

Chapter 1

Ethics and Evolution

THE SECRET CHAIN

Francis Hutcheson, in *An Inquiry Concerning the Original of Our Ideas of Virtue or Moral Good*, wrote “[i]t is true indeed, that the actions we approve in others, are generally imagin’d to tend to the natural good of Mankind, or that of some Parts of it. But whence this secret chain between each person and mankind? How is my interest connected with the most distant parts of it?” (Hutcheson, 1969, p. 111). The secret chain that Hutcheson had in mind was the chain that links private interest and universal benevolence. The metaphor captures one of the central problems faced by the eighteenth century British moralists. It was a problem that captured the imagination of Darwin when he rejected the providential solution endorsed by his kinsman Sir James Mackintosh. It is an appropriate metaphor for the interconnected themes of this book. In addition to Hutcheson’s chain there is the chain that allegedly links biology and evolution to ethics, the chain that links views of human nature to the explanation and justification of moral theories, and the moral echo of the chain of being that details the phylogenetic development of the moral sense.

What, if anything, can we learn about ethics or morality from the theory of evolution and the fact that human beings have evolved from ancestral forms? This topic has been controversial since the publication of Darwin’s *Origin of Species* (in 1859) and *The Descent of Man* (in 1871). Darwin argued that evolutionary theory could throw some light on what was known in the eighteenth and nineteenth centuries as the *moral sense*. Darwin’s “bulldog,” T. H. Huxley, argued that nature was violent, competitive and the antithesis of morality. Human morality, he thought, arose in opposition to the evolutionary tendencies of nature. Herbert Spencer, their contemporary and an evolutionist before Darwin, argued that biological evolution, social evolution and the evolution of morality were all

part of a single process—a single cosmic evolution. Spencer, unlike Darwin (in his more cautious moments) or Huxley, was a progressionist, who believed that evolution tended toward the better. Kropotkin took exception to Huxley's reading of evolutionary theory as portraying nature as "red in tooth and claw" and emphasized what he saw as natural tendencies toward cooperation and sociality.

A philosophical reaction against drawing any ethical consequences from evolutionary theory was started by the English moral philosopher Henry Sidgwick (in the 1870s) and crystallized in G. E. Moore's (1903) claim that evolutionary ethics committed what he called the *Naturalistic Fallacy*. The alleged fallacy was related to a cautionary note sounded by Hume with respect to the tendency of some writers on ethics to glibly slide from expressions of the form "X is . . ." to expressions of the form "X ought. . . ." Moore did not mention Hume in his analysis, and his view that *good* is indefinable rests on a number of dubious and contentious metaphysical assumptions. With respect to the evolutionary ethicists of the nineteenth century in general, and Herbert Spencer in particular, Moore was concerned with the implied identification of claims of the form "X has evolved" with "X is good" and "X is more evolved than Y" with "X is better than Y." In any case, any reasoning from the facts of nature to conclusions about the good or what ought to be done has come to be labeled as *committing a naturalistic fallacy*.

For a time the ethical implications of evolutionary theory became a nonissue. Then, in the early 1940s, Julian Huxley, the grandson of T. H. Huxley, reexamined his grandfather's arguments and claimed that granddad got it wrong. Nature and ethics were in harmony not in opposition. Still, nothing much happened until the advent of sociobiology in the early 1970s. All of a sudden, ethics and evolution became respectable again, at least in some quarters. Critics of sociobiology were quick to point to the "fallacy" committed by inferring ethical conclusions from scientific or factual premises or by construing biological altruism as related in any significant way to ethical altruism, for example. Several philosophers and biologists, such as E. O. Wilson, Michael Ruse, and Robert Richards, have tried in the past several years to construct versions of evolutionary ethics that outflank the naturalistic fallacy or otherwise defuse the criticisms directed against sociobiological analyses of ethics. In 1989, Princeton University Press reissued T. H. Huxley's *Ethics and Evolution*, with a historical introduction and an afterword by a leading sociobiologist, G. C. Williams. Williams argues, in effect, that not only did Huxley get it *right*—nature is evil, as his recent paper entitled *Mother Nature is a Wicked Old Witch* has it—we now have the sociobiological arguments to prove it.

