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Behavioral Archeology

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are in a state of fatigue-induced cease-fire rather than one of peace. The reintroduction of archaeology as a discipline must receive top priority, and with it must come the resolution of the problems left unsolved by the processualists.

BEHAVIORAL ARCHEOLOGY

Behavioral archeology is the particular configuration of principles, activities, and interests that we offer to reintegrate the discipline (Reid, Schiffer, and Rathje n.d.). The formulation and realization of a behavioral archeology depends on making explicit the multiple roles of laws in archeological research, and on showing how the strategies of a behavioral archeology, whether they emphasize the use or discovery of laws, are interrelated. In this work, the term “law” is used frequently, and a working definition is therefore needed.

Philosophers of science employ “law” as a technical term to denote certain relational statements having empirical content. Nagel (1961) refers to these principles as “experimental laws,” while Hempel (1966) uses the designation “covering law.” In applications of these terms, no connotations of immutability or compulsion inhere. Laws are simply one kind of relational statement, which function (in conjunction with other information) to explain or predict empirical phenomena. Statistical and probabilistic laws are, of course, encompassed by this formulation (see Salmon 1971). In this work, the philosophical perspective on laws is maintained. A law is an atemporal, aspatial statement relating two or more operationally defined variables. Because many relational statements in archeology possess these properties and also function to explain and predict empirical phenomena, the appropriate designation for these principles is laws. This usage naturally leaves ample room to subject all such relational statements to discussion, restating, or, in many cases, extraction from the archeological literature and initial testing.

Reid, Rathje, and I (Reid 1973; Reid, Rathje, and Schiffer 1974; Reid, Schiffer, and Rathje n.d.) propose that the subject matter of archeology is the relationships between human behavior and material culture in all times and places. The kinds of questions that can be asked about these relationships form the framework of a behavioral archeology consisting of four strategies. These strategies, defined on the basis of question type, are displayed in Figure 1.1.

Strategy 1

This strategy is concerned with using material culture that was made in the past, to answer specific descriptive and explanatory questions about the behavioral and organizational properties of past cultural systems. For example, one might ask: What was the average population of Grasshopper Pueblo between A.D. 1275 and 1400? When was the Eva Site occupied? What plant and animal resources were exploited by the Upper Pleistocene inhabitants of Tabun? Why was there a decrease in dependence on agriculture in the Hay Hollow Valley from A.D. 1200 to A.D. 1300? Such questions, bound to specific time-space loci, form the basis of archeology as it has been practiced traditionally, whether it is prehistoric, classical, or historical.

It should be emphasized that, although particular questions deal with both description and explanation of past events and system properties (Binford 1962a), explanatory goals have come, properly, to dominate studies of the past (Willey and Sabloff 1974). As archeologists grappled with the nature of explanation, they found it necessary to draw on a wide variety of behavioral laws to facilitate documenting and explaining past events. Regardless of whether or not one subscribes to the Hempel–Oppenheim model of explanation, the emerging importance of laws in archeology is apparent.

Archaeologists working within Strategy 1 are law users (Binford 1968; Spaulding 1968; Trigger 1970; Stickel and Chartoff 1973; Fritz and Plog 1970; Watson, LeBlanc, and Redman 1971; Schiffer 1972a, n.d.a). Some fail to recognize this fact, yet proceed, nonetheless, to make ad hoc generalizations that function as laws. It usually is argued that the laws used in Strategy 1 derive from ethnology or other social sciences (Trigger 1970), and it is now quite fashionable to discuss the interrelationship of archeology and ethnology (Chang 1967), even though this relationship is said to involve a one-way flow of laws into archeology. While it is certainly true that some archeologists use laws that originated in other disciplines, especially ethnology, it is not true that all archeological laws are borrowed (Schiffer n.d.a). Many archeologists have recognized that a science is likely to generate only the laws for which it has a use. Consequently, there is no reason to expect that ethnology, or any other discipline, has produced, or can produce, all the laws required to describe and explain the events of the past. The thrust of this realization has been the development of Strategy 2.

Strategy 2

Research within Strategy 2 pursues general questions in present material culture in order to acquire laws useful for the study of the past. Some general
questions that typify this strategy are: What are the traces of various techniques of manufacture on a given type of material? What is the relationship between the population size of a community and its habitation area? How long does it take various materials to decay under given conditions of deposition? Why are whole, usable items sometimes discarded? These are general questions because they are not bound to specific time-space referents. The answers to these questions take the form of experimental laws. “Experimental archeology” (Ascher 1961), “action archeology” (Klein-dienst and Watson 1956), “ethnoarcheology” (Oswalt and VanStone 1967), and “living archeology” (Gould 1968) are labels for variants of Strategy 2.

One can distinguish two major types of research design within Strategy 2. The first, probably the one more aptly called “experimental archeology,” consists of carefully contriving a situation in which to observe the interaction of selected variables. In this activity, the archeologist can control relevant variables and boundary conditions by direct intervention and manipulation. The second type of research design requires the observation of interacting variables in an ongoing system that is selected on the basis of certain boundary conditions. This latter approach has been termed “living archeology” (Gould 1968). As the work of White and Thomas (1972) has shown, however, the distinction between experimental archeology and living archeology is not hard and fast. Nor should it be.

