

ering the preservation of the entire gene pool as a contingent primary value." Even a lukewarm eugenicist should not find it difficult to demolish that line of reasoning.

As a final example, and as if to provide the more strident critics of *Sociobiology*'s inferred political message with the ammunition they wanted, Wilson assures us that science has pronounced the sentence of death on Marxism. Marxism is "mortally threatened by the discoveries of human sociobiology," since it relies on "hidden premises about the deeper desires of human beings and the extent to which human behavior can be molded by social environments. These premises have never been tested. To the extent that they can be made explicit, they are inadequate or simply wrong." One wonders how we could know them to be wrong if they have never been tested. One also wonders what Wilson understands by Marxism. It seems most likely that he has equated it with the more foolish remarks of his radical American critics. The fact that people who call themselves Marxists have held certain views, for example on human genetics and the malleability of human behavior, does not imply that such views are a logical corollary of Marxism as a theory. It would not even follow had Marx and Engels themselves held such

views—although in fact they did not. The social and political implications of biological facts are more complex and less determinate than is often thought. They deserve much more serious consideration than Wilson gives them—if only because of the increasingly widespread belief that the facts, theories, and speculations of human biology carry a message that will be welcome only to the most reactionary conservative. Wilson can hardly be blamed for this: he is, indeed, much less culpable than his radical critics, whose opposition makes it clear that they either share this belief themselves or else assume that the rest of the world does.

What can one say for *On Human Nature*? In all conscience, not much. Wilson is a distinguished scientist, but neither the distinction nor the science is much in evidence here. Where he offers us scientific hypotheses, he rarely provides the evidence to support them, and frequently does not stop to consider how one might set about collecting relevant evidence. Where he offers us his political and social views, he does so as though the respect due to science would lend them added authority. It does not.

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Caribou Hunters

Nunamiut Ethnoarchaeology. LEWIS R. BINFORD. Academic Press, New York, 1978. xiv, 512 pp., illus. \$39.50. Studies in Archeology.

More has been written about the Eskimos than about most traditional societies, and the subject of hunting looms large in this literature because the Eskimo are one of the few societies in the world today where people depend on large game animals for their livelihood. So it may surprise some archeologists and anthropologists to find that, in the face of this mass of literature, someone has written a book that opens up a new dimension in the ethnography of Eskimo hunting.

Lewis Binford's book is a technical study of contemporary Eskimo hunting and meat consumption in relation to faunal discards. One of Binford's principal concerns is to test the relevance of anthropological conceptions of culture to the material remains on which archeolo-

gists must base their inferences. But, although he has much to say about archeological theory, the main contribution of the book lies in its wealth of empirical detail concerning how present-day Eskimos hunt, butcher, organize, consume, and discard various anatomical "packages" of caribou and, to a lesser extent, wild sheep under varying seasonal and logistical constraints. It is without question the most detailed ethnographic description and analysis ever presented of the meat-procurement behavior of any society. As such, it occupies a place in the literature of anthropology somewhat comparable to that of Franz Boas's often-cited 1921 monograph about the Kwakiutl Indians (which contained roughly 300 pages of recipes for salmon and other basic foods, half in Kwakiutl and half in English translation). Like Boas's Kwakiutl study, Binford's book demonstrates the central importance of certain key resources in the life of the

people studied. Unlike Boas, however, Binford uses the data he has gathered to posit general relationships between different kinds of adaptive behavior vis-à-vis contingencies that affect all aspects of the society's meat procurement and consumption and the physical characteristics of the material remains of this behavior (especially frequencies of different anatomical parts at various sites where it is possible also to specify the personnel that were present and the activities that were carried on). This book proposes general sets of relations between various kinds of adaptive behavior and their archeological "signatures," and it should not be regarded as just another particularistic ethnography of the Eskimo.

Binford concludes that nearly all of the observed variability within the domain of Nunamiut procurement, consumption, and discard of game animals is due to complex interactions between the availability of the natural game resource and specific contingencies such as transport distances, storage characteristics (especially as they are affected by changes in weather), weather itself as it affects travel and transport, and considerations of utility with regard to various portions of the animal. In this last case, an elaborate effort is made to specify the utilitarian considerations that influence Nunamiut choices at different times and places with respect to which portions of the anatomy of the game animals are used and the different ways such use can occur. Binford produces a series of utility indices that provide a framework for measuring dietary and other economic aspects of meat, marrow, and grease among the Nunamiut as well as drying versus frozen storage. These indices, in turn, are used to model the decision-making and behavior that lead to particular assemblages of faunal discards under varying conditions where such variables as seasonality, technology, personnel, and a wide variety of other contingencies are also observed and controlled for.

