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Cultural Ecology and Ethnography

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ECOLOGY is the study of the workings of ecosystems, of the behavioral interdependences of different kinds of organisms with respect to one another and to their nonbiotic environment. *Cultural* ecology is the study of the role of culture as a dynamic component of any ecosystem of which man is a part. Unique among organisms, man carves his ecological niches primarily with cultural tools of his own invention rather than with biological specializations. This niche-carving activity of man not only remolds existing biotic communities but also has a shaping effect on the tools—that is on man's cultural knowledge and equipment—themselves. In addition, man constantly devises new tools for carving out more effective places in the ecosystem surrounding him. Because of this progressive cultural adaptation and specialization to environmental conditions, the study of cultural ecology, under one name or another, has been closely linked with theoretical interest in culture history and culture evolution. Steward, who framed the present designation of the subject, construes cultural ecology largely as a methodology for building evolutionary theory (Steward 1955:30-42).

Although the utility of ecological studies for such pursuits is undeniable, it is not necessary to regard cultural ecology simply as a methodological

adjunct to nobler tasks. Cultural ecology, in that it refers to a delimitable system of phenomena, is a legitimate field of anthropological interests in its own right, as legitimate as the study of social systems which has so absorbed the efforts of many of us. If the social system be envisioned as a network of relationships among persons of a *social* community, then the ecological system is a network of relationships between man, the other organisms of his *biotic* community, and the constituents of his physical environment. In both cases the net is woven of cultural threads, and the two networks are, of course, inter-connected at many points.

But before the possibilities for general theory inherent in a study of cultural ecological systems are fully realized, the problem of describing these systems, the ethnographic problem, must, I think, be taken more seriously. As Hymes (1960:343) has remarked of linguistics, "One need not stop with the individual systems, but one must pass through them." The comparative method, whether on the scale of a Murdock (1949), a Steward (1955), or a Gulliver (1955), cannot yield results of greater validity than that of the data being compared. This paper has the purpose of assessing cultural ecology as an ethnographic endeavor. First, I will present some notions of what constitutes an ethnographic description, then I will suggest some ways in which ecological studies might be encompassed within the framework of these notions, giving a brief example from my field work.

Following Goodenough (1957), this paper proposes that a description of cultural behavior is attained by a formulation of what one must know in order to respond in a culturally appropriate manner in a given socio-ecological context. Such a description, like a linguist's grammar, is productive in that it can generate new acts which will be considered appropriate responses by the members of the society being described. A successful strategy for writing productive ethnographies must tap the cognitive world of one's informants. It must discover those features of objects and events which they regard as significant for defining concepts, formulating propositions, and making decisions. This conception of an ethnography requires that the units by which the data of observation are segmented, ordered, and interrelated be delimited and defined according to contrasts inherent in the data themselves and not according to a priori notions of pertinent descriptive categories.

The necessity of coming to terms with one's informants' concepts is well recognized in some ethnographic endeavors, kinship studies providing the most notable example. No ethnographer describes social relations in an alien society by referring to the doings of "uncles," "aunts," and "cousins." Many ethnographers do, however, describe the pots and pans, the trees and shrubs, the soils and rocks of a culture's environment solely in terms of categories projected from the investigator's culture. In comparison with studying religious conceptions or kinship relations, the description of the tangible objects of a culture's ecosystem is usually regarded as one of the ethnographer's simpler tasks. If he does not know a word for a specimen of fauna, flora, or soil, he can always ship it off to a specialist for "identification." However, if one in-

sists that no specimen has been described *ethnographically* until one has stated the rules for its identification in the culture being studied, then the problem of describing a tangible object such as a plant may become rather more complex than the relatively simple task of defining contrasts between categories of kinsmen. Consider, for example, the problem of identifying plants according to the Hanunóo system of folk botany (Conklin 1954, 1957). The Hanunóo, tropical-forest agriculturists of the central Philippines, exhaustively partition their plant world into more than 1,600 categories, whereas systematic botanists classify the same flora into less than 1,200 species. To place correctly, by Hanunóo standards, a newly encountered plant specimen in the appropriate one of the 1,600 categories requires rather fine discriminations among plants—and these discriminations rely on features generally remote from the botanist's count of stamens and carpels. By discovering what one must know in order to classify plants and other ecological components in Hanunóo fashion, one learns what the Hanunóo consider worth attending to when making decisions or how to behave within their ecosystem.