Several major shortcomings characterize much of the research undertaken to date within Strategy 2. Although many of these studies have produced interesting and useful results, in general, they have been restricted in the scope of variables examined. Most investigations deal with manufacturing behavior, the traces of use wear on specific artifacts, or the processes of decay and noncultural deposition (Hester and Graham 1967; Coles 1973; Clark 1957; Hole and Hester 1973). But I emphasize that this strategy subsumes the entire range of behavioral and organizational variables in relation to material, spatial, and even environmental variables. Fortunately efforts guiding the necessary expansion of Strategy 2 are underway along a broad front (e.g., White and Thomas 1972; Donnan and Clewlow 1974; Salwen 1973; Leone 1973; Saraydar and Shimada 1973; Shimada n.d.; Binford 1973; Longacre 1974).

Not only are these studies, taken as a body, narrow in scope, but they also are scattered widely in the literature and are unsystematized (see also Coles 1973). Many are purely descriptive, and others fail to express results in lawlike form (Schiffer 1974). A bibliography of experimental archeology (Hester and Hester 1973) is a needed first step, but to salvage useful principles, one must extract the laws and assemble related ones. By this process, we can increase the set of accessible laws for understanding the past, and discover what is undiscovered.

As archeologists investigated a variety of questions on present material culture, they found, like cultural anthropologists before them, that ethnographic data are not very useful for testing laws about long-term processes of cultural change. There have been two solutions to this problem. The first was to turn to nonanthropological disciplines in search of potentially useful laws. Thus, a major trend now evident in archeology is interdisciplinary borrowing. Principles, methods, and techniques from fields as diverse as systems theory, biological ecology, information theory, and geography now frequently punctuate the archeological literature (Clarke 1968 being the classic example). Although the ultimate utility of many of these ideas remains to be demonstrated, such borrowings are inevitable and necessary.

The second solution was to explore the possibility that the archeological record itself might be an ideal laboratory for deriving laws of cultural change processes (Binford 1962a; Waichope 1966; Leone 1968; Schwyder 1970; Zubrow 1971, 1975; Woodall 1972; Poll 1973a,b, 1974). Once available, these laws could also be applied to explain and predict contemporary behavioral change. The realization that archeologists could use their data base from the past to answer questions about long-term change processes has led to the conscious emergence of Strategy 3.

**Strategy 3**

Strategy 3 is the pursuit of general questions in the study of past material remains to derive behavioral laws of wide applicability that illuminate past as well as present human behavior. The questions that typify this strategy, like those in Strategy 2, do not have specific time-space referents. Examples include:

- What are the determinants of variability in organizational complexity?
- What factors explain variability in storage capacity?
- How do cultural systems adapt to changes in population?

As in Strategy 2, these types of question are answered in terms of laws. An implication of this strategy is that such laws are potentially relevant to modern social problems and issues.

Strategy 3, with its prominent theme of social relevance, is rooted deeply in the writings of the late Paul S. Martin (1954, 1971; Martin, Quimby, and Collier 1947; Martin and Plog 1973; also Fritz and Plog 1970). This theme of relevance has been stifled in the past for lack of an appropriate methodological vehicle, and remained only a muted plea until the emergence of explicit concern with formulating laws. Since laws are atemporal and aspatial, they should be applicable to any situation in which the initial and boundary conditions are met (Hempel 1966; Reynolds 1971). Although concern with laws provides the long-awaited methodological breakthrough, relevance and the search for laws are not bound inappreciably. Laws can be formulated and tested without being applied in a socially relevant context. This is an investigator’s prerogative. However, the converse does not hold. If statements derived from the past are to be applied in a socially relevant context, they must conform to the format of a law.
Strategy 3 gives substance to the claim that, within anthropology, only archeology possesses the requisite time depth necessary for studying long-term cultural change (cf. Plog 1973a, 1974). It is difficult to imagine insisting on the importance of time depth without also insisting on the need for generating and testing laws. Archeology’s contributions to predictive anthropological theory are contingent on these statements (Titiev 1961:83).

Time depth is not archeology’s only potential contribution to anthropology. By virtue of years of research within Strategies 1 and 2, archeologists now possess an expanding body of theory, method, and behavioral laws for the study of material objects and human behavior regardless of time and space. As archeologists in urban environments have sought to teach and test archeological principles, they have turned to modern material culture as a largely untapped, renewable database. In exploring the relationships between archeological principles and material culture, they have discovered that archeology can make contributions to the understanding of present human behavior and have, thereby, opened the way to Strategy 4 (Salwen 1973; Reid, Rathje, and Schiffer 1974; Rathje 1974).

