

*The  
Archaeology  
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## Technical Choices and Social Boundaries in Material Culture Patterning: An Introduction

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Our discipline has recently witnessed a proliferation of theoretical approaches. There are now so many, in fact, that many of us question whether any themes or interests still unite archaeologists into a single field of inquiry. Most of us, however, still share at least one common interest: we study material culture to answer questions about the past. The specific medium of material culture and the particular past (or present) that we study varies widely from one archaeologist to the next. It is also true that many archaeologists study formal variation in material culture through space: in site morphology, in artifact types, in architectural forms, and in raw materials, for example. A primary goal in studying formal variation across space is to identify social groups, whose boundaries are marked by distinctive patterns in the archaeological record. The study of social boundaries is a perennial archaeological interest, whether one focuses specifically on ancient “ethnicity,” migration, or economic systems.

Not only do archaeologists study spatial variability, but we also study ancient technology to illuminate processes and activities of past societies. We suggest in this book that relevant methods for doing so may be found in a growing body of French literature on *techniques et culture*, whose distant North American cousin is an “anthropology of technology” (following Pfaffenberger 1992). This resurgence of archaeological interest in material culture and technology involves different trends in the Anglo-American and European traditions of archaeology. Although these two technologically oriented approaches from opposite sides of the Atlantic seem complementary, little synthetic research has been done to date (but see Dietler and Herbich 1994a).

To begin remedying this situation, this volume focuses on relationships among technical choices, social boundaries, and material culture patterning. As archaeologists, we continually debate the validity of different conceptual tools for measuring social boundaries and the meanings of the patterns that we find. Archaeologists have often assumed that studies of *style* will provide clues for distinguishing social groups in the archaeological record. A wealth of stylistic studies is now available from most portions of the globe and for almost every period (for recent reviews, see Carr and Neitzel 1995; Conkey and Hastorf 1990; and Hegmon 1992). Various debates have used ethnoarchaeological or archaeological data to argue that style has iconological, emblematic, assertive, symbolic, isochrestic, or even "stylistic" aspects. Style is either active, contested, negotiated, residual, or unconscious. Yet it is distressing to hear one of the debates' most thoughtful representatives intone that, "despite increasing concern with style . . . we are not much closer to agreement on basic questions than we were in the early 1960s" (Plog 1995:369).

This chapter's goal is to provide a theoretical and historical context for studies of social boundaries, technical choices, and material culture patterning contained in this volume. We must rethink fundamental questions concerning how we study material culture patterning and why we seek a unified theory of style (Carr and Neitzel 1995:6-8; Conkey 1990:8-11; Dunnell 1978; Sackett 1990). What is the relationship of style (as it has been variously defined) to social boundaries? Is it possible to detect conditions under which social boundaries and material culture patterning will coincide? Where might we look for guidance in developing more appropriate theory regarding social boundaries and material culture patterning? No ready answers to such questions have yet been found. Perhaps we can begin to resolve such intractable problems associated with conventional approaches by embracing a *technological* approach to artifact variability.

#### STYLE, SOCIAL BOUNDARIES, AND METHODS

Papers in this volume offer innovative methods and heuristic tools from both European and Americanist archaeology to study social boundaries. The French tradition of *technologie* explores links between cognition and technical choice by examining the process by which variation is created during the manufacturing sequence. The Americanist approach examines formal variation in finished products and uses a number of different techniques to interpret spatial patterning in the archaeological record.

Two basic premises form a working foundation for contributions in this volume: (1) French archaeologists have already developed a useful set of methods for studying formal variation, glossed as the manufacturing sequence or *chaîne opératoire*.

*toire*; and (2) Anglo-American archaeologists have refined various techniques for undertaking spatial analysis and interpreting distributional patterning. Each contributor tries to bridge these divergent perspectives toward a common agenda. Let us first explore briefly the history of the relationship of material culture studies and anthropological archaeology in the Americanist intellectual tradition.

#### MATERIAL CULTURE AND TECHNOLOGY STUDIES IN THE AMERICANIST TRADITION

As is widely known, material culture studies formed the foundation of early anthropological research and guided the development of Americanist archaeology (Miller 1987:110–112; Pfaffenberger 1992; Stott and Reynolds 1987). Archaeologists have undertaken replicative studies of lithics and ceramics, for example, since at least the eighteenth century (Coles 1973:13–14; Trigger 1989:61). Anthropologists and archaeologists also published detailed descriptions of traditional technologies during the late nineteenth and twentieth centuries (for reviews, see Conkey 1989 and Ingersoll 1987). Many of these studies were undertaken in situations of rapid assimilation and fit into the Boasian tradition of particularistic anthropological research. Most cultural anthropologists lost interest in studies of technology and material culture at some point after 1920, as goals of anthropological research changed. However, archaeologists retained their interest in this topic as it contributed to the construction of culture histories and regional chronologies.

