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Niche: A Productive Guide for Use in the Analysis of Cultural Complexity

LEWIS R. BINFORD

THIS CHAPTER EXPLORES some of the interpretative implications of a failure to consider the potential causes for organized variability among cultural systems. The niche concept is considered useful when exploring organizational similarities and differences among cultural systems and central to a productive discussion regarding the differences between living systems that are biologically as opposed to culturally organized. Some interesting issues regarding systems complexity are focused upon through a discussion of mutualism and what is implied by the term when students of cultural systems use the idea.

SCIENTIFIC STUDIES AND THE IMPORTANCE OF BOUNDARY CONDITIONS

Current discussions in science frequently focus upon process differences and hence “boundary conditions.” The latter focus seeks to constructively differentiate between the basic types of recognized natural system, both non-biotic and biotic. Physicochemical systems are said to be primarily of an equilibrium type, characterized by slow energy dissipation and dominated by reversible systems state trajectories. Biological systems are of the nonequilibrium type, and may exhibit self-organizing properties and irreversible macrostate trajectories. Compelling arguments point to such systems as being entropy-driven (Brooks and Wiley 1988). Importantly, biological systems

have somatically structured information as a major determinant stabilizing reproduction such that structurally coherent inherited temporal formal trajectories are produced. Two different scales at which variety may be produced are recognized, (a) individual phenotypic variability fixed by natural selection, and (b) body plan variability thought to be conditioned by structural change in ontogenetic programs. The latter results in macrochanges such as the appearance of new lineages, or even larger-scale differentiations such as between genera, families, and so on. Such macroclasses of system are characterized by initial somatic structures of ontogenetic information that structures, and thus insures, highly coherent macroclass lineages.

In marked contrast, there are cultural systems where the information guiding their coherent reproduction is organized extrasomatically. Information conditioning cultural reproduction is embedded in different social units, families, and social formations of several kinds that transmit information to succeeding generations. Special institutions may be specifically dedicated to cultural reproduction, for example, maturational institutions such as schools, or age-graded social sets. To complicate things, the extrasomatic transmission of culture may be organized at different social scales, such as through tutorial one-on-one social relationships, versus, for example, corporate school systems. All such units are organized extrasomatically and justified to the membership through operative learning experiences. This means that the forces conditioning general culture change may simultaneously change the information content of what is passed on to the next generation (Binford 2001:32–43) and could also condition changes in the organizational structure of the transmission system itself. Given such flexible organization, culture change may be very rapid. Insofar as information loss and/or replacement occurs, the result may be irreversible systems trajectories analogous to biological systems. On the other hand, because of the rapid response potentials of extrasomatically stored and transmitted information, one may anticipate that emergent change, or dramatic punctuated change event sequences should also occur. In addition, we may expect that organizational forms common to macrobiological systems among humans could be organized and/or reproduced by different mechanisms operating on different units or classes of phenomena. Nevertheless, we might anticipate that ecosystems and cultural systems could be analyzed in common dimensional terms as a way of recognizing differences that the extrasomatic organization of information within cultural systems might condition varying organizational forms of unknown type and/or nonexistent among ecosystems.

THE NICHE CONCEPT

I recently explored the relationships between ecosystems and social systems organized culturally (Binford 2001:32, 40–42, 115–116, 158). In so doing,

I became convinced that the niche concept could be an important conceptual aid in the examination of cultural variability. I suggested that cultural systems may be organized like ecosystems and at the same time participate in ecosystems. Before this suggestion may be explored further, several issues must be clarified.

The first issue is *what is intended by the phrase "organized like ecosystems"* and *how the relationship between organization and stability is imagined*. In the former case, I simply reference that ecosystems may be characterized in terms of patterned or redundant energy pathways among the constituent units. Such systems may be seen to differ in complexity, as the number of possible microstates or niches increases (Brooks and Wiley 1988:83–85, 97–98). Put another way, two systems occupying equal areas could be said to differ in complexity if one supported more subsystems, each of which exhibited recognizable degrees of cohesion across time. Cohesion in this case refers to the degree that constituent units remained stable and recognizable as organizationally the same in form and integration across considerable periods of time. Species are the fundamental segmental units of ecosystems organization. They are a good example of units with cohesion that might be enumerated in measuring scales of ecosystems complexity and/or diversity. This reiterates a proposition that has been generally accepted in anthropology for many years, namely, complexity refers to the degree of internal functional specialization and structural differentiation.

