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RESEARCH PRIORITIES IN NORTHEASTERN PREHISTORY

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For the purposes of this presentation, I am defining "the Northeast" as New England and its adjacent states and provinces. That will evoke surprise, even indignation, in some quarters. After all, "the Northeast" is New York State, isn't it? (Ritchie and Funk 1973; Weide 1975). However defined (and no two definitions agree) the Northeast has traditionally been considered a marginal, culturally retarded outlier of the eastern United States. The result has been a consistent bias in summaries of Eastern prehistory, where Northeastern culture history is given short shrift, rarely being referred to except for passing mention of Paleo-Indian and Archaic sites and the Iroquois. "Real" Eastern prehistory is the story of burial mounds, temple mounds, stone carvings and beautiful ceramic vessels (vide Willey 1966; Jennings 1968; Brose 1973; Ford 1974; Dragoo 1976; Griffin 1978). Even the most recent attempt to define pan-Eastern cultural periods cuts them to fit events in the Mississippi Valley (Stoltman 1978). No Northeastern archaeologist should be expected to work from that Procrustean bed.

But they have tried. For too long, Northeastern researchers have obligingly cut off their theoretical appendages to squeeze their work into such unsuitable conceptual structures, and then they have apologized for the messiness and inconclusiveness of their research results. From this experience, there has developed a widespread tendency to deprecate the value, quality, and significance of the region's prehistoric cultural resources, to their detriment. There have been few attempts to appreciate and justify the unique qualities of Northeastern prehistory. Few are the voices asking "Why is Northeastern prehistory unlike that of the Midwest or Southeast?" Even fewer voices may be heard answering.

CURRENT STATUS OF KNOWLEDGE

The intellectual history of Northeastern archaeology is mainly the story of diligent excavation in the service of old research questions. From the sheer mass of data recovered, described, and interpreted according to time-honored canons of inductive science, we have gained much. The basic outlines of post-glacial cultural chronologies are reasonably well established for southern New England, New York, and New Jersey (Ritchie 1969a, 1969b; Dincauze 1968, 1976; Kraft 1975; Funk and Rippeteau 1977). Much remains to be learned to the north. Refined methods in ethnohistory have improved greatly our ability to relate late prehistoric and contact sites to the historical record (Trigger 1978: various articles). Crude, barely serviceable models of settlement and subsistence patterns are available for parts of New England and New York (Ritchie and Funk 1973; Funk 1976; Dincauze 1974; Dincauze and Mulholland 1977). These major research goals have changed little since the 1950's, except in the fullness of their data bases.

A number of important anthropological issues remain unresolved. Of the foraging peoples who occupied the region for millennia, we know next to nothing about population sizes and structures, resource exploitation patterns, land use, the social functions of the burial cults, and the socio-economic significance of the artifact style provinces. We are, if anything, even more ignorant of the cultural and ecological dynamics related to the introduction of horticulture in the region. Were the several exotic cultigens introduced as part of a technological complex, or did they arrive singly, at different times and perhaps by different routes? What was the major source area for the introduction(s) and what were the social and economic circumstances? What impact did horticulture have on social structures, and on the annual round of foraging peoples? What environmental or social conditions limited or encouraged the spread and/or acceptability of horticulture? A major gap in the archaeological knowledge of the Northeast is the late prehistoric (pre-contact) period. Even the rough outlines of social organizations in the region remain elusive. We lack details on the annual round, land tenure and utilization patterns, population size and structure. These data are essential to an adequate understanding of the period before the European invasions, and of the nature and scale of the cultural disruptions and adjustments which followed them.

These issues are raised here as an introduction to the discussion to follow. It is my perception that researchers in the Northeast would generally agree on the cogency of these topics for anthropological understanding of the prehistoric record. They are significantly different from the traditional direct-historical, culture-historical and chronological issues which crowd the literature of the past. These are not the kinds of questions we have been answering, but they lurk at no great distance from our best current interpretive efforts. However, the point I wish to make today is that these particularistic anthropolgical questions do not seem to be, in fact, answerable from the kinds of data we are currently collecting in the field. In order to answer them, we must seek different data, data which will be identified by theory adapted from several disciplines in addition to anthropology. Furthermore, to

answer these relatively simple, particularistic questions, we need to begin by asking more universalistic ones.

RECOMMENDATIONS

I am advocating a fresh start toward the understanding of Northeastern prehistory, beginning with an acceptance of its special values and capitalizing on its strengths. Toward this end, I offer a plan for action which consists of the four research priorities discussed below. What I particularly want to emphasize is the rank-order of the priorities: the first is problem definition; the second , selection of appropriate theory; third , research design; and fourth , research strategy or method. This sequence is not news. It has been advocated in the literature of anthropological archaeology at least since 1940 (Kluckhohn 1940). In the Northeast it has been soundly ignored, and still is honored only in the breach when we are urged to develop research designs first, worry about theory later.

Our first best efforts must be directed toward the identification of a number of universalistic questions or "problem domains" within which Northeastern data have potential for contributing to the social and behavioral sciences on a global scale. The identification of such potential contributions should go far toward justifying the humanistic and scientific values of our data, and should instill a sense of purpose and direction into our research designs.

