

SOCIOBIOLOGY AND RELIGION: A DISCUSSION OF THE ISSUES

by Daniel R. DeNicola

I have been asked to synthesize the discussions of this conference, to provide the week's conversation with a sense of "culmination rather than termination." That is an audacious assignment. Of course it would be a grand thing to produce a sweeping synthesis in the Hegelian style: to reconcile the scientific and religious theses and antitheses of the conference in a fuller, more inclusive synthesis that would articulate better the purposive activity of Reason. But such a high reach far exceeds my grasp. My aim is simply to elucidate the controversies of the conference by identifying pivotal issues, by delineating and discussing briefly those areas in which, as they say in law, "the issues are joined."

The questions we have been addressing are ancient: What are our origins? What is our nature? And how do these portend our destiny? These questions are religious as well as scientific; they lie in long-disputed territory pocked with the scars of old battles. What is new is the development of sociobiology—a scientific synthesis that promises detailed and final answers derived from a penetrating and elegant integration of nature and culture. Our attempt to relate the findings and the approach of sociobiology to the insights of religion has been, in part, a venture in intellectual diplomacy. These discussions have gained an unusually sharp focus and intensity because we went beyond the collation of sociobiological hypotheses with religious doctrines to confront a striking claim: that sociobiology can provide a scientific explanation for religion itself. By detailing the biological basis of human social behavior, sociobiologists will, so they say, eventually locate the genetic bases of our religious impulses and provide a scientific explanation of our propensity for religious experience, be-

Daniel R. DeNicola, dean of the faculty and associate professor of philosophy, Rollins College, Winter Park, Florida 32789, presented this paper at the Twenty-sixth Summer Conference ("Evolution, Human Nature, and Values") of the Institute on Religion in an Age of Science, Star Island, New Hampshire, July 28-August 4, 1979.

[*Zygon*, vol. 15, no. 4 (December 1980).]

© 1981 by the Joint Publication Board of *Zygon*. 0044-5614/80/1504-0004\$01.72

lief, and practice. This claim is key, and the issues I shall discuss all relate to understanding its meaning and import and to evaluating its plausibility.

SOCIOBIOLOGY AS A PARADIGM

Our *locus communis* is Edward O. Wilson's *On Human Nature*, discussion of which has returned us to his *Sociobiology: The New Synthesis*.¹ I begin with a heuristic point about how we are to regard these works and the enterprise of sociobiology itself. Wilson says that sociobiology is a new discipline; it is not, he urges, (merely) a new theory. Yet he is at considerable pains to show that sociobiology is *testable*—a property one would expect in a theory but not in a discipline. My suggestion is that sociobiology is best understood neither as a theory nor as a discipline but as a *paradigm*—Thomas S. Kuhn's now famous term for a comprehensive model from which flows a coherent tradition of scientific research. Kuhn cites Aristotle's *Physica*, Ptolemy's *Almagest*, Isaac Newton's *Principia*, and Charles Lyell's *Geology* and says: "These and many other works served for a time implicitly to define the legitimate problems and methods of a research field for succeeding generations of practitioners. They were able to do so because they shared two essential characteristics. Their achievement was sufficiently unprecedented to attract an enduring group of adherents away from competing modes of scientific activity. Simultaneously, it was sufficiently open-ended to leave all sorts of problems for the redefined group of practitioners to resolve."²

This account applies nicely, I believe, to Wilson's *Sociobiology*. By extending population biology and evolutionary theory (now grounded in molecular genetics) to social arrangements, Wilson has fused a new paradigm, a unified model that links the languishing social sciences to biological underpinnings. *On Human Nature* follows as a work that speculates on the results to be achieved within the sociobiological paradigm and on the long-term significance of the paradigm itself. It is manifestly not a work of "normal science." Kuhn uses the term "normal science" for paradigm-based research that includes (1) the determination of significant facts comprehended by the paradigm, (2) the matching of facts with theory within the paradigm, and (3) the further articulation of the paradigm itself. (These are the alluring problems left for "the redefined group of practitioners to resolve.") In *On Human Nature* Wilson identifies a research agenda for sociobiology that includes such problems. Furthermore, he conjectures about the combined outcomes of this future research,

and (in contrast to some strident critics) he envisions a dramatically beneficial impact from the fully articulated paradigm.

One consequence of the characterization that I am suggesting is that it helps to account for two of the "defects" some critics have decried in *On Human Nature*. Even if these features are genuine "faults," they become understandable and even defensible. The first criticism is that Wilson's pronouncements regarding the scope and power of sociobiological explanations are headily optimistic. It is true that in this book he permits his expectations to soar and sing. In the final chapter, called "Hope," he prophesies the fashioning of a "biology of ethics," the explanation of religion as a product of the evolution of the brain, the long-awaited unification of the sciences with the humanities, and the installation of the evolutionary epic as our presiding myth. Kuhn would remind the critics, however, that an emergent paradigm needs such enthusiasm to announce the unprecedented accomplishment and to attract researchers to do its remaining work.

