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Environmental Anthropology

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comes a matter of consensus—namely, the consensus of native informants, who must agree that the construct matches the shared perceptions that are characteristic of their culture. Note that the particular research technique used in acquiring anthropological knowledge has nothing to do with the nature of that knowledge. Emic knowledge can be obtained either through elicitation or through observation, because it is sometimes possible that objective observers can infer native perceptions.

Etic constructs are accounts, descriptions, and analyses expressed in terms of the conceptual schemes and categories that are regarded as meaningful and appropriate by the community of scientific observers. An etic construct is correctly termed "etic" if and only if it is in accord with the epistemological principles deemed appropriate by science (i.e., etic constructs must be precise, logical, comprehensive, replicable, falsifiable, and observer independent). The validation of etic knowledge thus becomes a matter of logical and empirical analysis—in particular, the logical analysis of whether the construct meets the standards of falsifiability, comprehensiveness, and logical consistency, and then the empirical analysis of whether or not the concept has been falsified and/or replicated. Again, the particular research technique that is used in the acquisition of anthropological knowledge has no bearing on the nature of that knowledge. Etic knowledge may be obtained at times through elicitation as well as observation, because it is entirely possible that native informants could possess scientifically valid knowledge.

Defined in that manner, the usefulness of the emic/etic distinction is evident. Answers to the most fundamental anthropological questions—including the origins of humanity, the characteristics of human nature, and the form and function of human social systems—are part of the worldview of every culture on the planet. Like all human beings, individual anthropologists have been enculturated to some particular cultural worldview, and they therefore need a means of distinguishing between the answers they derive as enculturated individuals and the answers they derive as anthropological observers. Defining "emics" and "etics" in epistemological terms provides a reliable means of making that distinction.

Finally, most cultural anthropologists agree that the goal of anthropological research must be the acquisition of both emic and etic knowledge. Emic knowledge is essential for an intuitive and empathic understanding of a culture, and it is essential for conducting effective ethnographic fieldwork. Furthermore, emic knowledge is often a valuable source of inspiration for etic hypotheses. Etic knowledge, on the other hand, is essential for cross-cultural comparison, the sine qua non of ethnology, because such comparison necessarily demands standard units and categories.

JAMES W. LETT

SEE ALSO: Cultural Materialism

HARRIS, MARVIN. "History and Significance of the Emic/Etic Distinction." *Annual Review of Anthropology*, vol. 5 (1976): 329–350.

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ENVIRONMENTAL ANTHROPOLOGY

Environmental research in anthropology has been a part of the discipline from its very beginnings. It is often referred to as the ecological approach in anthropology, but "environmental anthropology" is a more inclusive term than "cultural ecology." The ecological or environmental approach in anthropology includes topics as diverse as primate ecology, paleoecology, human adaptability studies, ethnoecology, agrarian ecology, pastoral ecology, geographic information systems and remote sensing, landscape ecology, and a number of other areas, many of them interdisciplinary in scope and methodology.

Franz Boas led the way in the United States with his original study of Eskimo adaptations to life in the Arctic, *The Central Eskimo* (1888), which stresses the interrelationship between geographical and cultural factors. This focus on geographical factors came from a tradition that goes back at least to Greco-Roman times in so-called geographical determinism and/or environmental determinism. These views varied but tended to emphasize that environmental factors, such as latitude, played a major role in the character of people: "Mountains produce isolation and cultural stability, while lowlands promote racial and cultural mixture and migration; topography that promotes isolation and overexhuberant flora [as in tropical forests] inevitably produces political and cultural stagnation" (Thomas 1925). While these views have been shown to be inadequate simplifications many times, they recur because of their simple appeal to the ethnocentrism present in all societies.

A not dissimilar view is represented by a view that the environment, while not determining human society, exercises a powerful limitation on human possibilities. This view, exemplified in the work of Thomas Malthus and most of Boas's work, presented the role of environment as passive. In other words, certain things could not occur because they were environmentally not feasible (e.g., stone houses in an environment that lacked stone). Most of these views were characterized by a kind of cultural determinism that privileged culture as the factor that explained the constitution of society. This view has once again gained prominence in anthropology under the guise of postmodernism, which relegates environment to a trivial factor in the construction of culture and history.

