SINGER, SOCIOBIOLOGY, AND VALUES: PURE REASON VERSUS EMPIRICAL REASON

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Abstract. E. O. Wilson argues that we must use scientifically based reason to solve the values dilemma created by the loss of a transcendent foundation for values. Peter Singer allows that sociobiology can help us understand the evolutionary origin of ethics, but denies the claim that sociobiology or any science can furnish us with ultimate ethical principles. We argue that Singer's critique of Wilson's attempt to bridge the gap between fact and value using empirical reason is unconvincing and that Singer's own ethical principle of disinterestedness requires major support from empirical reason and is not sustainable by pure reason alone.

To put it mildly, sociobiology has not been greeted with open arms (Caplan 1978; Leeds and Dusek 1981, 1982; Ruse 1979). Scientific and philosophical critics view it as pseudoscience and unconfirmable/unfalsifiable speculation. Social and political adversaries find in it the ideologies of social Darwinism, racism and sexism. Moral philosophers criticize as fatally flawed its attempts to build the edifice of ethics on biological foundations.

In this paper we address this latter critique of sociobiology by the moral philosophers. In particular, we shall examine Peter Singer's recent, very sympathetic and perceptive examination of Edward O. Wilson's attempts to link biology and ethics (Singer 1981). Singer, unlike most philosophers who have addressed themselves to the issue, finds much of positive value in sociobiology for the moral philosopher (Ruse 1979, 74-101, 194-214; Alper 1981; Flanagan 1982). Nevertheless, he firmly rejects Wilson's contention that sociobiology can furnish us with ultimate ethical principles. As a result Singer concludes that Wilson's position reduces to an ethical subjectivism, and this emotivist stance of ethical subjectivism is unsatisfactory. Singer thus offers a positive al-

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[*Zygon*, vol. 19, no. 2 (June 1984).]
 ISSN 0044-5614

ternative account of the foundations of ethics based on a principle of disinterestedness established by pure reason.

We shall contend that Singer's critique of Wilson's sociobiological account of ethical foundations is not convincing and that his charge of ethical subjectivism also fails because it rests both on an inadequate critique of Wilson's ethical naturalism and on a neglect of Wilson's stress on the role of empirical knowledge in ethical considerations. Thus, we contend that the real issue between Wilson and Singer is not, as Singer believes, between the advocates of emotion and those of reason but between the advocates of empirical reason and those of pure reason as the source for foundational ethical principles. When looked at in these terms, it then seems to us that the advocates of empirical reason, of which Wilson is one, have the upper hand.

First, we shall discuss Singer's views on the positive contribution that sociobiology makes to ethics. Second, we shall examine his critique of Wilson's attempt to give a sociobiological foundation to values and his charge that Wilson's ethical views reduce to ethical subjectivism. This will lead us to examine Singer's own positive account of ethical foundations in terms of pure reason and to consider the relative adequacy of pure and empirical reason as sources for foundational ethical principles.

Contributions of Sociobiology to Ethics

Singer maintains that sociobiology makes a major contribution to our understanding of the evolutionary origins and causes of ethics (Singer 1981, 23-86, 125-47). It does so by accounting for the evolutionary bases of altruism. Sociobiologists claim that the solution to the problem of altruism is their major theoretical success. By viewing the genotype as the unit of selection, rather than the individual or the species, sociobiologists can explain the evolution and maintenance of behavior which benefits kin and nonrelated conspecifics at a cost to the altruist. Thus, they can explain the selection for altruistic behavior as opposed to purely selfish behavior. The presence and maintenance of such altruistic behavior explains, in Singer's view, the origin of ethical behavior. With the gradual development of the use of reason in a social context to justify one's actions to other members of the group to which one belongs, the innately based altruistic behaviors come to be ethical behaviors in the full sense of that term, namely, actions based on ethical principles.