The second criticism is that Wilson gives a misleading imbalance in his presentation: Despite his acknowledgment that learning and social conditioning play crucial roles in the creation of cultural differences, Wilson continually stresses the genetic basis for social organization. He says, for example, that our genes "hold culture on a leash." Clearly this is true, and clearly we have a scientific imperative to determine the length of this leash and the terrain over which it permits us to roam. But the metaphor is also deceptive, for culture also can constrain our genes through practices that affect the human gene pool. There is, more accurately, a complex interaction between genes and culture that we have yet to model fully. Wilson agrees but has chosen to emphasize the genetic determinants. Bernard D. Davis has pointed to Wilson's lack of treatment of individual behavioral differences—differences which may have an enormous, direct effect on the proper formation of social policy. Wilson has chosen to stress behavior patterns that are species-wide. But again there is a point to Wilson's choices of emphasis. A new paradigm inevitably tends to counterpoise prevailing doctrines and to contrast with outworn paradigms (it is to the advantage of a new paradigm to do so—such are the demands of conceptual evolution!). Wilson's emphases counteract the commonplace that human nature is infinitely plastic—a view advanced, for example, by many behaviorists and existentialists. The plasticity of human nature is subject to definition only by the reinforcement schedules of the environment according to the behaviorist interpretation, or subject to definition only by arbitrary free choices made in fear and trembling according to the existentialist interpretation.

ZYGON

To summarize crisply: Wilson has been criticized for his overconfidence, for his speculative presumption, and for his distorting emphases in presentation, but these are all understandable concomitants of the publication of a new paradigm. They may in a way be obligatory. And they are not likely to mislead as paradigm-based research goes forward. In any event, this is the understanding I have as I turn now to address the first joining of issues.

MATERIALISM, REDUCTIONISM, AND FREE WILL

We are about to enter a philosophical thicket with many well-worn paths, from which we shall emerge with a fistful of issues, some of them quite thorny. But there is no avoiding this trip, for these issues have been profoundly important to the conference discussions. Some rhetorical questions may provide orientation: What are the most basic methodological assumptions of sociobiology? What sort of materialism does Wilson assume? Is materialism able to account for consciousness? Is sociobiology a reductionist effort and, if so, in what form? Is the sort of determinism espoused by Wilson compatible with the free will of ethics and religion? Let us begin with materialism.

Scientists present at this conference have, I believe, unanimously affirmed materialism to be a cardinal principle of scientific thought. The theologians have taken various ontological positions, although no one I can recall has directly denied materialism. But it remains unclear whether materialism can support a religious world view. More generally can the humanities thrive if all there is is matter? Well perhaps, for there have been many attempts at a religious materialism, including even a prominent Christian materialist—Tertullian. For his part, Wilson is decisive. He promulgates a “scientific materialism” that makes these “minimal 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.”³ As stated, this is a rather mild and tolerant form of materialism. It requires only a consistency of laws, not a uniformity or a reducibility. It demands only a physical basis for mind, not an identity of consciousness with brain-state correlates. And it claims only to cover the *visible* universe, although I suspect Wilson meant to include the *sensible* universe. Because he has given these as minimal claims, he is free to exceed them, and he sometimes does. But even such minimal claims are not self-evident and without difficulty. Furthermore, he

confuses the issue by giving a different definition of scientific materialism in the glossary of the same book. There he defines it as “the view that all phenomena in the universe, including the human mind, have a material basis, are subject to the same physical laws, and can be most deeply understood by scientific analysis.”⁴ This definition covers *all* phenomena, not just the visible; it is more likely interpreted as reductionist (“subject to the same physical laws”); and it adds the cryptic notion of a deeper understanding.

As an aside, let me note that physicists—the arch-materialists of yesteryear—have learned to live with a dazzling array of “energy packets in rhythmic motion” in place of their former collection of nuggets and pieces. What we mean today by a “physical basis” makes traditional materialism seem simple-minded. Wilson says that our transcendental goals “have faded . . . one by one, like mirages, as we drew closer.”⁵ The same might be said of our conceptions of the ultimate constituents of matter. My point is that our understanding of materialism changes with our understanding of matter, and we should be wary of the reliance on concepts that have long since been eroded away.