The view that the environment, or a culture, exercised a determining influence on human society was matched by a no less important body of scholarship that emphasized the interaction of human beings with the physical environment. This "adaptational" body of knowledge gained impetus with the development of evolutionary theory. This adaptationist/evolutionary approach mediated between the two other views and offered an alternative to their tendency toward determinism. This tradition, based on Darwinian concepts of evolution and adaptation, became a significant trend in anthropology in the late 1950s.

CULTURAL ECOLOGY

Significant progress came from the development of what came to be known as "cultural ecology," an approach proposed by Julian H. Steward, whose emphasis on behavioral considerations and on the comparative method make this approach among the most robust in the study of environmental anthropology. It serves to focus attention on the interaction between social organization, subsistence requirements, and those aspects of environment that matter to people (Steward 1955; Netting 1977). This version of environmental anthropology is still practiced, with modifications, in both archaeology and cultural anthropology. It is now more quantitative, more inclusive of biological variables, and more historical than when it began to be practiced in the 1950s and 1960s.

ECOSYSTEM ECOLOGY

Other approaches followed cultural ecology that expanded the scope of environmental research in anthropology. Whereas cultural ecology seemed to be concerned with cultural areas as a unit of analysis, the approach proposed by A. P. Vayda and R. Rappaport (1976) emphasize that humans are but a compartment in much larger ecological systems. The ecosystem concept accords the physical environment a more prominent place than any other biological concept or theory. This attention to abiotic factors is an important contribution in itself that complements evolutionary ecology's greater emphasis on biotic interactions (Schulze and Zwölfer 1987). Ecosystems are said to have distinctive structure and function and these systems can be studied as systems through which energy flows and matter cycles. As such, humans participated in this process, affecting flow and cycling in distinctive and important ways (Moran 1990). During the important multidisciplinary studies sponsored by the International Biological Program between 1964 and 1974, a large number of biological anthropologists, and a modest number of cultural anthropologists, took part in studies of human adaptability to a variety of ecosystems with the objective of arriving at a better understanding of the genetic, physiological, and cultural ways in which humans adapt to their habitats (Jamison et al. 1978; Baker and Little 1976; Baker 1978; Moran 1979).

The ecosystem approach was attractive to anthropologists for a number of reasons. It endorsed holistic studies of humans in their physical environment. It emphasized structural, functional, and equilibrium considerations that suggested common principles with biology and the possibility of modeling. In archaeology the ecosystem approach found form in the use of catchment analysis and regional surveys rather than

the traditional study of particular sites (Butzer 1990) and gave impetus to a move toward macropaleoecology (Jochim 1990). The impact of the ecosystem approach in social and cultural anthropology was notable in increasing the degree of quantification thought desirable, which took the form of energy flow analysis (Thomas 1973), time-allocation studies (Johnson 1974; Gross 1990), and analysis of choice-making (Wilk 1990; Barlett 1982).

This approach led environmental research in anthropology away from a focus on cultural areas to a concern with "population" as the appropriate unit of analysis. These studies emphasized the plasticity of our species and the important role of physiological and behavioral adaptation—in contrast to the important role that was presumed by geneticists. For example, it was long thought that the Inuit had unique genetic adaptations that facilitated cold adaptation. Instead, the Inuit repertoire of adaptations was found to be largely cultural, emphasizing appropriate clothing, housing, diet, and management of exposure (Jamison et al. 1978).

