patterson 1985b), Mexico (Papousek 1981), and elsewhere. In some of these areas, as is the case with many of the rural potters exporting vessels to Udaipur and Jodhpur, manufacture is primarily for, and most sales are (reportedly) to, villages and hamlets within 10 or 15 km of the potters' home communities.

Some maps suggest that density of settlement is somewhat greater in the area surrounding Udaipur, but it is unlikely that the evident differences between the two centers' catchment areas can be attributed to this factor alone. Interviews and data from shop censuses suggest that some of the sources at a considerable remove from Jodhpur export large quantities of vessels to that city. Some Jodhpuris say that *matka*s from Pachpadra are desirable because the clays from which they are made contain salt, and that these vessels therefore keep drinking water cooler and sweeter. The general sentiment in favor of Pachpadra vessels is reflected in the imitation of the Pachpadra *matka* "style" (distinguishable primarily by rim form and rim decoration) by potters living much nearer Jodhpur.

On the ground, the transport net in the immediate vicinity of Jodhpur seems somewhat poorer in quality than that serving Udaipur. Those settlements providing Jodhpur with large quantities of earthenware, although comparatively distant, are situated on the better roads, whereas a more complex network of paved roads exists nearer Udaipur.[5] It is conceivable that, in contrast with Udaipur, potters in Jodhpur's immediate hinterland are more directly bound up in *jajmani* obligations, and export more of their wares to rural settlements and comparatively fewer to the center. Finally, it cannot be irrelevant in a consideration of spatial distributions that some potters in Pachpadra, and in even more distant Phalodi (147 km from Jodhpur), have relatives among Jodhpur's *kumhars*, whereas kin linkages on a comparable spatial scale are not evident in Udaipur and its regional catchment.

Conclusion

Jodhpur has fewer active potters, but in terms of some functional measures (e.g., services and institutions) it is larger than Udaipur. Data in Table 10.1 indicate that it has more pottery shops, more vessels, and more vessel types. More castes are represented in Jodhpur's vendor population (a difference evidently unrelated to the number or population size of castes in the two cities), and Jodhpur has more shops diversifying by selling other goods. Shops are found in a greater number of neighborhoods; where they cluster, there are more of them; there is a greater range of pots as well as more shops with large inventories. Set in a more desertic environment than Udaipur, Jodhpur's shops have four times the number of *matkas* (water storage vessels). Founded a century earlier, Jodhpur also has slightly older shops, and more of them (see Figure 10.7), but there is no clear association between shops' ages and either number of vessels or diversity of vessel types. The mean number of vessel types per shop is larger in Jodhpur, as is the mean number of external sources represented in its shops. A larger number of external sources supplies the city as a whole, their size range is greater, and, as was noted above, some of them are located at relatively greater distances from the city than is the case in Udaipur (Figure 10.8).

While both cities import much of their pottery from settlements in their immediate hinterlands, they also boast vessels made in several comparatively distant communities. Three of those at some remove (Ajmer, Dungarpur, and Nagaur) are, like Jodhpur and Udaipur, capitals of administrative districts; they are all characterized by substantial demographic size, but their ceramic contributions to the assemblages of Jodhpur and Udaipur are (quantitatively) negligible and (reportedly) occur on an irregular and unpredictable basis. This sort of spatial distribution might be anticipated by various gravity models (cf. Carrothers 1956), and I would suggest that in an archaeological context the "exotic" imports from these centers would be discernible in distinctive forms and in comparatively small numbers of ves-

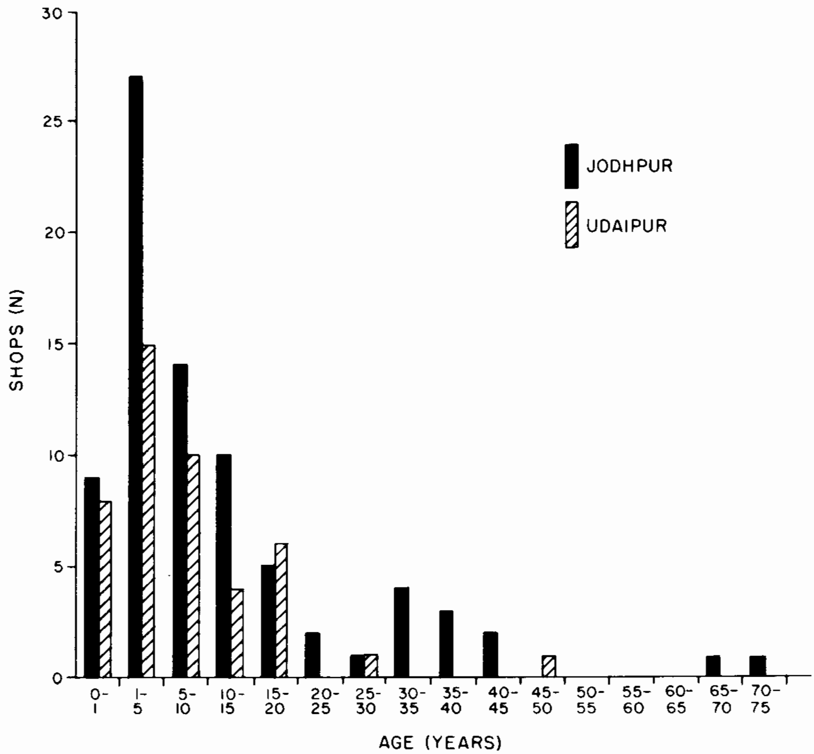

FIGURE 10.7. Ages of shops selling utilitarian earthenwares.