In addition to providing a causal explanation of the origin and persistence of ethics as altruistic behavior, sociobiology, as well as other scientific and factual knowledge, can supply important information both about the best means for attaining the ethical values we have

chosen and about the consequences of pursuing such values (Singer 1981, 63-68). Moreover, it can lay open the biological bases of certain ethical principles or intuitions that we have hitherto taken as self-evident (Singer 1981, 68-72); and it can force us to revise out notions of what is natural or unnatural. Thus, it can play a debunking role requiring us to revise our judgments about the bases of our assessments of ethical principles and practices.

Finally, sociobiology teaches us that we are animals whose behaviors are to some extent shaped by our genes and who act on inclinations and emotions that are in part genetically determined and influence us to favor self, children, relations, and neighbors over strangers and foreigners. If this is right, and Singer believes it is, then any ethics, including one built on pure reason, as is Singer's, must in his view take these facts into account. It must close the circle of ethical practice (Singer 1981, 148-67). As a result pure reason's goal of disinterested consideration of all persons can be realistically achieved only if these genetically determined aspects of our behavior are recognized. A society therefore must have moral rules and maxims based on these aspects of our behavior to supplement pure reason's ethical principle of disinterestedness. Thus, Singer is convinced that sociobiology can make a positive contribution to ethics.

Singer's Critique of a Sociobiological Foundation of Values

However, Singer rejects Wilson's contention that sociobiology can make a much more fundamental contribution to ethics. Wilson has argued that sociobiology can discover and account for the cardinal values which we need to justify our ethical actions (Wilson 1978, 195-212). Wilson has suggested that these values are, first, the maintenance and preservation of the human gene pool; second, the maintenance of the diversity of the human gene pool; and third, universal human rights. These cardinal values support various secondary values which themselves provide a link to more concrete ethical norms and practices.

Not surprisingly, Singer finds Wilson's contention fundamentally flawed since, in his view, it falls prey to the naturalistic fallacy. Singer contends that there are several aspects of values which make it clear that they are fundamentally different than facts and thus that anyone who attempts to define the former in terms of the latter is committing the naturalist fallacy (Singer 1981, 72-83). We can summarize these distinguishing aspects of values in terms of their role as motivators, norms, and objects of choice. Thus, Singer argues that an examination of the role of facts in ethical decision making, in particular such biologically based facts as those which form the basis of Wilson's alleged cardinal values, reveals that facts by their nature do not motivate,

provide norms, or allow for choice. Rather they help describe and explain situations and are discovered rather than chosen. So, for instance, we are not moved to make the preservation and maintenance of the common human gene pool an object of our actions unless we already value it. Nor can it play any prescriptive or justificatory role by itself. And even if it could be established that our genetically determined actions directly or indirectly aim for the maintenance and preservation of the common human gene pool, we can choose to ignore such a goal and value something else. Singer believes that these differences between values and biological facts can be summed up in the ineliminable distinction between participant and observer standpoints. The former preserves a necessary role for choice based on reasons which motivate, prescribe, and justify those choices. The latter eliminates choice and predicts and explains a behavior on the basis of an analysis of the causal factors bringing about the behavior.

Granting the soundness of this critique of Wilson's attempt to provide a sociobiological basis for value theory, Singer believes that Wilson is left with nothing but ethical subjectivism and relativism as an ethical position (Singer 1981, 84-86).[1] Thus, in Singer's view, the issue between himself and Wilson becomes one of the relative merits of emotion as a foundation of values, the position to which he believes Wilson's reduces, and reason, Singer's own position. And when formulated this way Singer believes that the advocates of reason have the superior position. But before we move on to Singer's own positive account in terms of pure reason we need to evaluate the adequacy of his critique of Wilson.

The Adequacy of Singer's Critique

We believe that Singer is correct in interpreting Wilson as attempting to bridge the gap between fact and value. But unlike Singer we maintain that the gap is bridgeable. We do not intend here to meet the entire panoply of arguments directed against attempts to bridge the gap between fact and value, nor do we intend a full scale defense of a naturalistic ethic (Edel 1980). Rather our aim is to show that the prima facie persuasive arguments offered by Singer against a Wilsonian version of a biologically based naturalistic ethic are not convincing.

