types of links being talked about were already highly abstract and could not therefore be seen "on the ground" in the way so many of the contributors in this book seem to imagine. In any case, ties in themselves, without a consideration of what they might be about, are pretty meaningless. Some of the contributors try to overcome this problem by talking of intensity, but here again the idea of intensity without a consideration of what kind of intensity does not help much, and if further refined the idea becomes too complicated to be handled by simple measurements of scale.

The authors are all in various ways aware of the problem. Some just give up such an ambitious project to talk about something else less all-embracing. Others try to corner the notion of scale, and this is especially true of Barth himself. He, at least, has the advantage of clarity over such contributors as Jacobson and Grønhaug, who further muddies the water by barely relevant mathematical analogies, as does Schwartz with even more misleading biological ones. Barth seems the most enthusiastic advocate of concentration on scale, which he sees as providing a way of contrasting different social situations that is both significant and empirically verifiable. He starts his concluding chapter by stressing again and again how much the study of scale is a procedure of discovery of nonsubjective, real, out-there phenomena. It comes therefore as something of a surprise to be told by him that the most generally applicable sense of scale is "the size of the minimal region or population that embraces all types of members within a system." Surely he cannot believe that types of members within systems can be observed in the natural science sense he seems to favor, and indeed as we proceed in his conclusion we inevitably move away from this material view of society to ever more theoretical or subjective aspects.

With such problems in deciding what scale is, or what it is the scale of, it is not surprising that the authors have problems in attributing any very specific correlate to it. Indeed, two of the papers clearly imply that without a deeper knowledge of the character of the social formation scale and differences in scale of social organization are not very illuminating. Barnes, in a paper largely devoted to showing that the framework developed by Redfield and Wirth was, in fact, based on the particular circumstances of North and South America, demonstrates that it does not apply to the very different circumstances of Norway. The point surely is that there are other, equally or more significant factors at work that themselves give meaning to differences of scale, while scale of itself tells us little. The point is made even more emphatically by Berreman in a lively contribution where he contrasts the effects of village size and intensification of external contacts in Northern India and the Aleutian Islands. His conclusion is that these are different cases and that no general lesson can be learned simply in terms of scale. It seems a pity, therefore, that the implication of this has not been taken to heart or challenged by those other contributors who seem more convinced of the usefulness of the concept, and confrontation of the issue is not replaced by describing the complexities of scale here and there, since this in no way can demonstrate its universal and analytical importance.

There are other interesting chapters in this book, but they seem to touch on the central issue only peripherally. Thus Gellner discusses his theory of nationalism, which tries to explain why nationalism should occur precisely in those societies where earlier theories, such as that of Durkheim, predicted that it would become irrelevant. Colson argues that as the number of people we come into contact with increases we develop mechanisms for exclusion, and she gives the example of the Gwembe Tonga of Zambia, on which she has exceptionally good long-term data. Bailey explores the way British political parties can be considered either a good or a bad thing, and some data on the immensely complex question of "tribes" in India are given by Sinha. None of this, however, really establishes a theory of scale.

I have no doubt that this book and the conference on which it was based were genuinely called for. The ideas with which it deals are all too often left unexamined. For me the examination has demonstrated that scale in itself is not a very illuminating concept. This is not something that is immediately obvious, and I am grateful to have been enabled to reach such a negative conclusion. I believe that with a little less enthusiasm the main contributors to the book might have done the same.

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A Proffering of Underpinnings

On Human Nature. EDWARD O. WILSON. Harvard University Press, Cambridge, Mass., 1978. xii, 260 pp. $12.50.

On Human Nature completes, its author tells us, an unplanned trilogy, which, starting with insect societies, progressed through the sociobiology of vertebrates and is here concluded as a speculative essay on the application of sociobiology to the study of human affairs. Sociobiology is here defined as a "hybrid discipline that incorporates knowledge from ethology . . . , ecology . . . , and genetics in order to derive general principles concerning the biological properties of entire societies." Wilson's thesis is that without the underpinning provided by such principles the humanities and social sciences are doomed to remain ineffectual, unable to provide more than limited descriptions of superficial phenomena, with no real understanding of underlying causes. It is a thesis not calculated to endear its author to all his readers.

The first, and central, proposition is that our social behavior is to a significant extent genetically determined. "The accumulated evidence for a large hereditary component is more detailed and compelling than most persons, including even geneticists, realize. I will go further: it already is decisive." What does this statement mean? And why should we accept it? Let us consider the evidence first. Wilson points to some rather obvious ways in which human society is affected by human nature. It can hardly be doubted, for example, that our capacity for language is in some sense dependent on our genetic makeup and that human culture has been profoundly affected by that capacity, or that most social organizations reflect, in one way or another, the length of an infant's dependence on its parents. Even the most determined opponent of sociobiology would presumably accept that human society reflects some biological facts such as these. If this were all Wilson had in mind, there would be little to argue about, and *On Human Nature* would be a very dull book.

But it is not. We are soon given more exciting fare. Wilson sees evidence of genetic determination in a wide, not to say haphazard, array of supposed facts. Some examples will give a flavor of the argument. First, there are characteristics we share with other higher primates. Thus "our intimate social groupings con-

tain on the order of ten to one hundred adults, never just two, as in most birds and marmosets, or up to thousands, as in many kinds of fishes and insects." And the difference in physical size between men and women leads to the prediction, based on interpolation from other primates, that the "average number of females per successful male" should be greater than one but less than three. "The prediction," we are assured, "is close to reality; we know we are a mildly polygynous species." Where our social behavior differs from that of other primates, Wilson sees evidence of genetic determination in cultural universals. Traits such as bodily adornment, dancing, interpretation of dreams, law, medicine, personal names, and trade are "as diagnostic of mankind as are distinguishing characteristics of other animal species—as true to the human type, say, as wing tesselation is to a fritillary butterfly."

