

Anthropological Archaeology in theory and practice

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Introduction: what is Anthropological Archaeology?

Anthropological archaeology is distinguished by its focus on culture as the central object of study. In common with much of anthropology generally, its ultimate goal is the explanation of similarities and differences in human culture, through time and over space. Culture is a group-level phenomenon, traditionally seen as the central organizing concept of all anthropology, although as the concept of culture gradually has become more and more divorced from the realities of human social and material life, some currently grieve the «self-destruction of a once-respected, learned discipline» (Douglas, 1999). This focus distinguishes anthropological archaeology from other approaches that focus, variously, on behavior, the individual, technology, etc.

Anthropological archaeology has developed primarily in the New World, and is typically, although certainly not exclusively, an American approach to the field. Within this perspective, archaeological materials are seen less as a body of data to be described and interpreted, and more as a source of information on the changing patterns of organization of human life, under varying conditions and through time in the past. It is these patterns, then, which become the phenomena in which we are interested and which we ultimately wish to explain.

In short, archaeological reconstructions, rather than being the end result of research, form the starting point, the data, for an anthropological description and interpretation. This is why research on the development of principles of archaeological analysis and interpretation aimed at the reconstruction of the organization of prehistoric behavior so often now is termed 'middle range theory', to contrast it to the theoretical and methodological concern with understanding such behavioral organization once it is reconstructed.

Perhaps the contrast with a non-anthropological approach to archaeology can be illustrated by comparing the 'levels' of archaeological description, reconstruction, and explanation as seen by Gardin (1980) with those that typically might be recognized in an anthropological approach, as in this paper (Fig. 1).

In what follows, I will not attempt to provide a comprehensive overview or assessment of anthropological archaeology today, in all of its many guises. Instead, I will attempt to

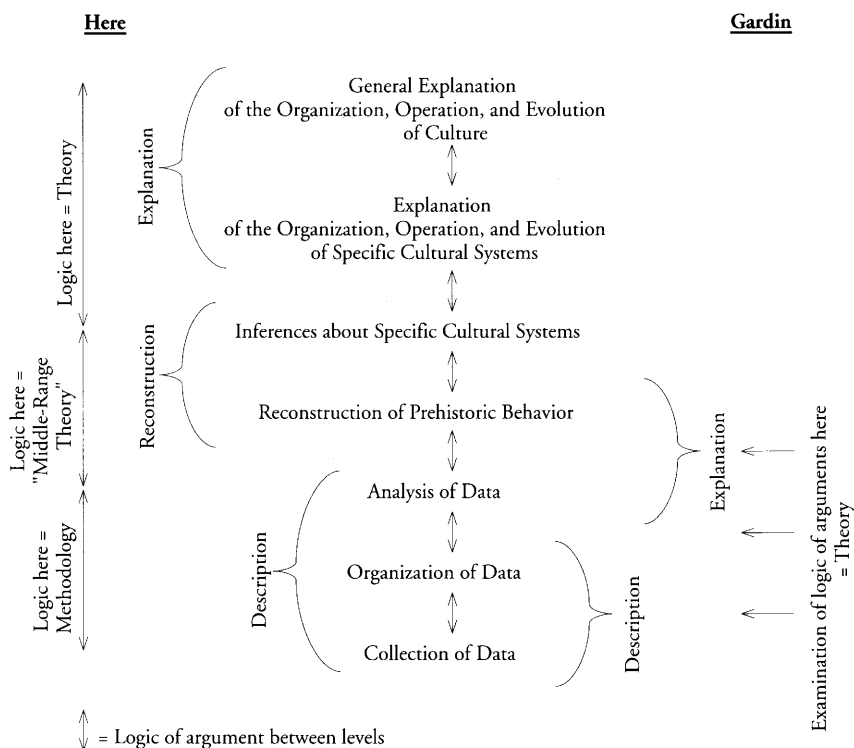


Fig. 1 - Schematic outline of the Gardin's (1980) characterization of the structure of archaeology, compared to that used in this paper.

sketch an outline of what I see to be the main aspects of this approach to archaeology and to lay out what I see as some of its critical theoretical and methodological bases.

Historical background

Anthropological archaeology is a characteristically American approach. This is largely because of the history of the development of archaeology as a discipline in the United States, where archaeology has been seen virtually from the beginning as a study of past human societies or cultures. Seldom, if ever, has it been characterized by a primary focus on prehistoric artifacts or technology, and so cannot be said to have passed through an early stage of 'antiquarianism' as in the development of European archaeology (Daniel, 1967).

In large part, early interests in archaeology in America came from direct contact with Indians and the consequent curiosity about their history and their remains. Although much of the early work in archaeology, particularly in the 19th century, was carried out in a spirit of exploration, discovery, and description, some was undertaken to solve specific culture-historical problems, for example, the question of who the 'mound builders' were. Virtually all, however, was undertaken in some direct relation with ethnology and ethnological societies or institutions, e.g.:

– E. G. Squier & E. H. Davis's work leading to the publication of *Ancient Monuments of the Mississippi Valley* (1848), the first major contribution to classification and description of North American archaeological materials, was supported by the American Ethnological Society, which corresponded with them in the field and helped arrange the publication of the monograph.