sels (or sherds) compositionally differentiable from those originating nearer the centers investigated. I would also expect such "donors" to be substantially (numerically) underrepresented in relation to those at comparable distance(s) whose wares are imported to the cities more frequently and in larger quantities (and, in some cases, typically also in larger and/or less easily stacked forms). While this variable cannot be explored in detail in the present context, I would suggest that mode of transport and (associated) travel times affect patterns of ceramic distribution in patterned and predictable ways that might well leave archaeologically relevant signatures. Simply put, clay vessels are differentiable in terms of form, surface treatment, and compositionally

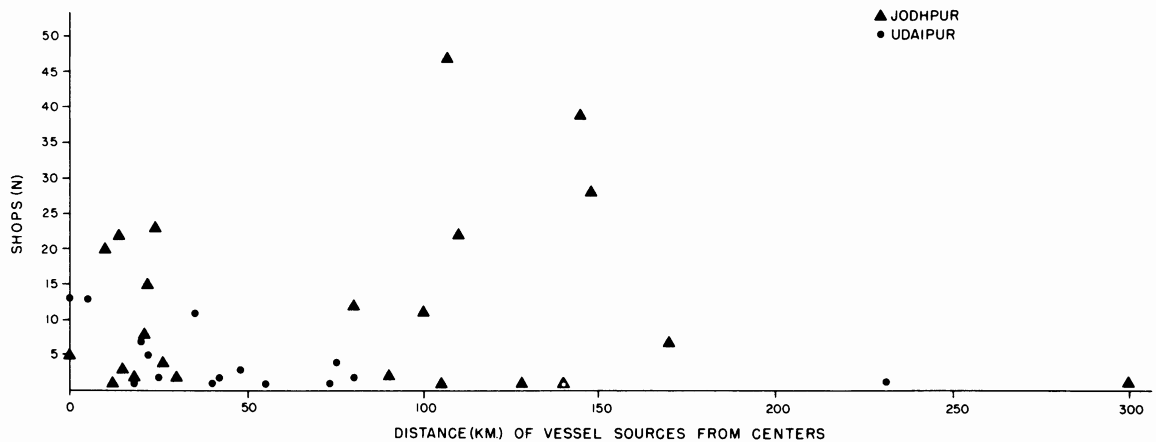

FIGURE 10.8. Distances of settlements exporting utilitarian earthenwares to Jodhpur and Udaipur.

identifiable (mineralogically idiosyncratic) attributes, and a formidable array of techniques exists to pinpoint characteristics useful in differentiating wares made locally from "outliers," "imports," and "exotics."

Imported vessels enter cities in sometimes comparatively small quantities and/or on an intermittent or ad hoc basis, as well as by mechanisms described above. Urbanites' tourism, for example, is sometimes causally related to the purchase of ceramic mementos from such famous production centers as Pokaran, whose wares are sometimes available at periodic fairs and at pilgrimage localities. At railroad stations, vessels are sometimes purchased in small quantities by travelers. Vessel diversity at such transit loci is variable; one vendor at Jodhpur's railroad station specializes in one vessel type (a portable water jar) used by travelers in transit, whereas other shops (like those at Jodhpur's stadium, referred to above) have a markedly wider range of forms. I would expect that vessels purchased in and "exported" from such travel-related loci come to rest in comparatively small numbers at a wide range of destinations at variable distances from the centers where they are bought (if not also made). I further submit that just as these mechanisms remove vessels from transit points in Jodhpur and Udaipur, so do they introduce them—in small quantity, and from the diverse and differentially distant places visited by urban travelers for an enormous range of reasons. I have ethnographic documentation for small-scale "opportunistic" or "serendipitous" earthenware importation in both cities as well as in several villages, and could readily obtain more such information by systematically sampling a large and diverse range of households' pottery holdings. Hypotheses relating to scalar differentiation in ceramic distribution, including those focusing on mechanisms and possible sources of small-scale opportunistic distribution of archaeological ceramics, might be tested through the application of such laboratory techniques as X-ray diffraction, neutron activation, and petrographic analysis.

Hypotheses about scalar differences between centers' imports might be explored by examining different data sets. I obtained ethnographic data on imports to Jodhpur and Udaipur of selected goods (e.g., clays, pigments, potters' tools) and personnel (wives and mothers, itinerant pottery assistants). Data on raw materials reveal that in these respects, too, Jodhpur exploits a larger and more complex catchment, and its potters utilize more sources, at comparatively greater (mean) distances, than is the case in Udaipur. Part-time hired *kumhar* assistants, mothers, and wives of Jodhpur potters also come from greater distances than do those connected with Udaipur respondents.[6]

In sum, data from two Indian urban centers that differ in areal, demographic, administrative, and functional size reveal differences in the number and variety of their shops, numbers of earthenwares, diversity of types, and numbers and distances of external sources. While numbers of mosques and temples probably reflect differing proportions in the cities' Muslim, Hindu, and Jain populations, these differences do not appear to affect ceramic types or numbers. Responses to numerous queries in a variety of quarters strongly suggest that Hindus, Muslims, and Jains use the same kinds of vessels; what very slight consumer "specialization" may exist evidently does not affect local potters' production or marketing strategies, or consumers' behavior, to any appreciable extent. It is suggested that this preliminary evaluation of systematically collected data from potters and vendors in Rajasthan gives cause for optimism that—assuming appropriate strategies for surface collection and excavation—some fundamental and behaviorally significant differences between complex settlements of large but differing size might be detectable in their archaeological ceramics.

Acknowledgments

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Notes

1. "Functional size" refers to the range of goods and services present in a settlement. Delhi, for example, has a larger functional size than Jaipur, which in turn has a larger functional size than Udaipur. Among the measures of functional size used in my study are numbers of banks and bank branches, police stations, post office branches, hospitals, schools, temples (of various religions), hotels, restaurants, and cinemas. Measures of the centers' areal sizes were taken from maps referred to here, and from others.