Other considerations in addition to sociobiology justify a reexamination of the philosophical relevance of evolutionary theory. In recent years,

there has been a resurgence of interest in various naturalistic approaches to philosophical issues. In particular, there is a large and growing literature in what is called *evolutionary epistemology*.¹ There are obvious parallels between epistemology and ethics, and it would seem that if a case can be made for an evolutionary approach to epistemology, it is possible that a parallel case could be made for an evolutionary approach to ethics as well.

EPISTEMOLOGY FROM AN EVOLUTIONARY POINT OF VIEW

Epistemology is the study of the foundations and nature of knowledge. The traditional approach beginning with Plato and developed in its modern form by Descartes is that epistemological questions have to be answered in ways that do not presuppose any particular knowledge. Such approaches might be termed *transcendental* insofar as the appeal to knowledge to answer these questions is rejected as question begging. The Darwinian revolution of the nineteenth century suggested an alternative approach, first explored by Dewey and the pragmatists. Human beings, as the products of evolutionary development, are natural beings. Their capacities for knowledge and belief are also honed by evolutionary considerations. As such there is reason to suspect that knowing, as a natural activity, should be treated and analyzed along lines compatible with its status, that is, by the methods of science. In this view, no sharp division of labor is made between science and epistemology. In particular, the results of particular sciences such as evolutionary theory and cognitive psychology are deemed relevant to the solution of epistemological problems. Such approaches, in general, are called *naturalistic epistemologies*, whether they are directly motivated by evolutionary considerations or not. Those that are directly motivated by evolutionary considerations and argue that the growth of knowledge follows the pattern of evolution in biology are called *evolutionary epistemologies*. Three distinctions need to be made.

The first distinction concerns two interrelated but distinct programs that go by the name *evolutionary epistemology*. One is the attempt to account for the characteristics of cognitive mechanisms in animals and humans by a straightforward extension of the biological theory of evolution to those aspects or traits of animals that are the biological substrates of cognitive activity; for example, their brains, sensory systems, and motor systems. The other program attempts to account for the evolution of ideas, scientific theories, and culture in general, by using models and metaphors drawn from evolutionary biology. Both programs have their roots in nineteenth century biology and social philosophy, in the work of Darwin, Spencer, James, and others. There have been a number of

attempts in the intervening years to develop the programs in detail (see bibliography and review in Campbell, 1974a). Much of the contemporary work in evolutionary epistemology derives from the work of Konrad Lorenz (1977, 1982), Donald Campbell (1960, 1974a, 1974b), Karl Popper (1968, 1972, 1976, 1978, 1984), and Stephen Toulmin (1967, 1972, 1974, 1981). I have labeled these two programs *EEM* (evolution of epistemological mechanisms) and *EET* (evolution of epistemological theories). (Bradie, 1986) *EEM* is the label for the program that attempts to provide an evolutionary account of the development of cognitive structures. *EET* is the label for the program that attempts to analyze the development of human knowledge and epistemological norms by appealing to relevant biological considerations. Some of these attempts involve analyzing the growth of human knowledge in terms of evolutionary (selectionist) models and metaphors (e.g., Popper, 1968, 1972; Toulmin, 1972; Hull, 1988). Others (e.g., Ruse, 1986; Rescher, 1977, 1990b) argue for a biological grounding of epistemological norms and methodologies but eschew selectionist models of the growth of human knowledge as such.

A second distinction concerns ontogeny versus phylogeny. Biological development involves both ontogenetic and phylogenetic considerations. Thus, the development of specific traits, such as the opposable thumb in humans, can be viewed both from the point of view of the development of that trait in individual organisms (ontogeny) and the development of that trait in the human lineage (phylogeny). The development of knowledge and knowing mechanisms exhibits a parallel distinction. Therefore, we can study the growth of knowledge from either the ontogenetic point of view of the development of knowledge and epistemic norms in individuals or the phylogenetic point of view of the development of knowledge and epistemic norms across generations. Similarly, we can study the ontogenetic development of brains in individuals or the phylogenetic development of brains in the human lineage. The *EEM/EET* programs cut across this distinction because we may be concerned either with the ontogenetic or phylogenetic development of, say, the brain or norms and knowledge corpora. One might expect that, because current orthodoxy maintains that biological processes of ontogenesis proceed differently from the biological processes of phylogenesis, evolutionary epistemologies would reflect this difference. For the most part they do not, curiously enough.

