SOCIOBIOLOGY AND ITS CRITICS

by Charles Frankel

The wheel of intellectual fashion turns and returns in universities—behaviorism, eugenics, the New History, the New Criticism, pragmatism, Marxism, logical positivism, existentialism, operant conditioning, revisionist history, structuralism. Yet something persists through the fashions and affects the career of ideas both substantial and insubstantial. It is the apparently inextinguishable capacity of large numbers of people in the academic community, including some of its most seasoned citizens, to treat each new wind of doctrine as though it had come to blow the world clean of its superstitions and stupidities. Our citadels of reason stand alongside certain fundamentalist sects in their susceptibility to the hope that, through some new revelation of truth, human nature can be freed of its corruptions and society made over as it was intended to be.

Yet universities of course have not simply been the homes of intellectual crazes. They have generated ideas which really have been revolutionary, which have altered human thinking and changed the face of the world, and which have done so not because they have fed people's passions or satisfied their will to believe but because they have shown a genuine staying power in the face of arguments and evidence. The recurrent problem when each new intellectual "breakthrough" is announced is to determine whether it represents just another bout of intellectual feverishness or something more important.

Once more an idea which invites such scrutiny has emerged. It is incorporated in a discipline which has acquired the name sociobiology and is concerned with the study of the genetic basis of social behavior in insects, animals, and *Homo sapiens*. The discipline carries the implication that mankind's social institutions and mores are the product not simply of tradition, historical accident, ideology, or the

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machinations of ruling classes but of dispositions and drives of the human animal that have developed in the process of biological evolution and belong to the species' genetic heritage. The idea is hardly new. It can be found in the Greek philosophers. In its broad outlines it accords indeed with the everyday gleanings of common sense. Human beings are born physically helpless and remain for relatively long periods physically weak; they are driven by imperious sexual urges which become manifest at predictable stages of their development; they grow beards and breasts with no thought or decision of their own, enjoy a period of vigor, and then age and die. All societies take account of such facts in their established patterns of life, and it is the ubiquity of such facts that enables human beings sometimes to understand one another across the barriers of different cultures, languages, and religions.

The very banality of these considerations would lead one to suppose that the advent of sociobiology, which seeks to extend our knowledge of the way such biological facts affect social institutions, would have been taken in stride as a natural expression of human curiosity and the desire for self-knowledge. On the contrary, sociobiology has caused a considerable commotion. It has come to birth in a culture impregnated with a sense of historical relativities, deeply aware of ethnic diversity and the plasticity of human behavior, and influenced by the hope that, through the proper manipulation of the human environment, violence, poverty, and injustice can be reduced and perhaps abolished. Sociobiology has broken upon the world therefore not simply as an event in science but as a political and ideological *cause célèbre*.

The key book in the charting of this new discipline is *Sociobiology: The New Synthesis*, by Edward O. Wilson, professor of science and curator of entomology at Harvard.[1] On its appearance it was immediately attacked as a thinly disguised revival of Spencerian rugged individualism, as a prescription for technocratic social engineering, as a defense of inequality and male chauvinism, as a restatement of racist doctrine, and as a contemporary version of the ideas which led to the gas chambers of Nazi Germany.[2]

One group of critics put forth this typical, though comparatively modulated, judgment: "We submit that, despite its bold theoretical poses, Wilson's *Sociobiology* embodies a form of social prophecy which coheres comfortably with the dynamics of modern market societies. It offers, under the guise of scientific objectivity, an invitation to cultivate what Wilson calls a 'philosophical ease' toward the unfolding of contemporary human affairs. We find ourselves unable to maintain the ease required to accept discrimination, militarism, and social in-

justice as natural and inevitable reflections of some vast and insensate sociobiological scheme of things."[3] In support of attacks like these, Wilson's departmental colleague at Harvard, Richard Lewontin, himself a distinguished biologist, observed decorously: "Wilson, like most scientists, expects to be able to put out a lot of bullshit about society and not get taken up on it." Wilson, surprised by the vitriolic character of the attacks upon his work, replied with charges of "academic vigilantism," and he has been busy clarifying and explaining his views ever since.

Writing in *Newsweek* in the summer of 1976, at the height of these quarrels about sociobiology, a more detached observer, the Nobel laureate economist Paul Samuelson, remarked: "How do yo keep distinct a Shockley from a Wilson? A Hitler from a Huxley? . . . To survive in the jungles of intellectuals, the sociobiologist had best tread softly in the zones of race and sex."

Is sociobiology another piece of scientific charlatanry? Wilson has considerable standing in the scientific community, and he has brought an immense amount of empirical data together in support of his views. For these reasons alone it is important to ask this question. And sociobiology is important for more than what it may say or imply about topics like social inequality or the role of women, which are at the center of attention at the present moment. It carries implications for the future of scientific inquiry and for age-old questions about the role of human intelligence and will, the meaning of ethical principles, and the nature and possibilities of mankind. What then are its credentials and significance?