Strictly speaking, the term "niche" references only the organizational status of a species within an ecosystem. Niche identifies where the species is dynamically located in the organizational space of an ecosystem. Such space implies all of the energetic, chemical, and nutrient articulations as well as the structural segmentation and functional specializations among the various species said to occupy the niches within the ecosystem. From an observational perspective, an assessment of functional specialization can be made only with reference to the broader ecosystem; however, structural differentiation can be accessed by examining the anatomy and physiology of the individuals belonging to a species or a set or sets thereof. Species definition is made in terms of recognition characteristics or a summary of attributes common to all members of the species. This includes behavioral responses to rhythms such as the reproductive cycles and other dynamic behaviors intrinsic to the species. Niche on the other hand references *all the regular articulations that individuals of a species maintain within an ecosystem*. In the biological world, niche refers to the regular and coherent patterns of articulation with other species, sources of energy, or other nonbiological constituents (e.g., minerals, oxygen, etc.). Strictly speaking, species and niche have distinct and relatively unambiguous referents in the biological "world."

As was so cogently argued by Brooks and Wiley (1988), there is always a hierarchy of informational structures within living systems. At least one

level, termed “macroscopic” information, constitutes a fundamental initial condition for any living systems reproductive process such that the new individual reproduced is constrained by the “remembered” properties of its parental source. One can say that the principle is simple, you cannot make a silk purse out of a sow’s ear, or there are structural constraints on the outcome of any given reproductive event. Randomness is not a fundamental part of coherent biological reproduction. Mechanistically we understand this today as conditioned and constrained by the genetic code, the DNA governing ontological development as well as adult physiology and morphology. The DNA “remembers” the basic genetic codes of the parents and this is passed on to the offspring, essentially duplicating a part of the variability in the gene pool represented by the parents. This structure of stored information acts causally in the production of new individuals of the same species. Such stored information structures and constrains the character of the niche that may be occupied by a species. This relationship may be seen in characteristics of the species such as differential abilities to digest different types of food, differing locomotor capabilities, and so on. *One may study the species in its environmental setting and understand the niche it occupies in an ecosystem, but this is not possible in any detailed manner with respect to Homo sapiens.* In the world of culturally organized humans, no such lack of ambiguity can be said to exist as regards niche. *Certainly, all humans do not occupy homologous or even analogous niches in the ecosystems nor the cultural systems within which they participate.* Human behavioral flexibility ensures that humans may participate in adaptively variable niches and yet remain a single species. This seemingly makes the comparative study of cultural systems and ecosystems difficult, or does it?

Both systems are energetically based natural systems, and they vary in organizational structure as is manifest among ecosystems as well as among suites of studied cultural systems. We should be able to look at both in terms of analytical dimensions of systems organization and gain some insight into the relationship between these two types of system. At this point, however, this discussion remains vague. “Until we have decided whether or not to regard a society as an entity, and until we have decided whether, if regarded as an entity, a society is to be classed as absolutely unlike all other entities or as like some others, our conception of the subject matter before us remains vague” (Spencer 1988 [1876]).

Spencer is making a very important point regarding science. I briefly mentioned above that science studies classes of phenomena. This is Spencer’s first point in the above quote. An additional point is that scientists generally have also to decide and define the units among which the chosen examples of the class of phenomena will be comparatively studied. For instance, I may decide to study houses as a chosen class of phenomena. In turn, I may specify that my comparative researches will be made among houses found in camps. This specification requires that I unambiguously

define what a camp is as opposed to settlements, villages, cities, and so on. The advantage of cases belonging to a well-defined class, comparatively studied across well-defined units (camps in the above example), permits us to isolate variability in houses and in turn recognize clues as to how such properties may be responsive to variables that could also be conditioning variant forms of camps or alternatively varying independently of "unit" characteristics. The properties definitive of both the class and unit are being held constant while unspecified properties of both houses and camps are free to vary and thus provide clues to the domains of variability requiring further research. Such domains provide opportunities for learning about additional variables that "must be equal" for a given generalization to be sustained regarding houses found in camps in this example. Science does not work if we do not design research to deal with relatively small "bites" of our ignorance such that our knowledge of the subject matter grows with each modification to the definition of classes and units employed in the comparative research design.