An ethnographer, then, cannot be satisfied with a mere cataloguing of the components of a cultural ecosystem according to the categories of Western science. He must also describe the environment as the people themselves construe it according to the categories of their ethnoscience. From a presentation of the rules by which people decide upon the category membership of objects in their experience, an ethnographic ecology can proceed to rules for more complex kinds of behavior: killing game, clearing fields, building houses, etc. Determining the requisite knowledge for such behavior shows the ethnographer the extent to which ecological considerations, in contrast, say, to sociological ones, enter into a person's decision of what to do. The ethnographer learns, in a rather meaningful and precise sense, what role the environment in fact plays in the cultural behavior of the members of a particular society.

A partial description of the settlement pattern of the Eastern Subanun, a Philippine people, will illustrate the notions of cultural ecological description advanced here. This analysis would ideally rest upon a presentation of the pertinent Subanun ethnoscience relating to agriculture and vegetation types. Limitations of time force a rather inadequate and simplified description, but one, which if not a contribution to ethnography, may at least point up some of the desirable features of a legitimate ethnographic contribution to cultural ecology.

The Subanun have carved a niche for themselves in the tropical rain forests of Zamboanga Peninsula, on the island of Mindanao, by swidden agriculture (or "shifting cultivation" Frake 1955, 1960; cf. Conklin 1957). The tropical forest agriculturist must establish a controlled biotic community of sun-loving annuals and perennials in a climatic region whose natural climax community, the tropical rain forest, is radically different in almost every respect from the community agricultural man seeks to foster. The swidden farmer meets this problem by periodically putting the forest through its suc-

cessional paces. He modifies and operates on an existing ecosystem rather than permanently replacing it with an utterly different kind of biotic and edaphic world, such as that of the wet-rice paddy.

The Subanun settlement pattern is one of clustered new, secondary, and fallow swiddens with individual nuclear family households dispersed within these swidden clusters. This pattern contrasts with that of many other Southeast Asian shifting cultivators who disperse their swiddens around relatively fixed and nucleated settlements.

The Subanun themselves do not have a notion of "settlement pattern" in the sense of an image of spatial relationships among households and settlements to which they must conform. Rather their settlement pattern as seen by an ethnographer is, like their "rule of post-marital residence," the outcome of a large number of individual decisions. These decisions are not made at random, say by flipping a coin, but by evaluation of the immediate circumstances in terms of a set of quite explicit principles about the desirable relations among houses and fields. An ethnographic description of the Subanun settlement pattern as part of their ecological adaptation must consist of more than a map locating house sites and more than a characterization as "neighborhood," "hamlet," or "village." It should comprise a set of rules which state what one must know in order to decide where to live. Ideally the description should be a set of rules which will generate the Subanun settlement pattern appropriate to any given set of conditions.

To simplify the discussion I will take three features of the Subanun ecological adaptation as given, although they too could be derived from further rules of individual decision. The givens are:

- 1) Swidden agriculture with grain-crop staples, requiring an annual shift in locus of primary agricultural effort.

- 2) Organization of production and consumption is assigned to the nuclear family. Each family has the responsibility for clearing and cultivating its own swidden and enjoys joint and exclusive control over the distribution of its produce. No social group larger than a nuclear family cultivates a single swidden. Any individual who is not currently a member of a nuclear family is responsible for his or her own support by swidden agriculture (see Frake 1960).

- 3) Division of the population at any one time into discrete social groups, here termed *settlements*. Settlements are local groups emerging from alliances formed by a half-dozen or so related families for cooperation in agriculture and other activities. (One basis for settlement groupings, that of swidden clustering, derives from the rules that follow. But this rule, in itself, is not sufficient to account for the division of the population into settlement groups. Here we take these social groups to be given and concern ourselves only with the spatial arrangement of households within a settlement.)