Philosophical Adornments

The reader of the angry literature that has grown up around sociobiology will inevitably be surprised if he turns to the book that has been at the center of all the excitement. Wilson's *Sociobiology*, for the most part, is an austerely scientific work. It is long, careful, full of definitions and the studious analysis of alternative explanations of the phenomena under consideration. It does not entirely neglect social and moral issues of current concern, but its focus is overwhelmingly on the forms of social behavior to be found in insects, birds, and animals. And while the information it presents is detailed, fascinating, and often startling, Wilson is extremely cautious about the generalizations he offers, and at many points his arguments depend on mathematical reasoning that can be followed only by specialists.

Over the course of many generations, as Wilson shows with the help of hundreds of examples, insect and animal societies change in vari-

ous ways. Periods of fertility become longer or shorter, for example. The ratios of old to young alter. The distribution of food or work or mating functions changes in pattern. The relationship of an animal population to the environment, or to other species, undergoes modifications, sometimes profound. The principal background of *Sociobiology* lies in the immense progress that has been achieved in recent research into the conditions leading to such evolutionary changes in the character, composition, and behavior of insect and animal populations.

Wilson began as a student of entomology. His best known work before he published *Sociobiology* was *The Insect Studies* (1971). At the conclusion of that book, he speculated that the same principles of population biology and comparative zoology that had worked so well in explaining the biological origins and functions of the rigid social systems of insects could be applied point by point to vertebrate animals. *Sociobiology* was the effort to give shape to this idea; it emerged as a book bringing vast and diversified bodies of empirical research together, synthesizing them, and delineating the outlines of a new discipline with an ambitious agenda of inquiry. Sociobiology, as Wilson defines it, is "the systematic study of the biological basis of all social behavior." For the present, its focus is on animal societies, but the discipline, he emphasizes, is also concerned with the social behavior of early man and with the social organization of the simpler human societies still in existence.

Wilson pursues this program, giving his chief attention to insect and animal behavior, with subtlety and with an extraordinary mastery of detail. The landscape he puts before us is an arresting one. It brings back and deepens the Darwinian shock. We are reminded yet again of the continuity between man and the animals; but we are reminded not only of the animal in man but of the degree to which animals have traits that we are conventionally disposed to call human. Deer, wolves, chimpanzees, and countless other species live inside social systems that have characteristics human beings can recognize, such as kinship relations, methods of communication, division of labor, hierarchical class structures, manners of courtship, sibling rivalries, differential treatment of members and nonmembers of the group, dominance and surrender rituals, and specific mixtures of competition and cooperation in the division of food, living space, and mates.

Moreover, animals change their ways of behaving in response to changes in their social environment even as human beings do. Indeed it is worth noting, since Wilson has been accused of an excessive emphasis on the genetic factors in human behavior, that he warns,

very early in *Sociobiology* against hasty generalizations about the predetermined genetic fixity of animal conduct. Thus aggressive encounters between adult hippopotami are rare when the population density is low to moderate, but when the conditions of hippopotamus life grow crowded, hippopotamus males have been known to fight viciously. Similarly the availability and quality of food affect behavior. Well-fed honey-bee colonies will be tolerant of intruding workers from nearby hives, but if these colonies go without food for several days they attack intruders at the nest entrance.

Nor are external conditions such as population density and the availability of food supply the only causes of variation in animal social behavior. Inventions, technology, outstanding individuals also make a difference. Wilson presents the case of the female monkey "genius" named Imo, a member of the troop of macaques on the Japanese island of Koshima, who, at the age of eighteen months, invented potato washing in the sea and at the age of four years invented a flotation method of separating wheat grains from sand. Both techniques were adopted by her community.

Although animal social behavior, particularly in the higher vertebrates, clearly covers a wide range of possibilities which are affected by environmental factors of differences in social "tradition" (the word is Wilson's), it is also plain that much of this behavior falls within preestablished genetic scales of behavior. Under pressures of population density, for example, hippopotami fight, but under similar pressures there are bird populations that become more cooperative, the females joining in little nest communities and raising their young together. The program of sociobiology, as Wilson sees it, is to investigate the evolutionary process affecting the transmission and modification of such genetic constraints. Carried far enough, such a program, he hopes, can throw vast new light not only on the evolution of the nonhuman world but on the development of the human.