2. The unexpected discrepancy between the cities' populations of active potters (particularly notable when viewed as a per capita measure) may be due to a variety of factors. It is conceivable that there are differences in artisans' reproductive strategies and hence in potters' raw numbers; in the scale of the two cities' consumer demands (perhaps particularly following Independence and Partition in 1947); in differential access to raw materials (particularly clays and fuels) and financial and other supports within and beyond the caste; and in cities' access to containers of other materials at competitive prices, perhaps in combination with changes in electrification, transportation, and distribution that might affect consumers' needs for specific morphofunctional classes.

3. This statement is qualified. The state of Haryana lies 500 km and more to the northeast of Udaipur. Some vendors in Udaipur claimed that a truckload from Haryana comes to the city every year or two. In five months in Udaipur, I saw only two vessels—for sale—identified as being "from Haryana." One of them had been brought to Udaipur by a pottery vendor

who had visited Jodhpur on personal/legal business (at the State Supreme Court; in Udaipur, he was asking more than double what he'd paid for it in Jodhpur); the other, reportedly obtained from a Haryana potter admitted to Udaipur's general hospital, and sold by an Udaipur vendor directly in front of the hospital, looked old and used.

4. These cities' central place functions with respect to regional marketing of utilitarian earthenwares were not a primary focus of my research (cf. Fox 1967; Mayfield 1963).

5. In a district area of 25,073 sq km in Jodhpur (as against Udaipur's digitized 19,183 sq km), a total of 650 linear km of major roads and 1,677 km of minor roads was measured off maps of Jodhpur district, compared with 635 km of major roads and 1,687 km of minor roads in Udaipur district. These measurements were executed by Glen Peterman of the University of Arizona.

6. Jodhpur's two most commonly used clay sources are at distances of 24 and 40 km; Udaipur's three most frequently used sources are at 3, 9, and 10 km. My data strongly suggest that more of Udaipur's potters' clay comes from within and immediately beyond the city limits than is the case in Jodhpur. Other raw materials, and tools, used in Jodhpur come from distances that in some cases exceed 100 km; the scale, again, is smaller in Udaipur. Data on "importation" of women reveal that mean distance of settlement of origin for Jodhpur *kumhars*' wives is 60 km, compared with 42 km for Udaipuri wives; a similar pattern is suggested by the data on an earlier generation of women (*kumhars*' mothers), with a mean of 116 km for Jodhpur and 33 km for Udaipur. The Jodhpur sample of provenienced mothers is small, however, and I am not at present inclined to argue that it is statistically meaningful. Further, while I by no means dismiss my data on distances over which female members of the potter caste are recruited and "transported," I consider marriage (in general) a far more complex phenomenon than the movement of either clays or pots. In Rajasthan (in particular) marital patterns, preferences, and prohibitions are complex, and (at least among *kumhars*) vary in some respects at the subcaste level. When such customs involve proscriptions and prescriptions relating to alliance formation among particular groups, and those groups have particular (and differing) locational attributes, such practices can inject directionality and other sorts of bias into the spatial component of the social web.

11

The Archaeological Purpose of Ethnoarchaeology

Raymond H. Thompson

Although ethnoarchaeology has been around for a long time (Cushing 1890:160; Fewkes 1900:579; Longacre 1970b), little attention has been given to the definition of its boundaries. Perhaps the reason for this failure to attempt to define the field is the rather obvious derivation of the term "ethnoarchaeology" from the combination of ethnography and archaeology. Despite the seemingly simple meaning that results, there is neither clear understanding nor widespread agreement of just where in the transition zone between these traditional anthropological subfields ethnoarchaeology belongs. Douglas Schwartz, in his foreword to the ethnoarchaeology seminar that was held at the School of American Research in 1975 (Gould 1978b), provides an unambiguous definition of the ethnoarchaeological practitioner: "The ethnoarchaeologist is an anthropologist conducting ethnographic research for an archaeological purpose, linking material remains to the human behavior from which they resulted" (Schwartz 1978:vii). The key feature of his statement is the emphasis it gives to the archaeology half of ethnoarchaeology. He tells us that whatever the ethnoarchaeologist does, it is done for "an archaeological purpose." It is important, therefore, that we examine more closely the territory where ethnography and archaeology meet with the criterion of archaeological purpose clearly in mind.

The Nature of Ethnoarchaeology

Figure 11.1 provides a schematic overview of the place of ethnoarchaeology in the field of anthropology. At the far left is the kind of archaeology that is carried out with little or no concern for ethnographic analogy as a basis for making inferences about the archaeological record. If there is any use of ethnographic data, it is only of those derived from the literature. No ethnographic fieldwork of any kind is conducted by the archaeologist. At the right center is the ethnographic counterpart, that is, ethnographic field research without any concern for potential linkages with archaeological data or relevance to archaeological problems, even though an archaeologist may find some useful information in the resulting report. These two approaches to research are fully legitimate, highly productive, and worthy of continued use, but they are not ethnoarchaeology.

While a great deal of archaeological research may be carried out without reference to ethnographic data, there are many situations in which ethnographic knowledge is critical to an understanding of the archaeological information. Archaeologists in search of ethnographic information with linkages to material objects have long been frustrated by the failure of many ethnographers to collect any data about such linkages, although more ethnographic studies of material culture have been produced than is often recognized (Thompson and Parezo 1989:42). Lack of interest, awareness, funds, and time has contributed to this situation. Archaeologists have discovered that they themselves can collect much of this ethnographic information about the material world (Watson 1979a:300–301). In general, there are three ways archaeologists may collect such information.

In the first and simplest way, archaeologists informally observe ethnographic situations. Many archaeologists have done ethnoarchaeology this way. In some cases, these observations may be no more sophisticated than those of a curious and experienced tourist. In emphasizing the informal, unstructured, ad hoc character of this kind of ethnography, I do not want to imply that the observations made are of no value. Not only are the observations valuable in themselves, but the making of them contributes to a higher level of awareness on the part of archaeologists, who are thereby able to approach the inferential enterprise in a more perceptive way.

