

2 Braudel's temporal rhythms and chronology theory in archaeology

MICHAEL E. SMITH

1992

This chapter relates Fernand Braudel's model of hierarchical temporal rhythms to current theoretical work on time and chronology in archaeology. The debate between Lewis Binford and Michael Schiffer over the existence of a "Pompeii premise" in Americanist archaeology serves as a point of departure, and it is shown that Binford's distinction between "ethnographic time" and "archaeological time" is encompassed by Braudel's model. The varying temporal rhythms associated with diverse socioeconomic processes are relevant to the methods of chronology-building, periodization, and cultural reconstruction. It is argued that these associations need to be considered not only at the level of interpretation, but also at the levels of research design and data recovery. Chronology-building is an integral part of the research process, and Braudel's formulation contributes to an understanding of the dialectical relationship between changing research questions and chronological refinement.

Introduction

Archaeology as a historical science

Since the early days of the "New Archaeology," one of the primary goals of archaeology has been the explanation of past culture change. The long time span represented in the archaeological record is seen as one of the most important resources for archaeology, and the analysis of processes of change is often viewed as archaeology's major contribution to knowledge (e.g., Plog 1973). Because of long-standing disciplinary and intellectual ties between American archaeology and anthropology (see Willey and Sabloff 1980), Lewis Binford and

the other new archaeologists took sociocultural anthropology as the model for their vision of archaeology's future. Archaeology was to be part of anthropology ("Archaeology as anthropology" - Binford 1962), specifically the part concerned with change ("Diachronic anthropology" - Plog 1973).

Unfortunately, sociocultural anthropology with its ethnographic foundation operates in a fundamentally synchronic mode, and ethnography simply cannot provide observations or models of change (or stability) over the long time spans typically dealt with in archaeology. As a "historical" discipline concerned with temporal processes, archaeology requires a conceptual structure quite different in orientation from that of non-historical disciplines like sociocultural anthropology or the other social sciences. In a theoretical treatment of this problem, Dunnell identifies two "underlying views of the nature of reality: space-like and time-like frames" (1982: 8). His argument that archaeology requires a time-like view (rather than the space-like view of the social sciences) in order to document adequately and explain the archaeological record is paralleled by Ernst Mayr's (1982: 32–67) discussion of the distinctiveness of evolutionary biology in relation to the physical sciences. As a historical field of study concerned with evolutionary change over time, biology has its own methods, theories, and epistemology that make it a very different kind of science from physics or chemistry, two fields that are often viewed as models for scientific procedure (see also Gould 1986).

These concerns are not limited to archaeology or biology, as Toulmin and Goodfield (1965) point out in their treatment of the development of the various historical sciences.¹ These sciences, including physical cosmology, geology, evolutionary biology, and human history (both documentary history and archaeology) all confront a fundamental methodological obstacle – the past cannot be observed directly. Historical disciplines must therefore devise indirect means to investigate the past. While the particular indirect methods are necessarily distinctive for each discipline, this common problem has produced some basic methodological parallels among historical disciplines (see Gould 1986). Toulmin and Goodfield make this point as follows:

Throughout the centuries of intellectual endeavor, the growth of men's historical consciousness across subjects ranging from physical cosmology at one extreme to theology and social history at the other, took closely parallel forms ... where disciplines with quite different subject-matters

have faced common forms of problem (e.g. the problem of establishing a well-founded temporal sequence of past epochs), they have – it seems – resorted again and again to similar strategies. To this extent, we conclude, physical cosmologists today may have more to learn than they yet recognize from the theoretical quandaries facing their predecessors in geology, and even in political theory. (Toulmin and Goodfield 1965: 15)

Similarly, archaeologists may have more to learn that we yet realize from the methods and theories of the other historical disciplines.

Some Americanist archaeologists recognize this, and have turned to aspects of evolutionary biology for models of sociocultural change based upon natural selection (e.g. Dunnell 1980; Rindos 1984; Leonard and Jones 1987). For the study of complex societies, however, models from the discipline of history may be more appropriate. While Americanists have often borrowed data from history (particularly ethnohistory), most have ignored the methods, models, and theories worked out by historians. This is a consequence of a dichotomy proclaimed by the New Archaeologists between history, viewed as particularizing and thus bad, and science, portrayed as generalizing and thus good (e.g. Binford 1964; 1972; Watson, LeBlanc, and Redman 1971: 165–70). This is a false dichotomy, however, and it reveals a profound misunderstanding of the nature of both history and science (see Walker 1972 for an early critique of Binford in this regard). Scientific history, referring to a concern with comparison, generalization, and rigorous explanation, has a long pedigree that includes such scholars as Marx, Weber, Bloch, Braudel, and Wallerstein. Science, on the other hand, is not a unitary pursuit concerned only with generalization; the investigation of particular unique events is a crucial component in all of the historical sciences (Toulmin and Goodfield 1965; Mayr 1982: 71–6; Gould 1987).

The relevance of history to archaeology is nothing new to archaeologists in Britain and Europe, where the two pursuits have long-standing disciplinary ties (Lewthwaite 1986). However, this relationship needs to be stressed in Americanist archaeology, which has yet to sort fully the wheat from the chaff of the New Archaeology (Trigger 1984; Kohl 1984; Dunnell 1986; Schiffer 1988). This paper explores the archaeological relevance of a particular historical construct – Fernand Braudel's notion of hierarchical temporal rhythms. This model ties in closely with current theoretical and methodological work on time and chronology in Americanist archae-

ology. Braudel's model not only helps place that work in a wider context, but it also contributes to the clarification of archaeological goals and explanations. In a separate paper in this volume (Smith), Braudel's insights are applied to the archaeological and ethnohistoric records of socioeconomic change in Postclassic central Mexico. In addition to showing the relevance of hierarchical temporal rhythms to archaeology, the case study also demonstrates their value in the correlation of parallel historical and archaeological data on long-term change.