Let's begin clarification with an old set of distinctions that hark back to the founding days of social science. The first recognizes that systems that are said to be segmental are organizationally composed of subsystems internally integrated in terms of likeness (Durkheim 1933:176). Such segments must differ sufficiently so that they do not "lose themselves in each other and be effaced" (Durkheim 1933:177). In more modern terms we might say that such segments are functional equivalents of one another. Examples might be families (a class at a less inclusive scale) that may be combined into a settlement or camp (a unit at a more inclusive scale). Durkheim would have said that such social formations are integrated through mechanical solidarity, or the simple duplication of organizationally similar units. On the other hand, the makeup of these segments, the persons found within the families, are internally differentiated males and females, young and old, married and single, and so on, and there would be accompanying role differentiations in behavior and perhaps status differentiations seen among the persons so differentiated. "They are constituted, not by a repetition of similar, homogeneous segments, but by systems of different organs each of which has a special role, and which are themselves formed of differentiated parts" (Durkheim 1933:181). This type of integration is what Durkheim referred to as organic solidarity. Put another way, the organization is built of structurally and functionally differentiated parts and integrated through some network of energy exchange and mutual dependency.

If we take only the simple organizational distinctions where mechanical and organic forms of solidarity are recognized, we have an analytical language to begin our discussion. Perhaps one additional distinction may facilitate discussion, that of "class" as the term might be used by a Marxist, or maybe a sociologist. Class in the latter context has reference to a "level" that is integrated mechanically, to use Durkheim's term, but unlike a segment it

refers to a unit that is integrated into a hierarchy of differentially scaled analogous units. The hierarchy is generally thought of as representing a scale of dependency among organically integrated units. Biologically speaking, a trophic hierarchy is composed of nutrient-dependent classes (e.g., plants, herbivores, and predators). A hierarchy of occupational castes in India might be an example of economically dependent and integrated classes.

Using such simple descriptive distinctions, we can appreciate that one may comparatively view cultural systems and ecosystems as similar in many of their general properties, particularly in the structural aspects of parts to wholes. It is suggested that this exercise should be productive since much of the comparative study of cultural systems has been conducted with no real attempt to deal with such issues as complexity in organized systemic terms. I think that most students of anthropology think of a hierarchy of complexity as moving from some property like small-scale egalitarian societies to large-scale ranked and/or stratified societies. Such a view implies that on any class level the cases included are organized in a similar manner. Generally in an empirical sense, this will never be the case except with regard to the class-defining properties and then only if they are used rigorously.

My recent comparative work on hunter-gatherers (Binford 2001) demonstrates that cultural systems vary organizationally in fascinating ways, particularly as regards the issue of complexity and variant forms of complex system.¹ This is perhaps best illustrated with cases normally cited as hunter-gatherers such as the Mbuti (Ichikawa 1983), Efe (Bailey and Peacock 1988), and Aka (Demesse 1980) of Africa, the Macu of Colombia (Silverwood-Coop 1972), or the Bihore of India (Williams 1974). By anthropological convention, these "peoples" are viewed as ethnically distinct. In turn, the conventional assumption is commonly made by anthropologists that ethnicity identifies the "natural units" (Quine 1991) by which different cultural systems may be recognized. Ethnic units are commonly considered the segments most analogous to species in biology. If so, by identifying an ethnic group, we could reasonably hope to study the niche occupied by the ethnic group in an ecosystem. This is not, strictly speaking, accurate. In all of the cases listed above, each is an ethnically distinct social unit that is organizationally integrated into a larger, more complex cultural system. In the latter larger system, other ethnically distinct peoples make up additionally differentiated segments residing within an essentially common habitat. Under the latter conditions, *all such ethnically differentiated segments are integrated into a larger system articulated by linkages that Durkheim would have described as exhibiting organic solidarity.*