A third distinction concerns descriptive versus prescriptive approaches to epistemology and the growth of human knowledge. Many have argued that neither the *EEM* program nor the *EET* program has anything at all to do with epistemology as traditionally understood. The basis for this contention is that epistemology, properly understood, is a normative discipline, whereas the *EEM* and *EET* programs are concerned with the construction of causal and genetic (factual) models. No

such models, it is alleged, can have anything important to contribute to normative epistemology. To the extent that this is true, it casts some doubt on the plausibility of related efforts in evolutionary ethics.

Traditional epistemology is in large part a normative discipline. Evolutionary epistemologies in particular, and naturalistic epistemologies in general, insofar as they construe epistemology as continuous with science, would seem to be purely descriptive. Can such enterprises deal with normative questions? How one approaches this question depends upon how one construes the relationship of evolutionary epistemology to traditional epistemology. If evolutionary epistemology is seen as a "successor" discipline to traditional epistemology, then one may well be prepared to write off many of the traditional questions that epistemology set for itself. Other naturalized theories of knowledge, for example, Laudan's, involve reinterpreting normative claims in terms of empirical hypotheticals (Laudan, 1984, 1990). Quine (1990) also argues that naturalizing epistemology does not lead to a rejection of norms; "normative epistemology gets naturalized into a chapter of engineering: the technology of anticipating sensory stimulation" (Quine, 1990, p. 19). Campbell argues that evolutionary epistemology is the descriptive complement to traditional epistemology. As such, it begs some of the traditional normative questions of epistemology, such as "How is knowledge possible?" (Campbell 1974b).

Deriving epistemological norms from the facts of human knowledge acquisition would seem to commit some version of the naturalistic fallacy. It is open to evolutionary epistemologists to challenge the contention that the naturalistic fallacy (or at least any attempt to base norms on facts) is a fallacy. An argument of this form can be found in Richards (1987) with respect to the naturalistic fallacy in ethics. Richards argues that not all derivations of moral norms from facts are fallacious. The general idea is that norms need to be calibrated against intuitively clear cases. If some evolutionary account is forthcoming regarding why we are inclined to argue in certain ways with respect to morality (or logic or epistemology) then we can ground our normative principles in these evolutionary considerations. Richards's argument is complex and perhaps not completely successful, but it is not unpromising. It is analyzed in some detail in Chapter 5. A similar argument should be constructible for epistemological norms (cf. Vollmer, 1987; Munz, 1985; Bartley, 1987; Bradie, 1989a). In any case, even if some evolutionary account of the emergence of epistemological norms is forthcoming, it is very unlikely that specific norms are going to be derivable or justifiable from biological or genetic considerations alone. The specific form of the epistemological norms that are accepted by communities of cognizers will most certainly reflect local cultural contingencies in much the same way that specific moral codes reflect local cultural contingencies.

ETHICS FROM AN EVOLUTIONARY POINT OF VIEW

Can a parallel case be made for an evolutionary approach to ethics? Given that both ethics and epistemology are normative disciplines, one might expect that the possibilities for and difficulties inherent in an evolutionary treatment are the same for both. We must proceed with caution, however, because the parallels are not exact.