Rhythms of temporal change in history and archaeology

One of Fernand Braudel's most important contributions to the study of history is his notion that different historical processes operate at different temporal rhythms or levels (Braudel 1972; 1980; see also Lewthwaite 1987; Knapp 1992; this volume). Briefly, Braudel discusses four hierarchical levels of temporal change. *Events* concern the individual actions that Braudel (1972: 21) calls "traditional history": kings, battles, treaties, and the like. The *conjuncture* (from the French *conjoncture*, not from the English sense of the term) is Braudel's term for two intermediate levels of historical duration; Braudel calls the study of conjunctures "social history, the history of groups and groupings" (1972: 20). Braudel divided conjunctures into two kinds: *intermediate-term conjunctures*, which include wage and price cycles, rates of industrialization, and wars; and *long-term conjunctures*, which refer to secular changes like "long-term demographic movements, the changing dimensions of states and empires (the geographical conjuncture as it might be called), the presence or absence of social mobility in a given society, [and] the intensity of industrial growth" (1972: 899).

The *longue durée* represents Braudel's most significant innovation in temporal categorization. This level describes "man in his relationship to the environment, a history in which all change is slow, a history of constant repetition, ever-recurring cycles" (1972: 20). In Braudel's two major historical analyses (*The Mediterranean* and *Civilization and Capitalism*), the *longue durée* forms an almost unchanging, centuries-long background that furnishes constraints and opportunities for the dynamic operation of change at the levels of conjuncture and event. It is an arena dominated by "structures," which for Braudel are "defined then first of all by duration and second by their effects on human action" (Santamaria and Bailey 1984: 79; see also Stoianovich 1976 on Braudel's notion of structure).

From an archaeological perspective, Braudel's con-

ception of the *longue durée* as a structural rather than a dynamic factor presents problems, since archaeologists deal with many examples of changes on time scales equivalent to and often much longer than the *longue durée*. Archaeology needs a construct that can treat 200–400 year intervals in a dynamic, not static, framework, and it needs additional temporal constructs of even longer duration. Such issues are dealt with by Karl Butzer (1982), who applies concepts from ecology and systems theory to the evidence for cultural change in the archaeological record. Butzer defines three "dynamic modes of adaptive systems," two of which correspond to Braudel's temporal rhythms. (1) *Adaptive adjustments* are short-term readjustments within a dominant adaptive strategy which resolve social and economic crises. As examples, Butzer lists "geophysical disasters, epidemics, famines, destructive wars, and dynastic changes" (1982: 290); this level corresponds to both Braudel's events and the shorter type of conjuncture. (2) *Adaptive modifications* involve "substantial revision of adaptive strategies within the context of a viable and persistent adaptive system" (Butzer 1982: 290), and include cases of agricultural intensification, demographic expansion, and cycles of growth, florescence, and decline of civilizations. These changes correspond to both Braudel's longer conjuncture and the *longue durée*. (3) *Adaptive transformations* involve the development of radically different adaptive modes, including late Pleistocene cultural diversification, agricultural origins, the formation of states, and the industrial revolution; this level of change is not treated in Braudel's scheme.

Butzer's scheme extends and improves Braudel's conception of temporal rhythms in two ways. First, it supplies an additional longer perspective (the adaptive transformation) required in many archaeological studies. Second, Butzer's dynamic ecosystem perspective corrects Braudel's static view of the environment by stressing both environmental change (Butzer 1982: 24) and the dynamic nature of the relationship of human populations with their environment (1982: 279–320).

Braudel's association of each temporal level with a suite of relevant sociocultural processes and constraints (personal and political processes at the level of the event; social and economic processes at the level of the conjuncture; environmental constraints at the level of the *longue durée*) represents an empirical finding that arose out of his research for *The Mediterranean* and finds support in *Civilization and Capitalism*. Comparative work in archaeology, history, and the social sciences suggests that these associations are valid (case studies,

this volume), and thus Hexter's (1973: 533) assertion that they are "arbitrary" is incorrect.

Bailey's work (1981; 1983; 1987) on "time perspectivism" in archaeology reaches similar conclusions independently, although he frames the issue in different terms. Bailey utilizes the concept of hierarchical causation, "in which causes at one [temporal] scale are treated as logically independent of causes at other scales" (1983: 182). Thus Bailey focuses on the nature of the variables that influence human behavior and adaptation at different time scales while Braudel focuses on the nature of the social processes that operate at different temporal rhythms. The basic principle of recognizing a diversity of hierarchical temporal rhythms is the same, however, and the work of Braudel, Butzer, and Bailey has important implications for the archaeological study of change.² This approach parallels recent theoretical work on biological evolution (Gingerich 1983) and changes in ecosystems (O' Neill *et al.* 1983), where hierarchical concepts of time and change (referred to as temporal scaling) are becoming important.

Braudel and chronology theory

Binford, Schiffer, and the "Pompeii premise" in Americanist archaeology

Braudel's work on temporal rhythms can contribute to conceptual advances in an area that might be called archaeological chronology theory. The debate between Lewis R. Binford and Michael B. Schiffer over the existence of a "Pompeii premise" in Americanist archaeology illustrates some of the issues involved. Robert Ascher (1961: 324) first used the phrase "Pompeii premise" to refer to the "erroneous notion, often implicit in archaeological literature . . . [that archaeologists recover] . . . the remains of a once living community, stopped as it were, at a point in time." Binford (1981) reviews Ascher's remarks and places them in the context of his own views of the archaeological record as a static contemporary phenomenon that was formed by dynamic processes operating over a long period of time in the past. According to Binford, the archaeological record relates to a different order of time from that of a living, functioning community. An ethnographer observing contemporary events and episodes operates in "quick time," while the archaeologist recovers artifacts and patterns produced over long intervals of time representing a "different order of reality" (1981: 197). I will refer to these two levels of time as ethnographic time and archaeological time.