The conception of matter involved in Wilson’s argument has not been so much at issue here, however, as have the reductive and eliminative aspects. Although he does conceive the disciplines as hierarchically ordered (each one an “antidiscipline” to the next higher one), and although he believes in reductionism as a purifying heuristic device, Wilson nevertheless claims to be an emergentist regarding scientific laws: “The laws of a subject are necessary to the discipline above it, they challenge and force a mentally more efficient restructuring, but they are not sufficient for the purposes of the discipline. Biology is the key to human nature, and social scientists cannot afford to ignore its rapidly tightening principles. But the social sciences are potentially far richer in content. Eventually they will absorb the relevant ideas of biology and go on to beggar them.”⁶ Presumably this means that there are some valid theoretical statements in a discipline that can be derived from theoretical statements in the antidiscipline and even some that must be. However, new organizational structures and novel relationships emerge at the higher level, so there also will be some valid statements in the social sciences, for example, that cannot be derived from the antidiscipline, biology. While macroscopic and microscopic accounts are compatible, the antidiscipline is unable to express all the truths of the discipline. In all of this Wilson does seem to limit the ontology of all fields to material entities.

Materialists have always had a rough time accounting for consciousness—it seems essentially other than matter. When ancient

materialists strained noticeably to describe the awareness of the soul (*psyche*) or mind (*noûs*), it would be made of matter all right, but matter exceedingly fine or pure or speedy or special in quality—a sort of matter a-go-go. Greek atomists, for instance, sometimes pictured consciousness as the epiphenomenal sparks given off by the friction of minuscule psychic particles colliding in very rapid motion. Expressing the views of Epicurus, Lucretius gives the following description in *De Rerum Natura*:

... The substance of the mind and the soul is formed of exceedingly fine seeds. . . . [This substance is complex, however, composed of delicate breath, warmth, and air.] . . . Yet these three all together are not sufficient to produce sensation and reflective thought. Some fourth substance must therefore be added to these: it has no name; but nothing exists which is more mobile, or more subtle, or which is made of smaller or smoother particles.

... Nothing in our body is further shrouded from our knowledge than it; and furthermore, it is the very soul of the whole soul.⁷

Compare that with Wilson's speculation:

An organism can be guided in its actions by a feedback loop: a sequence of messages from the sense organs to the brain schemata back to the sense organs and on around again until the schemata "satisfy" themselves that the correct action has been completed. The mind could be a republic of such schemata, programmed to compete among themselves for control of the decision centers. . . . It is entirely possible that the will—the soul, if you wish—emerged through the evolution of physiological mechanisms. But, clearly, such mechanisms are far more complex than anything else on earth.⁸

One senses that underneath our more sophisticated knowledge of physiology, the difficulty remains. Two millennia of scientific research have led us to favor extreme complexity over extreme purity and fineness as the composition of the mind or soul, but we still strain to reveal the "stuff" of consciousness, the structure of intentionality.⁹ Wilson seems ultimately to reject materialism in favor of an epiphenomenalism or not to recognize their differing ontologies, as when he predicts that "the mind will be more precisely explained as an epiphenomenon of the neuronal machinery of the brain."¹⁰ But he offers little elaboration. Yet religion, the humanities, and indeed culture itself are realms of consciousness, and one cannot fully comprehend these realms without an explanation of consciousness.

A related issue obviously is the question of free will, of the capacity for autonomous decision or moral choice. Wilson has not attempted to write a close and careful argument concerning determinism, but the issue is in the underbrush and peeks through here and there in *On Human Nature*. My best efforts at interpretation leave me unsure of his precise position. He says he believes that the social sciences are

linked ultimately to the physical sciences in “chains of causal explanation.”¹¹ This suggests a tight determinism. However, he is fully appreciative of the humbling discoveries of Werner Heisenberg on indeterminacy and Kurt Gödel on incompleteness, and so he insinuates a “probabilistic determinism” at several points. The official definition in the glossary, for example, says: “*Determinism*. Loosely employed to designate any form of constraint on the development of an anatomical organ, physiological process, or behavior.”¹² But the stricter version comes into full play during his discussion of free will.

I can find two very different models of free will in *On Human Nature*. The first is an interesting version of compatibilism that tries to retain both determinism and freedom by making the latter a relative or perspectival term. A technical formulation of this notion goes, I believe, as follows: *A* has free will for *B* (or from *B*'s perspective) if and only if the number and complexity of the variables affecting *A*'s behavior exceed the capacity of *B*'s brain (or intelligence), where *A* and *B* may be the same individual.¹³ What this means is that I may say correctly that I have free will if I cannot in principle completely predict my behavior—the reason being the relatively limited capability of my brain. This is a soft determinism, of course, since it is still the case that the uncomprehended variables function according to sets of causal laws beyond the simultaneous grasp of my understanding. Moreover, I would not have free will from the perspective of an intelligence that could comprehend all the operant variables of my behavior. Wilson removes some uneasiness about this eventuality, however, by saying that “such an accomplishment might be beyond the capacity of any conceivable intelligence.”¹⁴ Being free and responsible, it turns out, is a function of our finiteness. Unfortunately it is not clear on this model why our unpredictability should occur peculiarly in the moral arena and especially in situations of deliberation and choice.¹⁵ Nor is the simple fact of unpredictability easily transformed into the fact of free moral agency; on a phenomenological level my feeling of freedom is not merely a sense of uncertainty about my future behavior—I experience a sense of agency, of choice.