Once we know what we can and should be asking about, we are in a good position to seek bodies of theory which are appropriate to the fullest utilization of the distinctive values of the archaeological record. This search will begin within anthropology, but must extend outward into such disciplines as ecology, population biology, information theory, energetics, geography, and economics, among possible others. These extensions are entailed by the nature of human beings and their adaptive modes. The world around us is as important to our behavior as our personal (idiosyncratic) and corporate (cultural) goals. The nature of adaptation and group survival is fundamentally multi-variate, and working theory must be broad enough to encompass its diversity. The resultant body of theory will implicate data significant for the solution of a number of particularistic as well as universalistic problems.

The third step is logically subordinate to the first two, although operationally inseparable. The development of regional research designs will follow logically and easily from hypotheses developed from the problem domains and theories identified in steps one and two.

The fourth step is the identification and development of data recovery strategies which will facilitate collection of the information required to test the hypotheses. This step is already widely recognized as the operational corollary of regional research designs (Goodyear, Raab and Klinger 1978). It offers here no new insight but its position as the last instead of the first or second among the priorities should emphasize the scope of the challenge before us.

Several years have passed since the call for regional research designs was sounded. In that time, little progress has been made, despite the expenditure of much thought and tons of verbiage. It is my contention that our priorities have been misordered. We must first define clearly what we want to learn from the archaeological record, and have some clear ideas about the concepts which can help us to interpret it. Once those first steps have been achieved, the development of research designs and data-collecting strategies can be confidently and successfully addressed. We already know how to do these things; we have been hampered by uncertainty as to the purposes for which they are to be done.

These priorities are offered not only as an action plan for academic research, but also as the soundest foundation for state historical preservation plans. The first three priorities are essential components of a responsible management plan (King 1977). The first two --problem definition and theoretical orientation--are required to justify both the resource and the effort expended to manage it for the benefit of all people.

The Big Questions

The particularistic questions cataloged above as unresolved issues in Northeastern archaeology address examples of human behavior in particular circumstances. Topics of more universal significance can encompass these regional ones, and bring new dimensions of value to the regional sites. The special characteristics of the regional environment, and of its natural and cultural histories, make the Northeast an appropriate area for studying a number of global issues in human adaptation and behavior. Here I will only mention a few examples.

The Northeast is notable for the diversity of its landscapes and biotic communities. Diversity along latitudinal, longitudinal and altitudinal dimensions is expressed within relatively small distances. These characteristics make the region ideal for studying human modes of adaptation to small-scale environmental heterogeneity. Moreover, the region lies within the temperate zone, that part of the globe most often taken for granted, and least often studied, in terms of human adaptive strategies. Archaeological studies can investigate the relative importance of socio-technolgical and biological modes of adaptation, the range and relative success of hunter-gatherer adaptive strategies in temperate environments of high diversity, and the same problems for swidden horticulturalists.

Because most of the Northeast was glaciated during the Pleistocene, its natural history has been dynamic. Its temperate latitude and position on the eastern margin of a continental mass make the region's climate unstable, in both short- and long-term perspective. Temporal fluctuations of the physical environment, and therefore of biotic resources, are important factors in the success of human adaptive strategies. Temporal fluctuations in environment at several scales impose on human groups selective pressures which may be mutually

supportive or contradictory in their effects. The fascinating dynamics of such situations might be observable in the archaeological record, if we could ask the right questions and select our data appropriately.

There has been increasing interest of late in the relationships--causal or otherwise--between climatic change and cultural change. The literature, remarkably uneven in both quality and conclusions (Wendlund and Bryson 1974; Barry et al. 1977; McGhee 1978; inter alia) is both challenging and important. Faced as we are today by prospects of major climatic change, in either a warmer or cooler (United States Committee...1975) direction, we need to know more than we do about the social as well as biological risks of changing climates.

Twenty years ago, Caldwell attacked the progressivist evolutionary assumptions of North American cultural systematics by opposing the concept of "forest efficiency" to the prevailing notion of universal evolutionary trends toward statehood (Caldwell 1958; Willey and Phillips 1958). The "efficiency" concept was never adequately defined , and fell out of use. The issues, however, remain with us. In the Northeast, the span of post-glacial time did not see the development of ranked societies.

This fact has contributed to the neglect of Northeastern prehistory, which was dismissed as "retarded." Unless we are willing to assume, as I am not, that large numbers of people did not know what was good for them, it behooves us to find out why ranked societies either failed to develop, or were extremely slow in making their appearance. What factors, of environment and culture, made social complexity unattractive, unnecessary, or maladaptive? We should be able to gain precious insights into the human costs of social complexity if we could examine this reverse case.

Other global issues come readily to mind, but out of compassion for my readers I will not discuss them in detail. The role of coastal or estuarine habitats in supporting local high population densities for hunter-gatherers is one issue (Binford 1968; Osborn 1977; Perlman 1978). The process of incorpporation of cultigens into hunter-gatherer lifestyles is another (Green 1976; Bender 1978). The role, and frequency, of population replacement in culture history is a major unresolved issue, subject to waves of intellectual faddism because of the difficulty of investigating it (Fitzhugh 1972; Tuck 1975; Ford 1974).