It was not until the “New Archaeology” came to power in the 1960s that material culture studies faded in popularity among anthropological archaeologists. The Binfordian program criticized these “normative” approaches that culture historians routinely employed to classify material culture into culture areas (e.g., Binford 1965). Most New Archaeologists and processual archaeologists insisted that distributional patterning in the archaeological record could not be equated with ethnic (or ethnolinguistic) groups of the past (Cordell and Yannie 1991; Shennan 1989). Studying technological variation was called *passé*, and reconstructions of ancient technologies lacked merit unless and until they were placed in an explanatory framework. One reason New Archaeologists did not develop a theoretical framework of technology and material culture was that they viewed technology primarily as an “extrasomatic means of adaptation” (Binford 1965).

Throughout this period, most archaeologists equated conventional material culture studies with uncontextualized description that was considered “boring . . . and theoretically limited” (Ingersoll 1987:4). In many areas of the world, regional chronologies that were based on studies of material culture variability were now in place. As a result, processual archaeologists turned their attention to explanation,

and material culture studies were duly exiled to the archaeological basement. However, research on material culture by ethnologists, art historians, and other scholars continued during this interim on a wide range of media (e.g., Lechtman and Merrill 1977; Richardson 1974; Schlereth 1982).

The New Archaeologists' strident disavowal of material culture studies lay in their association of such research with narrow description and a lack of an appropriate theoretical framework (e.g., Longacre 1975). Only one area of archaeological research explicitly devoted to material culture studies gained popularity during the 1970s and 1980s. This field has variously been called "Action archaeology" (Kleindeinst and Watson 1956), "experimental archaeology" (Ingersoll and Macdonald 1977) or "middle-range" or "actualistic" research (Binford 1983). By the 1970s, studies of traditional technology—ethnoarchaeological and experimental—were subordinated to research that provided models of spatial variability or tested specific social inferences (see, for example, Gould 1980; Ingersoll and Macdonald 1977; Kramer 1979; Longacre 1981; Schiffer 1976).

New Archaeologists never dispensed entirely with their interest in technology and were keenly interested in studying formal variation, two intrinsic qualities of material culture. If anything, Binford's use of functional and systems theory approaches to understanding formal variation and technology elevated these studies to a higher level. One of the enduring legacies of the New Archaeology lay in its division of material culture variability into discrete realms of technology, function, and style. Technology was defined as raw materials and production steps, while function became associated with utilitarian or instrumental purposes (following Sackett 1990). As noted previously, style was viewed as a kind of residual quality, whose primary function was emblematic, selectively neutral, or even epiphenomenal (also see Dietler and Herbich, this volume).

Increasing numbers of studies were published that focused on style, function, and technology. Archaeologists appreciated the heuristic value of this tripartite scheme, as evidenced in the explosion of applications using Wobst's (1977) information exchange model (see Hegmon 1992 for a review), the growth of Ceramic Ecology (e.g., Arnold 1985), and in research by Darwinian archaeologists (Dunnell 1978). More intrepid researchers sought to reunite these qualities in novel case studies that combined technological research with ethnoarchaeological techniques to study traditional material culture (e.g., Aronson et al. 1994; Childs 1991; Wiessner 1990).

However, many ethnoarchaeologists who engaged in technological studies became frustrated in attempts to implement this processual model. Ethnoarchaeological studies of traditional societies from Africa (e.g., Braithwaite 1982; Hodder 1979b) to Asia (Longacre 1981; Stark 1995b) showed that makers and users of material culture routinely blur the boundaries between technology, function, and

style. As research in traditional cultures has demonstrated, style is not simply decoration, and technical choices are not governed simply by environmental pressures. Rather, these behaviors are socially informed actions that reflect a shared understanding of how things are done. As such, material reflections of technical choices are not neutral, and some are surprisingly resistant to change. These studies suggest that we move beyond dichotomizing models that oppose style and function to embrace more holistic understandings of material culture variability.

Some Americanist archaeologists today may be unfamiliar with the history of material culture studies, but most are clearly amenable to technological studies. Indeed, one might say that Americanist archaeologists have come full-circle to a latter-day appreciation of these topics. This recent resurgence of interest in material culture in Americanist archaeology is paralleled by contemporary developments in the British Isles. This trend reflects no fewer than four factors: (1) the growing impact of experimental-ethnoarchaeological studies on archaeological interpretation; (2) the introduction of new analytic instrumentation into our field from the natural and physical sciences; (3) an increased interest in technological studies as sources of inference for both analytical and theoretical research; and (4) an unsatisfactory conceptual framework for studying spatial patterning and formal variation in material culture.