Whether this hope is well founded is a question that we must consider. But it is important to recognize that Wilson's basic contribution, if contribution it be, has been to the science of biology and that the materials he has explored and brought together have not been presented with the same guiding intentions as have gone into many other recent books with a background in early human anthropology and in what is known as animal ethology. The indignation and hostility with which Wilson's *Sociobiology* has been received are explicable in part by the fact that a biologist of reputation, armed with information formidable in its magnitude and not easily contestable in its quality, has seemed to enter an ideological contest which has been going on for

some time—and, worse still, he has taken the "wrong" side. But Wilson himself goes to much trouble in *Sociobiology* to distinguish his effort from that of others with whom there might be a temptation to compare it.

For something like two decades a series of books has appeared stressing the genetic origins of current institutions and social problems. The best known, probably, have been Robert Ardrey's *The Territorial Imperative*, Desmond Morris's *The Naked Ape*, Konrad Lorenz's *On Agression*, and *The Imperial Animal*, written by two young scholars named, appropriately, Lionel Tiger and Robin Fox. Some of the authors of these books have had distinguished reputations as scientists, and all have drawn on research into the social behavior of animals and early humans, but these books nevertheless have been written, as their authors would concede, with current political and social preoccupations mainly in mind. Their common thesis has been that fundamental aspects of human behavior today are the results of evolutionary natural selection in the distant past, the genetic inheritance from the long period in which the human species preserved itself in hunting packs. The needs or official professions of our era push us to abstention from violence, to mutual cooperation, to equality. But needs of our bodies and minds which are as biologically rooted as our sexual drives push us to aggression and predatory behavior.

The authors of some of these books have said that they are trying to define a problem and not to declare it insoluble. Predictably enough, however, the message of these books has been interpreted as conservative or reactionary: Individual and group conflict, social stratification, role differentiation based on sex, the recourse to violence, are all innate, and not the consequences of the social environment. Predictably too there have been answering cries from anthropologists, sociologists, and psychologists. Erich Fromm, to take an example, has characterized Lorenz's views as "social and moral Darwinism . . . a romantic, nationalist paganism." There have been ripostes as well from other students, professional and amateur, of animal and human evolution. Thus Elain Morgan, in *The Descent of Woman* (1971), adopted by the Book-of-the-Month Club, has argued that, for a long moment in the past, the ancestors of the human race were forced back into the waters and that it was during that period of amphibious existence that the human race developed its distinctive characteristics, such as harilessness, sensitive fingers, and the capacity to stand erect. The period during which early humans hunted and gathered food in packs, when the phenomenon of role differentiation based on sex and male dominance appeared, is therefore of secondary importance,

contributing little to the biological heritage of the species. From these premises Morgan draws the conclusion that the roles traditionally assigned to women in society are distortions of the natural order of things.

In comparison with the books by Lorenz or by Tiger and Fox, Morgan's is an obvious confection. Nevertheless all these books have been written as direct contributions to the debate over issues which are at the center today of heated political and ideological disagreement.[4] The situation is different in the case of Wilson's *Sociobiology*. Whatever its political or moral implications—and Wilson would be the last to deny that it has these—the central excitement in it has to do with scientific theory. The book has a controlling vision, but it is of a new scientific synthesis and not of a new establishment of reason on the political scene.

Sociobiology represents, in Wilson's view, one prong of the two-pronged effort of modern biology to integrate the insights of Darwinian theory at a new level of comprehensiveness and precision. At one extreme molecular biology, neurophysiology, and adjacent disciplines such as endocrinology now seek to explain, at the microscopic level, the mechanisms of genetic inheritance and programming. At the other extreme, at the macroscopic level, sociobiology, as Wilson sees it, seeks to explain the evolution of social behavior in terms, first, of the growth and age structure of whole animal populations and in terms, second, of their genetic constitution. In Wilson's words: "The formulation of a theory of sociobiology constitutes, in my opinion, one of the great manageable problems of biology for the next twenty or thirty years. . . . The principal goal of a general theory of sociobiology should be an ability to predict features of social organization from a knowledge of these population parameters combined with information on the behavioral constraints imposed by the genetic constitution of the species."

In short, Wilson puts an extraordinary vista before us. The Darwinian theory of evolution, although it offers an organizing principle to explain why plants and animals in their immense diversity have the characteristics that they do, is not a deductive system; nor does it permit us either to predict future developments or to retrodict the past. It is unlike Newton's laws, which, for example, allow us, on the basis of information about the present positions of the planets, to deduce their past and future positions. If Wilson's program is successful, the Darwinian theory will have been transformed into something closer to the Newtonian.

He is in his own way then an advocate and a visionary. But he belongs in the tradition not of Karl Marx or Herbert Spencer but of

René Descartes. His vision is of a comprehensive new science, organized with mathematical rigor, that will unify fields of inquiry hitherto separate and replace gross generalizations with precise laws. And in one respect he goes beyond Descartes. He also believes that human traits can be brought within the framework of these laws.