The second model is very different and addresses these problems. On this model our genetic programming and our personal history of conditioning determine our behavior; we run along smoothly as though on “automatic pilot” in our normal mode of functioning. But interestingly we humans are wired with a kind of “manual override.” When we engage this device, we “take over the controls” of our behavior, acting freely and decisively and with full deliberateness. Wilson introduces this model in explicating the three dilemmas around

which *On Human Nature* is organized; these are: (1) Whence can we derive human purpose now that our transcendental goals have faded and we have no source of values outside our biological imperatives? (2) Which of our genetically programmed sensors and motivators should be obeyed or amplified, which curtailed or sublimated? (3) In what direction should we undertake the genetic engineering of human nature?¹⁶ This model is most explicit in the presentation of the second dilemma, in which he asserts that “we must consciously choose among the emotional guides we have inherited. To chart our destiny means we must shift from automatic control based on our biological properties to precise steering based on biological knowledge.”¹⁷

Although this picture seems closer to the traditional ethical and religious concepts of moral agency and free choice, I confess I cannot see how the actions of the manual override, which must be genetically designed into the neuronal equipment of our brains, can be freer and more morally responsible than those of the automatic pilot. Who or what is in the pilot’s seat? Under what conditions does it take over? Does it monitor alertly in continual readiness? And on what basis are the “manual control” decisions made? It is not clear to me how the second and third dilemmas can be made coherent. When we consider the issue of amplifying or restraining our evolved propensities, and of altering or engineering our genetically based capacities, what can we utilize in this “considering” except the very same genetically endowed capacities for valuing and deliberating? Surely the acquisition of biological knowledge can create only the *data* and not the *capacity* for “precise steering.” Wilson seems to be unsure himself, for he wonders, in discussing the third dilemma, whether “there is something already present in our nature that will prevent us from ever making such changes.”¹⁸ But he needs, I think, to retain some such picture as the autonomous manual override in order for us to have any genuine dilemmas at all. Unless we have more than one live option, whatever is going to happen is all that ever really could have happened.¹⁹

My treatment of these two models is an exercise in interpretation; at no point in *On Human Nature* does the author announce that he has two stories to tell about freedom of the will. Nonetheless I think they are there and Wilson needs them both, and yet they conflict. He needs the first model to secure his position on emergence, to synthesize a free will from sociobiology and neurophysiology. He needs the second model because he wants to set before his readers momentous questions of ethics and practical policy making. This predicament calls to mind Immanuel Kant’s somewhat reluctant conclusion in the

Foundations of the Metaphysics of Morals: Freedom cannot be explained because to explain a thing is to locate sensible occurrences of it and then to comprehend these in causal laws—which is by definition antithetical to freedom; nevertheless we must assume freedom in order to act at all.

We are about to leave this thicket and enter another. What have we gathered? (1) To be productive our discussions require a careful and precise definition of “scientific materialism.” If the point of “materialism” is ontological, that is, what kinds of things exist, then it must be tuned to the ongoing research into the ultimate constituents of matter. At the other end of the scale, we still struggle to include intentionality and consciousness within that same ontology, and it is moot whether that problem can be resolved by a more detailed neurological map. If on the other hand the point of the term here is methodological, that is, to declare commitment to a set of procedures for inquiry, then the assumptions and limits of these procedures await articulation by Wilson. (2) Conclusions in regard to reductionism and emergentism depend on the above account of scientific materialism. (3) Wilson’s scientific stance on the issues of free will versus determinism is a type of compatibilism, in which he weakens both terms to prevent head-on conflict: Determinism becomes probabilistic (at least at the subatomic levels), and free will is an emergent self-delusion created by our complex behavior and limited capacity to understand our own brain. Paradoxically we must participate wholeheartedly in this delusion even to pose the question “what should be done?”—whether that question occurs in the context of religious ethics or in the dilemmas raised by sociobiology.

