

Constructing Frames of Reference: An Analytical Method for Archeological Theory Building Using Ethnographic and Environmental Data Sets. *Lewis R. Binford.* Berkeley and Los Angeles: University of California Press, 2001, 583 pp., 360 illustrations. \$75.00, cloth.

Lewis Binford has been one of the most vocal and visible contributors in the past thirty-five years to debates about hunter-gatherers. This book is his "magnum opus," a book in which he believes he has solved a problem that has plagued him throughout his career: namely, the fact that he "could never figure out how to use the results [of cross-cultural tabulation and statistical tests] to develop an understanding of what the hunter-gatherer world was like and . . . how it was organized" (p. 1). His stated goal is clear: "The primary problem that this book addresses is the development of a method for productively using ethnographic data to serve archeological goals" (p. 3).

The book is indeed impressive in size, with nearly five hundred 8 × 10-inch pages of ten-point text. It summarizes data on features of 339 hunter-gatherer societies which Binford and his students have coded categorically or as continuous variables. I have reservations about the accuracy of much of that coding (cross-checks of cases that I know well show numerous errors), but even with noise we should be able to detect important trends in a sample of this size if they are present. The hunter-gatherer behavioral data are regressed against several dozen macroecological variables such as temperature, rainfall, net aboveground productivity, vegetation class, ungulate biomass, etc.—a process that Binford refers to as "developing a frame of reference." The book is both exciting and frustrating, but regardless of your final evaluation, it contains a massive amount of information.

In the first three chapters, Binford argues that the goal of anthropologists should be to account for the variation in the ethnographic record on hunter-gatherers by using the scientific method to search for regular patterns of association between behavior and explanatory variables. Readers already oriented to this perspective will find little to disagree with. However, Binford's fondness for inventing jargon undermines the clarity of presentation throughout this section and the remainder of the book. Terms such as "constructing frames of reference," "niche states," "structural pose," "knowledge goals," "referential domain," "source side and subject side knowledge," "dimensionalizing data," "archaeoscope," "second order derivative patterning," "structuring property space," "proportional" and "relational projections," etc., are sprinkled throughout the text, usually without definition. Most often these terms refer to some commonly understood scientific concept with a good existing label in English. For example, the last three terms on this list refer to graphing relationships and to carrying out univariate and multivariate modeling to predict values of a dependent variable.

The fourth chapter of the book introduces climatic variables and discusses their relationship to vegetation communities, primary productivity, and animal biomass (especially of moderate-sized ungulates). Several tables provide multiple measures of these variables for all 339 hunter-gatherer communities in the

Prince-Hughes begins to explore these ideas in the prologue by presenting the history of each of the four gorillas around which her book revolves. This history extends to a mixture of fact and speculation about scenarios under which those that were wild-born might have been acquired. This is followed by her "book of days"—a journal format collection of her stories of the gorillas and their behaviors that are presented as spanning February 28 of one year through March 4 of another. She admits that while the stories are true and based upon her notes, the characters and contents represent a composite. Therefore, this year may very well represent several. Each of her "entries" tends to focus on a particular topic or aspect of gorilla behavior, such as tool use, birth, food sharing, nest building, play, and imitation. Prince-Hughes's work contains many facts about captive and wild gorilla behavior, bipedalism, primates' understanding of numbers, primate evolution, and the status of gorilla conservation—just to name a few subjects covered. The illustrations by Anne Hulse, particularly those of individual's faces, are excellent. However, the book also contains much speculation about gorilla thoughts, emotions, and intent and includes the occasional diversion into somewhat less relevant topics such as the history of the Christmas tree.

In the end, I am left with somewhat mixed feelings about this book. On the one hand, it is an interesting and very fast read. At 130 pages, one can breeze through it in just a couple of hours. It does not dwell upon dry, technical details nor use complicated, scientific terminology or jargon. Therefore, it does not require much time or thought investment on the part of the reader. Certainly, anyone looking for an interesting, light read that focuses on gorillas would not be disappointed. On the other hand, it is not a scientific treatise. Although it was not Prince-Hughes's intention for it to be so, this does complicate what one can "do" with the book. Other than a couple of random facts, I do not feel that I learned much in reading this book. I realize, though, that my not finding it particularly intellectually stimulating is colored by years of reading other books and articles addressing gorilla behavior. While I do not think this book would be appropriate as a primate behavior text and I would not recommend its use in sophomore or higher-level courses, I do think it has a potential use in a four-field Introduction to Anthropology course as a supplemental read for first-year students. In such a course, one generally has little time to devote to examining primate behavior and seldom gets into the specifics of any particular species. I can see where this brief foray into gorilla behavior would be informative, useful, and even enjoyable for the first-year student. I believe that it could have an impact upon the novice reader. That reader will learn a bit about gorillas and may be inspired to contribute in some way to the conservation of this or other primate species.