With these givens in mind any arrangement of households found among the Subanun derives from the application of the following rules to particular ecological and sociological situations:

- 1) Minimum number of "wild-vegetation boundaries" (*gelunan* "to-be

- watches”) of a swidden consistent with other swidden-site requirements.
- 2) Minimum house to swidden distance (“house” means the residence of those persons responsible for cultivating a swidden).
 - 3) Maximum house to house distance consistent with the above rules.

These rules are explicit in that they are based on informants’ discussions of actual and potential residence-site choices as well as on observations of settlement and swidden patterns. Many other factors, of course, enter into individual decisions of where to live—house-site auguries, access to water, relations with neighbors, kinship obligations such as bride service, etc.—but these do not affect, in any systematic way, the *spacing* of households with respect to each other.

In most situations, settlement members can feasibly reduce exposed swidden boundaries by clustering all or almost all of their swiddens and by making new swidden clusters adjacent to previous years’ clusters. The first rule, then, has the normal consequence of clustering the fields of a settlement.

Since a swidden work group normally consists of a nuclear family (and is never a larger social group) the second rule, by demanding that each group live as close as possible to its own swidden, yields a norm of nuclear family households. It furthermore requires that new houses must be constructed periodically at new locations. A distance from house to swidden such that a separate field-house would be required as a base for agricultural operations is considered beyond the maximum limits. When this point is reached, if not sooner, a new residence is always constructed. When new houses are constructed they are invariably located at the absolute minimum distance from the current grain swidden; that is, they are placed inside it, situated to overlook as much of current and prospective swidden sites as possible. When a prospective swidden site is too far away to be cleared from one’s existing household, cultivators must temporarily reside in someone else’s house (since all houses are built within swiddens, and a new house cannot be constructed in a swidden before the swidden has been cleared and burned).

Within the restraints imposed by swidden clustering and location of houses with respect to swiddens, the Subanun explicitly endeavor to maximize the distance between households. Two households are never, for example, placed adjacent to one another across a swidden boundary, though such an arrangement would often be consistent with ecological considerations. Temporary compound households are maintained only so long as ecologically necessary to gain access to a new swidden. Once it is feasible to build a new house of its own, a family will always do so. This rule of household dispersal derives from the sociological facts of Subanun life which make it prudent to live sufficiently far from one’s nearest neighbor so that family conversations and arguments cannot be overheard (see Frake 1960).

The ecological rules (i.e., Nos. 1 and 2) which determine Subanun swidden and household arrangements are explicitly geared to protection of swiddens from animal pests with a minimum expenditure of time and energy in such tasks as fence building, field-house construction, and travel to fields for daily

watching. Yet the practice of clearing large areas adjacent to previously cleared areas increases, under certain conditions, the probabilities of succession to grassland instead of forest, thus removing the land from future swidden cycles. The Subanun emphasize the immediate returns of increased swidden protection and accessibility at the cost of some loss of control over the fallowing stages of the swidden cycle. Other swidden farmers of the same part of the world weigh the advantages and disadvantages of alternative techniques for controlling faunal and floral enemies differently with different consequences for swidden arrangements and settlement patterns (cf. Frake 1954; Freeman 1955; Conklin 1957; Izikowitz 1951). The contrasts among the remarkably different settlement patterns exhibited by Southeast Asian swidden farmers will become ecologically interpretable when one compares the factors which generate these patterns in each case rather than forcing ethnographic observations directly into a priori comparative categories. The full ecological and sociological implications of this analysis of Subanun settlement pattern for both internal and cross-cultural studies cannot be explored here. Hopefully, however, this incomplete account has revealed some of the advantages for the study of cultural ecology derivable from ethnographic description ordered according to the principles by which one's informants interpret their environment and make behavioral decisions. We were able to specify to what extent ecological factors determine settlement pattern, to point out significant general features of the Subanun ecological adaptation, and to discover some meaningful dimensions for cross-cultural comparison. These methodological suggestions are not, of course, intended to replace the analysis of an ecosystem that Western biological science can provide. A scientific knowledge of the climate, soils, plants, and animals of a culture's environment is an essential foundation for ecological ethnography—but it does not, of itself, constitute ethnography.

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