– The Bureau of Ethnology (founded in 1879 as a branch of the Smithsonian Institution, renamed the in 1894), fielded major archaeological surveys and excavations, and published enormous *Annual Reports* covering ethnology, linguistics (folklore), and archaeology. For example, it was mandated in 1882 by the U.S. Congress to spend \$5000/year on mound studies (Willey & Sabloff, 1974:49), and this tradition continued into the 1950's with the 'salvage archaeology' of the River Basin Surveys.

– An archaeologist, William Henry Holmes, whose major work was on prehistoric ceramics and stone tools, including many early classificatory studies, succeeded the famous explorer of the Southwest, John Wesley Powell, as director of the Bureau of American Ethnology in the early part of the 20th century (Willey & Sabloff, 1974:56).

This early work, although typically done under the aegis of an anthropological or ethnological organization, was often done by people trained in other fields such as zoology or geology. Professional archaeological work later began to be carried out by people trained in anthropology. In fact, the earliest quantitative seriation of prehistoric ceramics was made by A. L. Kroeber, one of the great names in American anthropology generally (Kroeber, 1916). However, individuals from other scientific disciplines, such as biology (e.g., H. S. Colton in the Southwest) also joined the developing field.

Thus, although anthropological archaeology often is considered to be a relatively new trend or perspective in the field (the *Journal of Anthropological Archaeology* began only in 1982), the link between archaeology per se and anthropology as a whole dates back essentially to the beginnings of the discipline in the United States. In spite of the common tendency to see anthropological archaeology as tied to the emergence of the 'New Archaeology,' with its leitmotif of «Archaeology as Anthropology» (Binford, 1962), the New Archaeology itself was an outgrowth from a tradition in which archaeology was seen as an integral part of anthropology as a whole, in which it could be adamantly stated that «American archaeology is anthropology or it is nothing» (Willey & Phillips, 1958:2).

This history has led to the prominence of two main themes in American archaeology:

1) Its relation to anthropology. The institutional relationships - that prehistoric archaeology is virtually always taught in Departments of Anthropology - indicate the close intellectual relationship to ethnology and social anthropology, both in archaeology's extensive referencing of substantive data from ethnography and in terms of theory - for example, Leone (1972:16) has characterized American archaeology as always being one step (paradigm) behind social anthropology.

2) A rigorous 'scientific' approach. This has always involved a strong emphasis on self-awareness and an explicit concern with theory and method (not only had individuals from generally acknowledged 'scientific' disciplines contributed much to, and frequently joined archaeology in its formative days, but anthropology generally considered itself throughout this period, and until relatively recently, also to be a science.)

The first of these themes has led to the characteristic focus of anthropological archaeology on culture as the central object of study, and on culture history as the

first goal of reconstruction in the practice of archaeology. The second theme has conditioned significantly the specific methodology of the field.

Culture

In discussing cultural systems, we must distinguish between several concepts, among them: culture, behavior, population, society, and group.

Culture and behavior

To begin with, behavior is what people do. However, what people do is patterned. There are regularities to the behavior of any individual and in the behavior of any group of people, and it has been suggested sometimes that culture or cultural patterns are nothing more or less than these behavioral regularities. There even has developed a school of behavioral archaeology, under the assumption that what we should study is, indeed, these behavioral regularities (e.g. Schiffer, 1976). However, in the perspective taken here, behavior, even regular and patterned behavior, does not equal culture, for several reasons:

- patterned behavior is characteristic of every living species; clearly what is important here is not that behavior is regular or patterned, but the basis for that patterning - where it comes from, rather than its simple existence;
- not all behavior is 'cultural' in the sense of being learned, non-instinctive;
- not all behavior is compatible with the cultural system, and there are a series of rules in all cultures to control or eliminate aberrant, disruptive, or deviant behavior;
- and, most importantly, other things besides behavior must be included in a definition of culture if it is to help us as a concept to understand the organization and operation of the typically human mode of adaptation, both to the outside world, beyond the human group, and among individuals within any group;
- there are the material components of culture (particularly of interest to us as archaeologists, of course);
- there are the 'ideological' components of culture (beliefs of all sorts, oral traditions, myths, etc.);
- there is language, which, although it sometimes has been seen as more of a prerequisite than as a component, nonetheless must be included as an integral part of the cultural system from our point of view;
- and, finally, there are the 'rules' of interrelationship among all these things - including behavior, whether it is related to the material social, or ideological sphere of activities.

The relationship between behavior and culture is thus a partial, but very important one. Culture generates behavior by providing the necessary shared knowledge and the 'rules' for using that knowledge in most situations and circumstances.