Perhaps the best place to start is with the normative role of values both in prescribing certain actions and justifying them. Values in this sense operate as reasons for certain actions rather than others, and they are typically contrasted with causes of action. We believe that in the context of Singer's attempt to distinguish values from biological features of human activity the distinction cannot be maintained. According to this distinction causal explanation ideally provides necessary

and/or sufficient antecedent conditions for the occurrence of an event or behavior. On the other hand, reasons that prescribe or justify actions are analyzed in terms of the goals or ends for which an agent acts. Thus, the distinction is sometimes put in terms of the difference between causal and teleological explanation. But looked at in this fashion there is no convincing reason why a scientific account of actions is prohibited. Scientific psychological explanations of human action, for example, those of current cognitive behavioral theories, are in terms of the goals of agents.[2] Such scientific explanations are clearly teleological (Rottschaefer 1982a, 1982b). Moreover, even purely behavioral psychological accounts of actions in terms of reinforcers and punishers are explanations by means of the consequences of behavior, not antecedents (Ringen 1976). They are teleonomic, to use Ernst Mayr's term, as are functional and evolutionary biological explanations (Mayr 1974, 91-117).

In such psychological and biological accounts of human action, teleological descriptions and explanations identify human capacities and potentialities and those objective end states of their functioning which directly or indirectly promote or detract from the well functioning of the human organism individually and socially. Such accounts necessarily involve persons, things, and situations fulfilling or not fulfilling these capacities and potentialities. These latter then are objective values or disvalues scientifically identified and specified. It seems then that neither psychology nor biology is precluded from playing a normative role, both prescriptive and justificatory, in human action. They are, among other things, sciences of values (Skinner 1971, 96-120; Sperry 1983, 62-76).

But such an understanding of these sciences also enables us to see how the fulfilling end states they identify also function to motivate human action. For as such they are the objects of human needs biologically specified and human desires psychologically specified. Of course, the motivations and values discovered by these sciences need not be distinct from those we already know about by our concrete ethical experience of the good, such as physical health, psychological well-being, community, and satisfying work. Nor are such scientific accounts sufficient for determining a particular ethical choice since the latter always requires concrete ethical experience. What these sciences help us to do is to explain why values are valuable and why they do motivate us to the extent that they do. Finally, such accounts do not necessarily eliminate the role of choice. In fact, Wilson himself denies genetic determinism and has argued for freedom (Wilson 1978, 71-78; Rottschaefer 1983, 63-67).

Thus, Singer's distinction between observer and participant perspectives collapses. He upholds such an ineliminable distinction for two

reasons: one correct, that human ethical action demands choice, and the other incorrect, that scientific accounts of human action necessarily eliminate choice. Of course, we can continue to make a distinction between observer and participant, but it does not, if our analysis is correct, preclude the scientific observer of human action from allowing for choice as a factor in human action, nor does it prevent the participant from including scientifically based accounts of the reasons for his choices.

Thus, we believe that Singer has failed to establish that there is an unbridgeable gap between fact and value. Moreover, the positive role of science, what we shall call empirical reason, in the identification and explanation of values suggests that Singer's account of the issue between himself and Wilson needs to be reformulated. Singer has contended that given the validity of his critique of Wilson's efforts to give an evolutionary basis for ethics, Wilson is left with the unsatisfactory alternative of ethical subjectivism. For if an evolutionary account of the genetic constraints on our behavior cannot provide any reasons for making the value decisions that we do, then all it can do is to explain the genetically based emotive causes of our behaviors. Singer views such an ethical subjectivism as an unsatisfactory position that must be replaced by one that provides a role for reason in the ethical enterprise. Reason must have a part in the founding of ethics, if ethical subjectivism is to be avoided. But if our critique of Singer is correct, it suggests that the issue between Singer and Wilson is not between the proponents of reason and those of emotion in the founding of ethics, but between the adherents of pure reason and those of empirical reason.