From this perspective, Binford (1981) criticizes Schiffer

(1976a) for advocating the application of transformations that would allow archaeologists to reconstruct Pompeii-like "fossilized" assemblages reflecting events on the level of ethnographic time. Binford (1981: 199, 201) quotes a passage in which Schiffer (1976a: 12–13) supposedly reveals that, in his archaeological research, he "wants to find Pompeii" (Binford 1981: 201). In Binford's opinion, Schiffer is wasting time by trying to reconstruct phenomena pertaining to ethnographic time. Rather than viewing the archaeological record as a distorted picture of past behavioral systems, archaeologists should treat it in its own right and confine themselves to the scale of archaeological time. Schiffer (1985) responded by noting that there are a number of different types of archaeological deposits, each created through the operation of distinct formation processes, and that Pompeii-like assemblages represent only one of many kinds of archaeological situation. Binford's critique focuses on Schiffer's discussion of house-floor assemblages, so Schiffer concentrates on this kind of deposit in his reply:

the real Pompeii premise is that the archaeologist can treat house-floor assemblages at any site *as if* they were Pompeii-like systemic inventories . . . by ignoring, overlooking, or downplaying the operation and effects of formation processes, especially cultural formation processes, investigators *tacitly assume*, in the employment of certain analytical strategies, that their assemblages have a Pompeii-like character. (Schiffer 1985: 18, 20; emphases in original)

This statement is backed up by detailed reanalyses of the work of Hill (1970) and others on house-floor assemblages in the American southwest (Schiffer 1985; 1987: 323–38). On this basis, Schiffer argues that it is Binford (e.g. 1964: 425) and his early students like Hill and Longacre who adhered to a Pompeii premise. Schiffer (1985: 18) points out (quite correctly) that Binford (1981) distorts his views, and reminds Binford that much of Schiffer's analysis in *Behavioral Archaeology* (1976a) is based upon secondary refuse whose accumulation is measured over the rhythms of archaeological time, not ethnographic time.

The chronological issues concerning the "Pompeii premise" may be discussed in two dimensions, the conceptual and the methodological. The conceptual dimension deals with the ways we interpret and assign significance to the different levels of time, and the methodological dimension concerns the possibility of measuring different time scales and temporal rhythms

with archaeological data. These are discussed in turn by focusing first on Binford's notions of ethnographic and archaeological time, and then on the questions of periodization and chronological refinement.

Binford's distinction between ethnographic and archaeological time

In a 1986 article, Binford discussed his views on the different levels of time referred to here as ethnographic and archaeological:

The archaeological record presents us with information vastly different from that which was available to the participants within past systems . . . The archaeological record also demonstrates temporal durations or a tempo of chronological change that is very different from that perceived by persons who participated in it. The rates of change for most archaeologically known eras are much slower than the rates of generational replacement for participants in those systems. This fact must be appreciated in two ways. First, the beliefs and perceptions of the past participants could not have been germane to a reality of which they could not have been aware, the macrotemporal scale of systems change and the factors that were conditioning it. Second, the observations by ethnographers and historical figures, while perhaps documenting something of the internal dynamics of cultural systems, cannot be expected to be necessarily germane to an understanding of a much slower and larger-scale process of change and modification. Thus the reality with which we deal is one that living, breathing persons have in fact never directly experienced. (Binford 1986: 473-4)

These two levels of time clearly parallel Braudel's distinction between the event and the *longue durée*, but there is a significant difference between the two formulations: for Binford, the distinction is fundamental, a qualitative difference between two "order[s] of reality" (1981: 197), while for Braudel, the distinction between levels is more quantitative in nature. Braudel's alternative temporal rhythms represent convenient sections along a continuum rather than distinct, fundamentally different phenomena. Binford is quite right in stating that the *longue durée* of much of the archaeological record represents a reality "that living, breathing persons have in fact never directly experienced" (Binford 1986: 474); indeed, Braudel makes the same point, referring to the *longue durée* as "unconscious history" (1980: 39). However, rather than insisting on the exist-

ence of two fundamentally different levels of time (ethnographic and archaeological), it is more useful for archaeologists to take advantage of the insights of Braudel's formulation of the issue and thereby recognize the existence of multiple temporal scales. The problem then becomes methodological. No archaeologist would deny the relevance of the *longue durée* and our ability to monitor stability and change at this level. But is it possible to study the faster rhythms of the conjuncture or the event with archaeological data?

Periodization and chronological refinement

Because of the methodological and conceptual impossibility of dealing with instantaneous occurrences, any consideration of temporal change must begin with periodization, the division of the time continuum into analytical units. There are special conditions in which an archaeological "period" may be very limited in time (e.g., knapping a block of flint), but the discussion here is not concerned directly with such temporal divisions. Periods are synchronic constructs in that events and conditions occurring within a given period are treated as analytically contemporaneous (see Michels 1973: 11). From the Neolithic stage onward, the most common kind of archaeological period is the ceramic phase, and archaeological studies of change usually consist of comparisons of variables and conditions across such units. Some archaeologists have voiced dissatisfaction with this procedure, which appears to impose a step-wise model of change upon the archaeological record. Plog (1973: 1974), for example, argues that change should be viewed as continuous rather than step-like, and that change can and should be monitored in the trajectories of individual variables without the necessity of synchronic reconstruction of conditions for each period (see also Dunnell 1982; Blake 1985).

The continuous-versus-steps issue is a question of scale and methods. In order to make comparisons between different points in time, periodization is required, because it is methodologically not possible to study "continuous change." The methods do not exist that can isolate and analyze instantaneous occurrences, and even if this were possible, which of the nearly infinite instances would we choose to analyze? The real issue is then the degree of refinement of the chronology employed; this issue is discussed below. Plog's second point is also problematic, as Schiffer pointed out in a review of Plog (1974):

his claim that [the archaeological] record can be read without making synchronic statements (reconstructing past lifeways) seems curiously

inconsistent. He suggests that to obtain the temporal trace of any past variable it is sufficient to construct quantitative indices from artifactual and other data, applicable to several points or periods in time. This approach would seem to depend on synchronic statements, and of course these are what Plog actually presents. (Schiffer 1976b: 183-4)

The necessity of using synchronic data and analyses to make diachronic statements does not commit the archaeologist to making complete reconstructions of life in two or more periods before studying change in selected variables, nor does it require viewing chronological differences as epistemologically equivalent to synchronic spatial differences, as Dunnell (1982: 13, 19) suggests. Mayr (1982) and Gould (1986) discuss the situation in biology, where knowledge of the diachronic processes of past evolution is based upon analyses of synchronic patterns in the present (Gould's [1987] discussion of the development of uniformitarian thought in geology is also relevant here).

