

**PREAMBLE:** Contrary to the citation listed at the top of the next page, the paper presented here was *NOT* given at the 1974 AAG meeting in Seattle. The author, Barney Nietschmann, could not attend the meeting so he asked Michael Watts, his PhD student, to deliver the paper in his stead. The chair of the session in which the paper was to be presented would not allow Michael to read the paper because he was not the author. This paper was never presented nor published. Copies once circulated among friends of the author, and "under the radar" of most scholars. It was an insightful, but little recognized and appreciated contribution to scholarship in the 1970s. I obtained a copy from the author in 1978 while a PhD student myself. Those of us familiar with the author and his work knew that as a cultural ecologist he struggled theoretically with how to handle external market influences on peoples, cultures, and economies that were once subsistence oriented. His book *Between Land and Water: The Subsistence Ecology of the Miskito Indians, Eastern Nicaragua*, 1973 exemplifies this struggle. It should therefore be considered a forerunner of what would eventually be known as political ecology. Unfortunately, few political ecologists know this as most of them read only recent literature and therefore continually reinvent proverbial wheels. The paper presented here articulates the issues with which the author struggled. Bernard Q. Nietschmann died of esophageal cancer in 2000 at age 58. I post this paper online to honor the memory of him.

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CULTURAL ECOLOGY: SOMETHING OLD, SOMETHING NEW,  
SOMETHING BORROWED, SOMETHING BLUE

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The Currency of Cultural Ecology

The newly minted concept of cultural ecology has been praised as the most worthy "coin of the realm" and criticized as being counterfeit. More accurately, it could be thought of as an I.O.U. note which has yet to be collected but holds some promise for future payment. To date, cultural ecology has been more a point of view for studying a wide range of topics rather than a means to assemble a fund of concepts, theories, or methodologies with which to draft an ecology of culture. Built on a storehouse of case studies with little theoretical or methodological equivalency, cultural ecology, nonetheless, has the potential of providing a common medium to tally and account for the diversity and similarity of human adaptation, cultural evolution, culture change, and environmental modification.

Among academics, there is incredible confusion about what ecology is and what it means in a cultural context. Compounding this problem is the widespread popular use of the word "ecology" to denote both process and object. Current wisdom has it that "they're ruining the ecology" as if they're also "ruining the

political science" or "sociology", which may be true in fact but not in definition. When two amorphous terms such as "culture" and "ecology" are joined we end up with something where the whole is less than the sum of its parts.

To my knowledge there is no common agreement on a definition of cultural ecology, much less agreement among cultural ecologists. The definition that I feel most comfortable with implies much and means little. It is based on a systems approach and as such is not particularly literate nor inclusive.

Cultural ecology is the study of the interrelationships between culture, human society and the environment, including biota and physical elements and processes. The primary focus is on the adaptive behavior of human populations and the exchanges of information, material, and energy within and between the various components of an ecosystem. Neither the environment nor a human population or its culture are viewed as acting on the other in a unilinear way, but are considered parts of an interacting system which, through its circular relationships and systems of negative and positive feedback, influences and modifies each one, and changes them together.

The use of an ecological viewpoint and a systems approach departs from most earlier research in geography and anthropology which was hindered by treating either culture or environment as idiosyncratic isolates or opposing forces that had deterministic influences on each other. Rather than seeking deterministic one-way influences or considering human populations apart from their habitat, several geographers and anthropologists have begun to explore the ecological relationships between human societies and ecosystems. In this way it was possible to bypass the double bind imposed by conceptually separating "culture" and "environment" and

then investigating autonomous or environmentally determined function or origin of cultural traits. Paleo- or neo-environmental determinism reminds me of Lenny Bruce's lavatory story of the not-so-immaculate conception where the environment alone could not determine the outcome.

The search for causal environmental forces is still a predominant theme in cultural ecology, less so in geography than in anthropology. To consider either "environment" or "culture" as dependent or independent variables is at best a heuristic device and at worst sloppy reasoning. Many individuals continue to do so, however, but that is their struggle. Fighting on for 30 years after the cause was over made Lt. Hiro Onoda a hero, so there may be some returns.