That this is a correct characterization of the issue is supported by the fact that Singer has misunderstood Wilson's position in several significant ways. These misunderstandings have led him to overlook the stress that Wilson puts on empirical reason in ethical considerations. First, Singer claims that "Wilson assumes without argument that reason has no significant part to play in ethics" (Singer 1981, 86). But this overlooks the entire thrust of *On Human Nature* which is to use scientifically based reason to solve the values dilemma created by the loss of a transcendent foundation for values. Singer must either assume that the scientific enterprise is not an enterprise of reason or assume that only pure reason can be relevant to ethical concerns. But the former assumption is hardly tenable and the latter we shall soon show has some major difficulties of its own. Second, Singer believes that "Wilson is closer to Hume's view that it [the ambivalence in human nature] is due to a conflict between self-interested desires and desires like sympathy and benevolence with reason standing on the sides powerless to intervene" (Singer 1981, 146). As a result, Singer interprets Wilson to be

saying that reason is and ought to be a slave of the *genes* (Singer 1981, 126). What this overlooks is Wilson's constant appeal to "knowledge as the great emancipator" and his argument that our genetically based cognitive capacities have put us into a position where we can choose between our various genetically based tendencies, for example, selfishness versus altruism. Reason has given us freedom.

Finally, Singer claims that Wilson would "dismiss as philosophical fantasy the idea that reason draws us toward a universal point of view" (Singer 1981, 126); and he implicitly asserts that sociobiologists are saying that, since the welfare of the species as a whole does not make evolutionary sense, we ought not to pursue such a goal (Singer 1981, 130). Both of these contentions fail to take note of the object of Wilson's three cardinal values all of which take a universal point of view, at least with regard to humans (Wilson 1978, 195-212).[3] Moreover, these cardinal values are in Wilson's view discovered by empirical reason, the capacity for which was selected in humans during our evolutionary history because of its adaptive value. On the other hand, Singer's imperative for universal concern can derive only from pure reason's tending toward consistency, which Singer believes is an evolutionary epiphenomenon of the ability to reason in general.[4] Wilson indeed may dismiss as philosophical fantasy that pure reason could lead us toward a universal point of view or indeed get us very far with any ethical pursuit. But this dismissal of pure reason is not the dismissal of reason as such.

Thus, it seems to us that the real issue between Wilson and Singer concerns the relative merits of empirical and pure reason in the founding of ethics. Let us now turn to Singer's own positive account in terms of pure reason.

Pure Reason and Empirical Reason as Foundations for Ethics

According to Singer pure reason provides a basis for value theory in the following way (Singer 1981, 87-124). If we start with the notion that ethics has to do with settling a dispute among members of a cohesive group of reasoning beings about what to do, Singer believes we can see that what will settle such a dispute is a principle of disinterestedness or of equal consideration of the interests of all. For a reason to gain the assent of the group it must ultimately be acceptable to all. Thus, it must include the interests of all and not merely those of its proponent. Values ought to be chosen and actions pursued which satisfy most interests in proportion to the relative strengths of the various interests. Although we need not go into the details of Singer's argument, we should note that he contends that this principle is not only a rational

one but the only rational one usable for founding value theory in a nonarbitrary way. It is the only usable rational foundation for value theory because other rational theories—egoism, Kantianism, and theories of justice and human rights—all either are reducible to the principle of disinterestedness or involve the implausible notion of objective values (Singer 1981, 102-11). It is rational in the basic sense that reason demands consistency and thus the equal consideration of all relevant preferences. In addition, the principle is rational because it has moved beyond the constraints of the emotions. Thus it takes into account not only the interests of children, relatives, friends, and fellow citizens but also those of strangers, members of different races, and foreigners (Singer 1981, 111-19). Indeed, Singer argues that the circle of disinterested reason should extend to all beings with interests, thus to all sentient organisms (Singer 1981, 119-21). This principle, the product of pure reason, relies in Singer's view on "nothing but the fact that we have interests, and the fact that we are rational enough to take a broader point of view from which our own interests are no more important than the interests of others" (Singer 1981, 111).