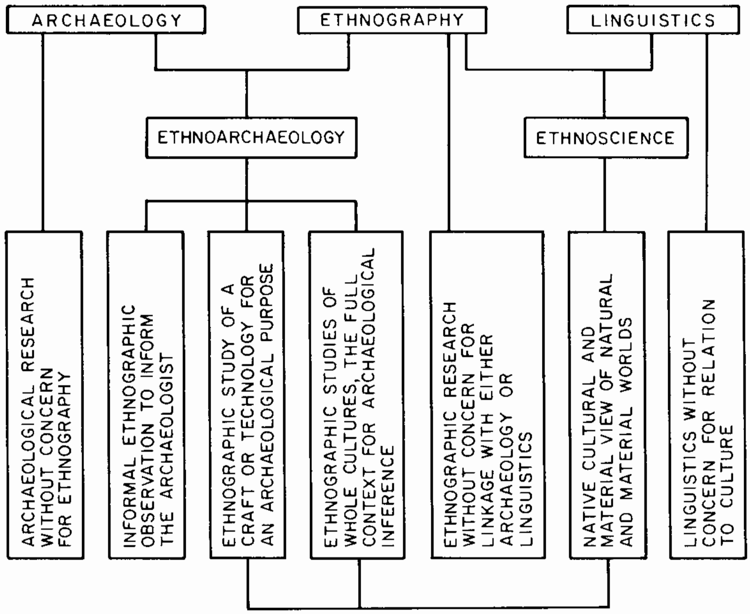

FIGURE 11.1. The place of ethnoarchaeology in anthropology.

A second and more formal way that archaeologists may do ethnoarchaeology involves the study of a craft or a technology "for an archaeological purpose." This sharp focus on a category of material culture has been highly productive because it deals directly with the objects for which archaeologists are seeking behavioral correlates. In fact, this kind of material culture research dominates the earlier ethnoarchaeological literature (Fewkes 1900; Guthe 1925; Wauchope 1938; Blackwood 1950; Thompson 1958).

A third and somewhat newer way for archaeologists to be ethnoarchaeologists requires the study in depth of significant parts of a living culture or even of an entire culture. The purpose of such studies is to go well beyond the identification of behavioral correlates of material objects. Nothing short of a full understanding of the cultural context of objects is desired. This fuller understanding of the meaning of the object in the host or producing culture provides an unusually rich base for the making of inferences about archaeological objects and pieces of objects. Such ethnographic studies, made "for an archaeological purpose" primarily by archaeologists, constitute a significant fraction of the ethnographic research being carried out today (Longacre 1974, 1981; Binford 1978; Watson 1979a; Kramer 1982a; Hodder 1982b).

As archaeologists become more deeply involved in ethnographic work, they may become so fascinated by the rich detail of the ethnographic world that they start carrying out research on living cultures without any linkage to archaeological problems. This situation is illustrated at right center in Figure 11.1. There is, of course, nothing wrong with such a shift in professional goals, but it is wrong to call this kind of research ethnoarchaeology. It is important to remember that ethnoarchaeology is ethnographic research for an archaeological purpose, not ethnography of any kind done by someone originally trained as an archaeologist. Unfortunately, some archaeologists who begin to do ethnography without an archaeological purpose find it difficult to abandon archaeology completely and, as some of the post-processualists have ably demonstrated, start writing fictional accounts of ancient cultures that are little more than archaeological fairy tales.

In fact, there is no reason why ethnoarchaeology has to be done by archaeologists. It is not who does the work that counts, but the purpose for which it is done. Excellent work of value to archaeology has always been done by perceptive ethnographers, especially those who work in the transition zone between ethnography and linguistics, the ethnoscientists (Figure 11.1, far right). Archaeologists can take real satisfaction not only that social and cultural anthropologists have finally discovered the marvelously detailed and compartmentalized way the human animal views the world around it, but also that they have largely stopped criticizing archaeologists for overclassifying the ancient remains of that world with mindless abandon (Thompson and Parezo 1989:47).

Ethnographic Analogy

The ultimate archaeological purpose of ethnoarchaeology is to obtain ethnographic information about the behavior associated with material objects for comparison with archaeological data. Comparative studies of this kind involve analogy. Archaeologists tend to think of analogy either in terms of a specific kind based on the direct continuity from an archaeological to an eth-

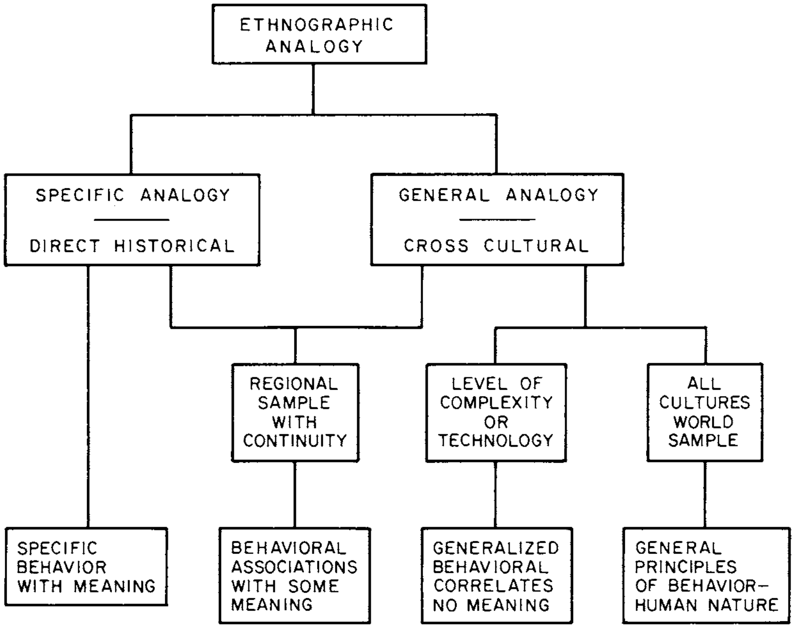

FIGURE 11.2. Interpretive expectations in ethnographic analogy.

nographic situation (Steward 1942; Gould 1974:39) or in terms of a general kind based on a broad cross-cultural sample. I believe that it is useful to examine a fuller range of potential approaches to the use of ethnographic comparison (Figure 11.2). More careful attention to these differences would go a long way toward relieving the legitimate concerns of the critics of ethnographic analogy. Their criticism is based more on the evidence of intellectual sloppiness and careless abuses of logic than on a perception of fundamental theoretical error.