Campbell (1974a, p. 1109) rejects the obvious criticisms by Flew (1967), Quillian (1945), and others, that evolutionary ethics fails to provide grounds for normative ethics. For Campbell, the evolutionary ethicist is interested in what Campbell calls *descriptive ethics*. Descriptive ethics portrays the moral and ethical standards that various past and present cultures employ and would aim at the formulation of "hypothetically descriptive laws of social organization, including optional modes of individual behavior for optimizing collective goals." Such an enterprise could rightly be called a *science of ethics*. Given that some goal G has been adopted by a group, the science of ethics could "provide sets of derived, mediational values, which if adhered to would further the achievement of the chosen ultimate values." It may also serve as a predictive, though not justificatory instrument, in that it should be able to predict "which ultimate values animals such as social humankind are likely to choose." The parallels between Campbell's conception of descriptive ethics and its relation to normative ethics, on the one hand, and his conception of descriptive epistemology and analytic epistemology, on the other, are obvious. It remains to be seen whether "descriptive ethics," so characterized, is not merely ethics "in name only." It is interesting to note, however, a certain parallel between descriptive ethics and what the eighteenth century ethical theorists called *moral psychology*. There is a sense in which the post-Hobbesian British moral theorists who set the stage for the problem of morality that Darwin tried to address were more akin to empirical psychologists describing the moral behavior of human beings than they are to moral philosophers as we understand them. It is, of course, a well-known fact that the distinction between philosophy and science as we construe it was not clearly drawn by the eighteenth century thinkers. In one sense, normative ethics is the late complement to a descriptive tradition in contrast to descriptive epistemology which is a late complement to a prescriptive tradition.

One can distinguish two approaches to evolutionary ethics corresponding to the EEM and EET programs in epistemology. The one, which we might label *EMM* (evolution of moral mechanisms), focuses on the evolutionary considerations that are relevant for understanding the phylogenetic development of the capacity of organisms to be ethical. Possibly no one today seriously disputes that the capacity to engage in practices for

which ethical judgments are appropriate, as well as the capacity to make moral judgments, have evolved. That is, no one disputes this except perhaps some religious fundamentalists and biblical literalists. A certain degree of intellectual ability, including the power to remember and reflect on one's actions, is a prerequisite for that capacity. Darwin was of the opinion that any sufficiently advanced social species would involve some ethical sense. Even so, it is a program with more promise than product because we do not know how the specific biological structures that make us "ethicizing animals" came to be or, in fact, which ones they are. The other, which we might label *EMT* (evolution of moral theses) can be construed either narrowly or broadly as contending that particular ethical systems or maxims or practices are capable of being explained or even justified in terms of some evolutionary or natural selection model.² Most of the arguments examined in this book deal with one or another aspect of the EMT program.

Just as there are three possible configurations of the relationship between evolutionary epistemology and traditional epistemology, there are three possible configurations of the relationship between evolutionary ethics and traditional ethics.

1. Evolutionary ethics is a competitor to traditional ethics. In this view, evolutionary ethics provides alternative answers to the traditional ethical questions, including those dealing with the evaluation and justification of norms. Herbert Spencer's *Principles of Ethics* and Julian Huxley's *Evolution and Ethics* are historical examples of this approach. More recently, Robert Richards has proposed such an approach in *Darwin and the Emergence of Evolutionary Theories of Mind and Behavior*.
2. Evolutionary ethics is complementary to traditional ethics. Evolutionary ethics, in this view, is a descriptive and explanatory account of the rise and development of ethical views. It complements the concerns of traditional ethics with normative issues. As noted earlier, Campbell has endorsed this point of view. Westermarck's monumental *The Origin and Development of Moral Ideas* is the classic here. Darwin's treatment of morality in *The Descent of Man* falls roughly into this category.
3. Evolutionary ethics might be construed as a successor discipline to traditional ethics. In this view, traditional ethics, with its focus on the justification of prescriptions, is to be rejected in favor of accounts that describe and explain how human beings come to have the moral beliefs and attitudes that they hold. Views that use evolutionary arguments to attack traditional normative accounts of ethics would fall into this category. Wilson (1979), Ruse (1986), and Ruse and Wilson (1986) would seem to fall here.

The distinction between phylogenetic and ontogenetic development carries over to evolutionary ethics as well. I do not have much to say about the ontogenetic development of ethics in this book, but following in the tradition of Piaget, Kohlberg, his students, and critics have addressed these issues at length. (See Kohlberg, 1981, 1984; Gilligan, 1982; and Wren, 1990.)

The parallels between ethics and epistemology are not exact. Allegiance to different ethical norms seems to shift more radically and more quickly than allegiance to epistemological norms. The extent to which this is true depends on the level of analysis. If goodness is the moral equivalent of truth, then moral norms appear to be more stable. Specific ethical maxims shift from culture to culture and era to era, but if they are analogous to specific epistemological methodologies or theories in science, then these latter do so as well.