**Strategy 4**

Strategy 4 is the study of present material objects in ongoing cultural systems to describe and explain present human behavior. This strategy, then, includes the study of contemporary industrial as well as nonindustrial societies. However, its potential contribution to social science derives from the research possibilities of studying material culture in industrial societies.

The questions asked within Strategy 4 are usually specific questions about ongoing societies. For example: What patterns of meat and liquor consumption characterize different ethnic groups in Tucson, Arizona? Do members of higher socioeconomic groups waste nonrenewable resources in Fayetteville, Arkansas? How many times is a television set owned before it is discarded in Los Angeles? The Garbage Project at the University of Arizona is now exploring solutions to many interesting questions in Strategy 4 (Rathje 1974; Harrison, Rathje, and Hughes 1975). It is anticipated that Strategy 4 holds much promise for those concerned with archeological relevance and for those wishing to contribute to the analysis and explanation of human behavior.

The expansion of research into Strategies 2, 3, and 4 more accurately reflects the development of archeology as a discipline, and should permit a meaningful pro cessual history of this subject to be written in the near future. The importance of this expansion to present discussions is that it reflects the essential interrelatedness of all four strategies. The pursuit of Strategy 1 always has required information gained through Strategy 2, and these requirements need not be met exclusively by ethnologists. In like manner, Strategy 3 embodies procedures that seek to contribute to anthropological theory and, thereby, to an understanding of contemporary behavior. Recognition of Strategy 4 merely closes a logical set of research options to embrace the attainment of goals common to most archeologists. I emphasize that a behavioral archeology is a synthesis of what archeologists have done and aspire to do, and that the essential interrelatedness among the strategies has roots deep in the progressive development of the discipline.

**INFORMATION FLOW IN A BEHAVIORAL ARCHEOLOGY**

Viewed as a conjunction of four strategies, archeology is more than a loose aggregation of subfields. Instead, the strategies are integrated into a coherent behavioral science by the flow of general questions and general laws. A behavioral archeology exceeds the sum of its parts, since it depends upon interaction among the four strategies. This interaction further distinguishes the uniqueness of individual research and highlights the unity of combined research activity.

Strategies 1 and 4 are the idiographic component of archeology, whereas Strategies 2 and 3 are the nomothetic component. Within this framework, the tresses debate about archeology as history or science (e.g., Trigger 1970) is seen to reflect overemphasis on one or the other component. A viable behavioral archeology must have both.

Strategies 1 and 4, concerned with answering particular questions about the past and present, cannot exist without Strategies 2 and 3 to provide needed laws. On the other hand, specific questions raised within Strategies 1 and 4 can lead to the discovery that no appropriate laws are available. This impasse is resolved when a general question, formulated and fed into Strategy 2 or 3, serves as a basis for law construction and testing.

I cannot emphasize too strongly that these research strategies are interdependent and together contribute to a more substantial body of theory and method and a more powerful behavioral discipline. This is not to say that any individual must be competent in the execution of all four strategies. That would be inefficient. It is also apparent that a single investigator may operate simultaneously in more than one strategy. If questions raised within Strategies 1 and 4 are to be answered successfully, it is necessary that the discipline as a whole support studies in Strategies 2 and 3. Furthermore, if Strategies 2 and 3 are to succeed in producing useful laws, appropriate questions must be obtained from Strategies 1 and 4.

The development of Strategies 2, 3, and 4 has led to a redefinition of archeology based on a broad conception of its subject matter and the kinds of
questions that are asked. It no longer seems possible to view archaeology as only the study of the past. To be sure, questions in Strategy 1 properly will continue to occupy the research efforts of most archaeologists, but a more productive view of the field as an integrated whole recognizes the essential contribution of other archaeologists. In the framework of a behavioral archaeology, the study of urbanization at Teotihuacan, stone chipping in the Outback, human adjustments to environmental stress, and meat consumption in Tucson, Arizona, all are legitimate and productive archaeological research activities.

2

A Synthetic Model of Archeological Inference

The early years of the new archaeology witnessed the frequent and unquestioning repetition of major methodological principles. One such principle was enunciated by Binford (1964:425) in perhaps its most explicit form:

The loss, breakage, and abandonment of implements and facilities at different locations, where groups of variable structure performed different tasks, leaves a "fossil" record of the actual operation of an extinct society.

Closely paraphrased variants of this statement have continued to appear in the literature, frequently as part of an introductory section to empirical studies. Under the aegis of this principle, new archaeologists have approached the remains of the past in bold and exciting ways, seeking with sophisticated techniques assorted patterns in artifact distributions and interpreting them directly in terms of past behavior and social organization. As often happens in times of normal science, few investigators have noticed that the principle is false.

It is false because archeological remains are not in any sense a fossilized cultural system. Between the time artifacts were manufactured and used in the past and the time these same objects are unearthed by the archeologist, they have been subjected to a series of cultural and noncultural processes which have transformed them spatially, quantitatively, formally, and relationally (see also Collins 1975). If we desire to reconstruct the past from archeological remains, then these processes must be taken into account, and a more generally applicable methodological principle substituted for the one that asserts that there is an