If we grant to Singer that there is a naturalistic fallacy, it is not at all clear that Singer's use of pure reason avoids committing this fallacy. For as we have seen he attempts to found his basic ethical principle of disinterestedness on the *fact* that we have interests and the *fact* that we are rational enough to take a broader point of view from which we consider our own interest no more important than those of others. Granting that such facts do lead us to infer the principle of disinterestedness, Singer does not explain how such an inference would avoid the naturalistic fallacy. On the other hand, Singer does not explain why these facts should lead us to value the interests of others equally with our own. The facts do not seem to demand disinterestedness. We could presumably choose to prefer our own interests to those of others.

One option Singer has is to confine the naturalistic fallacy to the use of empirical reason in moving from empirical facts to values. He might then argue that his principle of disinterestedness is derived by pure reason from an analysis of the concepts of reason and interest. Such an interpretation of Singer's position has some plausibility to it for several reasons only suggested but never fully developed by him. First, the fundamental aim of reason as conceived by Singer seems to be consistency rather than, for instance, empirical accuracy. Second, Singer introduces his account of reason by means of an analogy with the development of mathematics. Thus, we can give an evolutionary account of the adaptive advantages of counting, for instance, but not of mathematics. Mathematics, in Singer's view, represents a development of reason that serves no direct adaptive function. It is a development of reason that comes to be exercised for its own sake. So, too, Singer

believes that the pursuit of pure reason's goal of consistency when applied to a consideration of interests represents the use of an adaptation for its own sake. Analogously, we developed the automobile for practical transportation purposes, but we now sometimes find ourselves using it just for travel's sake. So reason leads our evolutionarily based altruistic tendencies to help our children and relatives to a set of wider concerns for strangers, foreigners, members of other races, and all sentient organisms.

Granting for the sake of argument that the naturalistic fallacy pertains only to the use of empirical reason in moving from facts to values, nevertheless it is not clear that pure reason as conceived by Singer is adequate for establishing Singer's principle of disinterestedness. For pure reason, it would seem, could be satisfied with consistency within any given circumference of the ethical circle. Why on the basis of consistency alone does one include all sentient organisms in the ethical circle and not merely white Anglo-Saxon males? Singer might reply that reason as such looks for universal consistency. Thus, it pushes beyond the boundaries set by the genes toward the limits of the ethical circle to embrace all organisms with interests. While this seems like a plausible reply, it does not really answer the difficulty. For as a principle of consistency pure reason is without content. Without some notion of interest and relevant interest reason cannot apply its principle of consistency. However, it is not at all obvious to us how pure reason will be able to supply any relevant content about interests for ethical decision making. The fact that we have interests, the nature of these interests, and their relative weighting seem to be objects of empirical discovery and investigation. Further, it does not seem that a conceptual analysis of reason and interest using pure reason will be sufficient for establishing the principle of disinterestedness. Such a conceptual analysis involves at least a minimal amount of empirical input, unless we postulate what seems to us an implausible a priori account of the origin of conceptual content. However, such a minimal empirical basis for conceptual analysis suffers either from the limitations of an individual thinkers' capacities or, if broadened, from the limitations of the intersubjective commonsense framework. What is needed to overcome these limitations is a scientific description and account of interest. But this moves us very close to a scientifically based value theory founded on empirical reason similar to the one suggested by Wilson.

Thus, it seems to us either that Singer himself commits the naturalistic fallacy or that the requirements of his own basic ethical principle of disinterestedness demand a place for empirical reason in its foundation.

Moreover, there are other parts of Singer's account of reason's role in the expansion of the ethical circle which suggest that ethical reason is

empirical. Thus, Singer constructs an empirical argument for the expansiveness of reason's ethical concern. He contends that there is a variety of "historical and cross-cultural evidence for an association of reasoning and the expansion of the circle of morality" (Singer 1981, 137). This claim may be interpreted narrowly as an empirical claim for only the correlation of reasoning with the widening of ethical concern. On this reading empirical evidence is used to support a claim about the temporal and spatial spread of the principle of disinterestedness. But the principle's foundation would be pure reason. However, what such a generalization more plausibly suggests is that as people learn to use their rational capacities they discover more about what constitutes the basis for ethical concern or interests, to keep with Singer's view, and about who possesses such interests. Both the identification of those who have interests and a knowledge of the nature of interests require empirical input. On this reading the ethical principle itself has an empirical foundation.