This does not mean, of course, that all behavior is cultural. Idiosyncratic and instinctive behavior also exist in humans. Instinctive (genetically controlled) behavior obviously will be patterned, that is regular and predictable, and even idiosyncratic behavior may often be so also for any given individual. Therefore, the study simply of behavior in itself may not be the most reliable way to study prehistoric culture. Behavior has multiple origins, and to study it is not necessarily to study a unitary phenomenon, even though culture seems clearly to be the primary driving and conditioning force behind human behavior.

The locus of culture

The locus of culture, as we understand it anthropologically, cannot be the individual. In even the organizationally simplest systems observable today, no individual knows all the elements or all the proper interrelationships among elements that comprise the cultural system. Individuals therefore are incapable of reproducing (perpetuating) culture by themselves. Thus, the cultural system cannot reside in the individual.

Instead, individuals participate in cultural systems, and they do so differentially (Binford, 1965:205). This has also been phrased in terms of the degree to which individuals share in the pool of knowledge which characterizes a culture, «The central idea is the use of the pattern of agreement or consensus among informants to make inferences about their differential knowledge of the shared information pool constituting culture» (Romney, Weller & Batchelder, 1986:165).

Culture, then, is a group phenomenon. The cultural system resides in the human group. This, however, is not necessarily the co-residential group, nor is it necessarily the language (or dialect) group, although both may be the case in particular instances, and it certainly need not be the biological (breeding) population. The cultural system seems rather to be a quasi-independent unit, whose relation to other social, linguistic, demographic, etc. units must be established empirically in particular cases. We presently do not know what factors determine the relationships between cultural systems and these other units. It is a question that has been little studied directly. In the case of small-scale, organizationally simple, hunter-gatherer systems, the cultural system is typically seen to be regional in scope. This is not an absolute given in all cases, however, and, in fact, there typically exists a hierarchy of more and less inclusive systems, among which it is difficult to choose a single level and say that it represents the cultural system in that instance.

Culture as a system

A system consists of a definable and delimitable set of parts that has a structured or organized set of interrelationships among those parts. Culture consists also of a number of 'parts' (e.g. specific beliefs, particular social behaviors, various technologies, material items used in all aspects of life, etc.), as well as the systematic interrelationships among them. Culture thus may be seen as a system in its composition and organization.

As in all systems, culture is more than just the sum of its parts. We thus see, once again, why a sole concentration on behavior alone is unlikely to be an adequate approach to understanding culture. In this respect, we may look also at the difficulties, and frequent dead ends, into which approaches that concentrated on reducing culture only to lists of traits have run in their efforts to reconstruct and understand individual cultures, culture history, and the associations among culture elements (e.g. the «culture element surveys» - Klineck, 1935; Kroeber, 1936; Driver & Massey, 1957; etc., eventually evolving into the Human Relations Area Files - Murdock, 1982).

An additional quality of cultural systems is that they are open systems, that is, there are important interrelationships between any cultural system and the environment in which it exists. In terms of system-environment interactions, there are three major variables that culture is organized to procure, circulate, consume, and return to the environment: matter, energy, and information. These are required by the system, and by the population that carries and reproduces a cultural system, for their survival and propagation. In other words, culture may be seen as an open system, or, in Leslie Whites (1959:8) well known terms, as «man's extrasomatic means of adaptation.»

A hierarchy of systems

So far we have spoken of 'culture,' 'the cultural system,' etc. as though these were unitary phenomena which occur at some single level or scale. In reality, however, there are many levels of system organization that may be called cultural, and these form a hierarchy of more or less inclusive systems. In fact, it is in the nature of culture, being a group phenomenon, that cultural systems should exhibit a hierarchical structure of greater to lesser inclusiveness or scale. (Note here that hierarchical levels of inclusiveness must not be confused with levels of cultural complexity.)

At some level in this hierarchy there typically is a correlation with some linguistic group (language or dialect), and this perhaps is the level most often recognized ethnographically, or anthropologically, as 'a culture,' although anthropologists often also recognize and discuss 'sub-cultures' within a 'culture' proper. In large-scale, complex cultural systems, such as modern nation-states, 'sub-cultures' frequently appear as dialectical groups, with a higher-level, 'standard' language defining the larger 'culture.'

In small-scale, organizationally simple cultural systems (bands, tribes), however, it seems more common that dialects mark the 'cultural' group as recognized ethnographically. From one point of view, of course, an essentially linguistic definition as usually used by the ethnographer makes good sense if we remember the central role and importance to cultural systems of the obtaining, circulating, and use of information. (At the level of language families, however, there seems to be little or no correlation with cultural systems at any level, and the distribution of individual languages making up such families seems more likely related strictly to historical and not organizational factors.)

Even in these small-scale, organizationally simple societies, though, a clear hierarchy of groups/systems must be recognized, ranging from the locally independent 'family' group to the regional system. In any specific case, this hierarchy can be more or less complex, but the important point is that there are 'cultural' systems that be identified and studied at levels both above and below that of the 'cultures' typically recognized and studied ethnographically and anthropologically.