The reader may decide for himself or herself whether these arguments are convincing. What one misses from Wilson's account is a serious and sustained attempt to analyze in just what sense our behavior or social organization is genetically determined, and just how certain genetically determined characteristics have worked themselves out so as to produce, let us say, such cultural universals as law. Even more distressing is the shifting sense given to the notion of genetic determination. Wilson is cautious at times: our genes do not always dictate our lives too narrowly. "Rather than specify a single trait, human genes prescribe the *capacity* to develop a certain array of traits." And he knows full well that social organization varies enormously across time and place and that the precise form of a particular trait is often, perhaps usually, culturally determined. But although at the outset of his discussion he provides an unexceptionable definition of a genetically determined trait as one "that differs from other traits at least in part as a result of the presence of one or more distinctive genes," he soon slips into the habit of equating genetic determination with genetic constraint. "Human nature is stubborn, and cannot be forced without a cost." And, "It is inconceivable that human beings could be socialized into the radically different repertoires of other groups such as fishes, birds, antelopes, or rodents. . . . To adopt with serious intent, even in broad outline, the social system of a nonprimate species would be insanity in the literal sense. Personalities would quickly dissolve, relationships disintegrate, and reproduction cease."

This, let us remember, is a scientist writing. But what sort of scientific statements are these? And why should we believe them? It is not merely that Wilson offers no evidence; he does not pause to consider what sort of evidence might persuade us that our personalities would disintegrate and reproduction cease if we adopted, for example, the social organization of birds.

A similar tension between the rash and the cautious, the outrageous and the dull, the provocatively reactionary and the orthodoxly liberal, is evident throughout the book. Many of Wilson's particular arguments seem nicely calculated to ruffle left-wing sensibilities: warfare is a consequence of ethnocentrism; we are all innately aggressive, although women less so than men; while, still on the subject of sex differences, girls are naturally more sociable than boys. But, before he can be easily typed, Wilson adjures us to prize human diversity rather than discriminate against minorities, to regard homosexuality not only as biologically normal but also as biologically valuable.

The picture of Wilson as a crypto-fascist, painted with such abandon after the publication of *Sociobiology*, is without question a crude and mischievous caricature. In the last analysis, the major defect revealed by the present book is not a matter of political stance; much more serious is an all-pervading confusion as to the nature of the arguments being advanced and the conclusions that may legitimately be drawn from them. Wilson does not appear to see, for example, that pointing to the adaptive significance of a particular trait or the evolutionary advantage conferred by a particular pattern of behavior or social organization will not necessarily tell us anything else about that trait and certainly does not rule out, supplant, or allow one to choose between various other classes of explanation. To take an example almost at random: Wilson is concerned to press a biological explanation of the prevalence of incest taboos in preference to a sociological or cultural explanation. According to "the prevailing sociobiological explanation," such functions as preservation of the integrity of the family or facilitation of bridal bargaining, favored by anthropologists as explanations of incest taboos, are "by-products or at most secondary contributing factors." The sociobiological explanation "identifies a deeper, more urgent cause, the heavy physiological penalty imposed by inbreeding." But biological explanations simply cannot preempt sociological explanations in this way. We could accept that the biological function of incest taboos was to prevent inbreeding, but this would not exclude the possibility that they served social functions also and not just as secondary, contributing factors. Nor would the identification of any such biological function allow one to choose between an infinity of possible proximate (social or psychological) causes. And finally, it would not even give any grounds for supposing that the behavior in question was in any significant sense genetically determined.

This failure to stress the limits—logical and conceptual rather than empirical limits—of sociobiological explanations is not confined to confusion between different levels of scientific discourse. Wilson equally tends to obscure the distinction between scientific explanation and judgment of value or political, social, or ethical belief. In a chapter on the sociobiology of religion, for example, the claim that "the highest forms of religious practice . . . confer biological advantage" is said to show that "religion itself is subject to the explanations of the natural sciences," to be treated as "a wholly material phenomenon." But even if we accepted that religion serves some biological function (and it is entirely characteristic that Wilson offers no evidence for such a proposition), what then follows? The answer is surely very little—certainly not that any of the claims made by or on behalf of religion are to be doubted. If the truth of a proposition is logically independent of one's motives for asserting it, it is even less dependent on the biological advantage its assertion may confer.

Evolutionary explanations, even if very much better founded than most of those on offer here, do not contradict other categories of explanation. Still less do they dictate ethical judgments. The gap between "is" and "ought" remains as wide today as it was when Hume pointed it out 200 years ago. Although Wilson pays lip service to this distinction between matters of fact and matters of value, we may be permitted to doubt whether his heart is in it. Had he taken it more seriously, he would never have asked us to believe "that a correct application of evolutionary theory . . . favors diversity in the gene pool as a cardinal value." Genetic diversity may be the stuff of which evolution is made, but evolution is not a cardinal value. And the particular implication drawn from this remark is distinctly weak: "If genius is to any extent hereditary, it winks on and off through the gene pool in a way that would be difficult to predict. . . . For this reason alone, we are justified in consid-

ering the preservation of the entire gene pool as a contingent primary value." Even a lukewarm eugenist 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 archeologists 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 ethnoarcheology.

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