Is this vision a pipe dream? All depends on whether the "general theory of sociobiology," whose formulation Wilson regards as a "manageable" problem in the next twenty or thirty years, really is found. As of now, we do not have that theory; we have only Wilson's trumpet call to begin the hunt for it.

Further, since he believes that the goal of such a theory is "to predict features of social organization," it is important to be clear about the content of that notoriously ambiguous word "prediction." Changes in social organization are not occurrences in closed, isolated systems of events; they are changes in systems open to external disturbance. In the case of animal societies, for example, changes introduced by human inventions and projects produce vast perturbations which are not foreseeable from the standpoint of population genetics or long-term ecological projections. "Predictions" about such societies therefore can only say at best that, under given circumstances, which may or may not occur, such and such effects will follow. And in the case of human social behavior the difficulties in the way of direct prediction are even more formidable. No biological or sociological theory, for example, could have predicted in 1960 that the Beatles would come along, with all the influence they exercised on manners, tastes, and values. Human sentiments may move along a predictable range—love, hate, loyalty, envy, the rest—but not their targets or contexts; and still less can we predict the content of the new ideas that will move us or the precise nature of the inventions that will change economic and social relations. After all, if we could predict them we already would have them in our possession.

Wilson, judged by his total performance, is not unaware of considerations such as these. It seems reasonable to suppose therefore that he does not intend sociobiology to be a new form of astrology and that all he has in mind is a theory that will help in the exploration of major alternative possibilities of human development, the determination of their limits, and the projection in a rough way of their costs. Although sociobiology has become entwined with the history of political and ideological controversy, it should be judged in the first place as a contribution to science. In these terms Wilson's synthesis of existing knowledge is an unusual achievement, and the lines of inquiry which he charts for the future promise considerable additions to human knowledge.

There is an arc in the history of many sciences. When they reach a certain point in their early development, the possibility appears of a theory that will pull the bits and pieces of new knowledge together and that will provide the basis for the reconstruction of human thinking more generally. Euclid had this effect on the Greeks, and Descartes was the spokesman for such a vision of mathematical physics. Later, when a science's achievements have become familiar and the first enthusiasm about it has cooled, critical philosophers, such as Aristotle or Immanuel Kant, emerge to call attention to its limits. Yet the early visionaries, the prophets of a new dispensation of knowledge, serve a crucial purpose. Although the possibilities they envisage may lie, in their totality, beyond attainment, the prophets see—and their contemporaries do not—that there are things to be accomplished; and many of these things are accomplished. There is an undeniable air of Cartesian optimism in Wilson's work, and sociobiology may well fall short of the ambitious intellectual goals he sets for it. Spurred by such goals, however, it is likely to achieve considerably more than it would without them.

Nevertheless Wilson must bear a bit of the blame for the fact that the supposed ideological implications of his work have deflected attention from the excitement it offers as an exercise in science. He begins *Sociobiology* with a short, speculative chapter called, provocatively, "The Morality of the Gene," in which he discusses such matters as Albert Camus on suicide, the origins of altruism, and the nature of ethical principles. And he ends his book with a chapter in which he speculates on the genetic sources of religion, ethics, and the arts, talks about the future of man, and permits himself to make statements such as: "The transition . . . to fundamental theory in sociology must await a full, neuronal explanation of the human brain. Only when the machinery can be torn down on paper at the level of the cell and put together again will the properties of emotion and ethical judgment come clear. . . . [B. F.] Skinner's dream of a culture predesigned for happiness will surely have to wait for the new neurobiology. A genetically accurate and hence completely fair code of ethics must also wait."

In this chapter he speaks of the inevitability in the next century of a "planned society," talks of the genetic constraints which would have to be understood and overcome, and begins his final paragraph with a sentence that would fit with no difficulty in the books of Ardrey and other popular ethologists: "It seems that our autocatalytic social evolution has locked us into a particular course which the early hominids still within us may not welcome." He has not been able to get

off the hook ever since, and his latest book, *On Human Nature*, for which he has been awarded a Pultizer Prize, is still another effort to clarify and explain his views.[5]

Sociobiology, as Wilson has formulated it, in fact consists of a core doctrine—a scientific program for a "new synthesis" of evolutionary ideas—and a penumbra of logically independent doctrines of quite another sort. The central one is a program for the unification of biology, the social sciences, and the humanities. It is based on a classic form of philosophical materialism and is joined to a version of what used to be called evolutionary ethics. Wilson also offers, almost as an appendix, a set of vague opinions about current social problems.

