JUST HOW USEFUL IS ARCHAEOLOGY FOR SCIENTISTS AND SCHOLARS IN OTHER DISCIPLINES?

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What is archaeological knowledge useful for? Do we have something distinctive to say about the past that scholars in other disciplines are, or should be, interested in? It is easy to think of a variety of disciplines and approaches for which archaeological data and findings might be interesting, relevant, and useful. But among these fields, there is great variation in the degree to which archaeology is taken seriously. Should archaeologists be concerned about whether our data are useful to other disciplines? Why have archaeologists been more successful in reaching audiences in, say sustainability studies than in political science or economics? If this is a worthwhile topic to pursue, what can we do to promote archaeology beyond archaeology? These were some of the questions considered in the plenary symposium at the 2009 Annual Meeting of the Society for American Archaeology, "Archaeology Beyond Archaeology" (organized by Michael Barton, Michelle Hegmon, and Michael Smith).

My goal in this paper is to provoke discussion of these questions among archaeologists, and the papers presented at the SAA symposium provide a point of departure. In this essay I am less interested in a rigorous scholarly discussion than in reviewing the topic broadly. More detailed treatments can be found in the publications of the participants, many of which I cite below. The topic of the use of archaeology by the general public, while of great importance to the discipline, is left for others to explore. Table 1 lists the papers presented at the SAA session. The present paper is a revised version of my opening presentation.

These papers (and the research programs they describe) provide a broad sample of work in "archaeology beyond archaeology." They can be divided into three themes that I call human ecodynamics, modeling of complex adaptive systems, and comparative social science. Archaeology has clearly had a positive impact on research in the first two domains, whereas its role in the latter domain has been almost invisible.

Because the target audience of this paper consists of archaeologists, I refrain from providing a lengthy discussion of the reasons why archaeological data are (or should be) particularly valuable for research in other disciplines. The most commonly discussed reason is the broad coverage of archaeology, both temporally and spatially. We are the only discipline with data on human societies across a truly long duration, and our fieldwork covers all humanly occupied parts of the earth (for further discussion, see Kirch [2005], Redman [2005], or van der Leeuw and Redman [2002]).

Domain 1: Human Ecodynamics

Kirch (2005:411–414) provides a nice summary of the development of archaeological research in this area. After building a successful research program of environmental archaeology in the mid-twentieth century (Butzer 1982), archaeologists began to interact intensively with ecologists and related scholars in the 1990s. Kirch notes two strands of this work: historical ecology (Crumley 1994; McIntosh et al. 2000), which developed in close collaboration with environmental historians and ecologists, and

Table 1. Presentations in the Symposium, "Archaeology Beyond Archaeology"

- Michael Smith, Just How Useful is Archaeology for Scientists and Scholars in Other Disciplines?
- Timothy Kohler, Model-Based Archaeology as a Foundation for Interdisciplinary and Comparative Research, and an Antidote to Agency/Practice Perspectives
- Michael Barton, From Narratives to Algorithms: Extending Archaeological Explanation Beyond Archaeology
- Margaret Nelson, Long-term Vulnerability and Resilience
- Joseph Tainter, Energy Gain and Organization
- Patrick Kirch, Archaeology and Biocomplexity
- Rebecca Storey, Urban Health from Prehistoric Time to a Highly Urbanized Contemporary World
- Carla Sinopoli, Historicizing Prehistory: Archaeology and historical interpretation in Late Prehistoric Karnataka, India
- Michelle Hegmon, Crossing Spatial-Temporal Scales, Expanding Social Theory
- Robert Costanza, Sustainability or Collapse: What Can We Learn from Integrating the History of Humans and the Rest of Nature?
- Discussants: Robert Costanza, James Brooks

human ecodynamics, a more explicitly archaeological approach (McGlade 1995). I use the term "human ecodynamics" here to cover these and other related research that link environmental archaeology to the discipline of ecology and related fields. Within this domain, I identify four themes of active current research in which archaeologists are interacting with other scholars and making contributions beyond the confines of archaeology: sustainability, resilience, long-term change, and modeling (I single out the latter theme for separate treatment as a second broad domain).