Theoretical Approaches

These universalistic problem domains can be investigated from a number of distinct perspectives. Here, I will briefly indicate five bodies of theory which offer propositions and models relevant for the elucidation of these domains. These theoretical tools, among others, are especially appropriate for enhancing the utility of the Northeastern prehistoric record to behavioral and social science. Propositions and models drawn from (1) anthropology, (2) evolutionary ecology, (3) population biology, (4) energetics, and (5) information theory have been

applied to Northeastern data by students and faculty in this department. I want to share some of the results with you, to illustrate the power of these theoretical tools to produce new insights into problems, and to generalize productively from the regional data to larger issues. For illustrative purposes, two of the problem domains discussed above will be considered in terms of appropriate theory derived from these five sources.

Adaptation to environmental heterogeneity ("patchiness")

First let us consider problems related to "human modes of adaptation to small-scale environmental heterogeneity." Theory from all five sources can be applied to this domain. Recent work in population biology has provided powerful analytical concepts useful for model building. Theoretical work on the qualities of environments, such as density, diversity, stability, etc. (Levin 1976; Horn 1974; Watts 1973; Brookhaven National Laboratory 1969) has made these concepts available for the construction of both models and hypotheses which have clear test implications expressible in terms of historical trends. Both qualitative and quantitative tests can be designed. Evolutionary ecology provides models of predation strategies appropriate to spatial and temporal variations in the scale, diversity, and density of prey resources (Wiens 1976; MacArthur and Pianka 1966). The theoretical propositions and models developed to study animal behavior in "patchy" (mosaic, heterogenous) environments have stimulating implications for the behavior of human individuals and groups in such environments. As with all models, these simplify the complexity of the real world, but they do so with a sophistication which forces the investigator to approximate it more closely (Levins 1966).

The development of theory to predict and measure foraging (feeding) strategies of mobile predators draws from evolutionary ecology (MacArthur and Pianka 1966; Schoener 1971; Charnov 1976), energetics (Winterhalder 1977), and information theory (Hamilton and Watt 1970). Models of food webs and niche breadth permit predictions about exploitative strategies in dynamic perspective. With these, we can greatly refine our anthropolgical concepts of "generalist" or "specialist" strategies. Energetics and information theory offer concepts highly relevant to the analysis and explanation of human settlement patterns (Wobst 1976; Moore 1978b). The risks and benefits of aggregated or dispersed patterns can be modeled, and partly explained, with these concepts.

Energetics and information theory can be combined with anthropological concepts to generate models exploring the adaptive value of technological variability in time and space. With these models we can escape from the old trap of static, or "modal," models of prehistoric behavior (Wobst 1978; Winterhalder 1977), and begin to investigate the range of human behavioral plasticity in time and space (Moore 1978a; Root 1978). The choice among alternative settlement patterns, seasonal variation in exploitative strategies, and sex-role differentiation or overlap can be elucidated.

The costs of social complexity

Any progress toward understanding the long-term conservativism of Northeastern socio-economic structures should contribute significantly to our knowledge of the cost and benefits of complex societies. We can draw relevant theory from anthropology, of course, and from evolutionary ecology, energetics, and information theory, at a minimum. Models of adaptation to patchy environments, utilizing concepts of patch quality (Weins 1976), resource density (MacArthur and Pianka 1966), resource diversity (Horn 1974), diet or niche breadth (Charnov 1976; Fretwell and Lucas 1969), information sharing (Moore 1978a, 1978b; Wobst 1976, 1977), energy conservation or maximization, and the dynamics of trade and mating networks (Wobst 1976; Gould 1978) all have their relevance here.

The adaptation of bodies of theory from economics and biology must not be misconstrued as either a reductionist or a determinist strategy on the part of an anthropologist. Theory and models from these other disciplines, appropriately applied to anthropological problems, can significantly contribute to the clarification of fundamentally human issues. Just as anthropology derived its great strength from the comparative method, permitting a more objective perception of the regularities and idiosyncracies of human behavior, so the addition of non-anthropological theory can clarify problems of perception and of explanation in human studies. It is unrealistic to deny that some aspects of human behavior, whether individual or corporate, are subject to biological explanations. Any body of theory which facilitates the recognition of those aspects can contribute greatly to the recognition and explanation of the cultural variables which interact with the biological ones.

Northeastern examples

The productivity of these theoretical perspectives for expanding the generality of Northeastern data will be demonstrated by three examples. These have been developed in seminars and discussions with graduate students and colleagues over the past three years.

The problem domain of human adaptation to environments of high spatial heterogeneity will be discussed in terms of adaptive patterns for (1) Paleo-Indian populations and (2) populations of the Late Archaic period of ca. 4000 BP. In both cases, the southern New England environment is briefly modeled, and implications for hunter/gatherer strategies are derived. The degree of congruence with current theories and models will be considered, and the productivity of the models will be evaluated.