In the study of change, we are thus required to construct periods or phases and then make comparisons among them. The issue of continuous change is a red herring, and the crucial question is how finely can we measure past time, or how refined can we make our chronologies? Chronology-building and refinement are costly and time-consuming activities, so the issue must be dealt with in two parts: (1) what degree of refinement is *possible* for a given archaeological situation? and (2) what degree of refinement is *needed* to address specific research objectives?

The major factors that determine the levels of chronological refinement possible in various archaeological situations are the following: the age of the contexts under study, the kind of cultural adaptation, the capabilities of chronometric dating techniques, the specific archaeological deposits encountered and analyzed, the archaeological recovery techniques employed, and the level of effort and funding invested. (1) The *age of the contexts* under study is a major determinant of the possible level of refinement, with more recent archaeological contexts susceptible to greater chronological control than more ancient contexts. This is due to a number of factors, including the time ranges of available chronometric techniques, progressive changes in the kinds of cultural adaptations present in many areas, and increasing population sizes and densities in most parts of the world. (2) The *kind of cultural adaptation* influences chronological refinement in several dimensions. Because

of the nature and quantity of archaeological remains produced, chronological refinement can generally proceed further for sedentary societies than for mobile societies, in complex societies relative to simple societies, and in societies with large dense populations compared to small dispersed groups. (3) The *capabilities of chronometric dating techniques* (e.g. Michels 1973) clearly influences chronological refinement, and the increasing sensitivity of most techniques (e.g., Hester 1987) will help to refine sequences in many parts of the world.

(4) The nature of the *specific archaeological deposits* encountered and analyzed exert a degree of control over chronological refinement. For example, architectural contexts often permit finer temporal control than non-architectural contexts, and structures which exhibit a high degree of modification and rebuilding can produce relatively fine chronological control (e.g. Blake 1985). In addition, burials and caches can provide abundant time-sensitive artifacts, and secondary refuse is more appropriate than primary refuse³ for chronological seriation, and thus permits finer control. (5) Finally, *archaeological recovery techniques* strongly influence the possibilities of chronological refinement. It is almost always possible to obtain finer sequences with excavated deposits than with surface material, and such excavation questions as natural versus metric levels, the size of grid squares, and the use of screening play important roles in determining the degree of refinement possible.

Chronological refinement and archaeological goals

Some of the constraints listed above are beyond the archaeologist's control and others are largely determined by the nature of his or her research goals. However, some of these factors are the direct result of fieldwork decisions, and to the latter must be added a final constraint – (6) *the level of effort put into chronology in both fieldwork and analysis*. Most existing archaeological sequences are capable of refinement if only the necessary time, resources, and funds are invested. However, chronological work is an expensive endeavor in both time and funds. How does the archaeologist decide what level of investment is appropriate? Should chronology comprise a large or a small portion of one's research activities? Braudel's work on temporal rhythms can help resolve this issue.

Because different sociocultural processes operate at different time scales (Braudel), or because different variables become significant at different times scales (Bailey), the level of chronological refinement required in archaeology depends heavily upon the kinds of sociocultural variables and processes under investigation.

Studies of large-scale demographic patterns or subsistence strategies can be carried out successfully with phases of several centuries' length, while analyses of the changing social or economic conditions of states or empires require finer phases, on the order of a century or less. Archaeological work on such questions as warfare, domestic cycles, or price movements, processes operating at the scale of the shorter conjuncture, requires even shorter periods, on the order of decades.

Chronology-building and chronological refinement should proceed in a dialectical fashion with other research activities. It is generally acknowledged that some form of chronology is needed as a first step in the archaeological investigation of a new area (e.g. Thomas 1979: 137–40). Once a basic spatial and temporal framework has been erected, archaeological research typically turns to other issues. As new research goals and issues arise out of the results of fieldwork, analysis, interpretation, or theory-building, finer chronologies may or may not be needed. As suggested above, Braudel's work can help the archaeologist decide how much effort to put into chronological refinement given the nature of the phenomena under investigation. If the existing sequence is not adequate, it can be amended, extended, or even replaced by a more sensitive periodization. For this reason, archaeological chronologies should not be viewed as final and unchanging, but rather as working constructs whose modification or abandonment will probably be needed periodically (see Hole *et al.* 1969: 5; Smith 1987).

Unfortunately, this attitude is often not carried into practice, and archaeological research in many areas continues to try to fit new problems into the inappropriate framework of old chronologies. There is a sentiment among many archaeologists that chronology-building is a necessary evil that must be gotten out of the way before we can address interesting questions (note the title of Redman *et al.* 1978, *Social Archaeology: Beyond Subsistence and Dating*). Some explicit attention to Braudel and the work of Butzer, Bailey, and others would help ameliorate this situation.

Temporal rhythms and cultural reconstruction

Braudel and cultural reconstruction

Beyond the relevance of Braudel's model for chronology-building and diachronic analysis in archaeology, the notion of varying temporal rhythms also comes into play in the area of synchronic analysis or cultural reconstruction. When an archaeologist constructs a model of a past society or culture during a

specific phase or period, what levels of temporal processes are represented in the archaeological remains? Ethnographic analogues are often used to interpret archaeological remains, but do the ethnographic and archaeological records pertain to compatible levels of time? This is the issue that prompted Binford's critique of Schiffer and his subsequent remarks on ethnographic versus archaeological time (see above). While Schiffer shows that in some cases it is indeed possible to monitor short intervals of time (Schiffer 1985; 1987), Binford is correct that in most archaeological situations, the "quick time" of ethnography is compressed so that the deposits recovered by archaeologists – including those working with the material remnants of complex societies – pertain to blocks of time beyond the life span of past individual actors.