What is it that Wilson means when he argues that sociobiology offers a basis for the unification of biology, the social sciences, and the humanities? In *On Human Nature* he sets forth his basic position: "The core of scientific materialism is the evolutionary epic. Let me repeat its minimum claims: that the laws of the physical sciences are consistent with those of the biological and social sciences and can be linked in chains of causal explanation; that life and mind have a physical basis; that the world as we know it has evolved from earlier worlds obedient to the same laws; and that the visible universe today is everywhere subject to these materialist explanations." Formulated in these broad terms, Wilson's position raises two questions. Why would anyone disagree? And why does Wilson attach such important implications to these propositions and think that they serve as the basis for the unification of the natural and social sciences and the humanities? It would be surprising if the laws of economics violated the laws of physics, and it would be hard for anyone but believers in the literal truth of miracles to deny the universal reign of natural laws. Nor would anyone who accepts the finality of death and sees no evidence for the existence of disembodied spirits have trouble conceding that "life and mind have a physical basis." Wilson calls this set of beliefs "scientific naturalism" or "materialism," and his manner of presenting them suggests that he regards them as radical and controversial. But they are the generally held views of educated people who take the findings of modern science to be too well corroborated to permit any other point of departure for their reflections on man and his place in nature.

In fact they are old beliefs which long antedate the rise of modern sciences. They were affirmed by Democritus and Lucretius, and they lurk behind the tortured questions raised in the Book of Job about the contrast between this morally unintelligible world and the presumed benevolence of its Creator. Science has not created these

beliefs. It has merely fortified them and helped give them more general currency.

To be sure, Wilson is not wrong to think they are important and have a biting edge. They undercut ideas to which large parts of the human race remain passionately attached, and when they are used as a basis for the study and evaluation of humanity's emergence, doings, and sufferings, they destroy or reshape habits of mind long enshrined. If, for example, one accepts these propositions which Wilson enunciates, one will not believe that there are fundamental discontinuities or "dualisms" separating man from the rest of nature, and one will hesitate to use a logic in the study of human beings wholly different from that which we use to study the domains of physics or biology. In this sense the natural sciences, the social sciences, and the humanities are "unified."

But Wilson attaches greater importance to these propositions even than this. He thinks them more radical in their implications, and more contrary to views that are widely held, because he reads a meaning into them which, in my opinion, they do not and cannot have. In *On Human Nature* Wilson calls for a deeper and more courageous examination of human nature that combines the findings of biology with those of the social sciences, and he spells out what he means immediately: "The mind," he says, "will be more precisely explained as an epiphenomenon of the neuronal machinery of the brain." Similarly on the opening page of *Sociobiology* he preaches a sermon to philosophers of ethics: "The emotional control centers in the hypothalamus and limbic system of the brain . . . flood our consciousness with all the emotions . . . that are consulted by ethical philosophers who wish to intuit the standards of good and evil. What, we are then compelled to ask, made the hypothalamus and limbic system? They evolved by natural selection. That simple biological statement must be pursued to explain ethics and ethical philosophers, if not epistemology and epistemologists, at all depths."

In short, Wilson's "scientific materialism" is a materialism of a quite special kind. It is a traditional form of reductive materialism. He presents us with more than the incontestable view that there are physical and biological conditions for our ideas and ethical reflections. He also implies that if we have adequate knowledge of the former, we can deduce the latter. And he apparently believes that this causal explanation of our thoughts and emotions will be a sufficient basis as well for their normative appraisal. Happily, although Wilson paints the outlines of this position boldly, he repeatedly veers away from its consequences. Nevertheless it is the source of great confusion.

There is a fairly simple logical reason why the social sciences and the humanities cannot be "unified" with biology in the terms that Wilson apparently contemplates. Propositions about the hypothalamus and the limbic system do not contain terms such as "love," "hate," "good," or "bad." They cannot therefore be the only premises we need to produce psychological or moral statements containing such terms. Nor can we do without such terms, for they have been developed to deal with discernible aspects and qualities of human experience which the languages of molecular biology and biochemistry cannot adequately characterize. It is an old notion that a belief in the universal reign of physical laws implies that all explanations must be in the vocabulary of the natural sciences. To be sure, if the necessary physical conditions were not present, human beings would not have the plans, projects, ideas, and emotions that they do. These are, in this sense, physical events and proper objects of study by the natural sciences. Yet this does not imply that they cannot at the same time be studied quite independently of the natural sciences or that nothing of significance will be revealed by such independent study.

Consider, for example, the ideas in Wilson's book, which presumably could be connected, if we had the requisite theoretical and practical information, to neuronal events in his brain cells. Would such an explanation of the physiological and chemical goings-on inside Wilson's head tell us anything about the logical content or merits of these ideas, or their relationship to the past and future of biological research, or their possible utility in assessing different forms of social organization? And when he says that "the mind . . . is an epiphenomenon of the neuronal machinery of the brain," does he mean to say that his ideas, even if they do not in themselves have characteristics such as spatial extension or mass, cannot be said to be the causes of anything in their own right? In a normal sense of the word "cause," they have demonstrably caused, for example, other people's anger. We presumably could trace the causal sequence leading to this anger through the glandular systems of Wilson's critics, but such an effort would tell us nothing about what is most pertinent—the particular extent of his ideas, the specific character of his critics' beliefs, and the distinctive quality of that emotion known as "anger"—for this word does not have a synonym in the language of neurons, which describes only its physical conditions. It is the name for a recognizable feeling, aroused by and directed toward objects, persons, or ideas describable only in commonsense language and not in the language of neurophysiology.