Taking Darwin seriously in ethics means at least that we reconsider what it means to be human and an ethical being in the light of all the evidence that suggests we are not the privileged agents in a divinely created universe as we once thought. The challenge of Darwin and evolutionary theory is to reconsider, in the light of that evidence, what it is to be a human being or biological organism who can make moral judgments and what it is that we know about the universe in the light of that fact.

MORALS AND MODELS

The eighteenth century British moralists who set the agenda for Darwin's sketchy treatment of the subject did not make a sharp distinction between science and philosophy. Much of what they had to say about human morals then was as much a contribution to moral psychology as it was to moral philosophy as we understand that term today. It is characteristic of science to produce models of the phenomena to be understood. Scientific theories employ models as the theoretical tools investigators use to predict and explain. The models serve as templates for the organization and codification of information about the behavior of the natural systems, for which they are primarily descriptive. Moral theories are putatively different in that they focus on prescriptions rather than descriptions. However, it will be useful to consider the extent to which moral theories can be construed as models, which are theoretical devices to help explain why human beings behave as they do and to provide some rationale for arguing that certain modes of behavior are preferable to others. Moral theories rest, either implicitly or explicitly, on theories of human nature. These theories or models contain both descriptive and prescriptive elements. The differences between Hobbes, Shaftesbury, Hutcheson, Hume, Butler, Smith, and Darwin on the nature and characterization of morality can be attrib-

uted, in part, to differences between the models of human nature each employs.

A close examination of these underlying models will lead to a better understanding of the moral systems themselves and the role of appeals to human nature in shaping those moral systems.

I adopt a method of analysis characteristic of the descriptive sciences and use it to analyze the moral models of the eighteenth century moral theorists who contributed to the set of problems concerning moral motivation inherited by Darwin. The idea that the difference between physics and morality was not as great as we conceive it to be today was a common assumption of the period captured in the phrase *a science of morals*. The differences between descriptive and prescriptive utterances were not as sharply demarcated as they are today, and the moral models of the period more or less imperfectly reflected these two elements.

In the physical sciences, we distinguish between the phenomenon to be explained (e.g., an elephant sliding down a steep hill) and a theoretical model or representation of the phenomenon which we use to try to understand it (Galileo's equations or an idealized model of a weight on an inclined plane). We can use a similar approach for understanding moral phenomena. It is important to distinguish between the phenomenon to be explained (e.g., a moral action of some sort, such as, Mother Theresa ministering to the poor of India) and a theoretical model we might employ to try to understand or evaluate that phenomenon (e.g., in terms of egoistic or benevolent considerations). I shall use the term *moral phenomenology* to characterize the range of phenomena that moral theories, so construed, are attempts to explain and justify. The models, typically, will be models of human nature that incorporate both descriptive and prescriptive principles. The need to incorporate prescriptive elements into the moral models marks a significant difference between moral and physical models, and it is an open question whether the need to do so disqualifies this approach from any chance of success.

Having made the distinction between moral phenomena and moral models we need to distinguish several issues:

1. What the model says. This will consist of an articulation of several principles of action based on empirical assumptions, usually concerning human nature, and normative assumptions.
2. What the phenomena to be understood are. This constitutes the moral phenomenology and consists in a catalogue of features that the author deems to be "moral," either in the broad sense in which any action or agent is capable of being characterized as good or bad, or right or wrong, or in the narrow sense in which the moral actions and agents are those we would call the *good* or *right* ones.

3. Whether the model is a "good" model of the phenomena. Here, the standard criteria of model fit would seem to apply. We want our models to be both descriptively adequate and prescriptively adequate. Prescriptive adequacy means that the model in question delivers the same moral judgments that are revealed in the moral phenomenology, at least with respect to central cases. The world being as it is, our models will not be perfect reflections of our moral experience. Some adjustments will have to be made. Whether we are led to revise our phenomenological characterizations or our models is something that needs to be decided on a case-by-case basis. But the situation is no different in the physical sciences.
4. What the implications of the model are. The implications of the model are those descriptive and normative consequences that follow from the fundamental assumptions of the model. The relationship between them and the considerations in 3 is this. To the extent that the fit between model and phenomena is a good one, the implications of the model, which are theoretical predictions, will be identifiable with some appropriate piece of the phenomenology.

