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PROCESSUAL CULTURAL ECOLOGY OF THE MIDDLE CONNECTICUT RIVER VALLEY

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The papers in this volume should minimally stimulate, possibly provoke and ultimately challenge the reader. They represent a departure from familiar ways of doing cultural ecology in New England; and, this departure should be the source of stimulation. However, the departure is not an arrogant retreat to the solitude of a newer archeology. The authors have the genuine goal of challenging the reader to enter into a discourse on the theory and history concerning human adaptation to New England.

Setting the framework for this discussion is the intent of my introduction. First, I will comment on the distinguishing assumptions and approaches of these papers. Their processual ecological approach is part of the rationale for assembling such diverse papers into a single symposium. Then, I will briefly describe the historical ecology of the Middle Connecticut River Valley, their second common theme.

A brief production note is in order. Versions of these papers were originally presented at the Quebec Meeting of the Northeast Anthropological Association in 1978. Revisions were based on the comments of the discussants, reviewer and others who attended the sessions. The discussant's comments are included in this volume.

Processual Cultural Ecology

In a phrase, processual cultural ecology distinguishes this collection of papers from what is usually done as cultural ecology in New England. Let us further consider this approach by starting with some widely shared concepts. Basically, the papers are aimed at understanding behavioral aspects of cultural systems. Behavioral similarities and differences are approached in all these papers with a cultural ecology research strategy. From a cultural ecological perspective, interactions between human populations and their natural and social environments are the keys to understanding variability through time and across space. If an interaction is systematically and formally understood, it is referred to as a process. Note, cultural ecology within a research strategy is inclusive, not exclusive. The enterprise of understanding similarities and differences begins with processual studies of social and natural relations; it does not end with these ideas. Processual cultural ecology, then, is the study of the behavioral relations linking human populations with their natural and social environments that result in cultural similarities and differences.

Nothing too controversial has been developed, yet. However, starting at this level of abstraction is not simply pretension, but marks one of the differences between these papers and much other New England cultural ecology. The present authors are working on problems in both anthropological theory and the history of New England. Thus, it is necessary to specify the area of theory, namely, general cultural ecological theory rather than structuralism or sociobiology, that is of concern. This is distinctive because theory receives so little attention in the New England literature. The usual reason given for this state of affairs is that too little data are available to make secure theoretical analyses. And yet

numerous philosophical analyses of science indicate that theory building consists of more than amassing data (e.g., Kuhn 1970). Every statement about history is based on many theoretical assumptions. These papers critically look at old assumptions and add some new ideas concerning the cause of cultural variability. In doing so they are building theory. By using Connecticut Valley data, they are clarifying New England culture history.

Given this interest in theory, it is worth noting the conspicuous absence of diffusion from these studies. Diffusion is a fairly common concept used to account for cultural similarities and differences (e.g., Turnbaugh 1975). Its absence from this collection, I suspect, has much to do with the way in which these papers treat typology and variability. Ernst Mayr, one of the fathers of the synthetic theory of biological evolution, has succinctly characterized the difference between a typological and a populationist approach (1976:28, see also Clark and Terrell 1978):

> For the typologist, the type (eidos) is real and the variation an illusion, while for the populationist the type (average) is an abstraction and only the variation is real. No two ways of looking at nature could be more different.

This is another point of difference between this collection and most others in New England, as these papers take a populationist perspective. And, a populationist does not use diffusion to explain culture change.

These two approaches (populationist and typological) generally have a very different way of treating the problem of similarities and differences and, by implication, culture change. Consider the typologist. Change from one type to another is problematic. Types are defined to be different; the gulf between them is a priori great. Change is most easily accomodated with type replacement, hence a diffusionary explanation. However, for the populationist, change is from one average to another. This change is often easier to imagine than change from one type to another, especially if the ranges of variation used to abstract each average overlap. For the populationist, change can be accounted for along one dimension by finding covarying change along another dimension. Specifically, in the cultural ecological approach, one looks for covariation between cultural systems and their natural and social environments. Diffusion drops out as a useful explanatory tool.