In addition, Singer believes that the limits of the ethical circle ought to be extended to include all creatures capable of having interests. This would include all sentient organisms, organisms capable of pleasure and pain, but not plants and inanimate objects (Singer 1981, 120-24). Singer contends that, although the interests of mouse and human, for instance, are not equal in all respects, our ethical considerations are lacking if they fail to consider the relevant interests of both of these sentient organisms. It seems to us that such an extension of the ethical circle demands the use of empirical reason not merely in the determination of which organisms do and do not have sentience but in the identification of interest with sentience and in an explanation of the relevance of sentience and interest to what is valuable.

Thus, there is a further contrast between Singer's reason-based ethics and that of Wilson's, whether or not the former is pure or mixed with some experiential/empirical component. If Singer takes pleasure and pain as ethical primitives, then no further explanation of their ethical relevance is possible. On the other hand, within the Wilsonian perspective, pleasure and pain are not primitives. Their ethical role can be understood as evolutionarily based cues about behaviors which make for the well-being of an organism and its reproductive fitness. That is to say, pleasure and pain, and more generally feelings and emotions, serve as more or less reliable indications of the presence or absence of objectively valuable things or states of affairs. Consequently, from the perspective of an evolutionarily based ethics, Singer has taken as primitive what are only derivative values. This is not, of course, a decisive objection to Singer's position nor a decisive argument for a Wilsonian type position. But it does show that a naturalistic ethic based

on an evolutionary perspective has a theoretical advantage because of the connections it can make with other areas of knowledge and because it can explain what Singer must, if our interpretation of him is correct, take as a primitive. We are not of course claiming that an evolutionarily based naturalistic ethical theory has no ethical primitive. It surely does. And it seems to be something like human species well functioning. Although we cannot argue it here, we contend that human species well functioning as an experientially based primitive captures more of human ethical experience than Singer's hedonistic primitive, and as a theoretical construct it is capable of much finer grained articulation and thus has more explanatory potential than the concept of interest.

Finally, Singer is quite explicit that the principle of disinterestedness is insufficient to motivate ethical action. We should recall that the ability to motivate is one of the features of values which distinguish them from facts. Thus, Singer claims that by itself his principle is an "ethic for saints" (Singer 1981, 159) and that alone it is so abstract that "it does not exist as a moral law commanding particular action" (Singer 1981, 106). Singer believes that the principle needs to be supplemented by moral rules and maxims based on our ethical experience and biologically based altruistic tendencies. Moreover, these biologically based tendencies need to be shaped by culturally devised plans to foster ethical practices that approximate the requirements of disinterestedness. So we believe there are indications in Singer's own argument that empirical reason must play a role in the expansion of the ethical circle.

In conclusion, we believe that Singer has given a very lucid and insightful account of the evolutionary origins of ethics. However, we have argued that Singer's critique of Wilson's sociobiological account of ethical foundations is not convincing and have suggested that there are positive reasons for maintaining such a naturalistic account. On this basis, and what we believe to be important misunderstandings of Wilson on the part of Singer, we contend that the latter's charge that Wilson's account reduces to an ethical subjectivism founded on emotions is inaccurate. The issue between Wilson and Singer is between the relative merits of empirical and pure reason in the founding of ethics. So formulated we believe that empirical reason proves superior even in Singer's own account of the principle of disinterestedness. These conclusions suggest to us that the merits of a naturalistic ethics employing empirical reason and based on the findings of biology and psychology about human capacities deserves further exploration.[5]

NOTES

1. The charge of ethical subjectivism and emotivism may have fitted Wilson's earlier tentative excursion into ethics in the last chapter of his classic *Sociobiology: The New Synthesis* (1975), but not his views in *On Human Nature* (1978).

2. For a brief account of the current cognitive behavioral theories see Mahoney and Arnkoff (1978) and for more extended discussion see Wilson and Franks, eds. (1982).