Sustainability. Many archaeologists are active participants in the explosion of research in the broad area of sustainability science (Kates et al. 2001). Joseph Tainter, for example, has made numerous contributions to sustainability studies, including both empirical analyses of archaeological data (Tainter 2006) and theoretical works (Allen et al. 2003). At the symposium, ecological economist Robert Costanza (2000, 2007) discussed the IHOPE project (Integrated History of People on Earth), a broad transdisciplinary investigation in long-term human-environmental dynamics. The fact that seven archaeologists are included as authors in *Sustainability or Collapse?,* the flagship publication of this project so far (Costanza et al. 2007), signals the potentially important role of archaeology in current sustainability research.

Resilience. The concept of resilience has recently come to the fore in both ecology and sustainability research. I single it out here because it provides a narrower domain where linkages between archaeology and ecology may be easier to see. Resilience can be defined as "the amount of change a system can withstand while retaining certain functions and/or structures" (Redman and Kinzig 2003:2). Although Robert McC. Adams (1978) was the first archaeologist to use the concept, it was not taken up intensively by archaeologists until after 2000 (e.g., Redman 2005; Redman and Kinzig 2003; Scarborough 2000). Participants Margaret Nelson, Michelle Hegmon, and their colleagues have been particularly active in applying the resilience concept to archaeological data (Hegmon et al. 2008; Nelson et al. 2006).

Long-term change. I use this category as a catch-all for archaeologists pursuing research on human ecodynamics that is not strongly wedded to the sustainability or resilience fields. For example, Kirch (2007) employs the concepts of sustainability and resilience in his research, but takes a broader perspective on long-term change that is more firmly rooted in archaeology. I would also include archaeological research in the human ecology and landscape approaches in this category (e.g., Fisher and Feinman 2005; Hornborg and Crumley 2006).

Quantitative modeling is used in the above approaches in various ways, and a number of researchers in human eco-dynamics employ the technique of modeling. Nevertheless I single this out as a separate research domain because it forms a distinct intellectual and scientific approach of its own.

Domain 2: Modeling of Complex Adaptive Systems

The domain of modeling of complex systems is both broader and narrower than the first domain. It is broader in that the complex systems approach transcends archaeology and ecology to include many additional disciplines, and it is narrower in that work in this domain is distinguished most strongly by its methods rather than its concepts. The field of complex adaptive systems is strongly associated with the work of the Santa Fe Institute. Although some authors suggest that this field differs greatly from the systems theory of the 1960s (Kohler and van der Leeuw 2007:5), it sounds to me very much like the systems theory I read as a graduate student in the 1970s (e.g., Buckley 1967; Maruyama 1963), but with better concepts (scale-free networks, chaos theory) and significantly improved methods (agent-based modeling, network analysis); see Bentley and Maschner (ed., 2003; 2008).

Although archaeologists adopted some concepts from the systems theory of the 1960s (e.g., Flannery 1968), there is little indication that this work excited much interest among scholars in other disciplines. One possible exception is Tainter's (1988) *The Collapse of Complex Societies,* a work employing systems concepts that has been influential both within and outside of archaeology. Today, however, archaeologists have become contributing members of broader communities working with complex adaptive systems. For example, a number of archaeologists have affiliations with the Santa Fe Institute (e.g., Robert McC. Adams, Tim Kohler, Sander van der Leeuw, Henry Wright). Agent-based modeling is a growing method within archaeology (e.g., Kohler and van der Leeuw 2007; Wilkinson et al. 2007), and this work is being done within a scholarly community that seems to value the data and findings of archaeologists (Alessa et al. 2006). Indeed, Michael Barton and other archaeologists have been involved in the establishment and promotion of the Open Agent Based Modeling Consortium (http://www.openabm.org).

Domain 3: Comparative Social Science

In comparison with the first two domains, the role of archaeology in comparative social science scholarship has been far less productive. Although most anthropological archaeologists working on complex societies would probably claim to be interested in comparisons and interaction with disciplines like geography, economics, or social history, in fact the level of collaborative work is quite low. Moreover, the impact of archaeology on most social science disciplines seems negligible. Why is this?