EXPLANATIONS AND REALMS OF MEANING

I remarked at the outset that the most provocative claim of our dialogue has been that sociobiology eventually will be able to explain human values and religion itself. I now want to direct attention to the central concept of explanation, for the concept is itself problematic and has been a source of confusion for us.²⁰

A simple but significant fact is that *many kinds of explanation are possible*. Here is an illustrative but not exhaustive list: (1) We may explain a phenomenon by showing it to be an instance of a covering law; for example, an astronomer may explain the orbit of the earth by reference to the laws of motion and gravitation. (2) We may explain our actions by revealing our intentions or motives; for example, I may explain to the police officer that I am dressed peculiarly because I am going to a costume party. (3) We may explain a state of affairs by

supplying a historical narrative; for example, a biblical scholar may explain the current order of the books of the Bible by rehearsing the story of the standardization of the text through various councils. (4) We may explain an unfamiliar phenomenon by analogy to the familiar; for example, a science teacher may explain jet propulsion by analogy to a deflating balloon. (5) We may explain a complex entity (at the macro level) by reducing it to its constituent parts (at the micro level); for example, a physicist may explain the diffusion of a gas by the laws of molecular motion. (6) We may explain a device or its effects by detailing its systemic functions; for example, we may explain an internal combustion engine or the movement of an automobile by detailing the functional relationship of the parts. (7) We may explain something by showing it to be an instance of a certain type; for example, we may explain a person's behavior by saying that he is a schizophrenic.

At the ordinary, everyday, commonsense level all of these forms (and still others) function as valid, satisfactory explanations—and in fact all of them function in scientific and technical environments too, although some forms may be preferred to others. Some are mechanistic; some are teleological; and some ultimately may collapse into others. But the niceties of their differences are not important here. What is noteworthy is that these many forms of explanations are possible because *explanations are pragmatic and their appropriate form and content vary with our purposes and information*. For example, depending on context, an explanation of “why my wife's eyes are blue” might involve reference to the laws of genetic inheritance and the concept of dominant and recessive traits, an account of the pattern of eye color in her immediate family history, a description of the light-diffraction properties of her eyes, the psychoanalysis of my preference for blue eyes, or, in some brave new world, a recitation of the motives of her parents who selected certain features of her genetic endowment. These explanations all answer “why?” But the appropriate explanation depends on what I already know and what I seek to know.

Furthermore, explanations of the “same thing” may take various forms because the facts and the descriptions of phenomena on which explanations rest may vary with our purposes and categorial framework. Mary Midgley has said this well: “*What counts as a fact depends on the concepts you use, on the questions you ask*. If someone buys stamps, what is going on can be described as ‘buying stamps,’ or as the pushing of a coin across a board and the receiving of paper in return—or as a set of muscular contractions—or one of stimulus-response

reactions—or a social interaction involving role-playing—or a piece of dynamics, the mere movement of physical masses—or an economic exchange—or a piece of prudence, typical of the buyer. None of these is *the* description.”²¹

The upshot of these contentions is that the facts and phenomena of human values and religion may be variously described and they admit of an indefinite number of “correct explanations.” Should the research program of sociobiology succeed it will offer *an* explanation, not *the* explanation, of values and religion. (This is in no way to suggest that one purported explanation is as good as any other.)

Yet another relevant feature of explanation is that *all explaining has a terminus, a context of the unexplained*. For Wilson that terminus is the big bang of cosmic commencement. If one is so inclined, one can think of God as the Creator of this Event—Wilson calls this move the “final redoubt” of theology.²² Why there is something rather than nothing is unexplained and possibly inexplicable by science; and so is why *this* something rather than some other—why these scientifically disclosed patterns rather than others—should exist. Ludwig Wittgenstein put the point somewhat sarcastically in the *Tractatus*: “Thus people today stop at the laws of nature, treating them as something inviolable, just as God and Fate were treated in past ages. And in fact, both are right and wrong: though the view of the ancients is clearer insofar as they have a clear and acknowledged terminus, while the modern system tries to make it look as if *everything* were explained.”²³

Now in light of these very general observations about explanation, what can be discovered about the claim that sociobiology will explain human values and our propensities for religious belief and practice? First, we find that the “explanation” referred to is not one but several, and of different forms. We need a structural explanation of the neurobiology of the brain, particularly of the limbic system (similar to explanation form 6 above). We also need to articulate further the central principles of sociobiology, that is, the causal connections between genetics and social behavior, so as to supply the patterns in which biology and culture interact (involving forms 1, 5, and perhaps others). And we need a historical account of the evolution of our values, valuing mechanisms, and “religious propensities,” that is, we need to know the particular ancestral conditions to which these were adaptive (involving explanations of form 3). This last will tell us how we got our mysterious “hodgepodge of special genetic adaptations to an environment largely vanished.”²⁴ Now this is a huge task, but Wilson and others have laid the groundwork, and research is proceeding

apace. There is nothing wrong with such complex and mixed-form explanations, provided the explanatory components are linked up carefully, with all connections explicit so as to prevent fallacious inferences. But a danger here is in committing the so-called genetic fallacy.

