

## Toward an Integrated, Contextual Approach in Archaeology: a Personal View<sup>a</sup>

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Systematic analysis of “natural” and “cultural” materials is not a novel concept in archaeology. Many early archaeologists were natural scientists by training. Between the 1920s and 1950s a new generation of archaeologists, with a more narrow background, frequently utilized the expertise of outside scientists to obtain types of empirical information not otherwise available. Since the 1960s there have been several calls for a new, “scientific” archaeology that aims to achieve high levels of interpretative success based on systematic study stimulated by improved research design. Problem articulation and *ad hoc* methodologies have become central to North American grant applications and the costs of research have increased exponentially. How scientific is this new archaeology and have the results warranted the noise and expense?

The best examples of contemporary archaeological research clearly are more complex and more informative than they were a decade ago. But the overall improvement in quality is disappointing. I personally feel that 3 contributing factors can be isolated:

(i) Most of the recent “calls to arms” were written by individuals with little or no training in the natural sciences and with a narrow, if not inadequate, concept of ecology. Anthropologists have been widely exposed to the sociological view that ecology is a matter of interrelationships between individuals, groups, or sets of groups within a population of the same species. There is seldom an appreciation that ecology focuses on systems that comprise interdependent ecological communities of *different* species within a habitat that further includes a multi-component non-living environment. I do not mean to imply that anthropologists should ascribe to a biological definition of ecology, and I am aware that modern, functional ecosystems are essentially beyond empirical study. For many biologists the ecosystem is basically a paradigm within which to organize and interpret data. This suggests that anthropologists in general, and archaeologists in particular, could formulate a broader paradigm more suitable to their particular problem orientation and empirical data.

(ii) The most obvious product of recent, explicitly scientific research is statistical manipulation of remarkably simple empirical data, most of which are traditional and artifactual in nature. Proper statistical processing is an essential component of scientific research, but only as a means to an end. When the intellectual framework is too narrow, the results, no matter how elaborately programmed, cannot hope to allow high level interpretations.

(iii) University curricula have not generated many students capable of attacking

<sup>a</sup>It is our pleasure to note here that Professor Karl Butzer joined us as Co-editor of this journal in the latter part of 1977, and this editorial note illustrates the philosophy which he brings to his editorship. G.D. and D.B.

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fundamental problems with an integrated, interdisciplinary approach. Curriculum reform was long overdue when a wave of change offered hope for university restructuring in the United States and Canada during the late 1960s. But the opportunity passed without tangible results and departmental structures remain as entrenched as ever. In archaeology this meant that anthropological paradigms—long productive in stimulating sophisticated, paleo-cultural interpretations—evolved in intellectual isolation to the point where they now inhibit development of better conceptual frameworks. No matter how many courses in botany, zoology, geology or geography a student is required to take, he/she will not be able to integrate them into his/her own intellectual make-up unless group ethos (as defined by professorial attitudes, curriculum demands and field experiences) is permeated with a sound, ecological conceptualization. Only a few training programmes at North American universities can chart a measure of success in this regard, small wonder when leading archaeological methodologists continue to ignore, sometimes explicitly deny, or even attempt to disprove the fact that prehistoric communities were part of dynamic ecosystems.

As outlined above, these negative factors are all symptoms of a general problem confronting the educational process. The traditional, scholastic curriculum of the Middle Ages and of the liberal arts college provided little practical knowledge but tried to teach students how to think, speak and write. This goal has generally been superseded by one that overemphasizes information and methodology. Particularly in archaeology, a labour-intensive discipline, professionals and apprentices must focus on economical data sources and data processing techniques. The overall result is too much technology and too little appreciation of how to use it effectively.

The fact remains that material objects, empirical data and appropriate analytical techniques are indispensable to elucidating culture history and the dynamics of ancient societies. We must, therefore, find a productive balance between research technologies and theory. We can do without the disciplinary isolationism of many pragmatic, inductive archaeologists and of most of the prominent minority that demands a deductive approach. Still in short supply are spokesmen for a truly scientific methodology, seasoned with extradisciplinary concepts and combining the best of the deductive and inductive—alternating these approaches repeatedly as problem orientation and research design are conceived, executed, reassessed and revised. We need individuals who will not only find things but who also study them; people less interested in creating personal images than in interacting with the peer group to achieve understanding; fewer prima donnas and more scholars. Scholarship unfortunately has become a rare commodity. I feel that the scarcity of scholarship is fundamental to the yawning gap between rhetoric and performance in archaeology. Its practitioners must read and digest more, sharing in the intellectual ferment of relevant cognate fields with a goal to broaden disciplinary paradigms and with a willingness to discuss fundamental issues with scholars of related fields.

A more productive paradigm in archaeology will require a far greater input of biological and geographical concepts, rather than methodologies. Particularly useful, if elementary, concepts are space, scale, complexity, interaction and stability. These points can be discussed briefly.

*Space.* Phenomena are rarely distributed evenly in space. Topography, climates, biological communities or human groups exhibit spatial patterning and are liable to spatial analysis.

*Scale.* Spatial analyses must distinguish small, medium and large-scale objects, aggregates or patterns. Similarly the configurations of living communities and physical aggregates are established, maintained, or modified by processes that operate at several spatial and temporal scales and that may be periodic or aperiodic. Micro and macro-studies are evidently complementary and both are desirable for comprehensive interpretation.

*Complexity.* Environments and communities are not homogeneous. This makes both characterization and delimitation difficult, so requiring flexible, multi-scale, spatial and temporal approaches.

*Interaction.* In complex environments with uneven distribution of resources, human and non-human communities interact internally, with each other, and with the non-living environment, at different scales, in variable degrees of proximity, and with changing and unequal rates.

*Stability.* The diverse communities of any environmental complex are all affected to some extent by trends that favour disequilibrium, either as a result of internal processes or external inputs. As a result, readjustment, whether minor or major, short-term or long-term, is the rule rather than the exception.

These simple points are difficult to apply in practice, and even their recognition is seldom apparent in implicit or explicit archaeological research designs. If they were indeed implemented we would have fewer claims for unilinear change or fundamental revolution, as well as fewer single-factor hypotheses to account for the dynamism of cultural systems. The now almost stagnant taxonomic and artifactual approach to Pleistocene palaeoanthropology and prehistory could be effectively revitalized by a more sophisticated implementation of geographical and biological concepts to an understanding of hominization and culture change. Similarly, at the younger terminus of prehistory, there is space for a fruitful application of contemporary experience with space, scale, complexity, interaction and stability in dealing with phenomena such as agricultural origins and dispersals, urbanization and the development of complex societies. A cautious implementation of ethno-archaeological data would represent one facet of such a re-orientation. But above all we need an adequate spatial-temporal approach that reflects a thorough understanding of geographical and biological concepts and their limitations. Such an approach could ultimately provide an effective *contextual* paradigm, far better suited to archaeology than either social ecology or the biological systems approach.

The *Journal of Archaeological Science* provides a high-quality medium for publication of research in the methodology and the application of scientific techniques in archaeology. But it can provide more than a convenient forum for the exchange of information and ideas among scientists whose background training was in diverse cognate disciplines. The journal has a unique potential to stimulate dialogue between excavators and archaeologically-orientated specialists whose techniques derive mainly from the earth, biological and physical sciences. The journal can serve to promote more effective interdisciplinary collaboration in all phases of archaeological work: research design, field execution, data analysis and interpretation, as well as in publication. It will depend greatly on the contributors and readers whether or not an integrated, interdisciplinary approach, within a refined contextual paradigm, can indeed be implemented.