#### Something Old, Something New, Something Borrowed, Something Blue

The major ongoing methodological question that cultural ecologists have tried to cope with is how can human-environmental relationships best be explored, described, measured, analyzed, and explained? To date, cultural ecology has contributed virtually no theory, concepts, models, nor much in the way of meaningful generalizations. Consequently, there are few comparable findings or significant predictions.

Cultural ecology is a relatively new concept which borrows heavily from older, more established fields with richer conceptual heritages. Like pack rats we have foraged about looking for shiny and glittery things to take back to our nests where they can be

made to glow with cultural and ecological luminosity. For example: "Cultural ecology is in the pioneer stage of development with a high net productivity and will become more established over time as efficiency and scholomass increases and conceptual webs and theoretical cycles become more complex."

The methodological and conceptual shortcomings stemming from cultural ecology's recent and eclectic origin, nevertheless, are the very things that make it creative and exciting. Too often, entrenched and patriarchal fields become like the Worm Ouroburos who survives by endlessly consuming its own tail.

Blue is the predominate color for articles given to male infants. Cultural ecology, along with many other fields, has a decidedly male viewpoint. Male researchers study male activities and speak of man's adaptation to or interaction with environments. This is a rather biased approach as females have as much a productive as a reproductive role in societies. By "man's role" and "man's impact" we all know that what is meant is mankind. But mankind is an awkward work and doesn't give the right ring (i.e., "Mankind's impact"). Nor does "human" or "person" seem to fit. Based on precedent and comprising a sizeable portion of the literature, the "man's role scholars" often are referring to Western white civilized adult males. If, on the other hand, we were to consider a statistical index for the largest race, age, and sex group, "man" would mean a young Chinese female.<sup>1</sup>

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<sup>1</sup>Pierre Bertaux, "The Future of Man" [italics mine].

## Recent Themes in Cultural Ecology

In the last few years several themes and approaches have become evident in cultural ecological studies. The following is a list of some of the methodological and theoretical approaches and assumptions along with citations from representative published research.<sup>2</sup> The studies selected were written by geographers and anthropologists who worked mainly in tropical areas and with tribal societies.

### 1. Cultural regulation of environmental relations.

Assumption: Continual or periodic decisions regulate human interaction with environmental processes and resources so as to insure long-term viability of the society and its habitat. Examples: a) Ritual. Tsembaga Maring pig festival operates as a negative feedback mechanism regulating the pig population, pressure on swidden sites, and intertribal aggression (Rappaport 1967, 1968); b) Seasonality and scheduling. Human populations schedule subsistence activities to coincide with optimum seasonal environmental conditions so as to maximize return and minimize over-exploitation of any one species or site (Flannery 1968, Nietschmann 1973); c) Fluctuations in group size and distribution. Nomadic migration and changes in group composition are adjusted to resource availability and work effort (Lee 1968, 1969, 1972; Spooner 1973; Woodburn 1972).

### 2. Carrying capacity..

Assumption: It is possible to measure the relationship between human population size and requirements, subsistence technology, and environmental resources and stability in terms of the maximum human population that can be supported without "environmental degradation". Examples: Rappaport 1968, Carneiro 1960, and Conklin 1959.

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<sup>2</sup> For more detailed recent reviews or collected readings of research in cultural ecology see Bennett 1973, Clarkson 1970, Cox 1973, Mikesell 1970, Netting 1971, Vayda 1969, and Vayda and Rappaport 1968.

### 3. Evolution of cultural systems.

Assumption: The evolution of cultural systems can best be understood by means of an ecosystem approach which includes consideration of population-environment exchanges of matter, energy, and information. Examples: Carneiro 1961, 1970; Flannery 1968, 1972; and Harris 1972. Premise 1 (logically unsound): "the similarity in the behavior of biological and cultural phenomena indicates that the same processes underlie both cultural and organic evolution" (Meggers 1971:181). Premise 2: Cultural systems evolved through the increased transfer of energy from ecosystems to human societies leading to deliberately simplified ecosystems (Flannery 1972:399). Premise 3: There were no single "prime movers" which acted as general mechanisms of state formation in all cases. Multivariant causality encompassing a "whole series of important variables with complex interrelationships and feedback between them" appears more satisfactory for evolutionary theory (Flannery 1972:408). Premise 4: Cultural evolution can be measured in terms of the increasing amount of energy harnessed per capita per year.