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database, based on regressions to weather data from a location nearby each forager society. Most of this data is likely to be useful in any attempt to find macroecological correlates to hunter-gatherer behavior. However, students who want to continue in this line of research in the future might be advised that there are now much more recent and detailed data on both vegetation and measured animal biomass for most hunter-gatherer regions (e.g., <http://www.nationalgeographic.com/wildworld/> for worldwide vegetation maps). They might also question whether the biomass of moderate-sized ungulates is a good measure of the total prey available to the foragers around the world (e.g., ungulates make up only 65 percent of the biomass in the Ache habitat and only 19.8 percent of the harvested prey biomass). Likewise, plant productivity measures in this book do not estimate the abundance of plant storage organs, which are probably more relevant to the available forager food base than gross somatic production (mainly leaves and structural components).

Chapter 5 introduces ethnographic data on the hunter-gatherer sample concerning density, subsistence, grouping, mobility patterns, and habitat type. Binford extrapolates from observed hunter-gatherer densities by habitat type to the entire earth's surface to give a worldwide estimate of about seven million foragers just prior to the origins of agriculture. But there are numerous mix-ups/typos here that will frustrate any reader wishing to verify this. The vegetational codes (VEGNU) for each hunter-gatherer group are listed in Table 5.01 with no key. The numbers used and the described vegetational types and number of ethnographic cases in each habitat do not match up across Tables 4.08, 5.01, 5.04, 5.06, 5.08, and 5.1. It is nearly impossible using these tables to figure out which vegetational codes each forager group really inhabits. However, some statements about the sample can be cross-checked. Binford says that "the number of documented hunter-gatherer cases is almost perfectly correlated with the actual area of the earth covered by the 28 plant communities in my classification" (p. 136). But using the data in Table 5.04, I calculate an $r^2 = 0.07$ and $p = 0.18$ for this regression. Binford also concludes that "marginal" habitats are *not* overrepresented in his hunter-gatherer sample, yet a plot of ethnographic density (cases/area of vegetation community) by primary productivity (from Tables 4.07 and 5.01) clearly shows that low-productivity environments *are* overrepresented in the sample. The environments with highest net aboveground productivity (NAGP) have only about 2–3 cases per 100,000 km² of habitat; but one habitat type with about one-fifth that productivity shows 95 cases per 100,000 km², and another environment with one-twentieth the productivity of the highest environments shows 16 ethnographic cases per 100,000 km². Some qualitative properties of the ethnographic sample are also curious. Not a single forager group from the South American Chaco is included in the sample, despite the fact that this area probably had the largest number of forager groups on the continent (at least eleven language groups from three linguistic families). On the other hand, there are 32 different entries for regional bands of Numic-speaking Basin-Plateau foragers (Shoshone/Paiute/Ute) who are treated as independent data points for the analyses carried out in this book.

Chapter 6 develops several models to predict dependency on gathering, hunting, and fishing around the world and then extrapolates from those models to

predict the economic mix in various parts of western Europe where no foraging societies were ever directly observed. These patterns are then discussed with respect to the spread of agropastoralism and archaeologically observed trends in European Mesolithic history. My main reservation here is the poor fit between NAGP, vegetation type, and percentage of the diet from gathered resources that is the basis for the extrapolation. There appear to be no statistically significant differences in *gathering* percentages among foragers listed in Table 5.01 in any vegetational classes outside the boreal/arctic zones. In fact, the most common vegetational classes that differ more than tenfold in net aboveground plant productivity (types 2 and 25 in Table 5.01) show no significant difference in percentage of the diet provided by gathering (mean VEGNU type 2 = 40.8%, mean type 25 = 42.5%, $t = 0.453$, $p = 0.65$).

Chapters 7 and 8 examine relationships among subsistence base, density and mobility patterns, residential group size, food storage patterns, polygyny and age at first marriage, and household and family size. Many of these relationships are stratified across climatic zones to produce a variety of complex patterns that Binford describes in detail. The relationship between climatic data and storage represents one of the very few results in the book in which a behavioral pattern is unambiguously related to an environmental variable. The other analyses include a great deal of interpretive handwaving to convince the reader that complex, but real, patterns exist in the data. Chapter 9 is the last chapter on "pattern recognition" and examines the relationship between grouping and political systems.

Chapters 10 through 12 are simulation exercises that constitute the "theory" derived from observations in the earlier chapters of the book. They explore topics such as economic reactions to population density, the emergence of sociopolitical complexity, and the transition from foraging to nonforaging economies. Here Binford presents his best models to explain some of the most important questions that have long interested anthropologists and archaeologists. Since climatic variables are available for many locations around the globe and for many times in world history, the macroecological perspective, if successful, should provide important insights. However, many readers will find themselves returning to concerns about procedures and supposed relationships described in the first nine chapters of the book as they attempt to evaluate these last chapters.