We have normal modes of thinking and speaking about phenomena of human life such as books, promises, marriage, constitu-

tions, schools, the experience of listening to music, the rules and interests of the scientific community. Intelligible statements, capable of being called true or false, sensible or foolish, discerning or obtuse, can be made in these modes. If "scientific materialism" means that the progress of science will expose such modes of thinking and speaking as superstitions, then it proposes to abandon irreplaceable forms of responsible discourse on which much human knowledge and wisdom are founded. Happily, however, a belief that man is part of physical nature does not carry this logical implication. Indeed, if it did, it would be a self-vitiating belief.

If Wilson's conception of "scientific materialism" is out of synchronization with the language and perspective of ordinary life, the same, I think, is true of his ethical philosophy. Our ethical principles are to be appraised in the light of their consequences for the human gene pool. Such an appraisal, to the extent that we are capable of making it, is of course important, but it is surely not the only relevant test of moral principles or social policies. A developed civilization has enterprises too varied and requirements too complex to permit any single set of considerations, even genetic ones, to monopolize moral judgment. Even if we knew more than we do about the actual effects of the moral ideas we employ on the future genetic constitution of the race, we could still not say what a desirable genetic result would be without invoking, in addition to this scientific information, an independent framework of social and moral norms. Although Wilson is obviously aware of the long debate over the propriety of using purely biological norms as a basis for ethics, I am not persuaded that his own version of evolutionary ethics is an improvement over nineteenth-century versions.

Indeed it is bogged down in some old nineteenth-century issues. The central problem of sociobiology, he tells us, is how the individual organism, genetically predisposed to struggle for survival, can also carry "altruistic" genes that dispose it to sacrifice its individual existence for the group. This problem concerned Charles Darwin, and Wilson's solution, though more elaborately developed, is not substantially different: Kin bonding is so important for survival that the genes that make for strong kin bonds and individual self-sacrifice tend to come through the evolutionary filter and to persist. But to argue that this is the "central" problem of sociobiology is to take it for granted that the polarity of individual versus society is the inevitable place to begin when one tries to understand animal or human behavior. If nothing else, the data accumulated by Wilson himself about the inbred social orientation of the higher primates should cast doubt

on the intellectual utility of such a point of departure. It owes more, it seems to me, to the old social-contract metaphor, now revived, than to materials intrinsic to the story of evolution.

Further, Wilson's materialism, which leads him, when speaking of human thoughts and feelings, to deflate them into "epiphenomena," leads him, when using moral terms such as "altruism," to inflate them into words without cash value. The insect killed by the queen of the colony as it fertilizes her eggs is, in Wilson's parlance, behaving "altruistically." From that behavior to the conduct of the religious martyr or the battlefield hero we have, if we use his vocabulary, a single unbroken spectrum of individual self-sacrifice for the good of the community. But when "altruism" is used indifferently to characterize unconscious instinctual behavior and voluntary sacrifice by a creature conscious of the nature of death, it is not scientific information or a naturalistic philosophical perspective that we are receiving. It is, I fear, an object lesson in the abuse of words.

Biological Wrappings

Yet these criticisms of the philosophical adornments which Wilson has added to his scientific endeavor still leave a central issue to be examined. When a wolf grovels before its conqueror or a peacock shows its feathers to a hen, they are not simply following a social custom. They are doing what they do as a result of natural selection and the transmission to them of certain biologically inherited traits. And human beings too grovel and strut and show their feathers. So the great question arises: What proportion of human behavior is physiological and genetic in its causes? How much of what we commonly explain as a product of history and convention, such as monogamous marriage, private property, or organized warfare, is in reality bone of our bones and flesh of our flesh and not subject to change except with extraordinary effort and unpredictable consequences?

This is the question which joins sociobiological research to moral and social concerns that are in the forefront of the contemporary consciousness. Yet, oddly enough, when Wilson addresses this question, his answers are usually so guarded or vague or so fundamentally in accord with the dominant conventions that it is a bit of a mystery why his critics have been so indignant. On the nature-versus-nurture controversy Wilson writes: "The evidence is strong that almost all differences between human societies are based on learning and social conditioning rather than heredity. And yet perhaps not quite all." On the social meaning of sex differences he says: "Here is what I believe the evidence shows: modest genetic differences exist between the

sexes; the behavioral genes interact with virtually all existing environments to create a notable divergence in early psychological development; and the divergence is almost always widened in later psychological development by cultural sanctions and training. Societies can probably cancel the modest genetic differences entirely by careful planning and training, but the convergence will require a conscious decision based on fuller and more exact knowledge than is now available."

