

A BRIEF HISTORY OF CULTURAL EVOLUTION:
STAGES, AGENTS, AND TINKERING

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May, 1996

The study of the evolution of cultural systems has undergone a series of permutations in the course of the past century. Studies of cultural evolution began in earnest with the work of two of the most important anthropological figures in the 19th century: Lewis Henry Morgan (1877) and Edward B. Tylor (1871, 1881). Both Morgan and Tylor recognized that there were broad patterns of similarity that could be recognized in many different cultures around the world, and developed parallel typologies for categorizing these crosscultural patterns. The typological system used by Morgan and Tylor broke cultures down into three basic evolutionary stages: savagery, barbarism and civilization. Both believed that all societies at the "civilization" stage had gone through the other two stages and those at the "savagery" or "barbarian stages were, presumably, on their way to "civilization." These three stages were characterized by specific supposedly shared attributes. Tylor look at different aspects of culture, such as language, mythology, "the arts of life," or "the arts of pleasure." In his discussion of each of these, he considered the traits and conditions that prevailed under the different stages and how later characteristics evolved out of earlier ones.

Modern music is thus plainly derived from ancient. But there has arisen in it a great new development. The music of the ancients scarcely went beyond melody. ... The musical instruments of the present day may all be traced

back to rude and early forms. The rattle and the drum are serious instruments among savages; the rattle has come down to a child's toy with us, but the drum holds its own in peace and war. Above these monotonous instruments comes the trumpet, which, as has just been seen, brings barbaric music a long step further on. ... In the modern [civilized] orchestra, the cornet is a trumpet provided with stops (Tylor 1881:164-165).

Morgan (1977) takes a somewhat complementary perspective by looking at broad evolutionary patterns including "the growth of intelligence," "growth of the idea of government," "growth of the idea of the family," and "growth of the idea of property." In his analysis of government, for example, he traces the development from "organization of society upon the basis of sex" characteristic of savagery as found among the Australian Aborigines, through the barbarian kin-based organization of the Iroquois and other North American Indians, up to the hallmark of civilized society, "the institution of Roman political society." There is a pervasive sense in the work of both Tylor and Morgan that cultural evolution represents "progress" in some external objective sense.

The educated world of Europe and America practically settles a standard by simply placing its own nations at one end of the social series and savage tribes at the other, arranging

the rest of mankind between these limits according as they correspond more closely to savage or to cultured life. The principal criteria of classification are the absence or presence, high or low development, of the industrial arts, especially metal-working, manufacture of implements and vessels, agriculture, architecture, etc., the extent of scientific knowledge, the definiteness of moral principles, the conditions of religious belief and ceremony, the degree of social and political organization, and so forth (Tylor 1871: 23-24).

The latest investigations respecting the early condition of the human race, are tending to the conclusion that mankind commenced their career at the bottom of the scale and worked their way up from savagery to civilization through the slow accumulations of experimental knowledge

As it is undeniable that portions of the human family have existed in a state of savagery, other portions in a state of barbarism, and still other portions in a state of civilization, it seems equally so that these three distinct conditions are connected with each other in a natural as well as necessary sequence of progress (Morgan 1877: 3).

In a subsequent generation of anthropologists, the evolutionary models of Morgan and Tylor were roundly criticized and largely rejected for a number of reasons. The particularism of Franz

Boas and his colleagues was just not concerned with general patterns of crosscultural similarities and evolutionary change. There was a sense that culture was not a phenomenon that could or should be explained through scientific principles. The primary task of anthropology under these conditions was to describe the historical path and inner working of individual cultures. The stage model of unilineal evolution came under the most severe attack. Broad generalizations about the commonalities said to be characteristic of each "stage" simply did not stand up to empirical scrutiny, as anthropologists developed a more comprehensive ethnographic record from cultures around the world. Many of the supposedly definitive traits, such as family types, assigned by Morgan and others to the different stages of savagery, barbarism, and civilization were found to occur in societies with markedly different levels of organizational complexity.

While mainstream anthropology in the first half of the 20th century may have disavowed the typological stage models of the previous generation, there was not a complete disavowal of the concept of cultural evolution. Scholars such as Robert Lowie, a student of Boas and staunch defender of the particularist view of culture, clearly recognized and studied developmental change among various aspects of the cultural system (Lowie 1920). Harris notes that Lowie's "Primitive Society is nothing if it is not a major contribution to the theory of cultural evolution. It

is such a contribution because time and again in its pages Morgan's view of the sequence of the emergence of specific institutions on both a worldwide and more localized basis are examined, criticized, and reformulated with the positing of a new sequence" (1968:348). Thus, even at the height of historical particularism in the first half of the 20th century, there was acknowledgment (if grudging) that human cultural systems have evolved over time and that crosscultural patterns could be seen in that evolution.