The answers and models in these papers, sharing a populationist perspective, are quite different from those developed within a typological perspective. Many studies on New England are concerned with artifact types, family types, community types, etc., and use diffusion to account for change from one type to another. Their explanatory models are historical scenarios. The populationist papers use behavioral processes to link change in the environment to change in the cultural system. When the variability in one component of a model (say, the environment) can be explicitly related to the variability in another (the cultural system), then the

conditions underlying diversity and change are known. The explanatory models, rather than being historical scenarios, are abstract statements of these behavioral relations.

From whence these behavioral processes? These authors have relied on cultural ecology. Their use varies from the intelligent consumption of sophisticated foraging models (e.g., Hamilton and Watt 1970; MacArthur and Wilson 1967) to the construction of innovative models (see particularly Moore and Root's and Meindl and Temkin-Greener's papers) which are theoretical contributions in their own right. The use of these abstract models is infrequent in most New England anthropology; the level of abstraction found herein will be discomforting.

Another distinguishing characteristic has a bearing on the manner used to unite these behavioral processes with the data on the Connecticut Valley. This is done with a problem orientation in both approach and exposition. There are two advantages to this. First, limited problems allow one to untangle the logic of complex processes resulting in the most efficient use of the complexly biased data of New England. Second, a problem-oriented exposition contributes to the reader's comprehension of the papers. The assumptions and processes are clearly presented so that the reader can refine and hone the ideas.

This brings me to the final distinguishing characteristic of these papers. They are <u>not</u> dogmatic in their approach to history. None of the authors claims to have found <u>the</u> process that fully elucidates human experience in the past. They are all multi-processual in their approach to history; they are all explicit in their approach to theory. Their goal is to articulate a small number of processes, often overlooked by other researchers, and see them in operation in New England. The clear presentation of the logic of the processes is a contribution to general anthropological theory; their application to New England data contributes to the culture history of this region. The multi-processual approach and the problem-oriented exposition are invitations to the reader to engage us in discourse on the theory and history concerning human adaptation to the Middle Connecticut Valley.

The differences between the papers in this collection and much other New England cultural ecology concern these perspectives, assumptions and expository styles. To summarize, these studies are based on the conviction that it is necessary to work simultaneously on theoretical issues and historical clarification. Using a populationist approach rather than that of a typologist, the studies appeal to processual relations between cultural behavior and natural and social environments, rather than diffusionary schemes, in accounting for cultural similarities and differences. The behavioral processes are developed from the abstract work of theoretical ecologists, geographers and anthropologists. A history of the Connecticut Valley from the perspective of processual cultural ecology, informed and informative for a wide range of processes, will ultimately be multi-processual.

While differing views on these assumptions may provoke some, those who basically share these assumptions will be stimulated by the specific processes under consideration. I will briefly review these, to whet appetites and to elucidate the points made above. Most of the papers deal with a similar problem - prehistoric and historic land use. Essentially, they pose the following:

1. Given a dynamic natural environment, what are the likely settlement-subsistence responses?

2. How will changes in both of these variables be reflected in the material record?

3. Are they reflected in the Middle Connecticut River Valley?

Curran models hunter-gatherer response to four paleoenvironments. The models are based on the theoretical hunter-gatherer literature (e.g., Jochim 1976; Perlman 1976) and Wobst's (1974, 1976) theoretical postulates relating hunter-gatherer demography to social organization and material culture. The expected differences in paleo-Indian and Archaic behavior and material culture are based on adaptive processes rather than diffusion.

Mulholland considers the causes of floral population variation as discussed in succession theory (e.g., Horn 1974; Levins 1968). Relying on a number of its postulates, he constructs expectations for post-glacial New England environmental change. This dynamic model is used to interpret the palynology and paleodemography of Archaic and Early Woodland periods throughout New England.

Moore and Root consider a variable usually ignored in settlement pattern studies by developing a model relating anadromous fish behavior to watershed characteristics. Optimal foraging assumptions generate the settlement patterns, which are evaluated with Archaic and Woodland data from Franklin County. The paper has a number of strong points, among them a review of the literature on anadromous fish and a judicious use of mathematical modelling to develop culture theory and illuminate culture history.