Many of the social groups analyzed by ethnographers, such as families or households, extended kin groups, work parties, neighborhoods, associations, and the like, are relatively short-lived phenomena and thus the archaeological record for such groups often consists of the compressed remains of several or many successive examples at a single location. As Binford (1982) stresses, the archaeological record reveals more about the *places* where past activities were repeatedly carried out than about the individual episodes and activities themselves. In other words, the nature of the deposits we excavate may limit our temporal resolution to the level of the *longue durée* or the longer conjuncture, whereas the ethnographic analogues frequently called on to interpret the archaeological record pertain to groups and processes that exist on the level of the event. This disjunction between ethnography and archaeology, discussed above in reference to Binford's work, can make ethnographically derived interpretations of the archaeological record problematic. The example of "household archaeology" illustrates this point.

"Household archaeology" and time: some problems

The household as a social group is defined by ethnographers in a variety of ways, in some cases emphasizing kinship and in other cases residence, while more recently functional attributes have come to the fore in household studies (see Yanagisako 1979; Netting, Wilk, and Arnould 1984). An anthropological focus on households has a number of advantages in the study of agrarian societies, for households are usually the primary units of production, consumption, and reproduction. The increasing attention being paid to households by anthropologists parallels recent trends in social history and the social sciences, and the cross-cultural and cross-

temporal study of households, domestic groups, and families is now an important social science subfield in its own right.

Archaeologists, particularly those working in Mesoamerica, were quick to jump on the household bandwagon, citing the same justifications for household study as are found in the literature of anthropology and other disciplines. In addition to the social-theoretical and comparative benefits of the household focus, there are two strong attractions of the household as a unit of analysis in archaeology. First, the study of households helps tip the balance of archaeological research away from temples, tombs, and palaces and toward the bulk of the population in ancient societies. Second and perhaps most attractive to archaeologists is the simple fact that houses are relatively prominent in the archaeological record, and this is a methodologically convenient scale of analysis (see Wilk and Rathje 1982; Rathje 1983; and Wilk and Ashmore 1988 for programmatic statements and case studies of household archaeology).

In their rush to study ancient households, archaeologists have ignored the issue of the temporal scales discussed in this article. The warnings of Dunnell (1982) and Binford (1981; 1986) on the compatibility of archaeological and ethnographic data are not acknowledged in this work. How do archaeologists isolate the remains of a single household in the past? This only happens in those cases where we have a catastrophic abandonment event (e.g., Pompeii), or in rare situations when new houses are built and occupied for only one generation before being abandoned (e.g., Snow 1989). In most agrarian societies, however, houses are used for more than one generation and the refuse deposits associated with a house contain the compressed remains of several successive households that occupied the structure. If archaeologists cannot identify and study individual households, then where does this leave "household archaeology"?

A brief example from my own research illustrates the problem that time creates for studies of ancient households. In 1986 the Postclassic Morelos Archaeological Project excavated 44 Late Postclassic houses at the sites of Capilco and Cuexcomate in Morelos, Mexico (see Smith *et al.* 1989). House remains consist of stone foundation walls and floors, and fragments of adobe (mud brick) were recovered adjacent to the walls. Relative and chronometric dating work indicates that over half of the houses were occupied for a century or less, with the remainder occupied for about two centuries. This accords with ethnoarchaeological observations of nearby modern adobe houses with stone foundations

that often have a use-life of a century or more. While the excavated houses have relatively dense middens in association, artifacts in those deposits cannot be assigned to temporal units finer than ceramic phases of about a century. Thus it is impossible to isolate the remains of single "households" from these sites, although it is likely on comparative grounds that households did indeed inhabit the houses. This situation of long-lasting houses and temporal phases of 100 years or more is not unusual in the archaeology of agrarian states. If we cannot identify or isolate a single "household" in these domestic remains, then what kind of social category is relevant to their interpretation?

An acknowledgement of the temporal problems involved in cultural reconstruction leads to a different approach to the social analysis of archaeological remains. Rather than simply borrowing analytical units from ethnography, as in the case of household archaeology, archaeologists should construct their own interpretive units to assign sociocultural meaning to the archaeological record. For the social interpretation of permanent housing in agrarian societies, I suggest the concept of "household series" as a replacement for "household" (see Smith 1989). The household series may be defined as the sequence of households that successively inhabit a given structure or house over a span of more than one generation. This analytical unit follows Binford's (1982) call for a place-orientation in archaeological systematics and has the advantage of being a unit that is relevant and detectable in many archaeological situations.

On the other hand, the household series has the disadvantage of being a construct whose social significance is virtually unknown. The social correlates of archaeological categories need to be established with comparative evidence, yet the ethnographic record tells us little or nothing about the nature of successive households at a single house-site over several generations, much less on the material expressions of such a phenomenon. Studies of the family developmental cycle (Goody 1958) are relevant but insufficient for dealing with changes over more than two generations. Can we make the assumption that the socioeconomic situation and activities of the successive inhabitants of a given house-site over several generations were relatively consistent through time? If the fortunes and conditions of household series fluctuate greatly from one generation to the next, then there may be a significant amount of synchronic socioeconomic variability that is masked by the compressed nature of most archaeological deposits. There is a clear need for comparative data on such

phenomena so that sociocultural analogues for archaeological remains will pertain to appropriate levels of time. Key social issues that need to be investigated involving the household series include the inheritance and sale of houses and property, changes in residence, and generational continuity in wealth, occupation, and other conditions. Archaeologists need first to assemble comparative ethnographic and historical data on these phenomena and consider the causal forces influencing intra- and inter-cultural variation, and then to develop appropriate models or correlates of their material expressions.