The light of 19th century evolutionism was kept burning in the work of the British archaeologist, V. Gordon Childe. Childe was actually an on-going adherent of the stage model of Morgan. He attempted to reconstruct the archaeological sequences of Mesopotamia, Egypt and India in terms of the stages of savagery, barbarism and civilization (Childe 1946). The significance of Childe's work was not so much the use of evolutionary type categories as his explication of the process of cultural evolution over long periods of time. The preceding evolutionists of the 19th century had attempted to infer hypothetical evolutionary sequences by comparing different groups in the contemporary ethnographic record. Childe made a comprehensive effort to look at how prehistoric cultures actually changed over time - what were the steps involved in the transmission from one evolutionary stage to the next.

The explicit study and theoretical exposition of cultural evolution reemerged seriously in the 1940s and 1950s with the work of ethnographers Leslie White and Julian Steward. Steward and White engaged in a lively intellectual debate about the nature and causes of cultural evolution. Steward (1951, 1955) proposed a model of "multilinear" evolution based on the concept of levels of sociocultural integration. According to Steward: "In the growth continuum of any culture, there is a succession of organizational types which are not only increasingly complex but which represent new emergent forms" (Steward 1955: 51; see also Steward 1950). The evolutionary levels of sociocultural integration included the "family", the "band" - patrilineal and composite - "folk society" and the "state". For Steward, these levels of integration were a typological means for analyzing cultures with varying degrees of complexity (1951: 380), and to reflect the emergent organizational forms that recur cross-culturally in many different parts of the world.

The approach of White was not focused on the evolution of particular cultural systems and he did not try and devise a typological system to group societies at different evolutionary levels. White was primarily interested in the evolution of culture as a general phenomenon as opposed to the evolutionary development of specific cultures. In this sense, White spoke of "the culture of mankind in actuality is a one, a single system; all the so-called cultures are merely distinguishable portions of

a single fabric" (1959:17). Looking at the whole of humanity, he presented a case that the basic function of culture is "harnessing of energy and putting it to work in the service of man" (1959: 39). Accordingly, the evolution of culture in this model was defined in terms of the amount of energy captured and expended through technology and the economic system. Simple and undeveloped cultures are those in which energy is captured through the human efforts alone. More complex cultural systems evolve as societies develop more effective means of harnessing energy through draft animals, irrigation, machines, etc. According to White, social and political complexity then evolved along with the progressive development of technological and economic systems for capturing energy.

While White and Steward were the clear leaders in the resurrection of cultural evolution studies in the mid-20th century, they saw their respective models as opposing rather than complementary. A subsequent generation of White and Steward students, led by Elman Service, Morton Fried and Marshall Sahlins, sought to bring together the multilinear, "specific" evolution of Steward with the energy-based "general" evolution of White (Sahlins and Service 1960). They built upon this specific/general foundation and developed alternative evolutionary models that looked at broad, "universal" patterns, but could be applied to specific evolutionary processes in individual cultures.

The first model to emerge was that of Elman Service who presented the now-classic evolutionary sequence of "band, tribe, chiefdom, state" (1962; see also Sahlins and Service 1960: 37). Service's model was derived directly from that of Steward in that he saw these sequential developmental stages as representing different levels of social integration.

Morton Fried (1960, 1967) developed an alternative evolutionary/taxonomic model that focused specifically on organizing principles of political organization. Fried's sequence of "egalitarian, ranked, stratified, and state society" is derived from crosscultural comparisons of social status, access to resources, and the organization of power in different societies. Somewhat in contrast to Service, Fried was less concerned about the cultural or political composition of the stages and more concerned about evolutionary transformations from one stage to the next. For example, how and why did cultures move from egalitarian, with equal social access to basic resources and positions of status to ranked society with equal access to resources but differential access to positions of status, and then on to stratified society with differential access to status and basic resources.

The evolutionary models of Fried and Service have provided a foundation for a tremendous amount of anthropological research in the course of the past 30 years. They have been widely applied in

cultural anthropology both to examine aspects of social and political organization at different evolutionary levels and to classify societies into one of the evolutionary stages. The models also proved to be a bridge between cultural anthropology and archaeology in that archaeologists found that the proposed evolutionary stages could be recognized in the archaeological record of past societies. The archaeological record, covering a long span of time, also proved to be suitable laboratory for studying the actual process of cultural evolution as ancient cultures evolved from one stage to the next.