To take a final example, here is Wilson on the supposed proneness of man to aggression: "Aggression does not resemble a fluid that continuously builds pressure against the walls of its containers, nor is it like a set of active ingredients poured into an empty vessel. It is more accurately compared to a preexisting mix of chemicals ready to be transformed by specific catalyst that are added, heated, and stirred at some later time." In other words, sometimes we are caused to be angry, and when the provocation is severe enough our anger runs away with us. Why? That is the nature of human beings. We would not act that way if our genes were different.

There is much of this sort of analysis in *On Human Nature*: Conformity to social norms is traced back to "conformist" genes; religion is explained by reference to an aboriginal human impulse, "sacralization." It is a kind of explanation that comes perilously close to the medieval proposition that opium, under proper conditions, can put us to sleep because it has dormitive powers. For that matter, at least we know, within reasonable limits, what "dormitive" means. When Wilson uses a word like "aggression," however, it covers a gamut from destruction for the pleasure of destruction to the behavior of an animal or human being whose vital interests are in collision with those of others. *L'éléphant est un animal féroce; quand on l'attaque, il se défend.*

In brief, where currently controverted issues are concerned, Wilson's views are usually conventional ideas in biological wrappings. On the whole, despite the brouhaha he has caused, he leans to the view that social environment is the primary agent in shaping human behavior. What separates him from the critics with whom he shares that view is only the qualification that, while environment is responsible for most of our behavior, it is perhaps not responsible for all.

Why then the brouhaha? One reason undoubtedly is that his critics are rendered anxious even by this small qualification. They would rather not have it expressed. It is obvious to them, as it is obvious to anyone, that human beings have characteristics which no society has created and to which all societies must respond or face trouble—needs for food, sexual drives, cycles of maturation and aging, requirements

for warmth, communication, emotional support. It is probably obvious to most of Wilson's critics too that individuals differ in their tastes and capacities and that, Skinner to the contrary notwithstanding, no environmental reforms can make everyone capable of creating a Sistine Chapel or even desirous of doing so. But they would prefer that such truths be treated with silence. The open mention of them, like the mention of sex in polite Victorian circles, can only incite wicked thoughts. Wilson, in their eyes, has opened a dangerous door: Once opened, no one can know what new and more disturbing reservations may have to be entertained about the omnipotence of environmental influences. And Wilson, despite the innocuous character of most of his specific opinions about social issues, nevertheless has done something himself to arouse such fears. Not only has he brought together a great mass of arresting information about the genetically programmed social behavior of animals, but he offers a great plan for sociobiological research, a sweeping form of scientific materialism, and a good deal of talk about social planning that suggests, at least to eager critics, that there is a technocrat or a eugenicist hiding behind his conciliatory words.

But perhaps there is also something more. The ideology of sociobiology is separable from its scientific merits. But as an ideology, at least in Wilson's formulation, it occupies one piece of common ground with the ideology of its critics. What we have is a quarrel between adherents of a common faith. It is the faith that the old notion of Divine Design can be replaced by an almost equally encompassing notion of Human Design.

Human Design

When Darwin produced massive amounts of data indicating that man and other primates had a common origin, he did not call attention to facts that no one before him had ever noticed. The similarities between monkeys and human beings had long been part of the common sense of mankind. Nor was it the idea that the human body and human nature were the products of a long process of development that essentially shocked the Victorian mind. There was a history of such speculation before Darwin, as there was also a history of argument that the destiny of man, like that of the animals, was to struggle grimly for survival. Darwin himself took this idea from a Christian minister, Thomas Malthus.

It was two other implications of the Darwinian theory that made the greatest trouble. One was the indication that there was no separate creation for man, no moment in the history of the evolutionary pro-

cess when the laws of development ceased their operation and man miraculously was invested with a soul. The other was the profoundly antiteleological thrust of Darwin's thought. There were no preordained ends to the evolutionary process; there were indeed no ends at all, only temporary terminations which were themselves new beginnings. Nature had no direction; it could not even be said to be a fumbling experimenter, seeking new and better forms for living things. And while human beings had ideals and goals, and these could be seen as the instruments used by the species to control its destiny, such ideals and goals were themselves products of the evolutionary process and freighted with the experience through which the species had gone. The dumb, inert past—out of human control and largely beyond human memory—controlled the behavior of human beings and the shape of human nature and human institutions. Human thoughts about the future were at best minor elements in the history of the race.