Paleo-Indian adaptations

The late-glacial environment has been traditionally reconstructed by analogy with modern high-latitude tundras (e.g,, Funk 1972). The picture presented is one of relative spatial homogeneity, low species density,

and low predictability. Models of human subsistence strategies have assumed human specialization on Pleistocene big-game or migratory caribou herds; the latter assumption has been usual for the Northeast (Funk 1972; Byers 1954; MacDonald 1968). The conclusion usually advocated is that human groups were following a specialist strategy, preying on large or herd game, moving often, and aggregating for efficient hunting of seasonally clustered prey.

Recent studies in paleoenvironments have revised this picture considerably, and have forced reconsideration of the human strategies usually assumed (Davis 1969; Brown and Cleland 1968; Adovasio et al. 1977; McNett et al. 1977; Ogden 1977; Curran and Dincauze 1977; Eisenberg 1978). The current picture of Paleo-Indian environments is one of spatial heterogeneity of resources, relatively low species densities, and low predictability. The spatial variation and low predictability together imply that "specialist" strategies would be inefficient, even fatally short-lived. In order to maximize the efficiency of search and "capture" time for resource collection, human foragers should have adopted a generalist strategy. That is, they should have been prepared to collect or capture the full variety of foods available to them. The fact that the variety was itself limited does not make its exploiters specialists. The diet breadth would have been constrained by the low density and predictability of resources. We cannot gratuitously assume that human foragers would have further restricted their diets by choice. Not, at least, until we can demonstrate such perversity in the record (i.e., demonstrate a cultural bias).

If, then, we conceive of Paleo-Indian foragers as generalists in an environment of high spatial variation and low resource density and predictability, there are informative implications to be drawn about the archaeological consequents. As generalists moving through spatial heterogeneity, these people should have developed tool kits characterized by multi-functional tools. The kits, moreover, should be duplicated in even widely-separated places, because they were not finely adjusted to specific locales. This model is partly supported by a recent study of tool kits in the Delaware-Hudson area (Eisenberg 1978). Furthermore, the model offers an explanation for that situation which was not well accounted for by Eisenberg's hypothesis of local specialization.

The repeatedly observed presence of exotic cherts in Paleo-Indian assemblages can be profitably compared with Gould's (1978) model for lithic transport and exchange in environments "subject to extreme fluctuation on an irregular and unpredictable basis" which are exploited by peoples organized into "widely ramified, long-distance, kin-based social networks." The exchange of items of exotic stone is interpreted as serving social and symbolic, rather than technological functions. The exchanges serve to reduce inter-group hostility and to symbolize risk-sharing interdependence.

Late Archaic adaptations

By 4000 years ago, the southern New England environment was different in almost all aspects from that of the Paleo-Indians. Marine inundation had reduced the extent of the land, the climate had ameliorated, and the biotic communities had changed to temperate forest flora and fauna (Davis 1969; Dincauze 1974). In qualitative terms, spatial heterogeneity remained high, but may have been somewhat tempered by late-successional stability in the major communities. Species density was high, diversity somehwat below its peak, and predictability probably at its maximum (Mulholland 1978).

Forager populations in high-density environments are able to reduce their mobility somewhat, and to settle into defined, and sometimes defended, territories (Dyson-Hudson and Smith 1978). Within bounded territories they must extract energy from the resources immediately available to them. The diet breadth will vary as a function of the diversity of resources within a territory. Each group will develop extraction strategies closely tuned to its resource mix, and in that sense each will be specialists. They will run the risk of specialists--jeopardy in the face of environmental perturbations. From territory to territory, the resource mix, and thus the diet, will vary. The regional picture, seen as we now see it as the sum of its parts, will be one of hypergeneralists utilizing edible resources down to quite low links in the food chain. Intensive resource exploitation of this sort has its cost--both economic and environmental. Resource selection tends, through time, to move to the lowest common denominator as the richest patches are depleted and/or degraded (Charnov 1976), and extraction costs in terms of effort rise with attendant loss of energetic efficiency (Christenson 1977).

The archaeological implications of this situation are that we expect a high variance of cultural and behavioral patterns through space and time (Hayden 1975). There should be a high functional (and perhaps formal) diversity of tool assemblages across space, and through time at both the seasonal and millennial scales. Populations living within small territories will have to develop exchange networks for the procurement of essential or useful commodities unavailable locally. Foragers living under these conditions will be at risk from environmental perturbations, including those imposed by their own or their neighbor's intensive resource extraction. In an environment of apparent richness, some failures may occur, and these will be visible first in the less productive territories.

The data presently available for the Late Archaic of southern New England conform closely to the predictions of this model. We see tool assemblages which contrast markedly over space. Settlement pattern data imply high seasonal contrasts in resource use. Exchange networks become more elaborate through time, and there begins a slow but apparently consistent abandonment of the less productive upland habitats, which were most fully utilized around 4000 BP and were demonstrably marginal by 2500 BP (Dincauze 1974).