In the cases of the Mbuti (Putnam 1948) and the Efe (Bailey and DeVore 1989; Grinker 1990), they have been described as mutualistically organized relative to ethnically distinct agriculturalists with whom they are economically and socially integrated. In biology, stable mutualistic integration is achieved between different species. Thus we see in the equatorial

regions of Africa (Kent 2002) and also among many tropical cases in South-east Asia (Junker 2002; Morrison and Junker 2002) ethnically distinct peoples who are economically articulated to other ethnically distinct peoples. Each ethnic group is a functionally differentiated and organizationally integrated subsystem of a larger multiethnic complex cultural system. "It is the permanence of the relations among component parts which constitutes the individuality of a whole as distinguished from the individualities of its parts" (Spencer 1988 [1876]:6-7).

This larger systemic whole is ethnically segmented, and yet the segments are organically integrated by virtue of economic specializations and social articulations among them. Current opinion is that the ethnically differentiated yet organically integrated organization of Mbuti like African "pygmies" with horticultural "nonpygmy" peoples has great antiquity. It is estimated to be on the order of 2,000 to 2,500 years (Cavalli-Sforza 1986:425). Western historical references to such relationships, although vague, suggest such relationships known during Roman times (Quatrefages 1969:1-19, 164-175). Clearly the indications are for very stable long-term integrations that appear to be "mutualistic" in the biological sense of the word. This form of organization defines a multiethnic complex sociocultural system within what was apparently originally, at least in many places, a common habitat. Differences in the immediate environments of the "mutualist groups" are apparently mostly anthropogenic (Roscoe 1990), or a consequence of their separate economic specializations and the differential exploitative impacts each has on the habitat.

In the above summarizing statements I placed in quotations the word "mutualist." Why? Instead of seeing the above as a complex system based upon segmental ethnic partitioning, for the anthropologist who studies culture the tendency is to favor "natural kinds" as being culturally defined. Thus for some researchers, the Mbuti or the Efe, for instance, are considered independent societies of hunter-gatherers. Somewhat in the opposite direction, the same properties when linked to trade or exchange of food, between what are judged to be differentiated ethnic groups, is interpretatively cited as evidence for mutualistic integration between ethnically differentiated groups. This same evidence for an earlier generation of archaeologists using conventions for interpreting the past would have been interpreted as evidence for diffusion of food sources from one ethnic group to another, or maybe even a migration or wave of advance of peoples from one place to another stimulating acculturation of original peoples to the newcomers. More recent work addresses some more informed patterns of interaction (Spielmann 1982, 1986) and puts in place more sophisticated arguments regarding different types of interethnic interaction (Gregg 1988:37-58).

How does the above paragraph relate to the question asked earlier: Why place emphasis upon the word "mutualist"? The answer is simple. By analogy to arguments presented in biology, where a species is commonly

the class of phenomena studied in geographical units for gaining an understanding the niche occupied by the species in an ecosystemic setting. Mutualism refers to ecosystemic forms of integrations between species.

I hope that one primary analytical focus of this chapter is now apparent. It is on the basis of the alternative interpretations for essentially the same archaeological data discussed in the groundbreaking publications cited above that I seek to use hunter-gatherer organization, as ethnographically documented, to explore how we might learn more about organizational "mutualistic" variability among ethnically differentiated hunter-gatherers as well as between hunter-gatherers and horticultural peoples in general. Some of the interpretative positions that were critically addressed by both Spielmann and Gregg, as cited above, have more recently been approached by me using a different analytical approach (Binford 1999, 2001:202–205).

This chapter is about the niche concept and its use in anthropological-archaeological research. It focuses upon the use of frames of reference as fundamental tools for both evaluating arguments already set forth as well designing research oriented toward the recognition of new and provocative forms of complex, culturally organized social-economic forms of interaction and integration. In the latter case this chapter focuses upon so-called cultural mutualism.

It is hoped that the niche concept will aid in this research and at the same time alert archaeologists to some of the complexities that might arise from viewing the same facts from the perspective of a very limited set of interpretative conventions. It is hoped that we will also learn how comparisons among ethnic units can be said to inform us about the organization of cultural systems relative to ecosystems. The idea is even entertained that at least some cultural systems may mimic the organization of ecosystems themselves. If so, it is reasonable to explore the conditioners of ecosystems variability as currently known. Such conditioners may also directly impact the embedded cultural systems within different ecosystems.