In the process of building models and analogies appropriate to the archaeological study of residences, archaeologists can turn to the historical record. Unfortunately, Braudel has little to say about households and their changes through time. This area is part of "material civilization," which is treated as a structural element in volume I of Braudel's *Civilization and Capitalism* (1981). The burgeoning field of "family history" has produced voluminous data on changing patterns of household demography and organization (e.g., Goody, Thirsk, and Thompson 1978; Netting, Wilk, and Arnould 1984), but the unit of analysis and comparison is the single household or the community, not the individual building.

A few French family historians have begun to explore relevant issues like the relationship of peasant households to individual house-sites, and the socioeconomic conditions of "lines" of peasant families, over several generations (e.g., Lamaison 1979; Segalen 1986). This is clearly an area that archaeologists need to pay attention to. Sabloff has recently suggested that "what ethnoarchaeology has been in recent years to the study of hunter-gatherer groups, history will be. I predict, to research on complex societies" (Sabloff 1986: 116). Sabloff's primary reason for making this statement is the lack of modern ethnographic analogues to the preindustrial state-level societies of the past. Beyond this factor, archaeologists also need history to provide comparative information on social units and social processes over longer time spans. This kind of information is required not only for studies of change, but for synchronic reconstructions as well. While Braudel's work makes few specific contributions to changing conditions on the household or family level, his temporal frameworks can be extended to this level, as is shown by recent *Annales* work (e.g., Lamaison 1979).

In sum, one of the major determinants of the level of comparability between the ethnographic/historical record and the archaeological record is the scale of time represented in the two sources of data (Binford 1981;

1982). Before archaeologists can make effective use of ethnographic and historical analogues in the interpretation of synchronic phenomena, they need to consider the issue of varying temporal rhythms. As in the case of diachronic analysis and chronology-building, Fernand Braudel's work is of clear relevance to the common archaeological procedure of cultural reconstruction.

Conclusion

The various socioeconomic processes that characterized past societies operated at different temporal scales, and Braudel's work demonstrates that archaeologists need to take this issue into account in their models. The significance of varying temporal scales is implicated not only at the level of interpretation and explanation, however, but also at the level of research design and methodology. The design and planning of archaeological research must include careful consideration of chronological issues in both the theoretical (temporal rhythms) and practical (archaeological sequences and chronological refinement) dimensions. Braudel's work ties in closely with current thinking by Bailey, Butzer, Binford, Dunnell, Schiffer, and others concerned with the theoretical and methodological bases of modern archaeology. A recognition of this linkage may help lay to rest the unproductive anti-historical orientation of the new archaeology while yielding a new appreciation of archaeology as a fundamentally historical science.

Notes

- 1 This paper takes the position that archaeology is and should be a scientific discipline concerned with the documentation and explanation of sociocultural variability as expressed in the archaeological record (*contra* Shanks and Tilley 1987). Most Americanist archaeologists would probably concur, and a materialist orientation is dominant in New World archaeology (e.g., Thomas 1979; Butzer 1982; Kohl 1984; Binford 1986).
- 2 The notions of time and chronology found in the work of Braudel, Butzer, and Bailey are based upon a materialist epistemology that incorporates a scientific approach to the study of the past. Shanks and Tilley (1987: 120-6) present an alternative "post-processual," anti-objectivist critique of Bailey's time perspectivism. While their remarks may have some relevance in the ethnographic study of perceptions of social time, their denial of the dimensionality of time and the possibility of an objective knowledge of the past is counter-productive for archaeology. Rudwick's (1985: 451-5) discussion of cartography as a metaphor for scientific enquiry, discussed by Lewthwaite (1986: 57), is useful in showing the necessary contributions of both "discovery" and "construction" in the historical sciences. While Shanks and Tilley are correct in observing that many new archaeologists may have tipped the balance too heavily toward objective science ("discovery") in archaeological interpretation, these authors'

rejection of objectivity in archaeology is a clear case of throwing out the baby with the bathwater.

- 3 Secondary refuse is the most appropriate kind of deposit to use for quantitative seriation techniques because of the variety and abundance of artifacts and the general lack of functional specificity of such refuse deposits (Smith 1983: 205–6). Seriation can often produce a very fine-grained ordering of deposits, but these refined sequences are usually collapsed into coarser phases for analysis just as adjacent stratigraphic levels are often lumped into phases. There are three reasons for this lumping, which reverses the normal direction of chronological refinement: comparability, sample size, and precision. Archaeologists need to make comparisons among deposits, and coarser phases are easier to use than the finer sequence of individual deposits (see Drennan 1976: 54). Also, individual deposits often have too few artifacts for confident quantification, and lumping chronologically adjacent deposits into phases enlarges the size of the artifact sample. Finally, a seriation curve may be accurate, though at a coarser scale than the sequence of individual deposits; lumping deposits into phases cancels out the potential lack of chronological precision in the exact order of deposits (see Smith 1983: 244).

Acknowledgements

I would like to thank Bernard Knapp for the opportunity and encouragement to write this paper, for stimulating correspondence on some of these issues, and for helpful comments on earlier drafts of the paper. Roland Fletcher also provided useful comments on an earlier draft. Geoff Bailey and James Lewthwaite kindly sent me reprints of articles relevant to the themes discussed here. I have had fruitful discussions on archaeological time and related issues with Michael Blake, Robert Dunnell, Cynthia Heath-Smith, Kenneth Hirth, Donald Lathrap, Scott O'Mack, and Dean Snow. My thinking on households and temporal rhythms was stimulated by a graduate student at the University of Washington who asked the right question at the wrong time. Finally, I would like to acknowledge Donald W. Lathrap's positive influence on my thinking about the role of chronology in archaeology.