#### MATERIAL CULTURE AND TECHNOLOGY STUDIES IN THE FRENCH TRADITION

Technology and culture studies have enjoyed an important place in French theoretical archaeology for several decades (Cleuziou et al. 1991:115-118). Where the "revolution" in Anglo-American archaeology demanded new conceptual frameworks and increased methodological rigor, an equally important shift in French archaeology involved the union of ethnology and archaeology. One outgrowth of this merger, with deep roots in Leroi-Gourhan's work, is the development of a methodology for the study of techniques (see, for example, Lemonnier 1986, 1992; Mahias 1993; Sellet 1993; van der Leeuw 1993). To date, these developments are not strongly associated with a particular theoretical school in archaeology, because of a continued emphasis on analytical refinement (e.g., Perles 1987).

One of Leroi-Gourhan's greatest contributions to French archaeology was his contention that we could understand social structures and belief systems of a society through the study of its technology (also see White 1993). Drawing partly on previous work by Mauss (1936), Leroi-Gourhan suggested that human behavior is characterized by *chaînes opératoires*, or deeply embedded operational sequences. These sequences comprise the foundation of a society's technology and are re-

flected in all manner of material culture, from everyday tools to the organization of space (Leroi-Gourhan 1993:305, 319).

When we view products as outcomes of multiple technical choices made during the manufacturing sequence, then undecorated artifacts—mundane, utilitarian goods—are also an appropriate study. Any technology is a system of behaviors and techniques, from architectural construction technology to cooking practices. Behaviors and techniques are guided by human choices, and most steps in any technological process can be carried out using several alternative approaches. It is this arbitrariness in technological traits that generates variability in material culture patterning. In artifact types, we may describe this totality as *technological style* (Lechtman 1977). We may describe the combination of manufacturing practices that a group uses to make different goods as its *technical system* (Lemonnier 1986, 1992).

In most media used to manufacture traditional technology, technical problems have alternative solutions. Most everyday goods are made through a series of repetitive and mundane activities; their consistency reflects “the way things are always done” in a local tradition (Wiessner 1984:161, 195). Alternatives selected by artisans in their choice of materials and in the form of their products reflect a thoroughly internalized understanding of the manufacturing tradition. They generally pass this knowledge from one generation to the next (Gosselain 1992b; Lechtman 1977:15; Sackett 1986:268–269, 1990:33, 37), and some aspects of the operational sequence are more stable through time than are others. These technical choices, rather than simply raw materials and or design styles, are crucial in determining the outcome of a product. Technological styles thus reflect conscious and unconscious elements of technical choices.

The interdisciplinary nature of technological studies is evident in the French tradition of *technologie*, because a social anthropologist, P. Lemonnier, has been one of its articulate advocates for the English-language audience (see especially Lemonnier 1986, 1992, 1993b). His ethnological background gives him a similar perspective to ethnoarchaeologists: in each approach, one can observe decision-making behavior, the material outcomes of these sequences, and the spatial distribution of each set of technical choices. One goal of cultural technology studies by French archaeologists has been to describe and understand the entire operational sequence (from raw material procurement to finished good) for a particular group of artifacts. Again, we may see parallels between the French and Americanist schools: Schiffer’s (1976) behavioral chain has strong affinities with the concept of the operational sequence (e.g., Sellet 1993).

Much of this theoretical research on culture and technology has gone unnoticed by the Americanist archaeological audience, perhaps primarily for linguistic reasons (but see Dietler and Herbich 1989). Fortunately, English-language publications by Lemonnier (1986, 1992) and Leroi-Gourhan (1993, in translation) have re-

cently appeared. So, too, have English-language reviews of the French literature on culture and technology (see especially Dobres and Hoffman 1994; Lemonnier 1993b) and English-language articles by European archaeologists who follow this approach (e.g., Mahias 1993; Roux et al. 1995; Sellet 1993; van der Leeuw 1993). The appearance of this literature has begun to make French archaeological approaches more accessible to Anglo-American archaeologists. White (1993:xviii) muses that, had translations of this French literature been available twenty years earlier, we might have avoided the *style vs. function* debate altogether!