A number of the papers, particularly those using historic material, reflect an additional concern with understanding Middle Connecticut River Valley responses to changing social environments. Wallerstein (1974) has proposed a political economic model of the modern world system that I find useful for studying these changes. The basic components of this model are core areas which are engaged in development through their systematic underdevelopment of peripheral areas. Throughout the seventeenth, eighteenth and nineteenth centuries, the Middle Connecticut River Valley tended from a peripheral to a core area.

Thorbahn and Mrozowski point out a problem with such political economic models through their consideration of settlement abandonment in the nineteenth century. They suggest that ecological processes tied to the

soil erosion which accompanied land clearing are an overlooked and important conditioning variable. A stage model for the evolution of hill town land use is proposed with data from Middlefield, Mass. and evaluated and refined with data from Sandwich Notch, N.H. This paper has important implications for political economists interested in world systems who have largely not integrated ecological process into their large scale models.

Spencer-Wood maintains this broader perspective by using the systemic development of a national market as a means to account for changing artifact inventories. Two general notions from geography, the friction of distance and central place theory, inform her inventory expectations. The evaluation draws in sites throughout the United States, though it focuses on Dummerston, Vermont.

McArdle's paper similarly recognizes the importance of not viewing the Middle Connecticut River Valley as an isolated region. He draws on general demographic theory to develop a model of a colonizing population, which has as a salient characteristic, rapid population growth. Out-migration (specifically town founding) is the strategy used to cope with the Malthusian problem. Again, this community analysis has implications for understanding the demography of world systems in general, and the modern world system in particular.

Finison's energy flow analysis of a nineteenth century farm provides a framework for studying the impact of modernization on rural life. Energy flow analysis has been quite useful in illuminating general behavioral processes on both the theoretical level (e.g. Odum 1971; White 1949) and as an analytic framework (e.g. Thomas 1973). More analyses like Finison's would enrich our understanding of historic New England in the direction of general evolution and energetics (e.g., Adams 1975; Georgescu-Roegen 1971).

Meindl and Temkin-Greener's problem concerns the decline in mortality in nineteenth century rural New England. Decline in mortality underlies much of what differentiates the human experience in contemporary developed areas from underdeveloped areas. Their comparative analysis of a hill and valley town suggests that fertility rather than improved public health conditions may have been the key conditioning factor. This certainly has a bearing on development strategies for modernization.

I noted at the start that the authors were challenging the readers to enter into a discussion on theory and history concerning New England. The comments by the discussants suggest that the discussion should be interesting.

Frank McManamon cogently comments on both the data problems and the choice of processual models that make these studies preliminary. If others are provoked to responses as stimulating as Frank's, the literature of New England will be beneficial reading.

John Worrell brings his vast experience in organizing and conducting interdisciplinary research to bear in his comments on the historic papers.

His holistic approach to the past, backed up by experience with a variety of data collection procedures, is reflected in his suggestions for intriguing, additional lines of research. Both sets of comments are greatly appreciated and are models of how to be sharp without being snippy.

I would like to make one final observation pertinent to a subset of these papers. Cultural resource management has become a dominant aspect of New England archeology - note, not dynamic. All too often a difference is made between academic archeology and cultural resource management archeology. This strikes me as a false dichotomy, and a number of these papers support me. Ulrich's paper, in particular, points out the dependence of resource management on imaginative theory and vice versa. Data is an important source of stimulation for theory. Site loss in New England means that managed resources have to be of use to the professionals as well as the general public. Ulrich, stimulated by a managed site, presents a creative model accounting for the slow acceptance of cultigens in mature ecosystems. His paper is not alone as Moore and Root, Mulholland, Spencer-Wood, and Thorbahn and Mrozowski all used data from conservation projects to solve problems of general anthropological interest. Clearly, there is neither the logical necessity nor the room for two types of archeology.

The perspective of processual cultural ecology serves to unite these papers and to distinguish them from much other work in New England. These papers are also united by a common concern with adaptation to interior New England ecosystems. A brief review of the important ecological parameters of the Middle Connecticut River Valley is next on the agenda.