Little need be said about the specific or direct historical variety, for this is the most familiar and successful form of ethnographic analogy. The key requirement is the demonstration of continuity between the archaeological and ethnographic units of comparison. The advantage of this kind of analogy is that the inferences about the archaeological objects deal with specific behavioral correlates and often involve meaning as well. In the Southwest, the rich body of ethnographic information on the Hopi is used to provide behavioral meaning to objects found at archaeological sites, such as Awatovi, with both prehistoric and historic Hopi occupations, and the Homol'ovi sites with legendary protohistoric Hopi connections (W. Smith 1980; Adams 1989).

At the other end of the scale is the kind of analogy that is based on summary information about general principles of behavior based on a comparative sample of all world cultures (Figure 11.2, far right). This broadest form of analogy is often misused because it borders on arguments derived from nothing more documentable than human nature. On the other hand, carefully selected cross-cultural samples can contribute significantly to both theoretical and interpretive discussions (Gilman 1987).

The next most familiar kind of ethnographic analogy (Figure 11.2, center right) is also based on large comparative samples but emphasizes technology (Blackwood 1950) or level of complexity, such as hunting-and-gathering cultures (Yellen 1977). Comparative studies based on large world samples have produced impressive information that allows the development of generalized behavioral correlates and expectations, but normally does not allow statements about meaning. The strong theoretical interest in evolutionary explanations following World War II contributed to the popularity of analogy based on level of complexity.

The most neglected and yet most promising kind of ethnographic analogy is based on tightly controlled regional samples where there is some evidence of continuity from the past (Figure 11.2, center left). This kind of analogy provides strong behavioral associations and general meaning for archaeological materials. The strength of this regional approach is that it can draw upon both the specific and the general forms of analogy. At the same time, because of this dual source of strength, this kind of analogy is carelessly misused. In the Southwest it is possible to develop a summary of Pueblo culture from both Western and Eastern Pueblos. This summary of shared behavior and meaning makes possible an unusually rich reconstruction of prehistoric Pueblo life. Yet analogies are often drawn in the name of this general and regional Pueblo culture, but documented by reference to a single pueblo and sometimes even to a unique, even aberrant, practice at that pueblo.

Nevertheless, archaeology has much to gain from more extensive use of carefully controlled regional analogy, for there is a real need for better regional synthesis in archaeology everywhere. In any event, whatever approach to ethnographic analogy is used, attention must be given to rigorous theoretical and methodological consistency. Or, to put it in fully archaeological terms, we must be as careful in defining the context of the ethnographic analogy we want to use as we are in defining the context of the archaeological objects that are to be the beneficiaries of the ethnographic comparison (W. Smith 1952).

The Archaeological Connection

None of these positive remarks about the importance of the behavioral correlates of archaeological objects can be used as a basis for the interpretation of the archaeological record until we establish the theoretical and methodological channels through which ethnographic behavior may be connected to archaeological fragments. How do we convert our miserable broken pieces of past material culture into abstract entities that can be legitimately compared with the abstractions about behavior drawn from ethnography? Rouse (1939) was faced with this very problem when he began his study of Haitian prehistory. He was one of the first American archaeologists to provide a clear and unambiguous discussion of this problem. His remarks came at an important time in the history of American archaeology and have had a continuing, though not fully recognized, influence on the discipline. He attempted to relate behavior to artifacts by analyzing the factors that influence an artisan's procedures, that is, how the maker builds attributes into the artifacts (Rouse 1939:15–22). His approach is summarized in Figure 11.3.

Rouse presented his graphic representation of the factors influencing the creation of artifacts as a part of his discussion of the classification of archaeological specimens. His model includes specific identification of the noncultural factors. He mentions chance, individual quirks, physical capacities of the artisan, and potentialities of the environment. However, he did not provide a parallel list for the cultural factors. Instead he presented the classificatory units "type" and "mode," which he "assumed to be elements of culture" (Rouse 1939:18). He supported that position by claiming that type was "a standard of artifact appearance" and that modes represented habits, visual patterns, or ideas. Although there are many who would find his discussion of these matters quite reasonable, most would agree that his model is too simple for today's needs. Nevertheless, his model has provided