Among organizationally simple hunter-gatherers, the boundaries between different 'cultures' at most, or all, hierarchical levels are generally blurred and not clearly defined. Such boundaries are defined relatively, by differences in the rates of interaction, exchange, movement, etc. across them as compared to within groups (cf. Birdsell, 1958:200).

However, while changes in rates of interaction generally seem to define observable boundaries between systems at any given level of inclusiveness, the geographical distributions of many aspects of culture do not necessarily correspond among small-scale, hunter-gatherer systems. There is thus no regular correlation among the distributions of language, material culture and technology, style, kinship ties, ideology, etc. All typically exhibit differential, overlapping and crosscutting geographical distributions. Only at the highest level of inclusiveness, or at the level of the regional system, may we begin to see some tendency for such correlation, which perhaps accounts in large part for the apparently usual correspondence between archaeologically defined 'cultures' and regional systems of simple, hunter-gatherer groups.

Ethnographic cultures and archaeology

Therefore, we must recognize the likelihood that what are recognized as archaeological 'cultures' in the case of simple, hunting-gathering groups probably are not equivalent to the systemic level that most often is recognized and described as a culture in ethnography and anthropology. Archaeological methodology, focused primarily on technological and/or stylistic traits and their distributions, undoubtedly works so as to produce this result,

and archaeological 'cultures' very likely, therefore, most often are representative of higher-level, perhaps most usually regional, groups. This, in itself is not a problem if recognized clearly, but it must be kept very much in mind when considering that most of the presently available interpretive models, especially analogical models, used in archaeology have been taken from the level of 'ethnographical' cultures and not from the level of regional systems.

From the systemic, adaptive, and evolutionary point of view, it often will make more sense, and result in greater understanding and explanatory potential, to focus attention and analysis at levels other than that typically and traditionally recognized by ethnographers and anthropologists. A critical point in the case of small-scale societies is that such traditionally recognized groups often will be seen not to be viable systems over the long term without the existence of the higher-level groups of which they are a part. Hunter-gatherer bands, for example, typically can not exist over the long run in the absence of the regional systems in which they participate. (And to carry this example into a more modern context, of course, even present-day nation-states can not survive as such without the existence of the 'world system' in which they are inextricably embedded.)

In dealing with a multi-level hierarchy of units such as this, the systems concept is essential. If one takes only the system elements at any level and treats them as isolated traits for the purposes of studying geographical distributional patterns or for the comparison of social groups ('cultures'), one typically finds a bewildering array of overlapping, crosscutting distributions and associations. This problem, familiar from many archaeological and some social anthropological studies (e.g. Klimek, 1935; Kroeber, 1936), underscores the fact that systems consist of more than the sum of their parts. One of the few ways, perhaps the most fruitful one, to bring sense and understandable order out of such situations is to recognize the critical importance of systems, that is organizations of traits in which interrelationships are as or more important than the traits (elements) themselves, and their hierarchical organization at levels of greater to lesser inclusiveness.

The biological population

Cultural systems, being phenomena proper to human groups, clearly are dependent upon the existence and maintenance of a human population. However, it is important to recognize that the biological, i.e. interbreeding and reproducing, population is not necessarily or usually identical to the cultural system at any level. The relationship between the biological population and cultural systems may be complex, and it varies among cultural systems of different degrees of complexity.

Among small-scale, organizationally simple societies, the demands of biological population processes - reproduction and maintenance - frequently impose some significant constraints and requirements on the cultural systems involved, such as the maintenance of breeding relationships among a group of people large enough to constitute a minimum equilibrium size population (cf. Wobst, 1974). Therefore, these biological processes often must be accommodated in the organization and operation of such cultural systems to assure the viability of the human population, and thus, of course, the cultural system itself with it.

Culture in animals

Recent studies of primates and other animals, however, have shown beyond doubt that other species also exhibit sometimes significant degrees of learned behavior that is transmitted from generation to generation within specific social groups. Thus, many of

the things that in the past frequently were taken to be unique to man and human culture are present in other animal species as well. Group-specific patterns of non-genetic, learned behavior, behavioral means for the transmission of this behavior and of other information, tool-making, etc. Do such species «have culture»? It is becoming more commonly argued now that they do (Whiten et al., 1999). However, they apparently lack 'ideology,' and certainly they lack language, even though some rudimentary capacity for learning symbolic representation of concepts is present in some. And, of course, we still observe that the great majority of their behavior is under genetic control and is species - rather than group-specific. Do such species, then, have a partial or 'proto-cultural' system?

This is not just a frivolous question or a straw man. So far in both anthropology (ethnology) and archaeology we have defined culture essentially on the basis of what we have observed about cultural systems known to us both ethnologically and sociologically today. By analogy, we extend this general picture of culture into the past. However, when we extend it far enough into the past, we gradually lose more and more of the behavioral, and material, elements that are universal in cultural systems as they have been defined in the present. Eventually, very early in the hominid line, there remains biological (anatomical) evidence for significant changes in the direction of typically human physical characteristics (e.g., bipedalism), but there is no material evidence at all for 'cultural' behavior.