Within the past ten to fifteen years, the stage models of both Service and Fried, like those of Morgan and Tylor before them, have fallen out of favor in both cultural anthropology and archaeology. The models have been criticized for overgeneralizing, obscuring cultural diversity, and for inaccuracies at a number of levels. It has been found, for example, that many of the attributes bundled together in Service's different stages do not always (or even often in some cases) co-occur when examined in the ethnographic and archaeological records. Similarly, the hard and fast distinctions of power and status central to Fried's theoretical model turn out to be indistinct and transitional in the empirical record. There is also an underlying concern that behind all stage models, no matter how benign in appearance, there is an implicit notion of "progress" in the sense of advancement. The

idea that the "state" or "civilization" is somehow the culmination of the evolution of culture is seen as reflecting a Western bias and does not give adequate regard to the accomplishments and independent character of nonstate societies.

The rejection of an evolutionary paradigm for studying culture is today most broadly and clearly manifested in cultural anthropology. The mainstream of cultural anthropology has turned away from evolution to highly-focused studies of individual cultures, culture traits and culture histories. With notable exceptions (see, for example, Ember and Ember 1994; Ferguson and Whitehead 1992), there is little concern for or study of broad cross cultural patterns of organization or the process of evolutionary transformation from one cultural configuration to another. In some ways, the current state of much of cultural anthropology harks back to the era of Boasian particularism, when evolutionism was dismissed, and anthropology concentrated on the details of cultures (see Fox 1991).

In archaeology, the study of cultural evolution has taken a different route. Archaeologists found that the great chronological depth of the archaeological record was particularly well suited to the study of long-term evolutionary change. Initially, archaeologists looked at the models of Service and Fried as a handy tool to pigeon-hole prehistoric cultures into "meaningful" anthropological categories. They also used the

stage definitions to flesh out the invisible details of the ancient past. Thus, for example, if an archaeologist found some evidence to indicate a particular culture was at Service's chiefdom level, it was inferred that the culture would have had all the attributes of Service's chiefdoms. However, as more researchers began to examine the organization and characteristics of past cultures, they increasingly found that many prehistoric societies did not have the full complement of traits ascribed to the different evolutionary stages. Furthermore, the causal variables hypothesized to be driving the evolutionary process also did not seem to work as they were examined and tested in the archaeological record (see Earle 1987; Feinman and Neitzel 1984; Haas 1990; Bettinger 1991).

Rather than dismiss the evolutionary paradigm altogether, archaeologists have gone beyond the stage models and evolutionary theory of the cultural anthropologists to look for alternative strategies for studying the process of evolution (e.g., Earle 1991; Ehrenreich, Crumley and Levy 1995; Gregg 1991). Indeed, the intellectual responsibility for studying the evolution of complex cultural systems has shifted almost entirely to archaeology in the past two decades.

The study of cultural evolution from the perspective of archaeology represents an optimal wedding of subject matter and discipline. Although much of the early evolutionary theory arose

out of cultural anthropology and the ethnological comparison of different contemporary cultures, the ethnographic record of individual cultures is necessarily limited to the present and at most one or two generations back into the past. To try and study the process of evolution ethnographically involves a circuitous inference of how one contemporary culture might be representative of the evolutionary antecedents (or descendants) of another contemporary culture. Such indirect inferences are difficult at best to test empirically and rely largely on the eloquence of logical argumentation. In contrast, the archaeological record by its very nature is diachronic and a direct material manifestation of culture change over time. Archaeologists are able to study the remains of past cultural systems extending back over hundreds and thousands of years and to examine more directly how those cultures may have evolved over time. The material record of past societies not only reveals how cultures evolved, but also provides broad contextual information for understanding why cultures evolved in response to environmental and social variables.

The shift of cultural evolutionary studies from ethnology to archaeology has been accompanied by new bodies of theory and alternative perspectives on the evolution of cultural systems. Although there are many different viewpoints on the archaeology of evolution, most work can be broken into two general schools of thought: the selectionist and the transformational. The

selectionist school, championed by Robert Dunnell and his students (see Dunnell 1980, 1989; Leonard and Jones 1987; Teltser 1995), and has intellectual antecedents in both the particularism of Boas and the specific evolution of Steward. The current school takes a Darwinian or "neoDarwinian" approach to the evolution of culture. The basic premise of this approach is that there is a range of variability to be found in any culture and that evolutionary change occurs through selection for some part of that variability over some other part. David Braun has summarized the basic selectionist model:

We should approach social evolution as a matter of "descent with modification," to use Darwin's phrase. But by "descent" here I refer to sociocultural rather than biological descent. That is, we should analyze social evolution as a matter of continuity and change in the statistical popularity of different social practices over time among individual human communities.... We can describe continuity and change in the popularity of different social practices in terms of two phenomena (e.g. Alland 1975; Kirch 1980). First, there always exists variation in the statistical popularity of different social practices at any given time among different interacting sets of people.... Second, there always exists a pattern of differential transmission of that variation over time (Braun 1990: 63-64).