### 4. Systems ecology.

Assumption: The use of systems theory and cybernetic lingo (positive and negative feedback, homeostasis, deviation amplifying, etc.) provide not only a heuristic but a realistic means to analyze human-environmental relationship (Foote and Greer-Wooten 1968, Rappaport 1968). Examples: a) Enercology. Energy flowthrough organizes cultural and ecological systems and is a useful common denominator for the measurement of ecosystem-cultural system interactions (Moran 1973, Odend'hal 1972, Kemp 1971, Hannon 1973, Rappaport 1971); b) Cultural thermodynamics. The first law states that you can't win, the second that you can't break even, and the third that you can't even get out of the game.

### 5. Subsistence systems.

Assumption: A subsistence system is a complex of functionally related resources and activities through which a group secures food for its own needs and by its own efforts, usually by the direct exploitation of the environment. Production, distribution, and consumption of foodstuffs are generally performed by discrete social units, such as a household or kin group, with little

circulation of labor or produce outside the social network (Nietschmann 1973). Much of the literature is filled with studies implying that subsistence societies led a hard marginal life, had to work continuously just to survive, could not produce a surplus, had a poor diet, and secured a low return from labor inputs. These conclusions often were based more on apriori prejudicial Western economic viewpoints than they were on accurate data analyzed within the context of the culture being studied. Recently, several investigators have provided contrary conclusions. Examples: a) Productivity-labor inputs. Hunting and gathering and traditional swidden horticulture provided high returns from low time inputs (Lee 1968, 1969; Rappaport 1968, 1971; Nietschmann, 1972, 1973); b) Diet and nutrition. Nutritional intake in subsistence societies was often adequate and acquisition of foodstuffs dependable (Lee 1968, 1969; Denevan 1971); c) Surplus. Production above subsistence requirements was limited not by technological inefficiency or time availability, but because of confidence in securing more when the need arose (Sahlins 1972).

6. Swidden systems.

Assumption: Traditional swidden horticulture as practiced by many tribal societies in the tropics is an ecologically conservative technique for producing diverse crops throughout the year. Polycultural swiddens are miniature human-created models which simulate the morphology and function of the tropical forest which they replace temporarily (Harris 1971, Rappaport 1971, Conklin 1957).

7. Population pressure and control.

Assumption: Most tribal societies had cultural mechanisms to regulate birth rates and maintain the total population size below critical environmental limits. Examples: Reichel-Dolmatoff 1971, Neel 1970.

8. Cultural adaptation.

Assumption: Culture is a form of adaptation for human groups. It is a strategy for survival and evolutionary potential by which a society alters its relationship to the environment and the habitat itself in order to maintain a balance between population density, resource use, and the long-range carrying capacity of the environment. Perturbations in population size, resource availability, new information and technology, among other things, may necessitate new cultural adaptations to altered conditions



(cultural evolution). Examples: a) Social structure. Differences in stratification in Polynexia are related to differences in the adaptation of cultures to their environment (Sahlins 1958); b) Resource pressure and mythology-cosmology. The sexual and religious symbolism of the Desana Indians of Columbia is highly adaptive in the context of maintaining a stable tribal density and resource availability (Reichel-Dolmatoff 1971, Janzen 1973).

9. Cultural and ecological impact of large systems on small systems.

Assumption: In exchanges among systems differing in complexity of organization of the flow of material, information, and energy is usually from the less highly organized to the more highly organized (Rappaport 1971, Margalef 1968). This is the ecological equivalent of the rich get richer argument. Contact between profit oriented market economies (large systems) and subsistence oriented tribal societies (small systems) generally has meant cultural and ecological disruption for the latter. Self-sufficient, internally regulated subsistence systems are being changed into dependent externally regulated market economies with degraded environments and cultures (Nietschmann 1973, Pollock 1973).

10. Models.

"I've tried to make simple for you  
The meaning of two, to, and too  
My problems I'll solve with a Model  
(I know one and she's got a bottle)."