Genetically programmed vs. cultural behavior

There have been, of course, long-standing and long-running debates on the respective and relative roles of «nature vs. nurture,» «nature vs. culture,» etc. with respect to human behavior, a number of which have dealt directly with the questions of the evolutionary origins of man and human culture. Most of these, however, have been very focused, polemical, and tendentious (e.g. Ardrey, 1976), and have avoided the interesting and serious questions of when, in what stages, with what consequences, and why genetically programmed behavior was increasingly replaced by culturally organized behavior.

From our perspective, one of the distinctive and most important results was ever-increasing behavioral and organizational plasticity, to the extent that probably all significant human behavioral complexes, and certainly all aspects of overall group organization of behavior, are organized today, and as far back as we know historically, by cultural systems. Although certain individual behaviors may still be instinctive, even they may be modified considerably by culture. As a consequence, the organization of human behavior is group-specific, not species-specific.

This allows a much greater flexibility in the evolution of adaptive behavior in an exceedingly wide variety of environmental circumstances, now encompassing virtually every environment of the globe. It allows, also, much more rapid rates of evolutionary change, with significant, fundamental shifts being attainable on a generation-to-generation basis, and in some cases perhaps even more rapidly. Finally, culture provides possibilities for increasing the quantities and rates of acquisition, circulation, and use of matter, energy, and information from the surrounding environment to levels that can surpass and eventually entirely outstrip any innate, biological capacities of the species.

Adaptation and evolution

Adaptation happens through human behavior, of course. However, organized behavior is not isolatable from technological facts, social phenomena, or ideology, all of

which constrain, control, or condition behavior. Selection, the differential perpetuation of behavioral patterns, probably operates directly on more or less successful behavior on the part of the members of any cultural group, but it is the cultural system that evolves. It is culture itself (which creates and organizes behavior) that must evolve (change) if new rules or principles by which behavior is guided are to emerge.

From another perspective, compelling arguments in biology and paleontology have been made that there must exist a hierarchy of units of selection in nature (Lewontin, 1970). Any unit that exhibits characteristics distinctive at its level of organization, that reproduces regularly over time, and that shows variability among individual units at that level that may confer advantages or disadvantages in reproduction will be subject to selection and evolve. Culture, being a group phenomenon in which individuals participate differentially, and which therefore cannot be reduced only to the sum individuals within it, must by the same token therefore be a unit subject to selection and evolution above the level of the individual.

In viewing cultural systems as independent phenomena at any particular organizational level, we must consider the adaptive advantages and disadvantages of various elements and organizational features of such systems, which place them subject to selection, leading to evolutionary change in culture as such, above and beyond the separate individuals that may participate in these systems.

System operation vs. system change

The above raises a critical point, however, which is that one must not confuse behavioral variability under changing circumstances (environments) with systemic change (evolutionary, or, eventually, 'devolutionary' change). A cultural system does not consist of a series of specified, fixed, and immutable behaviors. It consists, rather, of rules or principles (decision rules, or organizational principles) that guide or generate behavior in response to environmental conditions or situations. Cultural change occurs, thus, when these rules or principles determining behavior change. Such changes are most likely to occur when the range of behaviors generated by the existing rules proves to be inadequate or less effective than other potential behavior under conditions of stress (due to environmental fluctuations and/or competition). Adaptive change thus means systemic change.

Such changes may represent continuing adaptation of a human group to its environment, without effective change in the organizational complexity of the group. However, they may lead in various circumstances to the development of either higher or lower levels of organizational complexity (the latter sometimes offhandedly referred to as 'devolution'). All three of these possible long-term developmental outcomes may be seen as adaptive for a human group under different circumstances. The global, long-term trend towards the emergence of increasingly large and complex human societies is the result of the generally greater capacity of organizationally more complex systems to extract, circulate, and utilize matter, energy, and information from their environments.

In terms of the rules, or organizing principles, of cultural systems, a distinction of importance must be made between the proximate causes of behavior, which are those rules known to, and in terms of which, people in the system actually behave, and the ultimate causes of behavior, which are the fundamental principles in terms of which specific, proximate causes are organized. The difference typically exists because of various limitations to the perception and control of information in such systems and also because of various psychological factors involved in human behavior and its development in the individual and the social group. Typically, both perceptual limitations and psychological factors are intermingled in any particular case. This

difference between proximate and ultimate causes does not alter the principles of evolutionary change through selection, but simply reflects the nature of cultural mechanisms for generating and maintaining behavior.

Just as individuals participate differentially in their cultural systems, the different elements or aspects of culture generate (guide, or condition) behavior with different degrees stringency, i.e. they are embedded in the individual differentially, in more or less compelling ways:

- some are purely learned, technical, and are held with relatively little tenacity (although even there often are difficulties in trying to modify learned techniques);
- some are thrust on the individual by virtue of his/her position in the system, particular circumstances, etc. (ranging from kinship obligations to, in a modern situation, conscription into military service), in which various cultural sanctions work towards compelling certain behavior;
- some are held with moral persuasion, are based on cultural values;
- some are held through (supernatural) belief, are sacred; etc.