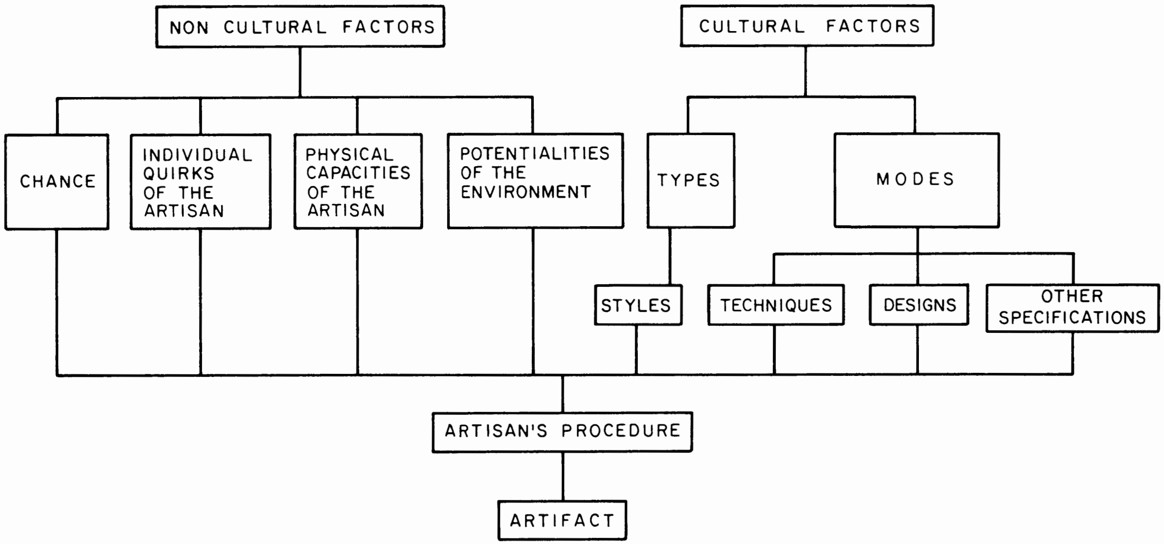

FIGURE 11.3. Factors that influence the making of an artifact (after Rouse 1939:19).

the stimulus for the expanded and more ethnoarchaeological view of the factors that influence the making and using of artifacts presented in Figure 11.4.

This expansion involves the addition of the user who manipulates the completed artifact, a detailed listing of the cultural factors, the introduction of the archaeologist and ethnoarchaeologist, and an attempt to show the archaeological linkages more clearly. Despite these additions, the resulting graphic model is not offered as an exhaustive presentation of all possible elements in this complex equation. On the other hand, some detail is included in the archaeological section in the lower right, in order to emphasize the need for rigorous methodological distinctions. For example, while some would include various correlations as a special form of association, it is clear that statistical correlations are different from the physical and observable associations of artifacts. The placement of ethnoarchaeology between the archaeological and ethnographic domains in the model emphasizes the transitional status of this subfield.

The version in Figure 11.4 is an active model going down on the left to symbolize the production and use of artifacts, and ultimately archaeological fragments, and up on the right to show the archaeological struggle to reconstruct the cultural context of those fragments. There is no attempt to illustrate any lateral connections between the two directions, largely because it would make this graphic model far too complicated. For example, it would have been possible to show a linkage from the "inference" box to the "makers" and "users" boxes as a way of recognizing more explicitly the processual interpretive possibilities. There should be some recognition of the role of formation processes in the production and distribution of the "archaeological remnants." It would be tempting to suggest some comparability between the box denoting the ethnographic "similar artifacts" on the left with the box of the archaeological "groups of similar artifacts" on the right. The very real questions of just how comparable these two abstractions may be, and to what degree they may represent reality, are important topics that deserve separate consideration.

Thus, while Figure 11.4 may be a useful model for describing the channels through which archaeological fragments may be connected to the behavioral information provided by ethnography, it does not deal adequately with the serious questions sur-

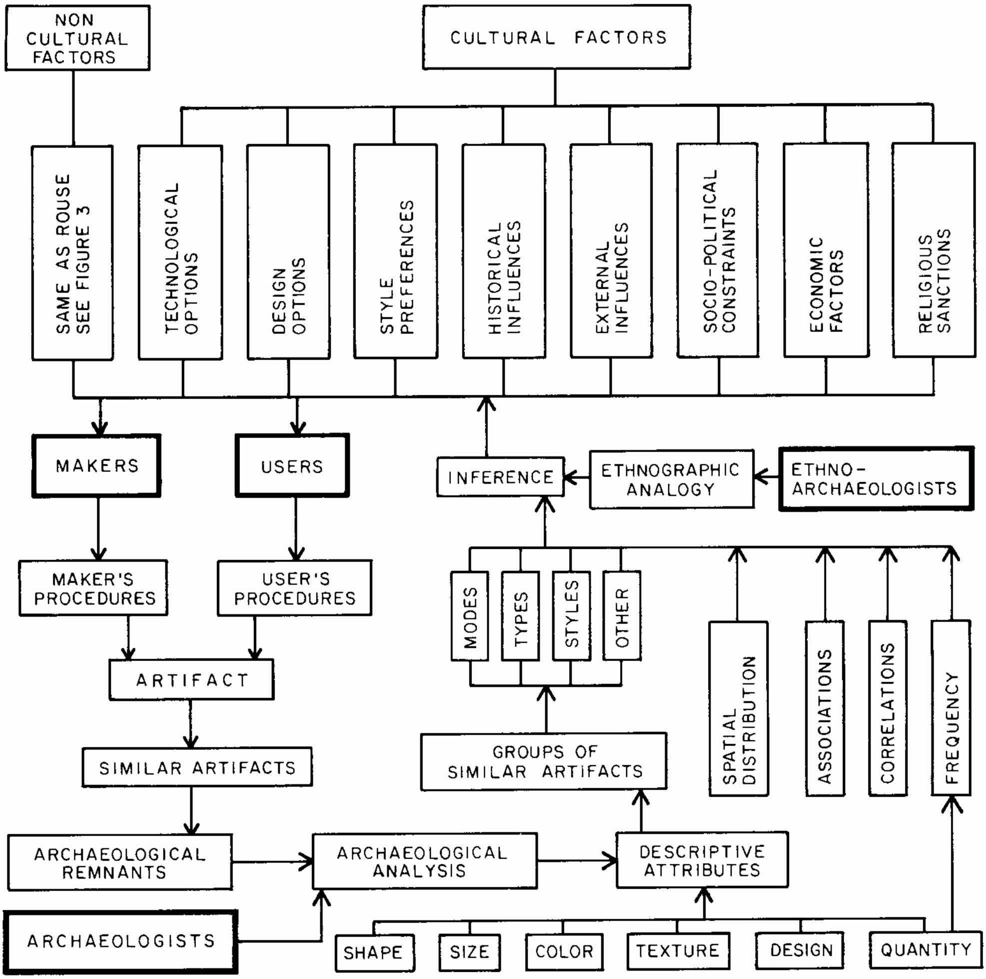

FIGURE 11.4. Rouse revisited. An expanded view of some of the cultural factors that influence the making and using of artifacts and the efforts of archaeologists to reconstruct them. Active participants are indicated by boxes with darker borders.

rounding the utility and validity of the constructs that we use to approximate reality.