Conservative social structures

Swidden horticulture imposed on the New England landscape a new intensity of spatial variation. New vegetative resources were introduced on arable land, creating patches highly contrastive with their surroundings. The crops increased local diversity and densities of edible plants, both while in the fields and in storage. The fallow cycle for cleared land introduced another dimension of patchiness and of increased diversity by initiating staggered local successional sequences. The locally high densities of edible plants created spatial foci for human populations, leading to relatively dense occupations near arable land, and the creation of sparsely occupied hinterlands between the valleys (P. Thomas 1976).

Swidden horticulture on limited arable land where local climatic conditions are unstable is not a highly reliable resource strategy. The New England Indians continued foraging to supplement their gardens and to hedge against crop failure or marginal returns. With territories apparently larger than those of the Late Archaic, the farming communities were more nearly "generalist" than "specialist" in their exploitative patterns. Surpluses were not hoarded, but were redistributed within and between groups. Because these people had a number of resource options available to individuals and families, the controlled and channelled access to key resources which supports social ranking was poorly developed among them.

The environmental situation and the social adaptation to it thus developed in directions different from those of the Midwest, where distinctive "edge areas" demarcate large-scale patches, creating a situation where specialist strategies and commodities exchange can, and perhaps must, be directed and controlled by ranked social orders (Struever 1968).

Indications for Research Designs

In the ranking of priorities advocated here, the preparation of research designs at regional and local scales will follow from, and be congruent with, the definition of problem domains and the selection of theoretical concepts for their investigation. Those first two steps are crucial for the success of our enterprise--the application of Northeastern archaeological resources to the science of humankind. They have been emphasized here because of their serious neglect in Northeastern studies and literature to this point in time.

Consensus among archaeologists in respect to either problems or theory is neither necessary nor desirable for the success of the undertaking. There is much of significance to choose among both, and emphases will necessarily vary among investigators and investigations. What we do need is a broadened awareness of the universe of problems and theories, and a sensitivity to their relevance to our data. In excavation, as in medicine, one should strive to do as little harm to the subject as possible. The more sensitive we can be to the totality of our

data base and its inherent complexity, the more fully we can realize its ultimate social value.

Research designs can be developed on a project-by-project basis, but only at the risk of the inadvertant loss of significant data classes (Goodyear 1977). It is more efficient to develop regional problem sets and hypotheses which can guide project designs toward the achievement of regionally or globally significant results. Universalistic problems should be addressed during any project undertaken. Schiffer has taught us how to expand the significance of single-site and activity-area investigations, by explicitly addressing the dynamics of site formation and transformation processes (Schiffer and Rathje 1973; Schiffer 1976). It is the explication of the problem that is the contribution; most of us recognize the processes and have long dealt implicitly with their consequences. The theoretical applications to Northeastern data discussed above are intended to serve as examples of problems and theory suitable for the generation of regional research designs. Many variations on these themes are possible and many other problems are inherent in our resource base and theoretical concepts (cf. Weide 1975). The examples given are sufficient to indicate significant directions for research designs.

The theoretical discussion above indicates the need for the collection and analysis of data which will deal, explicitly and explanatorily, with variance in the archaeological record. We need to investigate, at every opportunity, spatial and temporal variance in technology, population dynamics, population geography, and environments. By describing and analyzing variety we will ultimately understand human behavior in both its specifics and its generalities. "Modal models" of cultural adaptation and of behavior, prematurely generalized from limited or isolated instances to large blocks of space and time, have kept Northeastern archaeologists fettered to their particularistic data. This paradox can easily be resolved by granting more , not less, attention to specific data classes, so long as investigations are clearly justified by theories and problems of wide relevance.

Research Strategies

Research designs of the sort I am recommending have some obvious strategy implications for the archaeologist, which will be elaborated to suit the specifics of individual projects and problems. Within the classical archaeological dimensions of time, space, and form (Spaulding 1960), we need data of finer resolution and greater precision than we have been accustomed to gather.

In the dimension of time, we urgently need finer control of sequences of events in order to learn from them about processes. At present, our best information about time comes from stratigraphy and radiocarbon. The prospects for thermoluminescence are improving, and other methods are occasionally applicable. We should strive to raise the precision of our stratigraphic methods, and the rigorousness of the C14 sample selection, in order to derive from the field data the best

possible chronological control. Stylistic cross-dating, with its inherent generalization, cannot bear the burden of the hypotheses we should be testing.

The dimension of space includes both geography and environment, and each brings its own special problems of data definition and collection. The definition of "sites" and "site boundaries" is an important topic in the literature now, and still highly controversial. Survey strategies are in fact constrained, often unconsciously, by our ideas about what sites are and how they are manifested (D. Thomas 1975; Chartkoff 1978; Dincauze n.d., 1978b). The issue must be addressed in all survey and excavation projects, until it is resolved. Environmental/ecological data are not inherently site-specific, yet they are often collected as if they were. We need to broaden our strategies to seek ecological data where they occur, and to express awareness of, and concern for, ecological data sources during survey and within resource management plans. A cautionary note about problems of scale is relevant here. In the present state of the art, paleoecological reconstructions are produced at a high level of generalization. They are, with few exceptions, "modal models," and are weak foundations at best on which to build interpretations of human strategies. The paleoecological data which are given us, so to speak, in the literature of other disciplines must be used with sensitivity to their inherent limitations of scale and precision (Dincauze 1978a). Close collaboration between archaeologists and paleoecologists may lead to greater precision in reconstructions and therefore wider utility of the results (Butzer 1975).