These differences are relatively seldom considered but are, in fact, critical to understanding not only the organization and operation of cultural systems, but also their potential for evolutionary change and the rates of such change. In a less obvious vein, the adherence to certain behavioral patterns through blind (non-rational) belief may, in many instances, be seen as a component in adaptive behavior, where rational control is beyond the informational capacities of the cultural system (cf. Minc, 1986).

In considering cultural systems as adaptive systems, it is important also to remember, first, that not all system functions (elements and organization) are oriented toward directly coping with the external environment, that many are related to internal functions of regulation, integration, and control, and, second, that the external environment consists both of the natural world and the social environment of surrounding human population and cultures.

Understanding culture as an adaptive system requires, however, frequent abstraction from specific elements or characteristics, both of the cultural system and of the environment, to variables that bear a relation to matter, energy, and information and to their procurement, control, circulation, and consumption.

Methodological implications of an Anthropological perspective

The theoretical framework of anthropological archaeology differs significantly from the evolutionary and ecological approaches of other disciplines in its focus on a group-level entity-culture. Given this, the important locus of selection is the group rather than the individual, as in evolutionary ecology proper applied to human societies. Further, the process of cultural selection differs from the process of selection on reproductively varying individuals, largely because of the differences between biological and cultural transmission of (positively and negatively) selected features. Together, these differences create a distinctive cultural evolutionary paradigm within an ecological context that uniquely characterizes anthropological archaeology not only in theory but also in practice.

Given the distinctive paradigm of an anthropological archaeology, we now must consider its implications for the logic of investigating archaeologically the nature, and eventually evolution, of past cultural systems. Methodologically, an anthropological approach to the explanation of cultural similarities and differences, including in the case of archaeology especially similarities and differences over time, has been based

largely on the comparative method, meaning controlled comparisons of cultures in varying contexts.

In the first place, we must note that analogy is indispensable in at least the initial stages of this process. Analogy is normal to all science in this role of building first models. If these first models are based on only a limited number of variables, we tend to speak in these early stages of the establishment of empirical regularities, which then may be projected onto unknown situations, in this case into the past. If models are based on a large number of interrelated variables, they can be seen as systemic models.

This does not mean, of course, that direct application, or imposition, of any analogy is justifiable or useful, even in these later periods. It certainly is realized by now that the use of analogy is fraught with pitfalls, and that the best and most appropriate uses of analogy are heuristic and not explanatory. The only serious exception to this may be in those cases where the 'direct historical approach' is applicable, and a continuous link may be traced between archaeological remains and extant or historically known cultures from which analogies are drawn. In the great majority of cases, however, such direct links are nonexistent, and we must be constantly aware not only of the possibilities of false analogy, but also of the real possibility that the prehistoric cultural systems which we are trying to reconstruct have no direct analogs in the ethnographic present. The tendency to assume that ethnography and history present to us the full range of possible cultural variability, such that all prehistoric materials may be understood by comparison to one or another ethnographically known culture (in caricature, the tendency to see the people of the Upper Paleolithic as a bunch of prehistoric Bushmen, or Eskimos, etc.) has been dubbed the 'tyranny of the ethnographic record' (Wobst, 1978).

At first, we may build a specific model for each empirically observed case, producing a large number of descriptive models for these cases. From experience with these, and from ordering and comparing them, we start to acquire some ideas about how these models will normally tend to look in certain kinds of situations or about recurrent similarities among models under certain circumstances. On this basis, we typically next begin to create typologies, that is series of general models representing frequently occurring patterns, to which specific cases are assigned categorically. The familiar classification of cultural systems as bands, tribes, chiefdoms, and states (Service, 1971) is a good example of such typological thinking. Typologies are important first steps in reducing the enormous variability of empirical observations to a more readily grasped and comprehended representation.

The next step, however, is to go beyond the typological stage to an understanding of the critical, relevant variables and the nature of the interrelationships among them in these models. Note that this is, in effect, an approach to a more direct representation and understanding of systems, which are defined as a set of elements (variables) and their interrelationships. If, in this process, we are able to identify ultimate causes/variables as opposed to proximate causes/variables (see above), we will be able to move from descriptive models, tied to the specifics of observed cases, to analytical models, applicable to a wide range of cases, both completely and incompletely observable. Proceeding beyond typological thinking to the level of analytical models therefore is essential if we hope to develop an ability to model incompletely known, in this case past, systems.

At this level of modeling we still may see a series of recurrent organizational forms, or points of system stability, which had been recognized previously as 'types,' but which now can be defined as consequences of the nature of the systems involved or of their being found repeatedly in similar environmental circumstances.