Archaeological and Ethnographic Realities

One of the most difficult problems facing contemporary archaeology is the nature of the base that underlies comparative analyses. The comparative method is essential to all aspects of archaeological work. Essential to any form of comparative method is a common and well-defined base to which the unknown elements of the analysis may be matched. The traditional approach in archaeology has been to depend on a commonly and widely understood normative description as the base of comparison. In recent years, however, this normative approach has come under attack. Previously unrecognized forms of variation caused some to become so cynical about normative approaches—indeed, any classificatory approach—that they eventually abandoned them. Classifications, especially normative ones, were rejected because they were thought to be artificial constructs rather than what Rouse called "socio-cultural standards of artifact appearance." New and exciting ideas about processual interpretations were presented as useful approaches to the successful recreation of an image of archaeological reality.

However, change and process are difficult to study intelligently unless one knows what is being changed; hence the value of widely understood classificatory standards. Even with such standards and with the resulting normative bases of comparison, there have always been problems, both epistemological and practical, with the nature of past reality and the ability of the archaeologist to approximate it. On the one hand, there are many who believe that archaeologists classifying objects—that is, grouping them for analytical and interpretive purposes—create abstractions that are artificial constructs which may have little or no connection with how the makers and users of the objects viewed them. On the other hand, many archaeologists believe that when they group objects, they are discovering, albeit imperfectly, something approaching the way the makers and users grouped the same objects.

These two opposing views may be seen in terms of the simple linear model in Figure 11.5. The tendency to emphasize the extreme or pure position in such a model permits the examination

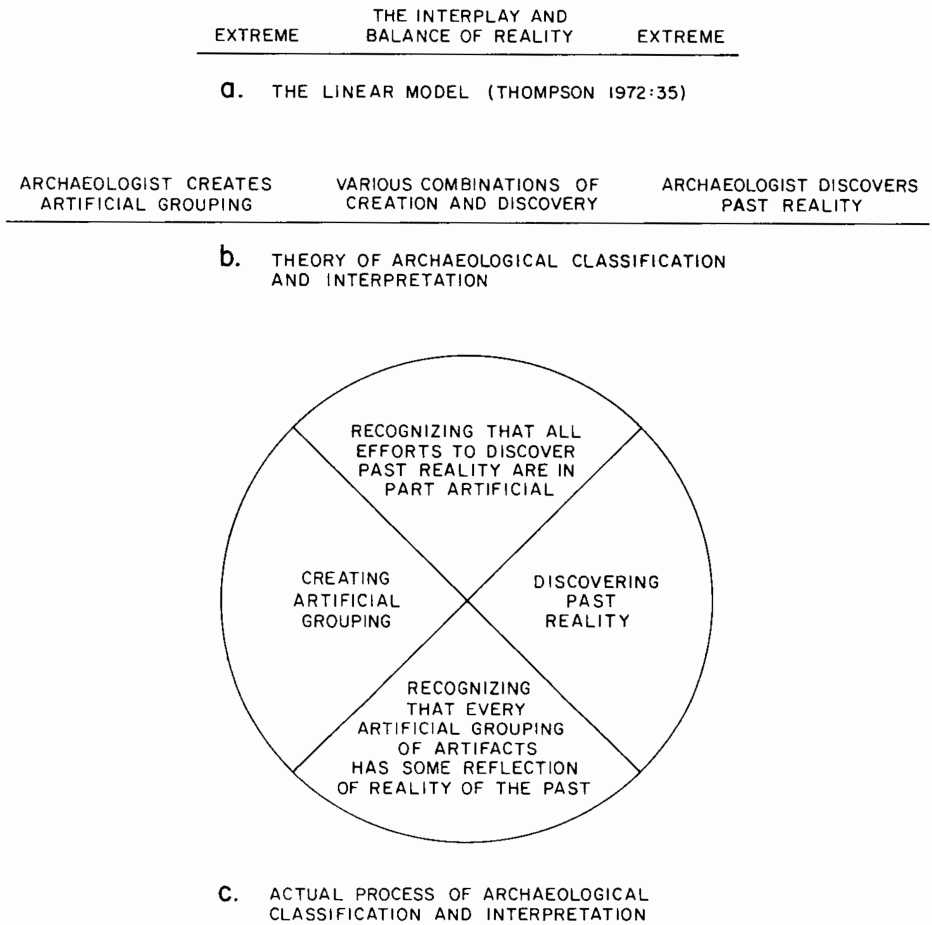

FIGURE 11.5. Theory versus practice in the linear model.

of each polar extreme in great clarity and splendid isolation (Figure 11.5a). The result of this theoretical isolation is that the idea or concept does not permit an examination of the true relative position of the idea in the complex world of reality. That world is represented by the middle position of the continuum of the linear model, where the "interplay and balance of reality" stimulate various combinations of creation and discovery (Figure 11.5b).