The selectionist approach in archaeology, because of its emphasis on the evolution of particular attributes within specific cultures has been used primarily as a tool for explaining variation in the prehistoric past:

For more than fifteen years a variety of archaeologists have advocated the application of Darwinian evolutionary theory to explain variation in the archaeological record.... In short, expanding evolutionary theory to explain variation in the archaeological record requires building new archaeological theory and method (Teltser 1995: 1).

A transformational view of culture is descended (if you will) from the earlier stage models of cultural anthropology and from the general evolution of White. The basic premise of this view is that cultural evolution involves certain fundamental shifts from one organizational structure to another (see Haas 1982; Creamer and Haas 1985; Price and Feinman 1995; Wason 1994) . While the changes a society undergoes in evolving from one form to another may be gradual and quantitative the sum of the changes amounts to a qualitatively different kind of cultural system. For example, a village may represent the product of gradual aggregation of households, but it is not just an aggregation of households (see Kohler and Van West 1996). A village carries with it new organizational principles and fundamentally new forms of social relations. Thus, the evolution of villages out of

antecedent single- or multiple-household homesteads represents a transformation of the settlement system. On a larger scale, Kristiansen has argued "a fundamental organizational divide exists between tribal societies, of which the chiefdom is a variant, and state societies" (Kristiansen 1991:17).

While recent transformational approaches to cultural evolution have largely eschewed the predetermined types of the earlier stage models, the approach itself is amenable to the study of both cultural variation and cross cultural patterns of similarity. Thus, using the same example from above, it is possible to examine the evolutionary transformation from households to villages in one particular area as well as the common pattern of village emergence found in many culture areas at different points in time (see DeMarrais, Castillo and Earle 1996 for a recent example of this kind of cross-cultural evolutionary study).

Although selectionist and transformational models are sometimes seen as standing in stark opposition to one another (Leonard and Jones 1987; Braun 1990), acceptance of one need not lead inexorably to the complete exclusion of the other. The two perspectives actually complement each other in interesting ways as alternative tools for studying the evolution of culture as a complex adaptive system. The selectionist model has largely abandoned the quest to address general patterns of evolution that

recur cross-culturally around the world and across long spans of time. It emphasizes instead the importance of being able to understand the unique evolutionary trajectory of individual cultures and focuses on the specific mechanics of those evolutionary events. Yet there are remarkably similar social and cultural phenomena that crop up again and again around the world and these similarities, these patterns of evolutionary change, demand explanation as well.

Settled village agriculture with similar kinds of social and political institutions, for example, independently develops in many different parts of the world over the course of several thousand years in human history. Subsequently in a number of widely disparate parts of the world (Asia, Africa, South America, Europe and Polynesia) we see the independent development of centralized societies with social ranking led by "chiefs". Then in six different centers of world civilization (Mesopotamia, Egypt, China, India, the Andes, and Mesoamerica) we see the independent development of remarkably similar bureaucratic polities with marked social stratification, cities, elaborate art and centralized religion. Empires follow in some world areas as do feudal societies and the nation-states of the recent historical record. The transformational model recognizes these broad patterns found in the evolutionary trajectories of many cultures and looks for explanations that transcend the specifics of individual cases.

Certainly there are individual circumstances that make each evolutionary change a unique historical event and there are singular evolutionary forces operating on all cultures at any given point in human history. At the same time, people of different cultures respond to their unique circumstances in similar ways with a relatively tightly defined range of variability. Explanatory models that can account for the similarities of evolutionary change across cultures and across time can greatly extend our insights into patterns of human behavior, both past and present.

Tinkering and Agent-based Modeling

The question then becomes how to combine the two evolutionary approaches in a more comprehensive effort to understand both the mechanics of cultural evolution at the local, societal level and the kinds of crosscultural trajectories that can be seen to recur around the world over the past 100,000 years of modern human history. One possible avenue for looking at both the mechanics of specific evolution and the patterns of general evolution is through a combination of agent-based modeling and what might be referred to as the "tinkering" view of evolution¹.

¹The "tinkering" theory of evolution has, to my knowledge, never appeared in print. It was a general idea floated by David Braun at a School of American Research Advanced Seminar on "The Development of Political Systems in Prehistoric Sedentary Societies" held in Santa Fe in 1986. Braun (1996:129; also personal communication, 1996) has recently discussed the relatively random generation of variability in cultural systems,