Anglo-American and French intellectual traditions in material culture studies have distinct trajectories, yet there are surprising parallels in the subjects under study and potential compatibility in the conceptual frameworks that each employs. Recent research on both sides of the Atlantic emphasizes the importance of understanding how technical behavior—the manufacture and use of material culture—creates and mediates social relations. Ironically, the theoretical polarization that now pervades Euroamerican archaeology precludes a shared vision of building material culture theory precisely at a time of renewed anthropological interest in the subject. One premise of this volume is that seemingly disparate schools of thought contain elements of a uniquely archaeological theory of material culture. The cross-fertilization of these perspectives in thinking about social boundaries, technical choices, and “style” promises to yield fresh insights.

#### STRUCTURE OF THE VOLUME

This volume contains ten case studies and one review chapter. It begins with several ethnoarchaeological case studies in which technical choices are examined in conjunction with their resultant distributional patterning. The first case study, by Robert Hitchcock and Laurence Bartram, explores these issues with findings from their long-term research program in the Kalahari desert. The second case study, by Robert Welsch and John Terrell, uses early twentieth-century ethnological collections and contemporary research to study social boundaries on the Sepik coast of New Guinea. Olivier Gosselain describes his ceramic ethnoarchaeological research in Central Africa in the next chapter. Scott MacEachern follows him with a chapter that discusses contemporary notions of ethnicity and material culture in Cameroon and Nigeria.

Four North American archaeological case studies are then presented to test the limits of this method. The first, by Elizabeth Chilton, examines technical variation in Algonquian and Iroquoian ceramic traditions. A second case study, by Robert Goodby, focuses on technological patterning and social boundaries in southern New England during the late prehistoric and contact periods. Catherine Cameron



studies architectural variation in three regions of the late prehistoric Southwest to reevaluate conventional explanations of culture change. Miriam Stark, Mark Elson, and Jeffery Clark focus on the archaeology of the Tonto Basin (Arizona) to study social implications of variability in vernacular architecture and in utilitarian pottery.

Two synthetic discussions of analytical methods, social boundaries, and material culture patterning conclude this volume. The first, by Michael Dietler and Ingrid Herbich, reviews French and Anglo-American intellectual traditions. Their critical analysis of the two traditions serves as a foundation for the proposal of an integrated, independent theoretical position, which further incorporates elements of the Bourdieuan practice theory that is not common to either. They illustrate their approach with ethnographic material from Kenyan research. Michelle Hegmon concludes with a thoughtful summary of recent developments in stylistic studies in Americanist archaeology.

#### CONCLUDING THOUGHTS

Findings in this volume make it clear that we require continued efforts to unite disparate intellectual traditions. It should come as no surprise that these authors, using divergent theoretical approaches to their research, provide equally divergent conclusions. This lack of agreement provides a good starting point for future work, and may be summarized in terms of the following questions:

1. Can social boundaries be identified in the archaeological record?
2. If such boundaries exist, what methods can we use to examine them in the material record?
3. What social processes and what kinds of social groups can we discern by studying discontinuities in the archaeological record?
4. How can we improve our general understanding of the relationship between technical choices and material culture patterning?

(1) Can social boundaries be identified in the archaeological record? We cannot shake our fascination with identifying social groups in the material record, although most archaeologists question the normative assumptions that such a quest requires. Every archaeological study in this volume searches for (and identifies) social boundaries in material culture patterning. Ethnoarchaeological studies pursue parallel research under the assumption that social boundaries are worth seeking.

The nature of social boundaries is clearly complex, and material culture systems are historically situated phenomena. Many previous studies have concluded that the relationship between style and social boundaries is highly contextualized (following Conkey 1990; Hodder 1979b; Lechtman 1977; Lemonnier 1986; Wiessner

1983): groups signal boundaries using different media from one another, and upon occasion, do not signal boundaries at all. This point is best illustrated in chapters that rely on ethnographic fieldwork (Hitchcock and Bartram, Welsch and Terrell, Gosselain, MacEachern, Dietler and Herbich); many of these studies focus on the relationship between contexts of production and contexts of use. Ethnohistorical studies in the volume by Goodby and Chilton use historical and linguistic evidence to support their contextual interpretations. Chapters by Welsch and Terrell and by Goodby remind us that social boundaries reflect a variety of activities that include efforts to maintain, cross, or blur these boundaries. Chapters in this volume demonstrate that the search for social boundaries in material culture patterning is a productive avenue of research.

(2) If such boundaries exist, what methods can we use to examine them in the material record? Most authors generally approve of this new method for studying material culture variability that incorporates technological and stylistic qualities of the manufactured object. Gosselain's study uses the *chaîne opératoire* approach to greatest effect, and finds it well-suited to unwinding the skein of social relations that affect material culture patterning in South Cameroon. Other authors who focus on technological aspects of material culture, like Cameron and Hitchcock and Bartram, find that this approach reveals new patterns of variation. The technological approach requires us to weld back together style, function, and technology into an integrated whole. Variation in technical systems generates more stable and resilient patterning of social boundaries than does "stylistic variation," but we clearly must learn more about the factors that affect technical behavior.