I will let the reader determine for himself how useful the "macroecological" frame of reference is for explaining hunter-gatherer diversity. Although many patterns proposed to exist in this data are intriguing, most were picked out by the author and highlighted with shaded regions as a subset of data points on scatterplots that show no pattern whatsoever between X and Y variables. A third dimension is introduced in almost all scatterplots and coded as a symbol type on the graph. Differences in the XY relationship by symbol type are asserted throughout the book, but not a single statistical test for these proposed interaction effects is presented. In all, I counted only eight figures in the entire book that show an unambiguous relationship between an environmental and a behavioral variable or two behavioral variables or that show a clear interaction effect between symbol type on the graph and the slope of the XY relationship.

Binford uses a theatrical metaphor throughout this book, likening it to the presentation of a play. If so, I was fascinated by some of the details in the script, but at the end I was left with an empty feeling that the play had no moral. Perhaps a new generation of students can take up where Binford left off and provide more direction to the plot.

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Archaeological Theory Today. *Ian Hodder*, ed. Oxford: Polity Press, 2001, 328 pp. £50.00, cloth; £15.99, paper.

This volume brings together fourteen scholars from across the Anglo-American theoretical spectrum to reflect upon the state of their craft. Behavioral (Schiffer and LaMotta), evolutionary (Leonard), cognitive (Renfrew, Mithen), historical (Yentsch and Beaudry), postcolonial (Gosden), and landscape (J. Thomas) archaeology are represented, as are archaeologies of agency (Barrett), identity (Meskell), and representation (Moser). A short introduction by Hodder and a closing, agenda-setting chapter by Shanks seal the volume.

Two main themes run through the book. One is the close relationship between archaeology and other disciplines. The authors explore the degree to which archaeological theory is informed by, and can contribute to, various "borderland" fields such as evolutionary psychology, gender studies, and art history. Archaeology's potential as a donor discipline is seen to lie in its deep time perspective and focus on material culture. Hodder also sees archaeology's potential as strengthened by theoretical pluralism within the field and the resulting debates over materiality and meaning, evolution and history, behavior and agency, and general and particular knowledge.

The other main theme of the book is the centrality of material culture in human life. The volume's contributors cast the relationship between humans and objects (broadly understood to include artifacts, landscapes, and visual representations) as *dialectical*; that is, each depends upon the other. The material world is assigned an epistemological status distinct from language. Thus, the metaphor of the object as "text" takes some criticism, most explicitly from Yentsch and Beaudry, but also from Renfrew, who warns against viewing objects as "disembodied verbal concepts." Barrett pushes the envelope in calling for an abandonment of the concept of the "archaeological record," since, in his view, material conditions can't simultaneously organize the structural properties of a social system and form a record of that system's existence. Thomas does good service by clarifying the sort of experiential understanding of past social realities that archaeologists can achieve via sensual, bodily interaction with ancient landscapes and monuments.

A few individual papers stand out as personal favorites because of their intellectual content and pedagogical value for the classroom. Leonard clarifies the assumptions of evolutionary archaeology and applies them to ceramic analysis at Paquimé in northern Mexico. His inference of cultural transmission or "drift" as a way to explain "homologous" similarities in ceramics between Paquimé and other areas could, however, be consistent with any number of other, nonevolutionary archaeologies that allow different aspects of material culture to respond to different influences from the natural and social environments. What seems to make the difference here is the particular method for analyzing the pottery, not necessarily the background evolutionary theory.

Mithen considers what archaeology can offer to an understanding of cognitive evolution. He sees material culture as a manifestation of "extended mind" and argues that the Upper Paleolithic record is both reflective *and* causal of evolving minds. In this context he makes a nice point about material culture's importance for grounding those counterintuitive concepts that natural selection has not designed the brain to think about. Mithen does good work in showing that archaeology can be valuable in correcting and enriching the rapidly expanding field of evolutionary psychology.

Gosden reviews postcolonial theory and issues in the relationship between archaeologists and indigenous groups. He makes a distinction between general *information* and local *knowledge* to argue that, whereas academics are interested in the former, indigenous peoples are interested in the latter. He suggests that collaborative, cross-cultural negotiation of intellectual and legal matters should be sensitive to this difference.

Moser's well-illustrated paper examines the conventions used to represent archaeological knowledge to academic and nonacademic audiences. These representations send particular messages about the nature of social life and history. Moser sensibly argues that scholars themselves are not immune from the effects of these representations. The interesting research issue thus becomes the processes or mechanisms that blur the boundary between knowledge and representation.

This volume nicely plumbs the thinking of some of the best minds in the field. Many of the ideas are familiar, but there are some useful new insights and proposals (e.g., Meskell on the need for a "third wave" feminist agenda for archaeology). Theoretical pluralism is on display, but so too is homogeneity as concerns the ethnic, class, and professional position of the volume's contributors. This book is mighty Anglo and Academic. There's nothing inherently wrong with that, but at this point in the history of the discipline, we perhaps should be less interested in what white folks at elite institutions are saying about the status and direction of archaeological theory and more concerned with what folks are saying out in the hinterlands, on the reservation, and in the streets.

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