The Middle Connecticut River Valley

The Middle Connecticut River Valley is roughly defined as that part of the drainage of the Connecticut River between the New England Upland geologic section of northern New England and the more temperate Seaboard Lowland section of southern New England. This is approximated by the portion of the drainage within Massachusetts (see Figure 1 which also notes the locations of the individual studies) - particularly the roughly 5000 square kilometers (1930 square miles) of Hampden, Hampshire and Franklin Counties. Alternatively, this is approximated by the area falling between Latitude 42° 00' and 42° 45' and Longitude 72° 15' and 73° 00'. Such closed boundaries, though convenient for data organization, often fail to coincide with all interesting cultural and ecological distributions. Thus, no hard and fast boundaries are proposed, an undesirable task given the transitional nature of the study area.

Within the study area the Connecticut River flows north to south in a downfaulted valley which divides the southern portion of the New England Uplands. To the east is the Worcester Plateau (drained by major tributaries of the Connecticut River, the Miller's and Chicopee rivers); and, to the west are the Berkshires (drained by the Deerfield and Westfield rivers). Two major altitudinal zones - the alluvial lowlands surrounding the Connecticut (about 30 meters-150 meters amsl) and the upland zone to the east and

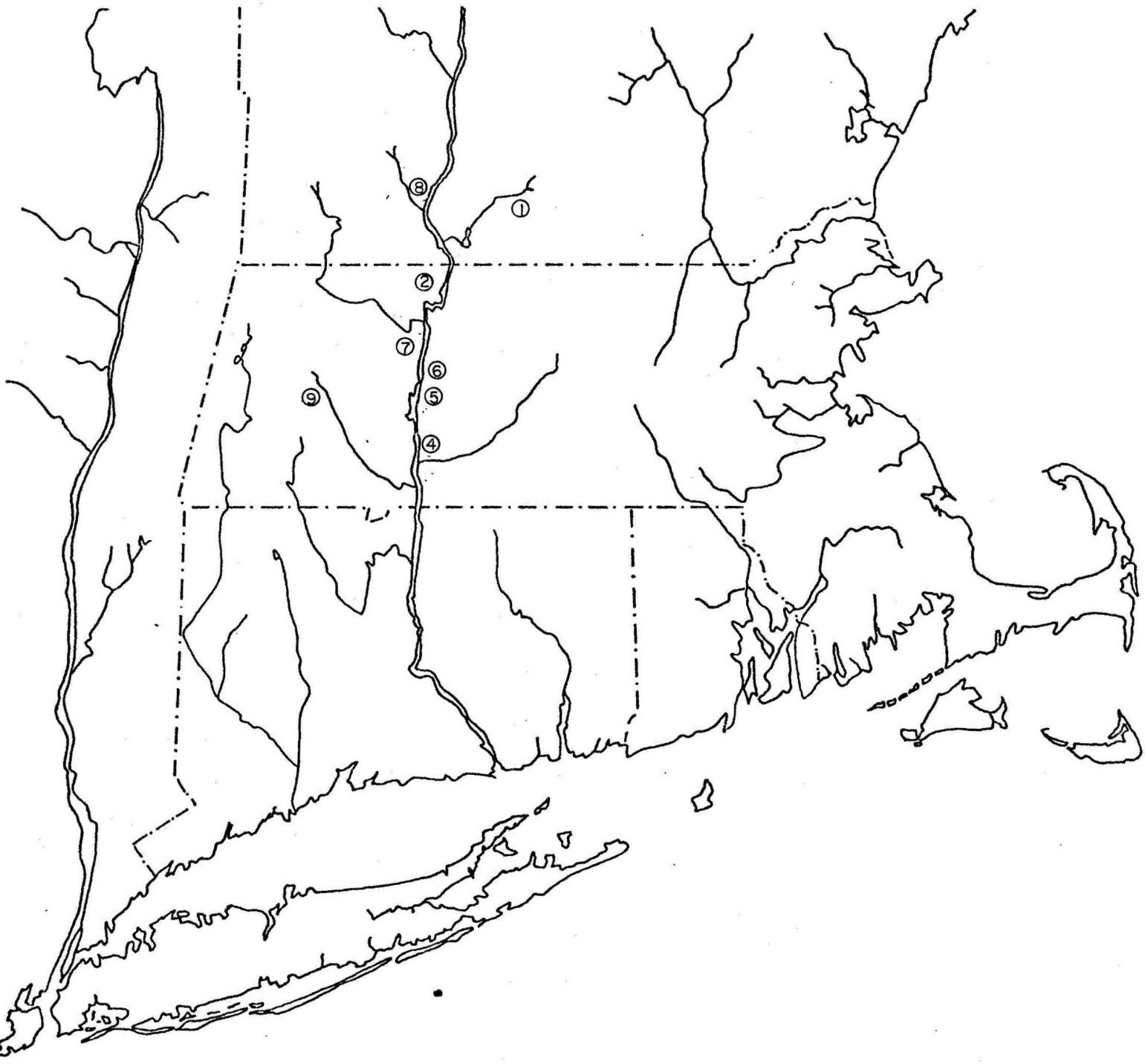

Figure 1. The Connecticut River Valley (numbers identify the areas of the studies in order of appearance in this volume).

west (above 150 meters) - largely contribute to the transitional character of the area (see Hartshorne 1969; Klimm 1933; and Schafer and Hartshorne 1965 for introductions to the area's geology).

Approximately 57% of the area falls in the upland zone and about 43% falls in the lowlands. This topographic diversity is mirrored in the temperature variability; the lowlands have about 120 frost-free days a year while the uplands will have as few as 90. Temperature and substrate variability affects the distribution of major biotic communities. The uplands generally exhibit Hemlock-Northern Hardwoods communities and the lowlands exhibit Oak-Chestnut communities, and their associated fauna. The riverine environments support anadromous fish and migratory fowl (for introductions to the contemporary ecological communities see DOI 1970; Jorgensen 1978; Lull 1968; Spurr and Barnes 1973). Though community composition has changed over time, the variability generated by the lowland/upland dichotomy appears to have been an important factor conditioning human use of the area (Bryson and Hare 1974; Curran and Dincauze 1977; Davis 1969; and Dincauze and Mulholland 1977 are useful introductions to the past ecology).