In the dimension of form, variation is almost infinite, for which we must all be grateful. A discussion of strategies for the collection or definition of data on formal properties is inappropriate here, beyond remarking that we may be able to pursue social and cultural meanings in formal manifestations much farther than we have at present (e.g., Wobst 1977; Bonnichsen 1977).

CONCLUSION

In my conviction that Northeastern archaeology can contribute significantly to a global science of humanity, I have suggested here a number of procedures and strategies which can hasten that happy day. The approaches recommended are demanding and challenging, and the goals will not be easily or quickly achieved. However, to an extent previously unrealized, the goals are scientifically respectable and socially significant. Archaeological research confidently launched from well-argued theoretical foundations and aimed at the solution of important problems is inherently worthwhile, to the professional community and to the public at large.

Using suitable theory, developed within anthropology or adapted from other disciplines, Northeastern archaeology can grow beyond its current limitations in exciting new ways. We are fully justified in replacing obsolete, static problems with dynamic, solvable new ones which can extract interesting new meanings from the data. We can investigate the

ecological and social forces driving cultural history; we need not be content to define stale stages and periods. We can evaluate the observed or purported correlations between cultural and climatic change, try to define the operational variables, and decide whether the correlations are causal associations, occasional coincidences, or artifacts of our tools of observation or analysis. We can try to recover more refined data on social structures and their cultural, social and ecological consequences. When we do, we can then stop apologizing for our data base, our research goals, and our professional worth as social scientists.

REFERENCES CITED

Adovasio, J.M., J.D. Gunn, J. Donahue and R. Struckenrath
1977 Progress report on the Meadowcroft Rockshelter--A 16,000 year chronicle. In Amerinds and Their Paleoenvironments in Northeastern North America, edited by W. Newman and B. Salwen. New York Academy of Sciences Annals 288:137-159.

Barry, R.G., W.H. Arundale, J.T. Andrews, R.S. Bradley and, H. Nichols
1977 Environmental change and cultural change in the eastern Canadian Arctic during the last 5000 years. Arctic and Alpine Research 9(2): 193-210.

Bender, Barbara
1978 Gatherer-hunter to farmer: a social perspective. World Archaeology 10(2):204-222.

Binford, Lewis R.
1968 Post-pleistocene adaptations. In New Perspectives in Archaeology, edited by S.R. Binford and L.R. Binford, pp. 313-341. Aldine, Chicago.

Bonnichsen, Robson
1977 Models for deriving cultural information from stone tools. Archaeological Survey of Canada Paper 60, National Museums of Canada, Ottawa.

Brookhaven National Laboratory
1969 Diversity and stability in ecological systems. Brookhaven Symposia in Biology 22. Upton, New York.

Brose, David S.
1973 The northeastern United States. In The Development of North American Archaeology, edited by J.E. Fitting, pp. 84-115. Anchor/Doubleday, New York.

Brown, J. and C. Cleland
1968 The late glacial and early postglacial faunal resources in midwestern biomes newly opened to human adaptation. In The Quaternary of Illinois, edited by R. Bergstrom. University of Illinois College of Agriculture Special Publications 140:114-122.

Butzer, Karl W.
1975 The ecological approach to archaeology: Are we really trying? American Antiquity 19(4):343-351.

Byers, Douglas S.
1954 Bull Brook--A fluted point site in Ipswich, Massachusetts. American Antiquity 19(4):343-351.

Caldwell, Joseph R.
1958 Trend and tradition in the prehistory of the eastern United States. American Anthropological Association Memoir 88.

Charnov, E.L.
1976 Optimal foraging: the marginal value theorem. Theoretical Population Biology 9:129-136.

Chartkoff, Joseph L.
1978 Transect interval sampling in forests. American Antiquity 43(1):46-53.

Christensen, Andrew L.
1977 Efficiency, Maximization and Population Pressure: Some New Light on Some Old Concepts. Paper presented at Society for American Archaeology, annual meeting, New Orleans.

Curran, M.L. and D.F. Dincauze
1977 Paleo-Indians and paleo-lakes: New data from the Connecticut drainage. In Amerinds and Their Paleoenvironments in Northeastern North America, edited by W. Newman and B. Salwen. New York Academy of Sciences Annals 288:333-348.

Davis, Margaret B.
1969 Palynology and environmental history during the quaternary period. American Scientist 57(3):317-332.