The genetic fallacy is defined as the error of confusing a temporal with a logical order, or as the treatment of historical origin as though it were a logical nature (and vice versa).²⁵ It is a species of the fallacies of irrelevance. An example would be the judging of the worth of a policy by the procedure which instituted it; another would be the substitution of a history of theology for an analysis of theological discourse. It would be committing the genetic fallacy therefore to confuse the history of the acquisition of a trait, propensity, or capability with the normative status of that trait, propensity, or capability or its logical relationship to other traits, etc. So if we learn about the conditions under which an impulse to altruistic behavior toward kin is acquired, we cannot make inferences therefrom about the logical and normative status of that impulse. Sociobiologists might concur and restrain such inferences; or they might claim that the genetic fallacy is not a fallacy at all when understanding human behavior—indeed that is the point of sociobiology. Coincidentally there does seem to be some question among philosophers about the status of the genetic fallacy.²⁶ Surely the important thing, however, is to define the explanatory framework clearly and to confine the inferences to be drawn to that framework. And there's the rub, I think. Because he has not always done this, Wilson has been led astray twice in anticipating the effects of his sought-for sociobiological explanation.

The first instance concerns the anticipated effects of the explanation of religion; this instance is an aberration and probably a lapse. Wilson's clearly dominant position is that religion is deeply embedded in human nature and should not flee the advance of science: "The predisposition to religious belief is the most complex and powerful force in the human mind and in all probability an ineradicable part of human nature."²⁷ Further, religious rituals "will certainly continue to be practiced long after their etiology has been disclosed."²⁸ The confusion and error occur when he says: "If religion, including the dogmatic secular ideologies, can be systematically analyzed and explained as a product of the brain's evolution, its power as an external source of morality will be gone forever. . . ."²⁹ Surely that is false. Such a result would require massive illogic. Consider the following parodying substitutions: If *science*, including the field of *sociobiology*, can be systematically analyzed and explained as a product of the brain's evolution, its power as an external source of truth and understanding of

human nature will be gone forever. Neither Wilson nor I believe that. Whether an explanation of ϕ will debunk or dismiss ϕ depends in part on the content of that explanation—which we do not now have in the case at hand—as well as on the relevance of the explanatory framework and form. Learning that blue eyes are produced by the lack of a specific pigmentation need not diminish my aesthetic appreciation of them. To put it simply, *to explain is not to explain away*.³⁰

The second instance concerns the anticipated effects of the explanation for ethics and social policy, most specifically for Wilson's second dilemma of determining which genetic properties to amplify and which to restrain. Here too I think Wilson sees rightly but sometimes strays out of bounds. Quite often he writes as though he believes that a sociobiological explanation of our valuing mechanisms will provide us with an ethic, perhaps even with a fairly comprehensive social policy. He speaks in *Sociobiology* of establishing "a genetically accurate and completely fair code of ethics."³¹ In *On Human Nature* he conceives of morality as having "no other demonstrable function" than keeping the human genetic material intact and asserts that "empirical knowledge of our biological nature will allow us to make optimum choices among the competing criteria of progress."³² On a neutral reading this is a fallacious inference of normative (moral) implications from evolutionary facts. It commits the naturalistic fallacy (discussed here and in the September 1980 *Zygon* by Davis, Philip Hefner, J. W. Bowker, and others) of inferring moral, value-laden conclusions from factual premises. Descriptions do not imply decisions. On the other hand, it is folly to sever our prescriptions for human action from our deepest insights into human nature. The facts constrain and inform; they filter our ethical proposals and ground our choices. But a full description of the genetic roots of human behavior will not, even by a process of elimination, prescribe an ethic or a social scheme. On Wilson's manual-override model we may choose, in full knowledge of the costs and risks, to buck or restrain our genetic propensities. A charitable reading of most passages of *On Human Nature* yields the conclusion that Wilson knows all this and agrees. At one especially lucid moment he says: "As the knowledge of human nature grows, and we start to elect a system of values on a more objective basis, and our minds at last align with our hearts, the set of evolutionary trajectories will narrow. . . . As the social sciences mature into predictive disciplines, the permissible trajectories will not only diminish in number but our descendants will be able to sight farther along them."³³

Throughout this discussion of the logic and effects of explanation I have used the terms "categorical framework" and "explanatory

framework" without announcing a precise meaning. Moving in that general direction will ultimately help us touch bottom, I think. Although my comments will necessarily be loose and suggestive rather than definitive. A person can take any one of an array of points of view in approaching the world—the scientific, the aesthetic, the economic, the philosophical, the historical, etc. These open us to ways of knowing or modes of experience or, in Philip Phenix's lovely phrase, "realms of meaning." Each is a human enterprise serving human purposes. Each has distinctive methods, and each erects paradigms to shape its insights and to serve as explanatory frameworks. Each has its integrity and may characterize a common referent differently from all others.