ORGANIZATION AND STABILITY

In order to explore further the organizational parallels between ecosystems and cultural systems, we must return to one of the problems introduced earlier, namely the relationship between organization and stability. One organizational issue, that of organic integration, is introduced above. Nevertheless, several issues remain unexplored relative to stability. Stability may be important with regard to both systems forms and the ethnic environments of the variable forms of cultural systems. It should be acknowledged that stability, in the sense of climatic fluctuations as seen in rainfall or solar radiation, is associated with varying stability states in ecosystems. In turn, it has been noted that long-term ecological stability in

the habitat of systems fosters coevolved mutualism (Cook 1985:172, 184–185) among biological systems. Field research has, however, shown that ecosystems stability also varies with the niche structure characteristic of the species articulations and interactions within an ecosystem. For instance, as the “depth” of energetic articulations among species increases, the overall systems stability tends to decrease. Put another way, the more species that a predator feeds upon, the lower the overall stability of the energetic base within that ecosystem. This property was generalized by May (1972:414): other things being equal, omnivores and trophic generalists tend to reduce system-wide stability, whereas an increase in the number of feeding specialists seems to enhance stability. At a slightly more inclusive scale, the more partitioned into feeding guilds the species in a habitat may be, the greater the stability relative to the total number of species represented (Binford 2001:172–174). The greater the importance of stable suites of organisms or “invariate sets” within a habitat, the more favored might be mutualist articulations within that habitat (Mainero and Rio 1985:202).

In my recent study I argued as follows:

Proposition 11.14: The more that cultural systems are integrated like ecosystems, the greater their stability—but the greater their potential for degrading the host ecosystem. Therefore, the organizational scale of the overall system, and that of the participants in such a macro-scale system, represents a trade-off between what is stabilized and the pattern of entropy flow within the larger system. The closer the scale of a participating subsystem comes to the scale of the larger ecosystem, the greater the risk of eco-systemic instability and therefore potential dependent crisis in the subsystem [Binford 2001:412–413].

We might think of the above proposition as pointing to the likelihood that as cultural systems approach the scale of the ecosystem within which they are embedded, the more stable the cultural system and the less stable the ecosystem. On the other hand, *the more a cultural system is organized like an ecosystem, the more the known organizational properties of ecosystems variability can be expected to be manifest among resident cultural systems.*

Shifting attention away from the macrosystemic issues back down to the level of niches, two points are important to keep in mind. First, when biologists speak of mutualists, the unit they reference is the individual, not the species. *This acknowledges that individuals participate in mutualist relationships, not necessarily all members of a species.* This is the way “obligate” mutualism can come into being through evolutionary processes. Second, all that is generally claimed by biologists for justifying the use of the term “mutualists” is that the fitness is enhanced for the individuals organized mutually (Janzen 1985:40). This basic claim does not distract from the issue of stability and its importance for understanding the presence

of mutualist articulations. The work of Whittaker (1972) provides an argument that has fairly direct implications for cultural systems. He suggested that mutualist relationships among species on different trophic levels generate increased species diversity. Put in simple terms, species production on one trophic level, say, among plants, creates potential niches for species on another trophic level, herbivores in this example. When this suggestion is combined with principles of competitive exclusion, we may reasonably expect the relationship between mutualists and species diversity to be curvilinear and concave since more species are supported by the same energetic base, nutrient supply, or area (Rosenzweig 1995:303–304). Therefore, as more mutualist niches are created, the rate of speciation diminishes. Nevertheless, it must be recalled that the numbers of mutualist niche articulations can be said to be diversity dependent. Put another way, (1) *mutualism is favored in diversity-rich areas*.

Most realize, other things being equal, that the greatest terrestrial species diversity is achieved in tropical systems; therefore we would expect mutualist integration of the intertrophic form to be a feature of tropical systems (Burns 1993:239–249). Since specialized niches are also a characteristic of high-niche diversity settings, we would again expect (2) *that specialist niches and mutualist niches should be positively correlated environmentally, other things being equal*. Is this expectation realized among cultural systems?