Prehistoric material suggests occupation of the Middle Connecticut River Valley since the paleo-Indian period (c. 12,000 B.P.). Evidence for occupation tends to be in the lowland zone - though the cause of this concentration is debatable. Hunting, gathering and fishing in essentially modern biomes began by about 6,000 B.P. and remained predominant until fairly recent times (c. 1,000 B.P.). By 400 B.P., a seasonal lowland agricultural site was a component of the settlement system of the native American inhabitants (see Curran and Dincauze 1977; Dincauze and Mulholland 1977; and Young 1969 for introductions to the prehistory of the area).

Permanent European settlement began in the 1630's A.D. The fur trade was a principal economic concern of the contact period. By the 1700's, the dominant economic orientation of the Euro-Americans was various forms of agriculture and pastoralism (the native American populations having been displaced by the end of the seventeenth century). Mixed farming continued as an important factor in the Middle Connecticut River Valley into the twentieth century. In the nineteenth century, the direct effects of the Industrial Revolution became evident in the scattering of factories and factory towns throughout the upland and lowland zones. The industrial orientation indirectly affected the settlement pattern of the area, resulting in depopulation of the upland towns and the concentration of newly arrived Europeans in the lowland towns. Throughout the nineteenth century and into the twentieth century, the economy of the region was focused on a combination of mixed farming and textile and munitions production (see Klimm 1933; Pabst 1941; Thomas 1976; Swedlund and others 1976 for introductions to the anthropological history of the area).

Now that the reader's feet are firmly planted in the Connecticut River, I need only reiterate my initial comments. These papers, as a collection, are different. They use data from the Middle Connecticut River Valley to build theory; and, at the same time, they use abstract theoretical principles to illuminate the history of the area. Their populationist approach

approach coupled with the principles from cultural ecology will contribute to a multi-processual history of the area. Read and be stimulated.

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