I found it hard to follow the derivation of the utility indices (chapters 2 and 3), and I suspect other readers may have a hard time with this part of the book, even though the utilitarian bias in Binford's argument here is fully justified both on the grounds of his Nunamiut data and in relation to current general theory in ethnoarchaeology.

Applying the indices, Binford distinguishes between "bulk" and "gourmet" curves, which reflect contrasting kill-butcher strategies in the choice of anatomical parts by Nunamiut. Bulk curves reflect strategies that select for



"Hunters about to fire on fall herds." [From *Nunamiut Ethnoarchaeology*]

large quantities of parts of both high and moderate value and discard parts of lowest utility at accelerating rates, whereas gourmet curves reveal selection for high frequencies of parts of highest value and abandonment of parts of moderate to low value. Binford argues that differences in such curves are due not to differences in culture but rather to variations in the way members of the same culture make use of the same knowledge and range of skills. Whatever one may think of the actual derivations of the utility indices applied to this argument, the argument itself is important, especially as it affects the differential patterning and breakage of animal bones at different localities under varying conditions of weather, topography, and other circumstances. This rigorous attempt at explaining archeological variability with reference to differences in circumstances rather than in culture is probably the most stimulating

part of Binford's analysis, and it is the part that has the widest implications for current views in anthropology.

Binford's study fits in well with present trends in ethnoarcheological theory. Ethnoarcheology has been moving away from reliance upon ethnographic analogies and toward a greater use of anthropological case studies in order to posit general relationships between human behavior and material discards. Indeed, there is relatively little in the body of theory offered in this book that is originally or uniquely Binfordian. The author presents theoretical arguments without attribution on such issues as postdepositional effects of natural processes on archeological remains (especially faunal remains), the value of positing general principles concerning relationships between behavior and discards, and the belief that cultural differences account for variability in material assemblages.



"The removal of the tenderloin from a spring-killed caribou." [From *Nunamiut Ethnoarchaeology*]

These are all ideas that have already been presented and amply applied by other scholars. Binford often does an elegant job of dealing with them, but there is something a little churlish about his failure to relate his discoveries among the Nunamiut to a body of theory that he is either drawing upon or reinventing for many of his best demonstrations.

A somewhat more serious omission occurs on pp. 87-90, where the author compares his results among the Nunamiut with observations he made among the Alyawara, an Aborigine society of central Australia, where hunting is also an important part of the subsistence economy. Binford presents the Alyawara findings as his own, and it is certainly true that he made original, firsthand observations of Alyawara behavior. But he neglects to mention anywhere in the text or the acknowledgements that his Alyawara observations were made by him in 1974 on a two-week field trip in Central Australia where he was a guest in the field camp of James O'Connell, who had already been studying the ethnoarcheology of Alyawara hunting and butchering for several years under the auspices of the Australian National University. I am afraid there may be something here that goes beyond mere churlishness. It should be known that the principal research on this subject among the Alyawara is being carried out by O'Connell and not by Binford, as one might suppose from reading what is said by Binford in his book. Errors of omission like these constitute the most serious blemish in what is otherwise an exceptionally important and useful book.

In some cases, Binford's data, though presented and expounded in copious detail, raise more questions than they resolve. For example, what does the Eskimo intake of meat as represented by faunal discards mean in relation to the total biomass or "standing crop" of the particular game species being hunted? Little is said about the ecology of the principal game resources, especially caribou, and the picture presented is one of hunting rather than predation. That is, the study is anthropocentric to such a degree that we are unable to assess the ecological interactions between predator and prey or to make quantitatively reliable inferences about the effects of different kinds of hunting behavior on the principal game resources. For archeologists, this curiously nonecological perspective results in some important unanswered questions, such as: What are the possible implications of these findings among the Nunamiut for the "Pleisto-

cene overkill'' hypothesis? There is no reason to doubt Binford's view that the Nunamiut represent an extreme case of utilitarian rationality applied to the procurement and use of meat supplies, but does this imply that true wastage of game in a big-game hunting society cannot occur? In other words, are we to believe that circumstances can never arise in which hunting societies overexploit their resource base? By ignoring the ecological aspects of Nunamiut predator-prey relationships, Binford has left us with no way of assessing the long- and short-term impacts of different hunting strategies on game populations. At some point in the analysis it would have been useful to take a more "caribou's eye" view of Eskimo hunting behavior.