Both Elizabeth Cashdan (2001) and Amber Johnson (2001) have documented that, indeed, *ethnic diversity does mimic species diversity among environmentally differentiated habitats*. Species diversity within ecosystems is correlated with ethnic diversity in homologous ecosystemically defined areas. Tropical systems therefore support more ethnic as well as more biological species diversity. It has already been documented that mutualism among biological species is a feature of high-diversity tropical settings.

Figure 10.1 documents the distribution of hunter-gatherer cases by temperature-defined climatic zones (see CLIM in Binford 2001:70). The latter variable is displayed in the property space of latitude and the log 10 values for primary net aboveground productivity. The cases with dark markers record the world's ethnographically known hunter-gatherers who have been identified as mutualists, such as the Efe, Mbuti, and Bayaka of Africa, or the Macu of South America as well as the Shompen and Bihore of southern Asia. Also plotted by dark markers are those who may be called product specialists or peoples who exploit the habitat for rattan and other forest products, etc., that are in turn exchanged for food, wages, or other products that can be exchanged for food. Commonly such specialists and their "employers" are articulated across two or more habitat zones. These peoples live like hunter-gatherers and are commonly identified as such by anthropologists. *On the other hand, mutualist forms of organic integration between species are generally found within a single habitat, or the form of*

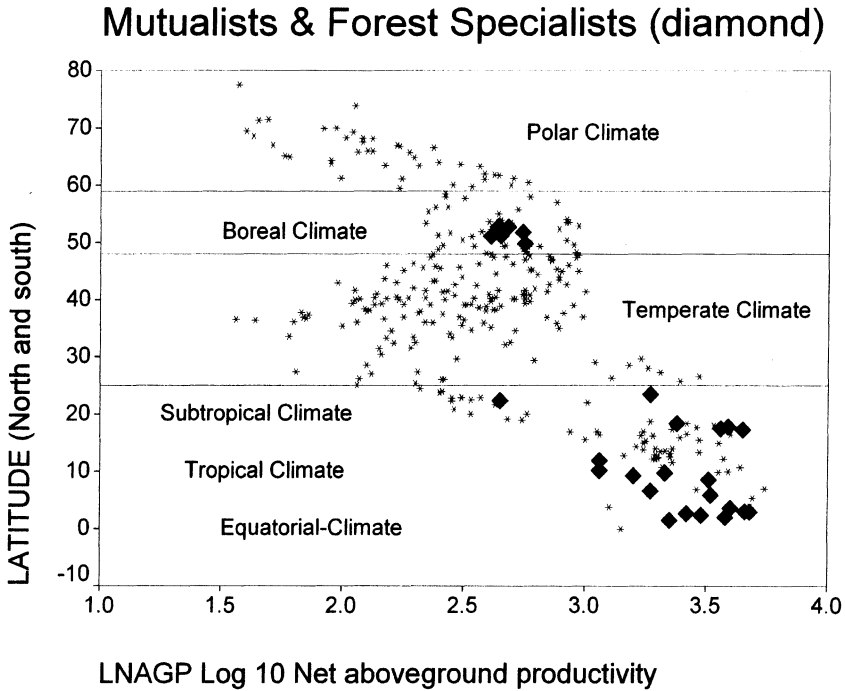


FIGURE 10.1 Global distribution of ethnographically recorded mutualists in environmental property space.

mutualism is one where one species provides the “habitat” for the other. It is clear that conventionally recognized mutualist and specialist cases of hunter-gatherers are dominantly documented in the tropical and subtropical environments of the earth. The only exceptions shown on Figure 10.1 are the fur trappers articulated to trading posts for “selling” their furs. This type of articulation is a function of an intrusive large-scale colonial system oriented toward commodity production with labor differentiation by economic sector (Johnson 2001:6) into a region otherwise dominated by hunter-gatherers who were formerly organized for subsistence production. This may be seen as a “core periphery” articulation as generalized in the global analysis of capitalism (Wallerstein 1974). Except for the fur trapper cases, the pattern of product specialists mimics the conditions said to favor mutualist and specialist biological species that are more commonly found in the tropics. *It is certainly feasible that this similarity in distribution indicates similar responses by biological and cultural systems to the same stability and diversity-enhancing variables recognized as characteristic of the tropics, high and reliable temperatures and rainfall.*