External Obstacles. Most social scientists who work on contem-

porary society don't really care what happened thousands of years ago. This is to be expected, since it is hard to argue that a knowledge of, say, growing inequality in Neolithic China can contribute directly to a better understanding of social classes today. But this lack of interest also extends to scholars who claim to have an interest in past societies and their changes through time.

Geographer Rhys Jones (2004) identified a phenomenon in scholarship in historical geography that can be called "recentism" (the term is from Sluyter 2005). Jones uses citation analysis to document a trend in major journals of historical geography toward increasing concentration on more recent periods in comparison to earlier periods. In the second half of the twentieth century, more and more papers were published in these journals on the present and recent past, with increasingly fewer papers on the medieval, or pre-medieval periods. Although I have not done a comparable citation analysis, my impression is that similar publishing trends exist in other journals of historical social science. In other words, scholarship in the historical social sciences has paid less and less attention to the distant past while concentrating more and more on the nineteenth and twentieth centuries. Thus, it is not surprising if scholars in these fields pay little attention to archaeology and the distant past.

In many cases, scholars in other disciplines are simply ignorant of the field of archaeology. The fields of economics and economic history can illustrate the situation. A very small number of economic historians take archaeology seriously as a source of data on ancient economies, and apply various economic models and methods to our data (e.g., Steckel 2008; Temin 2003). A few others take archaeology seriously and collaborate with archaeologists and ancient historians to analyze aspects of ancient economies (e.g., Hudson and Wunsch 2004). But the standard procedure for economists interested in understanding ancient societies is to apply models based on modern capitalist societies to an imaginary setting in the distant past, with no consideration that there might be any relevant archaeological data. Thus economist Yoran Barzel (2002) and political scientist Mancur Olson (2000) both believe they can explain the origin of the state without any data on early states; needless to say their models are off base and archaeologists do not find them convincing. Shouldn't we try to combat such ignorance?

Internal Obstacles. If we want other scholars to use our data and findings to illuminate phenomena beyond the archaeological record, two things are required. First, we need to explore other disciplines to discover concepts that can serve as bridges between those fields and archaeology. We will need to develop material indices and measures for the concepts and phenomena of interest. Second, we need to analyze and present our data in ways that can be compared to the findings of other disciplines. At present, non-archaeologists have a hard time accessing our data. They can read the summaries and syntheses that we write, but these typically do not have the richness and detail of our actual data, which are presented in formats that generally exclude non-expert analysis. The translation of archaeological data into formats so that others can use our data—not just our end-product interpretations—should be an important goal (Drennan and Peterson 2006). In another paper (Smith 2010) I illustrate these points with examples from the study of urbanism.

Transdisciplinary research projects can help break down the artificial barriers created by current disciplinary structures (Wallerstein 2003). Transdisciplinary work is important because "many, if not all, of the traditional approaches, as well as many heterodox tactics, fail to answer the most pressing issues plaguing the world" (Polimeni 2006:2).[1] Van der Leeuw and Redman (2002) argue that archaeology should take the lead in such transdisciplinary research on social and environmental issues.

Some Promising Directions. The participants in the SAA opening session joined others (e.g., Morris 2004; Smith 2010; Tainter 2008) in arguing that archaeology can and should generate both empirical data and theoretical insights of value to other social science disciplines and history. Carla Sinopoli's symposium paper explored some of the relationships between archaeology and history in the study of the Indian past; she joins Moreland (2001) and others in arguing that archaeology has more to offer historians than simple facts about individual places or events. Michelle Hegmon's paper went even farther than Sinopoli in this regard. While at a basic level archaeology is like history in telling us about "one damn thing after another," archaeologists have developed a considerable body of theoretical knowledge of potential use in other disciplines. At the session, Hegmon singled out aspects of temporal and spatial scaling as crucial components of distinctively archaeological knowledge with broader implications. In contrast, Rebecca Storey's paper focused on a single empirical domain—urban health—in which archaeological data have especially great potential for illuminating broader realms of scholarship (Storey 2006).

