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CULTURAL ECOLOGY:
A BRIEF OVERVIEW

by

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Cultural ecology is based on the interaction of culture, man, and environment. To the understanding of this relationship the present paper discusses the origin and development of cultural ecology, the various applications and techniques of cultural ecology by the anthropological discipline, and finally, criticisms and future goals of an ecological anthropology.

Ecology is not an anthropological subdiscipline, nor is it even a standardized approach in anthropology (Bates, 1953). Ecology may be defined as the science dealing with the study of entire assemblages of living organisms and their physical milieus, which together constitute integrated systems (Anderson, 1973:182). More simply, ecology is the study of the structure and dynamics of nature, mankind being a part of nature (Olum, 1975:1). Both of these definitions stem from concepts developed from biology and the biological nature of the world. The dualism which separates the study of "natural environment" from the study of "human environment" had effectively worked in the past to isolate the natural sciences from the social sciences. The holistic concept of ecosystem -- a type of general system capable of including the activities of man -- has recently gained wide acceptance. The ecosystem conceptually unites the biology, organization, and behavior of man with other animals, plants, and inorganic concepts within a single framework in which the interaction of the components may be studied (Anderson, 1973:183). This is particularly appealing to anthropology since it allows for the study of the mutually dependent interactions of organic, inorganic, and sociocultural components.

Within the discipline of anthropology, the concept of cultural ecology arose from a long series of thoughts and publications concerning environmental problems (e.g., Semple, 1911; McKenzie, 1924, 1926; Forde, 1934; Alihan, 1938; Kroeber, 1939; and others). Early in the ecological study of culture two intellectual camps formed. The environmental determinists claimed culture resulted from "a mechanical action of natural forces upon a purely receptive humanity." The environmental possibilists felt "cultures act selectively, if not capriciously, upon their environments, exploiting some possibilities while ignoring others" (Sahlins, 1964:132). There were those, though, who found utility in a combination of these theories. Otis Mason (1905:427) felt that nonhuman environmental factors determined cultural development, but also stated that the environment provided options for cultures.

Perhaps the most influential figure in the development of cultural ecology was Julian Steward. Steward recognized that the principle difficulty in using the cultural factor in ecological studies was the lack of clear objectives found in the biological use of ecology. Steward proposed the use of an explanatory or causal method with cultural ecology and an operational tool rather than as an end in itself. To do this, two different objectives were suggested: 1) an understanding of the organic function and genetic variations of man as a purely biological species, and 2) a determination of how culture is affected by its adaptation to environment (Steward, 1955:31). For anthropology, the second of these objectives was seen to have the most emphasis, Steward defined cultural ecology as a methodological tool for ascertaining

How the adaptation of a culture to its environment may entail certain changes, or, in a larger sense, to determine whether similar adjustments occur in similar environments (Steward, 1955:42).

Steward felt that the relationship of man, the organism, to the environment had to be considered separately from the relationship of culture to the environment. The biological adaptation of man is seen as constituting a separate segment of ecological research (Rayda and Rappaport, 1968:483). The key concept for anthropology, then, is the interrelation between culture and environment. This is the best studied through the use of three fundamental procedures of cultural ecology: 1) technoenvironmental relationships, 2) exploitation strategies, and 3) the effects of technological-exploitation procedures on other aspects of culture (Steward, 1955:40-41).

The purpose of cultural ecology is to explain the origins of particular cultural patterns which characterize particular cultural areas instead of deriving general principles applicable to any cultural-environmental situation (Steward, 1955:36, 1968:337). Emphasis is placed on the study of the particulars of local environments rather than on unique cultures histories (Wayda and Rappaport, 1968:483). However, Steward's method ultimately leads to the identification of related types of exploitative and demographic patterns which seem to shape kinship organization (Helm, 1962:631).

At the present time the field of cultural ecology can be divided into several different approaches, each approach tending to center on one or more aspects of the relationship of culture to environment. Others (Anderson, 1973; Richtsmeier, 1978) have devised classification schemes for some of the approaches toward cultural ecology. For the purpose of this report, certain of the categories as defined by Anderson and/or Richtsmeier, and deemed particularly significant by this author, will be examined in light of their past achievements and future potentials.

The first of the approaches to be examined is that of demography and population structure. The central question of this approach is, how do socio-cultural and other ecological variables relate to the numbers and distributions of human populations (Anderson, 1973:194)? Factors such as fertility, mortality, disease, nutrition, migration, and social organization are all pertinent variables that must be examined. Research in demographics may be directed at living (e.g., Birdsell, 1953, 1970; Lorimer, 1954; Barth, 1956) or prehistoric (e.g., Birdsell, 1958; Carniero and Hilse, 1967; McArthur, 1970) populations. A new aspect of this category recently garnering much attention is the concept of carrying capacity. Carrying capacity deals with the optimal number of people that a particular resource area can support. While still in its developmental stages, several people are using this concept to further their demographic knowledge in relation to archeological circumstances (e.g., Zubrow, 1971, 1975). While carrying capacity may develop great demographic utility if the techniques involved are refined, at present it is under a good deal of criticism (e.g., Brush, 1975, 1976; Hayden, 1975). Criticisms have been levied against the often arbitrary process of ecosystem boundary delineation, the undefined varying intensity with which groups use portions of their ecosystem, and especially the high margin of error present in the statistical methods used.