There appears to be a general failure of anthropologists to consider the organizational implications of ethnic group specializations and/or mutually articulated ethnic groups concentrated in the tropics. For example, the high frequency of such cases in the tropics has been cited as evidence supporting the proposition that true hunter-gatherers could not exist in high-biomass tropical settings without mutualist dependence upon horticulturists (Bailey et al. 1989; Headland 1986, 1999). It could be said that these authors instead failed to understand the conditioners of complexity in the domain of cultural systems. *As pointed out in the introductory paragraphs, cultural systems may be functionally specialized and structurally differentiated internally, yet the persons so organized may remain recognizable as members of a single species.* The lack of isomorphism between biological systems and cultural systems as regards niche differentiation drastically changes the relationship between the relatively stable species units in the biological domain, and quick change potential and thus potential for unstable ethnic and/or social unit organization in the cultural domain. Other things are not equal when generalizing or auguring from analogies between biological and cultural systems.

We must recognize that differing suites of individuals of the same species, nevertheless, may occupy different niches within the dynamic context of the macrocultural organization. The cultural analogy to mutualism in the biological world is not defensible, the former is really only systemic cultural complexity of a form not generally recognized by culture-studying anthropologists. Only one species is involved, and the niche differentiation is not by species but by ethnic group, a cultural unit. Most commonly, different suites of persons may be referred to as economically or occupationally differentiated classes, castes, or populations. Such intra-system differentiation signals complexity, and one form may be analogous but not homologous to biological mutualism.

Ironically, the most common argument in the contemporary literature cites trade as a diagnostic for mutualism. Most often, trade items distributed across habitats as well as ethnic boundaries are cited, with accommodating ancillary arguments, as the warranting basis for identifying mutualism (Spielmann 1986:297, 303). I am not a big fan of citing motives as causes in anthropology. There is, however, an irony that is hard to ignore. I have searched at least the hunter-gatherer literature and failed to find any convincing cases that did not trade when given the opportunity. It is true that the Polar Eskimo were certainly isolated at the initial contact with Europeans, and there are no reports of precontact trade. Yet these seemingly isolated peoples regularly shared food within their small population. Some organized relationships where goods were exchanged for other goods, labor, and/or considerations, such as protection, seems to be a generic feature of hunter-gatherer systems, including cases such as the Polar Eskimo. One suspects this is true for most other types of cultural systems as

well. In fact, it has been said that “only man has an economy. His high intelligence and symbolizing ability make true barter possible” (Wilson 1975:551). In fact, one of the traits that might well be distinctive of fully modern humans is trade and exchange of goods and labor, or as Wilson says above, “only man has an economy.” In spite of the probability that inter- and intrasystemic economic exchanges are a generic trait of fully modern humans, trade is nevertheless commonly cited as diagnostic for mutualism! This fact may be at least partially understandable by what best seems a breakdown in the use of scientifically useful learning strategies.

I suggested in the very beginning of this chapter that (a) scientists study classes of phenomena, and (b) such classes are commonly studied comparatively across dimensional units that have been defined so as to hold certain variables constant, for example, size, area, or the range of variability such as in the class example of houses being comparatively studied across defined units such as camps. In the latter example we would not expect to encounter penthouses in camps, using the two terms as they are generally used in common speech. Put another way, by defining units across which a class of phenomena is to be comparatively studied, one is generally restricting the range of variability included in or occurring with the class definition. That is, one is holding some variants of the class constant through the use of a heuristically defined unit.