In proceeding thus from direct analogies to an eventual control (understanding) of relevant variables and their interrelationships, the critical mental process is

abstraction. We abstract from the specific elements of particular cultural systems and their environments to arrive at general descriptive models (typologies), and we abstract further from the proximate variables in these models to ultimate variables as we move to the level of analytical models. This is, in effect, a movement toward models based on variables that bear increasingly direct relationships to matter, energy, and information, or to their extraction, control, flow, and consumption, from less general models based on the particular manifestations of these elements and processes in specific cases.

The greatest danger in this process is in not thinking through the abstractions as they are developed to the realities behind them. This must not be construed, however, as a caution against abstraction in dealing with human cultural phenomena. It means that one must be careful not to build word pictures. One must, rather, continually make sure that abstractions accurately reflect and represent the critical and relevant features of the phenomena being modeled.

Abstraction is necessary to model at all, however, and to move to higher levels of generalization requires higher degrees of abstraction. Theory, when it eventually will be developed, must necessarily consist of a specification of the highest-order, abstract variables and of the precise nature of the interrelationships among them. Aside from a basic understanding that they will be in some way intimately related to the fundamental elements of matter, energy, and information, we have as yet only initial ideas of what form these ultimate variables will take and of how such theory will usefully be framed.

The initial stages of modeling prehistoric cultural systems appear relatively uncomplicated in the Upper Paleolithic and later periods. From near the beginning of the Upper Paleolithic, it is more or less certain that we are dealing with the archaeological remains of our own species *Homo sapiens sapiens*, or anatomically modern humans, and we seem to find in the archaeological record from this time forward evidence for all those elements that are familiar and characteristic of all ethnographically known human cultures, no matter how simple in organization or technology. In these circumstances, particularly given the evidence for all the elements known ethnographically to be present and essential in any human culture, it appears that we can feel relatively confident in our use of analogies at least as a starting point for various models, reconstructions, or interpretations.

The problem of 'proto-cultural' systems

However, while the «tyranny of the ethnographic record» may be a significant problem for the Upper Paleolithic and later cultures, it becomes an absolute tyranny for earlier periods, for which we know that the creators of the archaeological record were hominids who were different from us at either the sub-species or even at the full species level (and in some instances, perhaps even at the Generic level). A different species almost certainly means a different pattern of behavior, and the same is probably true for many sub-species as well (and different Genera would seem inevitably to be behaviorally different). In the case of the Paleolithic archaeological sequence, therefore, we must consider seriously that there are not only changes in behavioral patterns through the course of the sequence, but changes in the basis for behavior as well.

For very early periods, one typically starts looking at primates for useful heuristic analogies to early hominid behavioral complexes. However, it is equally clear that, at least from the first appearance of regular tool-making on, we are dealing here with something more than the equivalent of a contemporary primate pattern of behavior. Nonetheless, we seem to observe a striking absence of many of the

elements and characteristics that we universally expect from modern human cultures. The obvious conclusion is that we are dealing in these periods with what may best be called 'proto-culture,' something with which we are almost totally unprepared to deal.

In short, hominid development and the archaeological sequence from the Oldowan to the beginning of the Upper Paleolithic, covers a transition from minimal 'proto-culture' to 'full culture.' Thus, this long, earlier Paleolithic sequence becomes particularly interesting, for it must encompass the origins of what we now know as modern human culture. This means that it is not only especially interesting, but that it is also especially difficult to study. One cannot simply approach its study as another case of investigating cultural similarities and differences, which we presented at the outset as the essential goal of anthropological archaeology. Rather, one must consider this first in the context of asking to what degree the archaeological materials being studied are the product of culture.

Anthropological Archaeology for the deep past

Unfortunately, although we have relatively good ideas of what fully developed cultural systems consist of, we have at the moment only the vaguest of ideas about what might constitute any proto-cultural system. A pressing and absolutely critical problem for Paleolithic archaeology, particularly for the earlier periods, is to make some progress in specific definition of such systems, even if these definitions are, as they must be, purely hypothetical, and will be very liable to future modification and replacement.

Even for the initial stages of descriptive modeling, there are no analogs for proto-cultural systems. At the moment, we attempt to «work from both ends» (primate societies, ethnographic examples), but we actually have little or no idea what such 'intermediate' or 'proto-cultural' systems might look like. The archaeology of this earlier Paleolithic sequence therefore must be truly anthropological, in the sense that it must consider deeply the question of what is 'culture' itself and how and why did hominid populations develop from an essentially pre-cultural beginning into the essentially cultural species that we are today.

Proto-cultural systems clearly must have incorporated 'cultural behaviors,' that is, non-genetic, learned behavior. However, we must remember, first, that the degree or extent of such cultural determination of behavior is not a priori obvious or specifiable, and, second, that animal species closely related to us exhibit similar cultural behavior. Therefore, we are brought again to a realization that we must move from a consideration simply of behavior to consideration of the systems which generate behavior. We are not studying the evolution of cultural behaviors in and of themselves, but of the organization and operation of entire cultural systems.