In many cases the distinction between 1 and 2 will not be clearly drawn. Thus, in the eighteenth century literature, *principles of self-love* must sometimes be read to refer to aspects of the situation to be understood and at other times to be elements of the explaining model. The fact that the same terms may be used in these two different senses is an unfortunate complication. A parallel is to be found in Hempel's analysis of the relationship between pure and physical geometry. The distinction cannot be made clear until one recognizes that crucial terms such as *straight line* can be used either to refer to elements of the physical world or components of a mathematical system (Hempel, 1949). These complications are endemic to the use of models in both science and morals. I am not implying that the eighteenth century moral theorists were consciously trying to construct such systems, although given their fascination with Newtonian methods, it is not beyond the realm of reason to construe their activity in this way. Adam Smith, who was an astute methodologist as well as an economist and moral theorist, saw one difference between science and morality in that scientific theories, which were accepted at one time, could be thought afterwards to be outrageous, whereas no moral theory that appeared could, in retrospect, lose all sense of plausibility³ (Smith, 1982, p. 313). But this rests on the questionable assumption that human beings are in such close contact with their sentiments and wills that they could not be long fooled about their true motivations. The Freudian revolution and its aftermath should give us pause here. More recently, the attempt by

some sociobiologists to argue that we are in fact mistaken about the nature of our motivations provides a contemporary example of the attempt to construct a theoretical moral model with which to interpret, understand, and evaluate human moral behavior.

The conflation of model descriptions with phenomenological descriptions may lead to a confusion between what are facts of moral phenomenology and what should properly be regarded as model assumptions, and vice versa. For instance, two authors may well agree that human beings have certain passions or appetites, from the phenomenological point of view, and yet disagree about whether for every such passion or appetite there is a corresponding element in the model. This feature of the situation is often obscured in arguments between reductionists and their opponents. Therefore, Hobbes is construed as a reductionist because he takes all passions and tries to reduce them to one. If self-interest is understood as an element in a model rather than as an element in the phenomenology, then this view is not subject to the criticism that human beings who act from other motives, or so claim to, are either self-deceived or duplicitous. Whatever the truth about Hobbes's view may or may not be, the reductionist account is not undermined by the observation that the passions of self-interest and benevolence are introspectively equally genuine.

The Darwinian legacy demands that the models of human nature or of our moral nature that form the basis of our characterization of moral phenomena must be situated within an evolutionary framework.

EVOLUTION AND ETHICS

The rationale for thinking that evolutionary biology has something interesting to say about ethics lies in the empirical fact that human beings have evolved to become what they are through the influence of natural selection and other factors. Thus, human nature, to the extent that such is compatible with an evolutionary way of thinking, has been shaped to no small extent by evolutionary and natural forces. All ethical systems, naturalistic or not, rest, either explicitly or implicitly, on a conception of human nature. The very foundation of ethical thinking would then seem to be rooted in biology.

At one level none of this is controversial. If ethics is rooted in human nature, and human nature is rooted in our biology, then it would seem that ethics should be rooted in biology as well. What is controversial is the claim that evolutionary biology has anything of *significance* to contribute to our understanding of ethics. There are three distinct but interrelated areas in ethics about which one might think biological considerations were relevant. These are, broadly speaking, particular moral issues, ethical theory, and meta-ethics.

The scope of particular moral issues can include issues faced by individuals on a day-to-day basis as well as questions about particular classes of moral actions. The former include such questions as, "Should I share this pie? Should I steal that apple? Should I have an abortion?" The latter include questions such as the rights and wrongs of abortion, capital punishment, equal rights for women, animal experimentation, and the like. There is little reason to suppose that an appeal to evolution will be especially relevant either to the explanation or the justification of particular decisions by particular individuals that are made on a day-to-day basis. The plasticity of human behavior would seem to preclude such appeals. There is some reason, and some have so argued, to think that an appeal to evolutionary considerations can explain the adoption or abandoning of particular norms. Whether such norms can be justified by appeal to evolutionary considerations is another thing entirely.