Dincauze, Dena F.
1968 Cremation cemeteries in eastern Massachusetts. Peabody Museum Papers 59(1). Cambridge, Mass.
1974 An introduction to archaeology in the Greater Boston Area. Archaeology of Eastern North America 2:39-67.
1976 The Neville Site: 8000 Years at Amoskeag. Peabody Museum Monographs 4. Cambridge, Mass.
1978a "Common sense" and scientific insight. Archaeology of Eastern North America 6:83-87.
1978b Predicting site encounter: Two techniques for landscape analysis. American Society for Conservation Archaeology Newsletter 5 (3):2-11.
n.d. Teaching prehistoric archaeology survey in the Northeast. In Memorial Volume for Marian E. White, edited by D. Grayson and W. Engelbrecht, in press. MS 1977.

Dincauze, D.F. and M.T. Mulholland
1977 Early and middle archaic site distributions and habitats in southern New England. In Amerinds and Their Paleoenvironments in Northeastern North America, edited by W. Newman and B. Salwen. New York Academy of Sciences Annals 288:439-456.

Dragoo, Don W.
1976 Some aspects of eastern North American prehistory: A review 1975. American Antiquity 41(1):3-27.

Dyson-Hudson, R. and E.A. Smith
1978 Human territoriality: An ecological reassessment. American Anthropologist 80(1):21-41.

Eisenberg, Leonard
1978 Paleo-Indian settlement pattern in the Hudson and Delaware River drainages. Occasional Papers in Northeastern Anthropology 4. Man in the Northeast, Inc.

Fitzhugh, William W.
1972 Environmental Archeology and Cultural Systems in Hamilton Inlet, Labrador. Smithsonian Contributions to Anthropology 16, Washington.

Ford, Richard I.
1974 Northeastern archaeology: past and future directions. Annual Review of Anthropology 3:385-413.

Fretwell, S.D. and H.L. Lucas, Jr.
1969 On territorial behavior and other factors influencing habitat distribution in birds. I. Theoretical Development. Acta Biotheoretica 19:16-36.

Funk, Robert E.
1972 Early man in the Northeast and the late glacial environment. Man in the Northeast 4:7-39.
1976 Recent Contributions to Hudson Valley Prehistory. New York State Museum Memoir 22. Albany.

Funk, R. E. and B.E. Rippeteau
1977 Adaptation, continuity and change in upper Susquehanna prehistory. Occasional Papers in Northeastern Anthropology 3. Man in the Northeast, Inc.

Goodyear, Albert C.
1977 Research design in highway archaeology: An example from South Carolina. In Conservation Archaeology: A Guide for Cultural Resource Management Studies. edited by M.B. Schiffer and G.J. Gumerman, pp. 157-165. Academic Press, New York.

Goodyear, A.C., L.M. Raab, and T.C. Klinger
1978 The status of archaeological research design in cultural resource management. American Antiquity 43(2):159-173.

Gould, Richard A.
1978 The anthropology of human residues. American Anthropologist 80:815-835.

Green, Stanton W.
1976 The Agricultural Colonization of Temperate Forest Habitats: An Ecological Model. Ph.D. dissertation, Department of Anthropology, University of Massachusetts, Amherst.

Griffin, James B.
1978 The Midlands and northeastern United States. In Ancient Native Americans. edited by J.D. Jennings, pp. 221-279. W.H. Freeman, San Francisco.

Hamilton, W.J., III and K.E.F. Watt
1970 Refuging. Annual Review of Ecology and Systematics 1:263-285.

Hayden, Brian
1975 The carrying capacity dilemma: An alternate approach. In Populations Studies in Archaeology and Biological Anthropology: A Symposim. Society for American Archaeology Memoir 30:11-21.

Horn, Henry S.
1974 The ecology of secondary succession. Annual Review of Ecology and Systematics 5:25-37.

Jennings, Jesse D.
1968 Prehistory of North America. McGraw-Hill, New York.

King, Thomas F.
1977 Resolving a conflict of values in American archaeology. In Conservation Archaeology: A Guide for Cultural Resource Management Studies. edited by M.B. Schiffer and G.J. Gumerman, pp. 87-95. Academic Press, New York.

Kluckhohn, Clyde
1940 The conceptual structure in middle American studies. In The Maya and Their Neighbors, edited by C.L. Hay et al. pp. 41-51.

Kraft, Herbert C.
1975 The Archaeology of the Tocks Island Area. Archaeological Research Center, Seaton Hall Museum, South Orange, New Jersey.

Levin, Simon A.
1976 Population dynamic models in heterogeneous environments. Annual Review of Ecology and Systematics 7:287-310.

Levins, Richard
1966 The strategy of model building in population biology. American Scientist 54(4):421-431.

MacArthur, R.H. and E.R. Pianka
1966 On optimal use of a patchy environment. American Naturalist 100(916):603-609.

MacDonald, George F.
1968 Debert: A paleo-Indian site in central Nova Scotia. Anthropological Papers 16, National Museums of Canada, Ottawa.

McGhee, Robert
1978 Discussion of "Holocene peopling of the New World" by William B. Workman. American Quaternary Association Abstracts. 1978: 149-152.

McNett, C.W.,Jr., B.A. McMillan, and S.B. Marshall
1977 The Shawnee-Minisink Site. In Amerinds and Their Paleoenvironments in Northeastern North America, edited by W. Newman and B. Salwen. New York Academy of Sciences Annals 288:282-296.