These theoretical models fail to mirror the practical world of archaeology because they overemphasize the isolation of the polar extremes. In these representations (Figure 11.5a, 11.5b), the polar positions are dead ends. In reality, when one is pushed to defend a polar position, one should ultimately be overwhelmed by the fact that the "purer" the argument becomes, the more sterile it is. Unless one has an ideological attachment to the polar position, the arguments for that extreme should also build the platform from which one examines cognate, transformed, or completely new ideas. The defender of a polar position should have such experiences, but usually does not. The simple linear model based on a straight line, therefore, is an inadequate one.

It may be useful to recognize that a line is no more than a locus of points and that a curve may be the independent variable which defines that locus. A circle is a type of curved line that is closed, as opposed to the simple continuum with two opposed ends. Just as the straight-line linear model has the advantage of highlighting the polar extremes, so the circular linear model emphasizes the transitions from one quadrant of the circle to another. The archaeologist who enters the circle (Figure 11.5c) with the idea of discovering the realities of the past through the analysis of an archaeological collection gradually comes to recognize that any such effort can only result in an approximation of past reality and that there is an element of artificiality to that approximation.

At the same time, the archaeologist who creates abstract constructs that are believed to be devoid of any relationship to past reality ultimately faces the realization that clusters of covariation in artifacts which are observable today must reflect some part of the reality seen by makers and users of those artifacts. Thus, while the circular model does not deprive an archaeologist of any opportunities to present and defend an idea with vigor, it does make it impossible for that archaeologist to adopt one of the polar extremes and become trapped in some theoretical and methodological dead end.

Rouse, whose seminal ideas about the relationships of artifacts and behavior provided the starting point for this discussion, has presented an approach to archaeological interpretation that involves distinguishing the strategies appropriate to different levels of inference (Rouse 1986:163–175, Fig. 30). An understanding of the objectives of each of his inferential levels is useful in determining where one might enter the circle in Figure 11.5c. For example, when one constructs chronologies on his Level 2, one tends to enter on the left side of the circle, because chronology building involves the creation of artificial groupings that one would not expect to have had any significance to the producers of the archaeological materials. On the other hand, when one operates on his Level 4 in order to reconstruct subsistence or settlement patterns, one would probably enter the circle on the right side, because such an effort is designed to reveal behavioral realities that existed in the past.

The circular model forces a progressive, continuing, self-renewing, consistent, and essential consideration of all views, not only the extreme ones but also the many combinations between those extremes. My personal predilection is to enter the circular linear model on the side of discovery. It not only gives me intellectual satisfaction; it also prevents me from emotional attachment to a ruling hypothesis (Chamberlin 1890). I cannot move in any direction on the circle without confronting and having to deal with other views, even opposing views.

This discussion seems to contrast the fragile, indirect, imprecise, approximate, and inferential nature of "archaeological reality" with what appears to be the observable, direct, concrete, contextual, and verifiable nature of "ethnographic reality." Such a contrast, however, is inappropriate, because it fails to take into account recent concerns about the integrity and validity of "ethnographic reality" (Whiteley 1985; Clifford and Marcus 1986). Ethnographers today are beginning to ask the same kinds of questions about ethnographic interpretations that Kluckhohn (1940) directed to the archaeological community. Archaeologists did not respond by rejecting "archaeological reality," nor did they look upon discussions of their approximations of it as little more than a form of literature. Rather, they took a more critical look at their theoretical and ideological biases and arrived at a better understanding of the nature of that reality (Taylor 1948; Binford 1972; Schiffer 1976; Leone 1986). It is to be hoped that archaeologists will contribute to a better understanding of "ethnographic reality" as they continue to develop ethnoarchaeology as an important subdiscipline of anthropology. The quality of their contribution will be determined by how successfully they address the problem of "truth in ethnography" (W. Smith 1952; Duerr 1987; Thompson 1990). The ultimate value of the information and the interpretations that they produce will depend on the archaeological purpose of their ethnographic research efforts.

Summary

This chapter is offered not as a contribution to the epistemology of ethnoarchaeology (Slotkin 1952; Fritz 1972; Wylie 1985; Upham 1987) but, rather, to the pragmatics of using existing theories and models in the practice of ethnoarchaeology. An attempt has been made to define the place of ethnoarchaeology in anthropology; to review the interpretive expectations of the use of analogy, especially of a regional variety; to outline the nature of the chain of connections between archaeological objects and ethnographic behavior; to discuss the contrast between archaeological and ethnographic realities; and, above all, to emphasize the critical importance of "an archaeological purpose" for all ethnoarchaeology, thereby strengthening the natural linkages between archaeology and cultural anthropology.

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About the Editor

William A. Longacre, professor of anthropology at the University of Arizona, received his doctoral degree from the University of Chicago in 1963. His dissertation was an innovative approach to the study of ceramics designed to explore the nature of prehistoric social organization in the American Southwest. Since then, he has devoted his scholarly life to enhancing our abilities to exploit ceramic variation as a means to infer aspects of prehistoric societal organization and behavior.

A member of the faculty of the University of Arizona since 1964, Dr. Longacre served as director of the Archaeological Field School at Grasshopper from 1965 until 1979. Convinced that the way to explore the interface between ceramics and human organization and behavior lay in the present rather than the past, he journeyed to the Philippines in 1973 to visit the remote Kalinga tribal villages in the mountains of northern Luzon to see if a study of modern pottery-making peoples might be done there. Finding a superb field site, he returned with support from the National Science Foundation to undertake twelve months of work among the Kalinga. Results were reported in a number of articles and book chapters. When military conflict in the area interrupted his work, he initiated new research among pottery-making peoples elsewhere in the Philippines. After peace was restored, he returned for another twelve months of fieldwork among the Kalinga along with a group of graduate students from the University of Arizona and the University of the Philippines during 1987 and 1988, again with support from the National Science Foundation. In 1989 and 1990, he initiated a new ceramic ethnoarchaeological project on the island of Cebu in the Philippines.

Dr. Longacre has been head of the Department of Anthropology at the University of Arizona since 1989.