EVOLUTIONARY ECOLOGY

In the latter part of the 1970s and a good part of the 1980s, anthropologists with environmental interests took a number of directions. One of the most notable ones was to focus on biocultural processes using concepts from evolutionary ecology. Evolutionary ecology refers to the study of evolution and adaptive design in ecological context (Smith and Winterhalder 1992). Its explicit goal is to explain the diversity of behavior that is encountered in human systems. To do so it gives a central place to the process of natural selection in an environmental context. Instead of emphasizing units of analysis such as ecosystems and populations, this approach focuses on individuals as the locus of evolutionary change. This view has been expressed in a number of books expounding theories of cultural evolution and cultural transmission. For example, according to R. Boyd and P. Richerson (1985), cultural evolution is a Darwinian process in the sense that information about how to behave is transmitted from individual to individual, but differs from biological evolution in that cultural inheritance is a system for the inheritance of acquired variation (Cavalli-Sforza and Feldman 1981).

ETHNOECOLOGY

Another direction taken by researchers was to focus on ethnoecology or ethnoscience, the study of how people categorize their environment. This has now become a fairly standard set of techniques available to all environmental anthropologists and is highly recommended in the early stages of any study. This approach focuses on "the words that go with things," trying to understand how a population segments by name certain environmental domains and examines the criteria that are used to arrive at that particular structure. This permits assessment of whether morphology or function are more important or whether color, age, height, or some other characteristic is used by a population. Data collection in the ethnoecological tradition aims at eliciting native terms for plants, animals, insects, soil types, and so on. It is a linguistics-derived tradition concerned with the "labels" that go with things and the distinguishing characteristics between them. It provides an excellent starting point for environmental research by providing a locally relevant set of terms and the meaningful differences between items. Unfortunately, only a handful of studies have tried to test the degree of correspondence between verbally elicited terms and observed behavior (Johnson 1974; Moran 1977). This approach is important for testing theories of cognition and perception (Berlin 1992).

HISTORICAL ECOLOGY

An even more recent development is the variety of forms of what is coming to be known as "historical ecology" (Crumley 1994). While concern with history in anthropology is ancient, many environmental anthropologists had taken notice that a concern with history had not been a notable part of environmental research. Influenced in part by "environmental historians," such as D. Wooster (1988), who looked to anthropology for insight into the history of resource use, contemporary historical ecologists focus on the role of individuals and communities in constructing not only their history but also their environments. This emphasis is interactional, like the adaptationist approach, but tends to give greater weight to the transformative powers of people in changing the environment, rather than their simple adaptation to it. They tend to be critical of discussions that present a false dichotomy between "natural" and human-influenced landscapes that they see as glorifying a nonexistent pristine nature. No spot on earth has escaped human action and landscapes that seem "natural" are often those that have experienced the most intense human uses (Balee 1989).

GLOBAL ECOLOGY

Global ecology is closely linked to what may very well become the environmental anthropology of the twenty-first century—one concerned with our history and evolution and with the consequences of these experiences to our present and future prospects on this and other planets. As the twentieth century draws to a close, it is increasingly clear that to address the seriousness of the environmental crises all around us at local and global scales will require systemic and comprehensive methods. Natural and physical scientists began intensive research in the 1980s on global environmental change and were joined in the 1990s by a growing community of environmental anthropologists concerned with the human dimensions of these changes. It is now generally acknowledged that humans are the biggest source of change on the planet through their use of resources, rates of population growth, and the exponential rate of growth in both of these dimensions.

Environmental anthropology builds on the past experience of anthropologists working on human use of environment but it must perforce go beyond those approaches. An environmental anthropology for the twenty-first century must build on the comparative approaches proposed by Steward if analysis of global environmental changes is to be informed by local and regional divergences in causes and effects. This poses a major challenge to research methods, in that generally agreed-upon ways of selecting sample communities or sites and what data is to be collected across highly variable sites must be undertaken despite differences in environment, culture, economy, and history. Efforts are currently under way at a number of international centers to arrive at these shared standards (Turner and Turner 1994; Moran 1992, 1994).

Solutions to contemporary problems will require the integration of experimental and theoretical approaches at various levels of organization. No single approach will be adequate to the complex tasks ahead. Approaches of the past, emphasizing equilibrium and predictability, were necessary to test null hypotheses, but they do not serve well as representations of real landscapes and hide the dynamic processes of patches within ecosystems. Dynamic, stochastic ecosystem models are necessary to address questions of global environmental change, and environmental anthropologists need to use such approaches to engage issues of ecosystem restoration, agroecology, and biosphere design and maintenance.