Moore, James A.
1978 What You Don't Know: Information Processing on the Hunter Gatherer/ Agriculturalist Frontier. Paper presented at the Society for American Archaeology, annual meeting, Tucson.
1978a The Effects of Information Networks in Hunter-Gatherer Societies. Paper presented at the American Anthropological Association, annual meeting, Los Angeles.

Moore, J.A. and D. Root
1978 Stream Ranking, River Ecology, and Settlement in the Connecticut Valley. Paper presented at the Northeastern Anthropological Association annual meeting, Quebec.

Mulholland, Mitchell T.
1978 Forest Succession and Human Population Change in a Temperate Forest Environment. Paper presented at the Northeastern Anthropological Association, annual meeting, Quebec.

Ogden, J. Gordon
1977 The late quaternary paleoenvironmental record of North America. In Amerinds and Their Paleoenvironments in Northeastern North America, edited by W. Newman and B. Salwen. New York Academy of Sciences Annals 288:16-34.

Osborn, Alan J.
1977 Strandloopers, Mermaids, and Other Fairy Tales: Ecological Determinants of Marine Resource Utilization--The Peruvian Case. In For Theory Building in Archaeology, edited by L.R. Binford, pp. 157-205. Academic Press, New York.

Perlman, Stephen
1978 Coastal adaptations. Ms. on file, Department of Anthropology, Virginia Commonwealth University.

Ritchie,William A.
1969a The Archaeology of New York State (revised edition). Natural History Press, New York.
1969b The Archaeology of Martha's Vineyard. Natural History Press, New York.

Ritchie, W.A. and R.E. Funk
1973 Aboriginal settlement patterns in the Northeast. New York State Museum Memoir 20. Albany.

Root, Dolores
1978 Hunter-Gatherer Social Organization and Utilization of Varying Environments. Paper presented at the Society for American Archaeology, annual meeting, Tucson.

Schiffer, Michael B.
1976 Behavioral Archeology. Academic Press, New York.

Schiffer, M.B. and W.L. Rathje
1973 The efficient exploitation of the archaeological record: Penetrating problems. In Research and Theory in Current Archaeology. edited by C.L. Redman, pp. 169-179. Wiley Interscience, New York.

Schoener, Thomas W.
1971 Theory of feeding strategies. Annual Review of Ecology and Systematics 2:369-404.

Spaulding, Albert
1960 The dimensions of archaeology. In Essays in the Science of Culture in Honor of Leslie A. White, edited by G.E. Dole and R.L. Carneiro, pp. 437-456. Crowell, New York.

Stoltman, James B.
1978 Temporal models in prehistory: An example from eastern North America. Current Anthropology 19(4):703-729.

Streuver, Stuart
1968 Woodland subsistence-settlement systems in the Lower Illinois Valley. In New Perspectives in Archaeology. edited by S.R. Binford and L.R. Binford, pp. 285-312. Aldine, Chicago.

Thomas, David Hurst
1975 Nonsite sampling in archaeology: Up the creek without a site? In Sampling in Archaeology, edited by J.W. Mueller, pp. 61-81. University of Arizona Press, Tucson.

Thomas, Peter A.
1976 Contrastive subsistence strategies and land use as factors for understanding Indian-White relations in New England. Ethnohistory 23(1):1-18.

Trigger, Bruce (ed.)
1978 Northeast. Handbook of North American Indians (vol. XV). Smithsonian Institutions, Washington.

Tuck, James A.
1975 The northeastern maritime continuum: 8000 years of cultural development in the far Northeast. Arctic Anthropology 12(2):139-147.

United States Committee for the Global Atmospheric Research Program
1975 Understanding Climatic Change. National Academcy of Sciences, Washington.

Watts, W.A.
1973 Rates of change and stability in vegetation in the perspective of long periods of time. In Quaternary Plant Ecology, edited by H.J.B. Birks and R. G. West, pp. 195-206. Blackwell Scientific Publications, Oxford.

Weide, Margaret Lyneis
1975 Research Design in Northeastern Prehistory. Paper presented at the Society for American Archaeology, annual meeting.

Wendlund, W.M. and R.A. Bryson
1974 Dating climatic episodes of the Holocene. Annual Review of Ecology and Systematics 7:81-120.

Willey, Gordon R.
1966 An Introduction to American Archaeology (Vol. I). Prentice-Hall.

Willey, G.R. and P. Phillips
1958 Method and Theory in American Archaeology. University of Chicago Press.

Winterhalder, Bruce P.
1977 Foraging Strategy Adaptations of the Boreal Forest Cree. Ph.D. dissertation, Department of Anthropology, Cornell University.

Wobst, H. Martin
1976 Locational relationships in paleolithic society. Journal of Human Evolution 5:49-58.
1977 Stylistic Behavior and Information Exchange. University of Michigan, Museum of Anthropology, Anthropological Papers 61:317-342.
1978 The archaeo-ethnology of hunter-gatherers or the tyranny of the ethnographic record in archaeology. American Antiquity 43(2):303-309.