3. Thus Wilson's naturalistic ethic is not evolutionary in the usual sense that the entire evolutionary process forms the foundation for ethical principles. It thereby avoids some of what are usually considered decisive objections against an evolutionarily based naturalistic ethic. For example, on an evolutionary basis, why favor humans over bacteria? On the other hand, this initially important relativization of evolutionary ethics to the human species must, we believe, eventually address the issues of the rights of nonhuman living things and nonliving things. This is, of course, a challenge to all ethical theories and one that Singer, much to his credit, has attempted to meet. But even on this score we believe, although we cannot argue it here, that empirical reason and a naturalistic account of capacities will prove more satisfactory than Singer's approach.

4. In Singer's view pure reason is evolutionarily epiphenominal because it does not directly serve an adaptive function. It survives because of the other important adaptive functions reason has. Confer below.

5. For a recent, different but also positive response to the possibilities for ethical theory in sociobiology see Murphy (1982). Also see Edel (1980).

REFERENCES

Alper, Joseph S. 1981. "Facts, Values and Biology." *Philosophical Forum* 13:85-108.

Caplan, Arthur L., ed. 1978. *The Sociobiology Debate: Readings on the Ethical and Scientific Issues Concerning Sociobiology*. New York: Harper & Row.

Edel, Abraham. 1980. *Exploring Fact and Value: Science, Ideology and Values*, vol. 2. New Brunswick, N.J.: Transaction Books.

Flanagan, Owen J., Jr. 1982. "Is Morality Epiphenominal?: The Failure of the Sociobiological Reduction of Ethics." *Philosophical Forum* 13:207-25.

Leeds, Anthony, and Valentine Dusek, eds. 1981-82. "Sociobiology: The Debate Evolves." *Philosophical Forum* 13 (nos. 2-3).

Mahoney, Michael J., and Diane Arnkoff. 1978. "Cognitive and Self Control Therapies." In *Handbook of Psychotherapy and Behavioral Change: An Empirical Analysis*, ed. Sol. L. Garfield and Allen E. Bergen, 689-722. 2d ed. New York: John Wiley & Sons.

Mayr, Ernst. 1974. "Teleological and Telenomic: A New Analysis." In *Boston Studies in the Philosophy of Science* 14, ed. Robert S. Cohen and Marx W. Wartofsky, 91-117. Dordrecht, Holland: D. Reidel Publishing.

Murphy, Jeffry. 1982. *Evolution, Morality, and the Meaning of Life*. Totowa, N.J.: Roman & Littlefield.

Ringen, Jon. 1976. "Explanation, Teleology and Operant Behaviorism: A Study of the Experimental Analysis of Purposive Behavior." *Philosophy of Science* 43:223-54.

Rottschaefer, William A. 1982a. "Is There a Values Expert in the House?" *Contemporary Philosophy: Philosophic Research and Analysis* 8 (Winter):11-15.

———. 1982b. "The Psychological Foundations of Value Theory: B. F. Skinner's Science of Values." *Zygon* 17 (September):293-301.

———. 1983. "Sociobiology, Another Blow to Freedom?" *Sweet Reason* 2:63-67.

Ruse, Michael. 1979. *Sociobiology: Sense or Nonsense?* Dordrecht, Holland: D. Reidel Publishing.

Singer, Peter. 1981. *The Expanding Circle: Ethics and Sociobiology*. New York: Harper & Row.

Skinner, B. F. 1971. *Beyond Freedom and Dignity*. New York: Alfred A. Knopf.

Sperry, Roger. 1983. *Science and Moral Priority: Merging Mind, Brain, and Human Value*. New York: Columbia Univ. Press.

Wilson, E. O. 1971. *Sociobiology: The New Synthesis*. Cambridge, Mass.: Harvard Univ. Press.

———. 1978. *On Human Nature*. Cambridge, Mass.: Harvard Univ. Press.

Wilson, G. Terence, and Cyril M. Franks, eds. 1982. *Contemporary Behavior Therapy: Conceptual and Empirical Foundations*. New York: Guilford Press.