One of the tools that will need to be used with growing frequency by environmental anthropologists is geographic information systems (GIS) and techniques of remote sensing and satellite data imaging. Remote sensing from such satellite platforms as AVHRR of the National Oceanographic and Atmospheric Administration (NOAA), Landsat TM 4 and 5 (from NASA), and the French satellite SPOT provide information of considerable environmental richness for local, regional, and global analysis (Conant 1978, 1990). For analysis of global processes or large continental areas, such as the Amazon Basin, NOAA's AVHRR is most appropriate because of its coarser resolution and daily coverage. Although this satellite was designed for meteorological studies, it has been used to monitor vegetation patterns over very broad spatial areas. Because of its large scale, anthropologists to date have had little participation in work with this data, but this may change in the near future.

Available since 1972, data from Landsat's Multispectral Scanner (MSS) is relatively inexpensive to obtain from the EROS Data Center in Sioux Falls, South Dakota. The pioneering work of Francis Conant and Priscilla Reining depended on MSS data (Conant 1978; Reining 1973). Use of MSS is valuable in particular for fairly dichotomous processes or categories, such as forest versus nonforest, grassland versus bare soil or desert, and water versus dry land. Efforts at making fine distinctions, such as those between mature moist forest and advanced stages of secondary growth could not be achieved with MSS data, and many scholars gave up on this effort (Woodwell et al. 1987).

Recent assessments of deforestation using single-band 30-meter resolution data suggest that earlier estimates of deforestation overestimated deforestation by as much as 50 percent (Skole and Tucker 1993) because of the coarseness of the AVHRR satellite data and the confounding of forest with secondary growth of more than a few years. Use of the Landsat 4 and 5 Thematic Mapper (TM) sensor provides not only 30-meter spatial resolution but also spectral data from the visible to the thermal infrared. This work has permitted detailed work at the field level at a number of sites in the Amazon Basin and elsewhere (Moran et al. 1994; Mausel et al. 1993; Brondizio et al. 1994). Discrimination of age classes in secondary growth following deforestation in Amazonian moist forests has been achieved, as well as discrimination between subtle palm-based agroforestry management and

flooded forest in the estuary. Others have been able to study shifts in agricultural fields and issues of intensification in indigenous systems (Behrens et al. 1994; Guyer and Lambin 1993), and erosion in Madagascar (Sussman et al. 1994).

LANDSCAPE ECOLOGY

As is the case with historical ecology, landscape ecology takes a view of the environment wherein people, other species, the physical environment, climate forces, and other processes interact in dynamic ways with consequences for each of the other components. Environmental anthropology is engaged in this multidisciplinary and interdisciplinary effort to understand the processes of global environmental change at a variety of scales from local to global. Such an approach takes as a given that the human species is a major force in bringing about both "positive" and "negative" environmental changes on landscapes. It is concerned with temporal changes and spatial changes. It is concerned with a range of scales from local to community to regional and even to global scale. It is concerned with understanding what behaviors lead to degradational patterns, to reduced or increased vulnerability, to reduced or greater inequality in income, and to patterns of increased or decreased forest cover and biodiversity.

RESEARCH QUESTIONS

Environmental anthropology still works with communities but more often than not it is concerned with clusters of communities across a region or number of regions. More likely than not environmental anthropology is team-executed rather than an individual enterprise, requiring collection of complex data across a number of disciplines. It is also multiscale, multitemporal, and multinational. Environmental anthropology, even more than earlier versions of environmental research in anthropology, is more concerned with addressing urgent environmental issues than in questions of purely disciplinary interest.