Darwin himself was disturbed by this implication of his theory and wrote Charles Peirce inviting the American philosopher to give his attention to the problem of how the human mind can function as an agent in human evolution. That it can so function is attested by history, not least the history of human creativeness since Darwin: Social insurance, public-health measures, the revolution in communications, the progress in surgery, nuclear energy are a few of the human artifices that have profoundly affected the character of human life and the nature of the human future, including the composition of the human gene pool. It is clearly a mistake to say that mankind does not have some power over its destiny.

But the picture of the human condition which emerges from the Darwinian theory remains untouched at its core. Man is an animal most of whose doings are not the product of conscious thought, whether his or nature's. He can come to know more about himself and the universe he inhabits. His nobility lies in his effort to master his fate. But he understands and masters it, when he does, at the edges. His reconstruction of his environment and of his own behavior and nature is piecemeal at best and can be nothing more. A great rational pattern, an encompassing idea of justice and goodness, cannot be successfully imposed on the natural or the human scene. These scenes are clutters of accident. A causal order can be discerned by man in some parts of the clutter, but that causal order is not what the human heart would like.

Religious people have had their own ways of rejecting this picture, or of absorbing it into their faiths. They speak of God's purposes as

inscrutable, or limited to another and immaterial world. But many of those who think of themselves as having wholly accepted the Darwinian scheme have also found this aspect of the evolutionary story too bitter to swallow. Consciously or unconsciously they have sought to think their way around it by returning purpose to the universe in the shape of a supremely masterful human reason. At one extreme, that reason can reshape man's environment and make a new animal of him. At the other extreme, that reason can grasp man's genetic structure and learn enough to shape his evolution to his heart's desire. This denaturalized humanism is the common thread that runs through the evangelical materialisms and positivism of the nineteenth century, and, as the quarrels over sociobiology reveal, it persists in the twentieth century and joins many in the hereditarian camp to many in the environmentalist.

The distinction between "hereditarians" and "environmentalists" is not a distinction between "conservative" and "liberals," or "Left" and "Right." Kant and Noam Chomsky, two men of the Left, have argued for preordained structures in the human mind. David Hume and Edmund Burke, usually called conservatives, have argued for the great influence of custom and convention. Indeed, at the extremes, neither hereditarians nor environmentalists, neither Wilson nor his opponents, are quite evolutionary enough in their thinking. On both sides they ignore or underestimate the significance of that great area of human life which is controlled by the custom that is second nature and which is the product of evolutionary experience, although it may leave no genetic deposit in its wake. Mankind lives within institutions—markets, legal systems, families, states, etc.—which are the products of history. They have not been conscious inventions, although at times conscious intelligence has figured in the process of remodeling them. But more frequently they have been changed by quite unintellectual forces, and we are living with the consequences, sometimes fortunate, very frequently unfortunate. Yet we cannot begin *de novo*. Try to think of remaking the world as though such structures did not exist, or had not shaped our ideas, character, and passions, and the human mind fails or sinks into forms of madness.

As a science, sociobiology is new and probably important. As the basis for an intelligent philosophy, it belongs to that stream of thought to which people of various political dispositions have belonged—Erasmus, Jean Jacques Rousseau, Denis Diderot, John Stuart Mill, Sigmund Freud—to name only a few. It reminds us of what the evangelistic fever about an idea tends to make us forget: that human beings have a certain physiology; that their bodies usually control

their minds; that they have certain drives and go through certain arcs of development, which are biological in origin. Societies shape these drives and affect these patterns of development profoundly. But just as there are a hundred ways of shaping shoes but the human foot remains there to pay the price, so, for each form of social orientation or control, there is a human cost. This is not a new thought, but it is a useful one. We are not machines to be taken apart or put together again. We are organisms with a long history in our genes and in our habits and sentiments.

But, as a social ideology, sociobiology breathes something of the same spirit that Skinner's *Walden Two* does. It is regrettable that a field of inquiry that can offer so much passionately interesting information and that has the potential to teach a reasonable philosophical modesty should be overlaid also with the vision of still another brave, new world. As Wilson might remind us, this is what tends to happen to ideas when an animal with the human genetic predisposition gets hold of them. Whether such an explanation holds, it is certainly what happens regularly on the present intellectual scene.

NOTES

1. Edward O. Wilson, *Sociobiology: The New Synthesis* (Cambridge, Mass.: Harvard University Press, 1975).
2. Arthur L. Caplan, ed., *The Sociobiology Debate* (New York: Harper & Row, 1978).
3. From the letters section of *Science* 192 (April 30, 1976).
4. See also Alexander Alland, *The Human Imperative* (New York: Columbia University Press, 1972), and Marshall Sahlins, *The Use and Abuse of Biology* (Ann Arbor: University of Michigan Press, 1976).
5. Edward O. Wilson, *On Human Nature* (Cambridge, Mass.: Harvard University Press, 1978).