Ethnoarchaeologists who adhere most closely to the *technologie* approach, such as Dietler and Herbich and Gosselain, identify particular steps in the operational sequence that provide the most information on cultural affiliation. Case studies by Chilton and by Stark, Elson, and Clark show the utility of this approach for studying fine-grained boundaries in the archaeological record. Chapters by Dietler and Herbich and by Hegmon emphasize the need to examine both agency (i.e., the actors responsible for manufacturing culture) and structure (i.e., the material patterning that results from these behaviors). They suggest that Bourdieu's theory of practice and his use of the concept of *habitus* can help bridge the gap between competing views of material culture.

(3) What social processes and what kinds of social groups can we discern by studying such distributions of material culture? Selected chapters in the volume bemoan the lack of fit between the types of social boundaries that we may want to see and the nature of material culture patterning (e.g., Goodby, MacEachern): the social boundaries that we identify cannot be equated with modern ethnic boundaries. Some of the most thoughtful researchers on both sides of the Atlantic still equate social boundaries with ethnicity (e.g., Lemonnier 1986, 1992; Sackett 1990).

As MacEachern and Goodby (this volume) so effectively contend, "ethnicity" is a highly contested and problematic modern concept that eludes translation into archaeological terms, particularly in nonstate societies.

Several papers point out the need for more research on the relationship between social boundaries, scale, and material culture patterning. Chapters by Welsch and Terrell and by MacEachern focus most intensively on the nature and scale of the groups within defined social boundaries. Along the north coast of New Guinea, processes that generate large "social fields" involve the exchange of goods and marriage partners in the quest to build alliances between "friends." These social fields are neither culture areas nor ethnic groups, as they cross-cut multiple ethnolinguistic boundaries. In MacEachern's study, material culture marks social boundaries in Africa that are similarly vast, and do not conform to colonial demarcations of ethnic groups or "tribes."

Social boundaries described in this volume demarcate entities at social scales that cultural anthropologists rarely address, and that archaeologists routinely try to understand. These entities are larger than villages, but smaller than regions or culture areas or ethnic groups. Archaeologists in the American Southwest, for example, have described these entities as branches (Colton 1939) or communities (Wills and Leonard 1994). Various studies in this volume introduce social explanations for how this patterning is created. Welsch and Terrell, for example, discuss social linkages that bind together individual villages (and sometimes groups of villages) into larger units described as "communities of culture" or "social fields." Stark, Elson, and Clark suggest that prehistoric populations in the Tonto Basin were linked into "local systems," or well-bounded, small-scale systems whose participants engaged in regular face-to-face interaction. These local systems were forged and maintained through the exchange of goods and spouses and the formation of dyadic relationships, friendships, and political alliances.

(4) How can we improve our general understanding of the relationship between technical choices and material culture patterning? Many of the volume's authors, irrespective of theoretical orientation, call for more research on the nature of social boundaries and on the relationship between technical choices and material culture patterning. Some ethnoarchaeologists like MacEachern call for systematic long-term ethnographic research that examines spatial scales of social boundaries vis-à-vis their material expression. Other authors, like Dietler and Herbich and Hegmon, advocate the adoption of extant theoretical frameworks to facilitate our archaeological research.

One critical difference among authors lies in their willingness to develop integrated models that have cross-cultural utility, the kind that are generally associated with processual archaeology. It is perhaps not surprising that at least two of the archaeological case studies (Goodby, Chilton) emphasize particularistic approaches

to understanding social boundaries, while some authors who believe in unifying principles that govern patterning (Dietler and Herbich, Gosselain, and Hegmon) work with ethnoarchaeological material. This topic clearly requires future work in several directions.

The goal of this volume is to develop new approaches for understanding social boundaries in the archaeological record. What is novel about this book is not its use of French analytical concepts such as *chaîne opératoire* nor its focus on social boundaries. Instead, it is the volume's efforts to conjoin these approaches into a new, and hopefully more productive, strategy for understanding material culture patterning. Papers in this volume illustrate that examining technical choices provides insights on the scale and types of social boundaries in a wide diversity of settings and time periods. Like any pioneering effort, applications of this technological approach are clearly more useful for certain types of material culture than others. Through their findings and critiques, case studies in this volume enrich our understanding of how technological behavior generates and reflects social boundaries and contributes to a growing archaeological theory of material culture.