Science is a beautiful and powerful communal endeavor for mapping the natural world; it produces a continually refined and splendidly detailed map designed for explaining casual relationships and predicting events. Of course this scientific map is not the world itself, and many other maps of the same terrain may be drawn for different purposes. So to be nonscientific is not to be unscientific. We may employ one way of knowing to study another. For example, we may seek an evolutionary account of our propensity to philosophize ("Is philosophizing really biologically adaptive?"), or, to reverse the polarity, we may scrutinize the epistemology of evolutionary biology. But in this rapprochement *there is no absolutely privileged perspective*. When Wilson says that the scientific ethos is superior to religion because of "its repeated triumphs in explaining and controlling the physical world" and because it is ready "to examine all subject sacred and profane," he asserts a privileged position for the scientific perspective.³⁴ Does religion aim to explain and control the physical world? Does science deal with the sacred as sacred? At this juncture—finally—the onus shifts to religion.

Throughout this conference we have regularly spoken of comparing science and religion. The proper comparison is science and theology (or perhaps religious studies). Religion, which includes rituals and rules of conduct and defined social roles, could be compared properly to science only if we added to the latter technology and the social structures involved in its pursuit. Our confusion has let us dwell on religion as a manifestation of biology/culture and slip away from theology as a search for religious understanding. How is theology to be characterized as a realm of meaning? We are owed answers to basic questions that at present must be left rhetorical: Is theology a cognitive activity, making true/false claims about phenomena? What are its procedures of verification? Or is theology an expressive and emotive activity, not directed at mapping and predicting?

Some scientists are blithely unaware of recent developments (advances?) in theology, such as evolutionary theism and process theology. When informed, they seem suspicious, as though the new theology is not religious at all and lacks content—just elaborate metaphors for sturdy scientific facts, overlaid like so many doilies. The old idea persists that theology and science offer competitive maps of the world and that theology has employed unreliable methods of cartography. If we are to get beyond this impasse, we need more discourse on theological method and a judicious and compelling statement of the aims and bounds of the religious realm of meaning.

CODA

David Hume wrote: “Here then is the only expedient, from which we can hope for success in our philosophical researches, to leave the tedious lingring method, which we have hitherto followed, and instead of taking now and then a castle or village on the frontier, to march up directly to the capitol or center of these sciences, to human nature itself; which being once masters of, we may everywhere else hope for an easy victory.”³⁵ It is in that spirit that Wilson has articulated his hope for a society which is informed in its decisions by a profound understanding of human nature, the genetic residue of its evolutionary history. This is a hope I share.

Where have the issues been joined? The crucial and enormously complex scientific issue is the proper modeling of the interaction between biological and cultural evolution. For religion the major pending issue is the elucidation of theological method and the status and function of assertions in religious discourse. But most of the sources of controversy have, I say unabashedly, been philosophical. I find this a predictable occurrence. Wilson has said that culture will accumulate around the nodes of epigenetic force. I might say that philosophical problems will accumulate around the nodes of interdisciplinary conflict. Finding fertile philosophical fields, I have in this discussion traversed sociobiology as a Kuhnian paradigm, the definition of materialism and the adequacy of materialist conceptions of consciousness, reductionism and emergentism, determinism and two models of free will, forms and features of explanation, the genetic fallacy, effects of an explanation of values and religion, the relation of facts and values, alternative ways of knowing and their relationship, and the status of theology as a search for understanding.