Questions that environmental anthropologists are currently addressing include helping to improve the resolution and prediction capabilities of Global Circulation Models (GCMs) so that questions about the directions of rates of change and human motives and actions can be incorporated in modeling efforts; helping to identify distributional effects, such as how change affects different groups of people; issues of environmental equity, such as the siting of toxic dumps and nuclear waste; issues of the patterned behavior of members of a society and the environmental consequences of this habitual behavior; modeling the risk to people of different alternatives to use of resources and to ensure sustainable use; understanding the role of institutions in bringing about changes in individual behavior; and clarifying under what conditions the tragedy of the commons can be avoided.

The scope of environmental anthropology is not dissimilar from earlier approaches known variously as cultural ecology, ecological anthropology, ethnoecology, human ecology, and so on. It differs from these in its greater concern with questions of more than disciplinary interest and its greater commitment to interdisciplinary questions of urgent significance to life in the biosphere.

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SEE ALSO: Adaptation; Biological Anthropology; Cultural Ecology; Historical Ecology

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ESKIMO/INUIT

SEE: North America, Eskimo/Inuit

ETHICS

In the introduction to her powerful book, *Death Without Weeping: The Violence of Everyday Life in Brazil* (1992), Nancy Scheper-Hughes confronts some of the most difficult circumstances surrounding anthropology. She notes that many young anthropologists have been influenced by French philosopher Michel Foucault's writings on the relationship between power and knowledge. Foucault argues that ideas are not neutral but rather that those with power are most likely to control the creation of knowledge. As a result, these anthropologists reject ethnographic research as a flagrant intrusion into the lives of "vulnerable and threatened people," seeing the anthropological interview as reminiscent of the "inquisitional confession" (Ginsberg 1988), and observations as a vehicle for turning *subjects* into *objects* of our "discriminating, incriminating, scientific gaze" (Horowitz 1967). Consequently, some young anthropologists have rejected traditional ethnography for quantitative methods and more distanced and formalized analyses. Others focus on themselves rather than on the apparent subjects of the study.

This critique generates crucial questions of professional ethics. Are field workers invariably engaged in exploiting people they study? Do subjects benefit from anthropological research? Such penetrating questions have shaped the debate on professional ethics and have taken on particular prominence since the eruption of the Project Camelot controversy in 1965.

THE ETHIC OF POWER

The ethic of power raises questions about the sponsorship and use of anthropological research. In the World War II era working for the United States government was considered a patriotic duty. Distinguished scholars like Ruth Benedict, Margaret Mead, and Gregory Bateson produced analytical papers for the government. Carolyn Fluehr-Lobban (1991) writes that Benedict worked on wartime secret conferences in support of the European underground and anti-Nazi partisan movements. Given the almost universal support for the Allied cause, those who contributed to the war effort were proud of their involvement and received the kudos of their colleagues.

This unanimity changed dramatically during the United States war in Vietnam. The death of Project Camelot in 1965 was one of the first salvos announcing that the social sciences had entered a new era. Increasingly, anthropologists began to scrutinize what projects they worked on, who were the sponsors, and what use would be made of their data.

Project Camelot, sponsored by the United States Army, was a six-country comparative study on the social, political, and economic causes of unrest in the Third World. The Army provided $6 million for the study—a sum never before available for any social science project. According to the lengthy unclassified 1964 study document, "U.S. Army Project Camelot," the findings would include recommendations to nation wide governments on how best to deal with potential uprisings. In addition, the United States Army would assist these allies in dealing with the root causes of popular discontent.

When approached for cooperation by an anthropologist representing the project, social scientists condemned Camelot for serving United States military interests and turned over the project document to the Chilean government. International controversy and an investigation by the United States Congress resulted in the Army's canceling the project. The debate about Camelot's legitimacy, however, raged in the social science community long after the project's demise.

Some scientists argued that Camelot would have yielded invaluable comparative data. For them Camelot represented a coming of age for social science when it would be taken as seriously by government policymakers as were the physical sciences. Yet, other scientists condemned Project Camelot as support for Pentagon counter insurgency policies, pointing to a long history of United States intervention in Latin America as evidence that social science should not serve military priorities.

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