I must disagree, too, with Binford's abrupt dismissal of stone artifacts as indicators of adaptive behavior. Certainly there is nothing wrong with his having chosen to study faunal remains instead of stone tools, but it is simply not true that "results of lithic studies overwhelmingly demonstrate that wear-pattern analysis yielded ambiguous results" (p. 7). I would call his attention to the recent work of Lawrence Keeley and his associates at Oxford, where convincing, unambiguous results have been achieved. Moreover, the parting shot at the end of the book, where Binford cites recent work by Vierra as a cautionary argument against further studies in lithic technology, is valid but by no means final. There is plenty of scope for ethnoarchaeological studies in technology, lithic and otherwise, provided we apply the same utilitarian frameworks, empirical observations, and ingenuity as Binford has in his faunal studies.

In an effort to anticipate the kinds of criticism his book might engender, Binford engages in a kind of academic "pre-emptive strike" in the last chapter. He attacks his critics, both real and imagined, for failing to understand the basis of his approach, especially in relation to his use of observational data in a society that is deeply involved with Western culture and cannot be viewed as providing an unsullied or "pristine" analog of ancient big-game hunting. (The Nunamiut sometimes even charter aircraft to assist them in their pursuit of caribou.) The assumptions Binford attacks here are already outmoded in ethnoarchaeology, and it is most unlikely that he will ever be faulted for his choice of either the people or the subject he has studied.

In short, Binford provides us with an elegant treatment of the general relations of Nunamiut subsistence behavior and the archaeological signatures of different

seasonal and activity-oriented aspects of this adaptation. The book is a major contribution to ethnoarchaeology and is a landmark in the application of current ethnoarchaeological theory to explaining the complexities of human behavior vis-à-vis material discards. But, as in much of Binford's earlier work, there is a persistent and high level of ego-involvement that affects the presentation of his findings. In a case like this, where we have a

book that will be referred to often by archaeologists in their efforts to explain their own faunal evidence and by ethnoarchaeologists for comparison with findings for other contemporary human societies, this becomes a matter of some concern.

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Farming Among the Maya: A Revised View

Pre-Hispanic Maya Agriculture. PETER D. HARRISON and B. L. TURNER II, Eds. University of New Mexico Press, Albuquerque, 1978. x, 414 pp., illus. \$20.

The 17 papers in this volume mark a watershed in our understanding of the support base for Maya civilization of the Classic Period (A.D. 300 to 900). It was not many years ago that most Mesoamericanists believed that swidden, or slash-and-burn, farming centering on maize, beans, and squash was the only system of cultivation that could have been practiced in the Maya lowlands. It is certainly true that the modern subsistence farmers of Yucatan and adjacent regions know only the swidden technique of shifting cultivation. But it now appears that this picture is at least in part wrong for the ancient Maya.

The first dissident voice to be raised

against the simplistic scheme was that of Bennett Bronson, who suggested in 1966 that root crops might have been just as important as seed crops to the Classic Maya. Then, in his 1968 doctoral dissertation, the late Dennis Puleston showed that the seeds of the breadnut tree (*Brosimum alicastrum*), stored in chultuns or underground chambers, could have been a food resource almost as valuable as maize. More recently, in 1972, Puleston and the geographer Alfred Siemens discovered through aerial reconnaissance that in favorable parts of the Maya lowlands agriculture had been intensified through the construction of chinampa-like raised fields.

In an introductory chapter to the book, Peter D. Harrison emphasizes the variability of food production systems available to any one group of Maya, a point of view taken up later in a paper by



"Remnants of ancient terraces near Lake Yaxha, Peten, Guatemala. The men are standing on three of the six visible terraces (flat surfaces), which have been constructed across a steep ravine." [From a paper by B. L. Turner II and P. D. Harrison in *Pre-Hispanic Maya Agriculture*]