Comparison of the Three Domains

In contrast with the third domain above, it seems to me that archaeology has been quite successful in promoting its mission and data in the areas of human ecodynamics and modeling of complexity. What factors may account for this differential success? Here are four likely contributing factors.

1. *Greater convenience in working with natural scientists than social scientists.* Natural scientists seem more inclined to participate in transdisciplinary research focused on specific questions than do social scientists and historians. Issues of

"turf" that inhibit such collaborative research are far more pronounced in the social sciences. In many disciplines, the postmodern paradigm has inhibited transdisciplinary research by its emphasis on "deconstruction" and "problematization" trends that slow the establishment of bodies of empirical findings.

2. *The use of common concepts and methods that bridge disciplines.* Concepts from ecology (e.g., ecosystem, resilience) and complexity theory (e.g., dynamic systems, feedback) serve to link archaeological research to work in other disciplines. There is a conscious attempt by archaeologists working in the first two domains to use these concepts in ways compatible with other fields. The adoption of methods such as agent-based modeling and GIS spatial analysis by archaeologists also helps bridge differences between disciplines. This contrasts greatly with the social sciences, where each discipline has its own theoretical framework. Concepts employed by multiple disciplines (e.g., social capital, culture, social class) are defined and used differently in each. There are few fora in the social sciences equivalent to the Resilience Alliance, where efforts to standardize concepts and compare diverse fields are encouraged.
3. *The simplification required for common concepts and methods.* Modeling and comparison are methods that require significant levels of abstraction and simplification. This tends to be appreciated to a greater extent in the natural sciences in comparison with the social sciences and humanities. Archaeologists working in the first two domains employ simplification in order to foster interaction with scholars in other fields.
4. *Higher levels of institutional support.* The level of institutional support for research is much higher in domains 1 and 2 than in the social sciences. The level of grant funding is much higher and there are special programs within the National Science Foundation that have supported much of the research by archaeologists in domains 1 and 2. The seminars and publications of the Santa Fe Institute also support this research, and there are a number of journals that actively publish work in this area (e.g., *Ecology and Society*). Although there are journals that publish comparative social science research (e.g., *Social Science History, Comparative Studies in Society and History*), their count of archaeological papers with a broader audience is quite low. And while there are a few programs that specifically support transdisciplinary research in domain 3 (e.g., several programs of the MacArthur Foundation), they are far more limited in their funding, visibility, and broader impact on research.

Discussion

One way to start bringing our work to the attention of scholars in other disciplines is to publish beyond archaeology. Within the domains of human ecodynamics and modeling, a growing number of archaeological publications are written, at least in part, with an intent to attract interest from scholars outside of archaeology (Kirch 2005; Peeples et al. 2006; Redman et al. 2004). This trend has been slower to develop within historical social science, however (Morris 2004; Smith 2009; Smith 2005). If we think our scholarship is of interest to others, then we need to present it in venues where it can become part of the wider realm of scholarship on human issues, from health to inequality to urbanism.

I do not want to suggest that all archaeologists should take time from their digging or classifying to explore other disciplines. We need to concentrate on what we do best. But there is a growing awareness that such interactions beyond archaeology can be both intellectually fruitful and professionally rewarding for the discipline. I think I speak for my co-participants in the 2009 SAA symposium in calling for continued exploration of the topic of "archaeology beyond archaeology."

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Note

1. For an example of this kind of research, see descriptions of the project, "Urban Organization Through the Ages: Neighborhoods, Open Spaces, and Urban Life" (http://latelessons.asu.edu/urban).

Needs Assessment Survey

Surveys will be distributed to all SAA members on October 13, 2010 through a secure link sent to you by this email (saasurvey@associationresearch.com). A postcard containing the link will be mailed out to those members without a current email address on file with SAA.

ANNUAL MEETING, from page 6 ↩

in the gold country by *Sunset Magazine*. For those looking for more excitement, whitewater rafting season on the South Fork of the American River traditionally starts at the beginning of April.

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Michael Marshall, the new Editorial Assistant for the SAA Archaeological Record, *in the field at Prospect Hill Plantation, San Salvador the Bahamas, December 2009.*