The relevance of evolutionary biology for ethical theory hinges on whether or not a case can be made for arguing that evolutionary considerations can explain why consequentialist or deontological analyses of morality are more or less appropriate.

Finally, there are issues in what is called *meta-ethics*. Meta-ethics deals with questions concerning the status of moral claims. Are they capable of being true or false or are they merely conventions or expressions of approval or disapproval? Are there any moral facts? If so, are they reducible to "natural" facts or are they *sui generis*? I employ the term *meta-ethics* in a broad sense to include not only these traditional questions of justification, objectivity, and meaning, but also questions about the origin, function, and development of morality. Many philosophers and biologists have claimed that evolutionary theory and the facts of human evolution are relevant for answering questions in one or more of these three areas.

Michael Ruse suggests that "a fuller understanding of the causes of morality will surely have fairly direct implications for the bounds which we draw to moral behavior" (Ruse, 1979, p. 198). A precondition for morality is the possibility of choice. Some human behaviors are not voluntary. Some exonerating reasons can and do rest on genetic causes. Ruse concludes that, in the light of this, "there are times when, because of a person's genes, we are less inclined to say that they are responsible for their actions." The bottom line for Ruse is that sociobiological research may well lead to a resetting of the limits on responsible human action. A "reverse" implication concerns the impact of ethics on evolution. Technological developments in gene manipulation procedures hold open the possibility of fulfilling the dream of the eugenics movement to control and direct the course of evolution in the future (Ruse, 1979, p. 81). On a less technological but no less sophisticated level, problems of ecological

manipulation raise delicate issues of the interrelationship of ethics and evolution. The greater our understanding of the processes underlying ecological change, the greater is our chance of successfully shaping the environment to our heart's desire.

To the extent that the resources of evolutionary biology can be tapped to provide an evolutionary account of the development of the capacity for making moral judgments, and perhaps for the development of moral visions as well, "moral philosophy, uninformed by contemporary breakthroughs in biology, can no longer be taken as the last word on subjects so central to the human social order" (Maxwell, 1984, p. 230).

According to Dewey, the significance of evolutionary theory for ethics lies in the emphasis it places on the "continuity of change." The evolutionary message is not progress but the fact of open possibilities that need to be addressed and readdressed. No static, finalistic vision of ethics is possible in a world with evolutionary possibilities (Dewey, 1957, p. 262).⁴

The bottom line for judging the relevance of evolutionary biology for ethics must rest on the answer to the following question: Would our ethical views or the analysis and support we offer for them be different if our evolutionary history had been different? If the answer is no, then we can effectively dismiss the claim that evolutionary biology has any bearing on ethics. The message of this book is that we cannot dismiss the relevance of evolutionary biology for ethics. Determining exactly how these evolutionary considerations do and should shape our ethical consciousness is a more delicate question for which the final answer is not yet known.

NOTES

1. See, e.g., Campbell (1974a, 1974b), Popper (1976, 1978, 1984), Bradie (1986), Ruse (1986), Callebaut (1974), and Wuketits (1990).

2. Whereas identifying survival value with truth value may be passé among evolutionary epistemologists, identifying moral virtue with survival value still has supporters among evolutionary ethicists (e.g., Wilson, 1978). For an attempt to show that an evolutionary model can justify as well as explain moral practices, see Richards, 1987, and Chapter 5 later.

3. For Smith's views on scientific methodology and the growth of scientific knowledge, see his essay "The History of Astronomy," in Smith, 1980.

4. Cf. Höffding (1909, p. 457): "All knowledge is systematic, in so far as it strives to put phenomena in quite definite relations, one to another. But the systematization can never be complete. And here Darwin has contributed much to widen the world for us. He has shown us forces and tendencies in nature which make absolute systems impossible, at the same time that they give us new objects and problems. There is still a place for what Lessing called 'the unceasing striving after truth,' while 'absolute truth' (in the sense of a closed system) is unattainable so long as life and experience are going on."