The important point is that we be precise and concrete in our specification of the elements and their interrelationships that make up such possible models of proto-cultural systems. Here, perhaps, we can draw on analogies and parallels with an understanding of such elements and interrelationships both in primate and in modern, cultural systems. If one component of the evolutionary emergence of human culture is an increase in the number of elements comprising a cultural system and an increase in the complexity of the interrelationships among these elements, then comparative study and analysis of both primate behavioral systems and of hunter-gatherer band organization and operation should in some sense lay out the encompassing framework within which proto-culture lies.

As noted above, however, the key to success in modeling both this framework and the proto-cultural, evolutionary stages within it is to move from thinking in terms of specific elements of particular cultural systems and their environments to the more abstract definition of essential, underlying variables and an understanding of the relationships among these variables.

In this process, given the absence of any extant analogs to 'proto-culture', archaeologists concerned with developing an anthropological explanation of the evolution of human culture must realize that they will have to place absolute reliance on hypothetical models which can then be tested against the archaeological record. Such models may be built within a framework of understanding critical and essential variables and their relationships within both primate and human groups. However, the final model of any proto-cultural system will inevitably look like nothing that we now know.

Keywords - *Anthropology, Archaeology, Culture, Selection, Evolution.*

BIBLIOGRAPHY

- ARDREY, R. 1976 - *The Hunting Hypothesis: A Personal Conclusion Concerning the Evolutionary Nature of Man*. Athenaeum, New York.
- BINFORD, L. R. 1965 - Archaeological systematics and the study of culture process. *American Antiquity*, 31: 203-210.
- BIRDSELL, J. B. 1958 - On population structure in generalized hunting and collecting populations. *Evolution*, 12: 189-205.
- DANIEL, G. 1967 - *The Origins and Growth of Archaeology*. Galahad Books, New York.
- DOUGLAS, M. 1999 - Culture clash in American anthropology (review of *Culture: The Anthropologists Account*, by Adam Kuper). *Nature*, 400: 631-632.
- DRIVER, H. E. & MASSEY, W. C. 1957 - *Comparative studies of North American Indians*. Transactions of the American Philosophical Society, Vol. 47, Part 2, Philadelphia.
- GARDIN, J.-C. 1980 - *Archaeological Constructs: An Aspect of Theoretical Archaeology*. Cambridge University Press & Éditions de la Maison des Sciences de l'Homme, Cambridge & Paris.
- KLIMEK, S. 1935 - *Culture Element Distributions: I The Structure of California Indian Culture*. University of California Publications in American Archaeology and Ethnology Vol. 37, No. 1, pp. 1-70.
- KROEBER, A. L. 1916 - *Zu-i Potsherds*. American Museum of Natural History, Anthropological Papers Vol. 18, Part 1, New York.
- KROEBER, A. L. 1936 - *Culture Element Distributions: III Area and Climax*. University of California Publications in American Archaeology and Ethnology Vol. 37, No. 3, pp. 101-116.
- LEONE, M. P. - 1972 Issues in anthropological archaeology. In *Contemporary Archaeology*, edited by Mark P. Leone, pp. 14-27. Southern Illinois University Press, Carbondale and Edwardsville.
- LEWONTIN, R. C. 1970 - The units of selection. *Annual Review of Ecology and Systematics*, 1: 1-18.
- MINC, L. D. 1986 - Scarcity and survival: the role of oral tradition in mediating subsistence crises. *Journal of Anthropological Archaeology*, 5: 39-113.

- MURDOCK, G. P. 1982 - *Outline of Cultural Materials* (5th rev. ed.). Human Relations Area Files, Inc., New Haven, CT.
- ROMNEY, A. K., WELLER, S. C. & BATCHELDER, W. H. 1986 - Culture and consensus: a theory of culture and informant accuracy. *American Anthropologist*, 88(2): 313-338.
- SCHIFFER, M. B. 1976 - *Behavioral Archaeology*. Academic Press, New York.
- SERVICE, E. R. 1971 - *Primitive Social Organization: An Evolutionary Approach*. (2nd edition). Random House, New York.
- WHITE, L. A. 1959 - *The Evolution of Culture*. McGraw-Hill, New York.
- WHITEN, A., J. GOODALL, W. C. MCGREW, T. NISHIDA, V. REYNOLDS, Y. SUGIYAMA, C. E. G. TUTIN, R. W. WRANGHAM, & BOESCH, C. 1999 - Cultures in chimpanzees. *Nature*, 399: 682-685.
- WILLEY, G. R. & PHILLIPS, P. 1958 - *Method and Theory in American Archaeology*. University of Chicago Press, Chicago.
- WILLEY, G. R. & SABLOFF, J. A. 1974 - *A History of American Archaeology*. W. H. Freeman & Company, San Francisco.
- WOBST, H. M. 1974 - Boundary conditions for Paleolithic social systems: a simulation approach. *American Antiquity*, 39: 147-178.
- WOBST, H. M. 1978 - The Archaeo-Ethnology of Hunter-Gatherers or the Tyranny of the Ethnographic Record in Archaeology. *American Antiquity*, 43: 303-309.