ZYGON

NOTES

1. Edward O. Wilson, *On Human Nature* (Cambridge, Mass.: Harvard University Press, 1978) and *Sociobiology: The New Synthesis* (Cambridge, Mass.: Harvard University Press, 1975).
2. Thomas S. Kuhn, *The Structure of Scientific Revolutions*, 2d ed. (Chicago: University of Chicago Press, 1970), p. 10. The account of "normal science" that follows is drawn from chap. 3.
3. Wilson, *On Human Nature*, p. 201.
4. *Ibid.*, p. 221.
5. *Ibid.*, p. 4. Curiously Wilson asserts that this has occurred "not so much by humiliating disproofs of their mythologies as by the growing awareness that beliefs are really enabling mechanisms for survival." If this were the case, would this realization not have the same eroding effect on our scientific beliefs?.
6. *Ibid.*, p. 13. This seems to be a prudent retreat from earlier comments (in *Sociobiology*) about one discipline "cannibalizing" another.
7. Lucretius *De Rerum Natura* 3.228-34, 273-75. The translation is mine, and I have inserted the bracketed material.
8. Wilson, *On Human Nature*, pp. 76-77. I am aware that there is dangerously loose talk in both Wilson's discussion and mine confusing such concepts as mind, soul, will, consciousness, and intentionality. Wilson has been sketching a general picture, and it is that which I have sought to characterize. For a more technical context a neater vocabulary is required.
9. Wilson recognizes this when he affirms: "The cardinal mystery of neurobiology is not self-love or dreams of immortality but intentionality" (*ibid.*, p. 75).
10. *Ibid.*, p. 195.
11. *Ibid.*, p. 201.
12. *Ibid.*, p. 215.
13. This formulation is reconstructed from Wilson's remarks, *ibid.*, pp. 77-78.
14. *Ibid.*, p. 73.
15. Epicurus, struggling with the atomistic determinism of Democritus, tried to make room for free will with the ad-hoc assumption that atoms would randomly "swerve." This famous doctrine of *parenklisis* has the same difficulty of trying to ground free will and moral responsibility in the randomness or unpredictability of matter.
16. The first two dilemmas are proposed in the first chapter (*On Human Nature*, pp. 2 and 6) and recur thematically thereafter; the third dilemma is developed only in the final pages (*ibid.*, p. 208) and is quickly bequeathed to posterity.
17. *Ibid.*, p. 6.
18. *Ibid.*, p. 208.
19. Wilson seems to understand and accept this schizophrenia fully, although he gives no explanation of how or why he can have such acceptance, for he says: "And at the center of the second dilemma is found a circularity: we are forced to choose among the elements of human nature by reference to value systems which these same elements created in an evolutionary age now long vanished. Fortunately, this circularity of the human predicament is not so tight that it cannot be broken through an exercise of human will" (*ibid.*, p. 196). Exactly how the will can do this is not at all clear. Incidentally William James used this point about dilemmas subtly and ironically when he titled a famous paper "The Dilemma of Determinism."
20. There is a vast philosophical literature on explanation. Important discussions may be found in various works by Carl Hempel, William Dray, Patrick Gardiner, Ernest Nagel, Patrick Suppes, and Israel Scheffler.
21. Mary Midgley, *Beast and Man: The Roots of Human Nature* (Ithaca, N.Y.: Cornell University Press, 1978), pp. 5-6. This book has a rich discussion of Wilson's *Sociobiology*, covering some of the same issues raised in this paper.
22. Wilson, *On Human Nature*, p. 191.
23. Ludwig Wittgenstein *Tractatus Logico-Philosophicus* 6.732.

24. Wilson, *On Human Nature*, p. 196.

25. A classic discussion of the genetic fallacy may be found in Morris Cohen and Ernest Nagel, *An Introduction to Logic and Scientific Method* (New York: Harcourt, Brace & Co. 1934), pp. 388-90.

26. Two examples come to mind. John Rawls, in his remarkable *A Theory of Justice* (Cambridge, Mass.: Harvard University Press, 1971), develops a procedural theory of justice in which the validity and legitimacy of basic principles of justice are derived from the way in which they are chosen. From one angle this seems to be an instance of judging the moral worth of a proposal on the basis of the procedure which instituted it. Stephen Toulmin in *Human Understanding*, vol. 1 (Princeton, N.J.: Princeton University Press, 1972), wrote: "... a comprehensive account of conceptual development must not merely consider concepts in the abstract, and in isolation from the men who conceive and use them, but also relate the history of ideas to the history of people, so placing the development of our conceptual traditions within the evolution of the activities by which those traditions are carried. At the time Kuhn first wrote, most philosophers of science were excessively wary of the genetic and psychologistic fallacies" (p. 116).

27. Wilson, *On Human Nature*, p. 169.

28. *Ibid.*, p. 205.

29. *Ibid.*, p. 201.

30. Perhaps Wilson had in mind something closer to an aesthetic argument: Producing a sociobiological understanding of religion would "spoil the charm" of our current religious mythologies and rituals. I think, in the end, Wilson's attitude toward religion is very similar to Plato's attitude toward art. Both men are in awe of the power and motivational force of these dimensions of human life, and for that very reason they find them dangerous and debilitating when not directed at the truth. Both propose to harness these forces in service to the truth—Wilson wants to make cosmic evolution the new myth. It is puzzling, though, that Wilson does not transfer his worry about religion to art; nor does he believe that a scientific explanation of our artistic creativity will "explain away" the arts and deprive us of aesthetic motivations. He says: "I... do not envision scientific generalization as a substitute for art or as anything more than a nourishing symbiont of art... Science can hope to explain artists, and artistic genius, and even art, and it will increasingly use art to investigate human behavior, but it is not designed to transmit experience on a personal level or to reconstitute the full richness of the experience from the laws and principles which are its first concern by definition" (*On Human Nature*, p. 206). Here he seems to recognize the integrity of the aesthetic "realm of meaning" that I discuss later.

31. Wilson, *Sociobiology*, p. 575.

32. Wilson, *On Human Nature*, pp. 167, 7.

33. *Ibid.*, p. 208.

34. *Ibid.*, p. 201.

35. David Hume, *A Treatise of Human Nature*, introduction.