The use of subsistence patterns in relation to cultural ecology probably embodies the largest percentage of the cultural ecology literature. Hunter-gatherers and pastoral nomadic societies have been the focus of anthropological studies for many years. Central to these studies is analysis of the energetics involved in the food procurement processes. Whether the analyses show maximal subsistence from minimal energy expenditure (e.g., Lee, 1969) or an energy consuming struggle for sustenance (e.g., Williams, 1968) total energetic processes remain unclear. Analyses of human energy relations in these types of societies is hypothetically simplistic, one reason being that they are seen to exist independent of other societies. It should be noted, however, that they do not (Richtsmeier, 1978). The subsistence oriented cultural ecological studies take an essentially deterministic position that: 1) adaptation is seen as the major process in culture change and therefore these studies have an evolutionary tone, 2) analysis is limited to the relationship between environmental and subsistence concerns, 3) both culture and environment are divided into relevant and irrelevant parts, and 4) the goal is to uncover models of linear causation by describing relationships which obtain between relevant variables (Richtsmeier, 1978:14).

An additional aspect of the subsistence pattern studies is the use of cultural ecology in studies of land use and the development of agriculture. When dealing with agricultural development a greater number of variables must be taken into account. Such things as the paleo-ecology of the area, the demographic and population distribution figures, the level of technology, and the social organization are especially important. Through the use of paleobotany and cultural variables certain progress has been achieved in this area (e.g., Boserup, 1965; Cohen, 1971; Bender, 1975, 1978).

Social organization in relation to cultural ecology is briefly mentioned in previous sections. The problem of this approach centers around the effect of features of the habitat upon the organization of groups, stratification, leadership, and other social institutions. Ecological studies are often based on the belief that socio-cultural institutions of populations -- laws (e.g., Oliver, 1965), ritual (e.g., Rappaport, 1971), warfare (e.g., Vayda, 1974, 1976), political organization (e.g., Stevenson, 1968), economic organization (e.g., Sahlins, 1971), etc. -- are adaptive processes of these populations to the surrounding environment. This requires a greater appreciation of the man-culture-environment connection (Richtsmeier, 1978). The major criticism of this type of study centers around the use of certain cultural variables to the exclusion of others, making the studies particulate rather than holistic.

Human biobehavioral studies provide a link between ecological and evolutionary studies. Application of the principles of mammalian ecology to protohominid ecology has provided useful results in the reconstruction or protohominid evolution (e.g., Bartholomew and Birdsell, 1953). Studies dealing with the social behavior and the ecology of sub-human primate populations contribute greatly to the reconstruction of hominid biobehavioral evolution (e.g., Washburn, 1961). An understanding of the importance of biological factors in the origins of cultural behavior has done much to develop our knowledge of human evolution (Anderson, 1973).

The final approach to be discussed in this report is perhaps the one representing the most potential. At the present only a few descriptive and analytical studies of specific human populations and their environments as systems have been attempted. These studies are generally longitudinal in nature and involve investigative attempts which necessitate an interdisciplinary team of researchers. These studies have focused on maintenance processes of particular subsistence systems that keep crucial variables within an adaptive range (Anderson, 1973:198). The studies of Conklin (1954a, 1954b), Lee (1965, 1969), and Rappaport (1967a, 1967b) stand out as the best examples of the systemic approach in cultural ecology. Despite high levels of accomplishment, these studies exhibit several weaknesses that can be avoided in subsequent studies. The works of Conklin are comprehensive and well done, but his separation of environmental features from cultural features leaves the work just short of a fully systemic approach. The works of Lee and Rappaport are especially well done in their use of caloric measurements and protein intake to estimate productivity and carrying capacity. Rappaport's main problems center around his use of data that lacks a link with theory and his failure to fully use the concept of energy flow within the ecosystem. Lee's studies also lack sufficient attention to the concepts of productivity, predation, and energy flow. These are the pioneering works of this approach, and it is only in their weaknesses that improvements need be made. As more variables come under consideration more complex problems will appear, but these are problems to be dealt with in the future, not the present (Anderson, 1973).

"As ideas sow a harvest of knowledge, they also reap its limitations; that is, the heuristic success of philosophical perspectives, theoretical viewpoints, methodological strategies, and research techniques are inevitably accompanied by counter-productive consequences" (Anderson, 1973:201). The concept of man against nature is looked upon by many as a powerful influence. Man is seen locked in a constant battle for conquest over nature. Man is placed above and separate from nature, nature being placed at the disposal of man to be used as man's rationality and purposes dictate. Growing from these ideas is the "nature-nurture" question and the idea of progress defined as technological advancement. While most, if not all, anthropologists would deny that any of the above ideas influence their perspective, each of these retarded man-nature studies in anthropology for many years and still are seen to influence the thoughts of many outside the discipline. A second and somewhat related concept is the image of environment as an external, discrete, and essentially static entity, to be subdued by culture in the course of human progress. This produced much the same effect on culture ecology studies as did the man vs. nature controversy. Culture must be seen as a system linked to the environment in continuous and dynamic feedback (Berkley, 1967).

In recent years the number of studies dealing with the interaction of man, culture, and environment has increased tremendously. The linking of anthropology to ecology is expanding beyond the original ideas of cultural ecology to what many are now calling "ecological anthropology" or "anthropological ecology." The greatest factor responsible for the delay of instituting this

approach is the required reuniting of culture and biology. To accomplish this union, the anthropologist must stop trying to explain culture only in terms of culture and begin to use the interaction of environmental, behavioral, and cultural factors. When this is accomplished, integrated research may proceed to the benefit of all involved.

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