Assumption: Complex human environmental relationships and exchanges can be quantified and modeled as an aid in the analysis of cultural-ecological systems. Examples: Two of the most interesting illustrations of the application of models utilizing ethnographic field data are based on Roy Rappaport's Tsembaga Maring Study (1968). Shantzis and Behrens (1973) employ Forester's computer model to simulate the Tsembaga's ritual regulation of the pig festival and resultant changes in human-environmental variables: "The model illustrates how this simple society has managed to establish a form of long-term equilibrium with its resource base; it also shows how easily that equilibrium might be disturbed by well-intended 'modernization' policies which eliminate the system's inherent limits to population growth" (1973:257). Hannon (1973) uses a static linear input-output model to compare Tsembaga-environment energy exchanges and efficiency of energy productivity in

subsistence against various other ecosystems: "Primitive agriculture is more than 40 times more energy efficient than modern food delivery systems" (1973:8).

Because of the predominance of the case study approach in cultural ecology and the limited comparability of findings, the above assumptions and comments should be considered exploratory rather than anything truly substantive.

### Further Palavering

Ongoing research in cultural ecology needs as much rethinking as it does new thinking. Much of the research is grounded on fairly rigid formal logic, narrowly defined epistemological premises, and phenomenal distinctions deemed appropriate by scholars who adhere to a corpus of Western assumptions about the universality of mankind. These criticisms can be best clarified by viewing them in the context of the following statements:

- Neo-functionalism. Much of the recent research in cultural ecology has sought to show the rationality of cultural institutions with respect to their environments rather than to other elements in society. "Function" becomes adaptive function. "It is the deadly weakness of functionalism that it identifies the rationality of the element while ignoring the rationality of the system" (Freidman nd:18).
2. How does the system know? Several studies have attempted to demonstrate how negative feedback systems maintain certain variable below crucial limits (carrying capacity, over-exploitation, etc.). Strain on the system is supposed to trigger a negative feedback loop but how does the system or society "know"? Does the system or the population have some built-in perceptual radar? Did these mechanisms evolve at some time in the past when the society actually exceeded carrying capacity? If not, why are they implemented well below a theoretical carrying capacity level which the group itself may never have experience?

3. Systems. The use of systems terminology and concepts is becoming increasingly popular. In viewing culture as a system we are searching for structure and relationships which may be real but may also be our own mental constructs which exist because we've defined their existence. There is a tendency to forget that systems models are often only aids to attempt to discover important relationships rather than something real in themselves. They are valuable as heuristic and descriptive devices to assist in efforts toward explanation. What we imply from the "system's" structure is based greatly on our own epistemological premises and cultural conditioning.
4. Functionalist-empiricist ideology. There is a strong inclination to describe and explain other societies in terms of the functionalist-empiricist ideology which has characterized most American social science (Freidman nd:16). Economic maximization, economic determinism, and economic rationality are often considered universal traits rather than peculiar to the investigator's society. When we study other cultures from this viewpoint, we assume in advance that understanding means explanation in terms with which we are already familiar from our own experience and descriptions of what the world is like. As one anthropologist, Paul Riesman, said, most of us "carry on as if we know reality while 'other cultures' merely have approximate 'versions' of that reality." We often read of "native" classification and cognitive systems which are prefaced by "ethno" (i.e., ethno-science, ethno-botany), failing to remember that our own classification systems contain ethnobiases as well. Natural history in a very real sense is cultural history, just as the study of another culture is a study of our own.
5. The original ecologists. There is also a tendency to interpret and describe tribal societies and their intimate relationship with the environment in terms of "the original ecologists" living in a static temporal setting. All societies are dynamic; all societies change. The difference is the rate of change. Are present-day tribal societies representative of past ones, or are they survivors because of superior adaptiveness or isolation? If all human populations were supposedly so perfectly adapted in the past, why did cultural evolution take place? The history of biological and cultural evolution is filled with populations that didn't make it. That is what keeps paleontologists and archaeologists in business. If cultural ecology doesn't maintain its adaptiveness, our work will be but fodder for future history of science scholars.

By studying ecological relationships in other, supposedly less complex, societies, we are often seeking to fathom by bits and pieces the history and evolution of human culture. We also look at others to see how much we've lost in order to know how much we've gained.

"We fret ourselves to reform life, in order that posterity may be happy, and posterity will say as usual: 'In the past it used to be better, the present is worse than the past.'"

---- Anton Chekhov

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