References

- Ascher, R. 1961 Analogy in archaeological interpretation. *Southwest Journal of Anthropology* 17: 317–25.
- Bailey, G. N. 1981 Concepts, time-scales and explanations in economic prehistory, in A. Sheridan and G. Bailey, eds., *Economic Archaeology: Towards an Integration of Ecological and Social Approaches*, pp. 97–117. British Archaeological Reports, International Series 96. Oxford: BAR.
- 1983 Concepts of time in Quaternary prehistory. *Annual Review of Anthropology* 12: 165–92.
- 1987 Breaking the time barrier. *Archaeological Review from Cambridge* 6: 5–20.
- Binford, L. R. 1962 Archaeology as anthropology. *American Antiquity* 28: 217–25.
- 1964 A consideration of archaeological research design. *American Antiquity* 29: 425–41.
- 1972 The "Binford" pipe stem formula: a return from the grave. *Conference on Historic Site Archaeology Papers* 6: 117–26.
- 1981 Behavioral archaeology and the "Pompeii premise." *Journal of Anthropological Research* 37: 195–208.
- 1982 The archaeology of place. *Journal of Anthropological Archaeology* 1: 5–31.
- 1986 In pursuit of the future, in D. J. Meltzer, D. D. Fowler, and J. A. Sabloff, eds., *American Archaeology Past and Future*, pp. 459–79. Washington, DC: Smithsonian Institution.
- Blake, M. 1985 Canajaste: an evolving Postclassic Maya site. Ph.D. dissertation, Department of Anthropology, University of Michigan.
- Braudel, F. 1972 *The Mediterranean and the Mediterranean World in the Age of Philip II* (translated by Sian Reynolds). 2 vols. New York: Harper and Row.
- 1980 *On History* (translated by Sarah Matthews). Chicago: University of Chicago Press.
- 1981 *The Structures of Everyday Life: The Limits of the Possible (= Civilization and Capitalism 15th–18th Century, volume 1)* (translated by M. Kochan and S. Reynolds). New York: Harper and Row.
- Butzer, K. W. 1982 *Archaeology as Human Ecology: Method and Theory for a Contextual Approach*. New York: Cambridge University Press.
- Drennan, R. D. 1976 *Fábrica San José and Middle Formative Society in the Valley of Oaxaca*. University of Michigan, Museum of Anthropology, Memoirs 8. Ann Arbor.
- Dunnell, R. C. 1980 Evolutionary theory and archaeology. *Advances in Archaeological Method and Theory* 3: 35–99.
- 1982 Science, social science, and common sense: the agonizing dilemma of modern archaeology. *Journal of Anthropological Research* 38: 1–25.
- 1986 Five decades of American archaeology, in D. J. Meltzer, D. D. Fowler, and J. A. Sabloff, eds., *American Archaeology Past and Future*, pp. 23–49. Washington DC: Smithsonian Institution.
- Gingerich, P. D. 1983 Rates of evolution: effects of time and temporal scaling. *Science* 222: 159–61.

- Goody, J. (ed.) 1958 *The Developmental Cycle in Domestic Groups*. New York: Cambridge University Press.
- Goody, J., J. Thirsk, and E. P. Thompson (eds.) 1978 *Family and Inheritance: Rural Society in Western Europe, 1200–1800*. New York: Cambridge University Press.
- Gould, S. J. 1986 Evolution and the triumph of homology, or why history matters. *American Scientist* 74: 60–9.
- 1987 *Time's Arrow, Time's Cycle: Myth and Metaphor in the Discovery of Geological Time*. Cambridge, MA: Harvard University Press.
- Hester, J. J. 1987 The significance of accelerator dating in archaeological method and theory. *Journal of Field Archaeology* 14: 445–51.
- Hexter, T. 1973 Fernand Braudel and the monde Braudellian. *Journal of Modern History* 44: 480–539.
- Hill, J. N. 1970 *Broken K Pueblo: Prehistoric Social Organization in the American Southwest*. University of Arizona, Anthropological Papers 18.
- Hole, F., K. V. Flannery, and J. A. Neely 1969 *Prehistory and Human Ecology of the Deh Lühran Plain: An Early Village Sequence from Khuzistan, Iran*. University of Michigan, Museum of Anthropology, Memoirs 1.
- Knapp, A. B. 1992 *Society and Polity at Bronze Age Pella: An Annales Perspective*. Sheffield: Sheffield Academic Press.
- Kohl, P. L. 1984 Force, history, and the evolutionist paradigm, in Matthew Spriggs, ed., *Marxist Perspectives in Archaeology*, pp. 127–34. New York: Cambridge University Press.
- Lamaison, P. 1979 Les stratégies matrimoniales dans un système complexe de parenté: Riennes en Gévaudan (1650–1830). *Annales: Economies, Sociétés, Civilisations* 34: 721–43.
- Leonard, R. D. and G. T. Jones 1987 Elements of an inclusive evolutionary model for archaeology. *Journal of Anthropological Archaeology* 6: 199–219.
- Lewthwaite, J. G. 1986 Archaeologists in academe: an institutional confinement?, in J. L. Bintliff and C. F. Gaffney, eds., *Archaeology at the Interface*, pp. 52–87. British Archaeological Reports, International Series 300. Oxford: BAR.
- 1987 The Braudelian beaker: a Chalcolithic conjuncture in western Mediterranean prehistory, in W. H. Waldren and R. C. Kennard, eds., *Bell Beakers of the Western Mediterranean: Definition, Interpretation, Theory, and New Site Data*, pp. 31–60. British Archaeological Reports, International Series 331. Oxford: BAR.
- Mayr, E. 1982 *The Growth of Biological Thought: Diversity, Evolution, and Inheritance*. Cambridge, MA: Harvard University Press.
- Michels, J. W. 1973 *Dating Methods in Archaeology*. New York: Academic Press.
- Netting, R. McC., R. R. Wilk, and P. J. Arnould (eds.) 1984 *Households: Comparative and Historical Studies of the Domestic Group*. Berkeley: University of California Press.
- O'Neill, R. V., D. L. DeAngelo, J. B. Waide, and T. F. H. Allen 1986 *A Hierarchical Concept of Ecosystems*. Princeton: Princeton University Press.
- Plog, F. T. 1973 Diachronic anthropology, in C. L. Redman, ed., *Research and Theory in Current Archaeology*, pp. 181–98. New York: Wiley.
- 1974 *The Study of Prehistoric Change*. New York: Academic Press.
- Rathje, W. L. 1983 To the salt of the earth: some comments on household archaeology among the Maya, in E. Z. Vogt and R. M. Leventhal, eds., *Prehistoric Settlement Patterns: Essays in Honor of Gordon R. Willey*, pp. 23–34. Albuquerque: University of New Mexico Press.
- Redman, C. L., M. J. Berman, E. V. Curtin, W. T. Langhorne, Jr., N. M. Versaggi, and J. C. Wanser (eds.) 1978 *Social Archaeology: Beyond Subsistence and Dating*. New York: Academic Press.
- Rindos, D. 1984 *The Origins of Agriculture: An Evolutionary Perspective*. New York: Academic Press.
- Rudwick, M. J. S. 1985 *The Great Devonian Controversy*. Chicago: University of Chicago Press.
- Sabloff, J. A. 1986 Interaction among Classic Maya polities: a preliminary examination, in C. Renfrew and J. F. Cherry, eds., *Peer Polity Interaction and Socio-Political Change*, pp. 109–16. New York: Cambridge University Press.
- Santamaria, U. and A. M. Bailey 1984 A note on Braudel's structure as duration. *History and Theory* 23: 78–83.
- Schiffer, M. B. 1976a *Behavioral Archaeology*. New York: Academic Press.
- 1976b Review of *The Study of Prehistoric Change* by F. T. Plog. *American Anthropologist* 78: 182–4.
- 1985 Is there a "Pompeii premise" in archaeology? *Journal of Anthropological Archaeology* 41: 18–41.
- 1987 *Formation Processes of the Archaeological Record*. Albuquerque: University of New Mexico Press.
- 1988 The structure of archaeological theory. *American Antiquity* 53: 461–85.