Recent arguments have postulated mutualist articulations as characteristic of societies from northern Europe (Gregg 1988). Such a suggestion was warranted by citation of known mutualists from Africa (e.g., Mbuti) and an implied argument from analogy. Since such suggestions appeared, others have accommodated similar ideas to the situations where trade seems implied archaeologically as, for example, in the American Southwest (Spielmann 1991). Still other authors have inserted ideas of mutualist intersocial articulations into world systems theory and other contemporary grand cognitive schemes (Baugh 1982, 1984, 1991; Kohl 1987; Schortman and Urban 1986). The result appears to be a growing belief that mutualist forms of integration can occur anywhere and among any types of human society. This problem also seems characteristic of “core periphery” kinds of articulation postulated among non-capitalist forms of systems. Is this really likely to be the case? Persons who argue for such interpretations fail to consider the causes for the properties identified among ethnographic cases. Simply because something exists within the known range of documented ethnographic variability, as an example, hunter-gatherers, or capitalist systems, it does not mean that any given variant can be expected to crop up in any ecosystems context or in any location where alleged hunter-gatherers lived or where capitalists were absent, and so on, in the past. The latter is a common interpretative fallacy. If one is going to use ethnographic analogy, the positive analogy should also include variables that are considered as possible conditioners for the forms cited as being of interest. Only with such

suggestions is theory-building even attempted. After all, arguments from analogy point to similar causes for similar forms! We might give some attention to understanding such causes.

CONCLUSION

I have come full circle. I began this chapter with a discussion of "boundary conditions," or those properties which unambiguously, it was hoped, discriminate among basic types of natural systems. My focus was initially upon cultural versus biological systems. During the course of the latter discussion, I introduced an analogous issue, differentially organized cultural systems. I pointed out major differences between ethnically differentiated independently organized cultural systems and systems of organized cultural units that were internally differentiated ethnically. A strong warrant for suspecting that the conditions that favor ethnically complex types of internal integration are predominantly found in the tropical and subtropical ecosystems was advanced. "Part of our job as scientists is to identify systems characterized by fundamentally different determinant and conditioning properties" (Binford 1983:214).

I have not shown that different conditioning variables or dimensions favor what some have called "mutualism," only that high values on certain variables such as species diversity, temperature, rainfall, length of the growing season, and so on are characteristic where known complex multiethnic organizations and economic hunter-gatherer specialist cases are concentrated. This is also where a concentration of analogously organized species are reported (Figure 10.1). Finally, this is in addition an environmental zone where caste systems (Southeast Asia and Africa at least) are known to exist. Caste systems are cultural systems that are also internally differentiated ethnically, both segmentally and in terms of "simultaneous hierarchies" (Johnson 1982). This association of relatively small-scale² cultural systems that are internally differentiated ethnically with specific environmental conditions suggests that working with ideas of niche and the conditioning factors for ecosystems variability are a good place to begin when seeking to avoid what are likely to be very off-the-wall or even impossible interpretative propositions.³ I suggest that the naive expectation that mutualist integration could occur anywhere is the kind of thinking on our part that prompted Robert Lowie, in his dated and quaint language, to equate our understanding of "civilization" to a "chaotic jumble."

To that plan-less hodgepodge, that thing of shreds and patches called civilization, its historian can no longer yield superstitious reverence. He will realize better than others the obstacles to infusing design into the amorphous product; but in thought at least he will not grovel before it in fatalistic

acquiescence but dream of a rational scheme to supplant the chaotic jumble [Lowie 1920:441].

NOTES

1. Anthropology debated the issue of multilinear versus linear evolution of sociocultural systems numerous times in the past. In general this issue was treated as an ontological issue. Is the real world created by (1) diversification and increased numbers of forms as is seen among cases of increased species diversity through time or (2) are the numbers of forms limited and constrained by causal conditions such that variability at any one time is a result of different rates of evolution resulting in many different forms in different places being contemporary, that otherwise represent classes of systems that unfold evolutionarily in a set sequence or hierarchy of evolutionary development. I think that the ontological issue is resolved by recognizing that both patterns are recognizable, and the issue therefore becomes when and under what conditions one or the other pattern obtains within a given change trajectory.

2. I do not mean to imply that India is a small-scale system today, but that it was, relatively speaking, when the caste system came into being. In fact, if we look around at modern nation-states, many are internally differentiated ethnically, but few are totally segregated so that social mobility is impossible. It might well be that as systems become larger and very complex that one measure of such complexity could be the numbers of criteria employed in internally differentiating segments or "mechanical units" as well as "organically" differentiated components.

3. Brian Hayden has repeatedly made such errors in postulating characteristics of the Northwest Coast hunter-gatherer societies as a precondition to the development of agriculture, and so on. See Hayden (1995:294) and comments by Binford (2001:424–433, 468–470, 486).

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