- Segalen, M. 1986 *Historical Anthropology of the Family* (translated by J. C. Whitehouse and Sarah Matthews). New York: Cambridge University Press.
- Shanks, M. and C. Tilley 1987 *Social Theory and Archaeology*. Albuquerque: University of New Mexico Press.
- Smith, M. E. 1983 Postclassic culture change in western Morelos, Mexico: the development and correlation of archaeological and ethnohistorical chronologies. Ph.D. dissertation, Department of Anthropology, University of Illinois.
- 1987 The expansion of the Aztec empire: a case study in the correlation of diachronic archaeological and ethnohistorical data. *American Antiquity* 52: 37-54.
- 1989 The spatial organization of settlement at late postclassic sites in Morelos, Mexico, in S. MacEachern, D. J. W. Archer, and R. D. Garvin, eds., *Households and Communities: Proceedings of the 21st Annual ChacMool Conference*, pp. 450-9. Calgary: The Archaeological Association of the University of Calgary.
- Smith, M. E., P. Aguirre, C. Heath-Smith, K. Hirst, S. O'Mack, and T. J. Price 1989 Architectural patterns at three Aztec-period sites in Morelos, Mexico. *Journal of Field Archaeology* 16: 185-203.
- Snow, D. R. 1989 The evolution of Mohawk households, A.D. 1400-1800, in S. MacEachern, D. J. W. Archer, and R. D. Garvin, eds., *Households and Communities: Proceedings of the 21st Annual ChacMool Conference*, pp. 293-300. Calgary: The Archaeological Association of the University of Calgary.
- Stoianovich, T. 1976 *French Historical Method: The Annales Paradigm*. Ithaca, NY: Cornell University Press.
- Thomas, D. H. 1979 *Archaeology*. New York: Holt, Rinehart, and Winston.
- Toulmin, S. and J. Goodfield 1965 *The Discovery of Time*. Chicago: University of Chicago Press.
- Tourtellot, G. 1983 An assessment of Classic Maya household composition, in E. Z. Vogt and R. M. Leventhal, eds., *Prehistoric Settlement Patterns: Essays in Honor of Gordon R. Willey*, pp. 35-54. Albuquerque: University of New Mexico Press.
- Trigger, B. 1984 Archaeology at the crossroads: what's new? *Annual Review of Anthropology* 13: 275-300.
- Walker, I. C. 1972 Binford, science, and history: the probabilistic variability of explicated epistemology and nomothetic paradigms in historical archaeology. *Conference on Historic Site Archaeology Papers* 7 (3): 159-201.
- Watson, P. J., S. A. LeBlanc and C. L. Redman 1971 *Explanation in Archaeology: An Explicitly Scientific Approach*. New York: Columbia University Press.
- Wilk, R. R. and W. Ashmore (eds.) 1988 *Household and Community in the Mesoamerican Past*. Albuquerque: University of New Mexico Press.
- Wilk, R. R. and W. L. Rathje (eds.) 1982 Archaeology of the household: building a prehistory of domestic life. *American Behavioral Scientist* 25 (6).
- Willey, G. R. and J. A. Sabloff 1980 *A History of American Archaeology*, 2nd edition. San Francisco: W. H. Freeman.
- Yanagisako, S. 1979 Family and household: the analysis of domestic groups. *Annual Review of Anthropology* 8: 161-206.

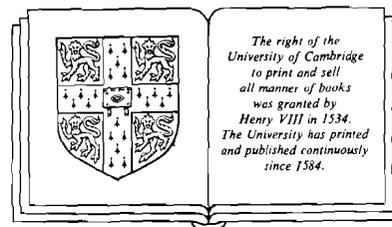
Archaeology, *Annales*, and ethnohistory

Edited by

A. BERNARD KNAPP

Macquarie University, Sydney

1992



CAMBRIDGE UNIVERSITY PRESS

Cambridge

New York Port Chester

Melbourne Sydney