KANTIAN ETHICS: AFTER DARWIN

by John Teehan

Abstract. In this article I reevaluate Immanuel Kant's moral philosophy from a post-Darwinian perspective. Taking an evolutionary approach to human reasoning and incorporating some recent work on the science of the emotions, I argue that the Kantian bifurcation of reason and emotion, which underlies his moral philosophy, is no longer tenable. Kant's practical defense of his ethics as being the only option that can save morality from the dangers posed by naturalism is also considered and rejected. Instead, I argue that an evolutionary view of reason and emotion can provide an adequate ground for morality and explore the possibility and advantages of such an ethics.

Keywords: emotions; ethics; evolution; Immanuel Kant; naturalism; rationality.

Since the publication of *On the Origin of Species* ([1859] 1975) it has been evident that evolutionary theory poses a radical challenge to humanity's traditional understanding of itself. Advocates and opponents alike recognized that the import of Charles Darwin's ideas reached well beyond biology. In the conclusion of the *Origin* Darwin himself suggests the possible contributions of evolutionary thinking to an understanding of human psychology, and in *The Descent of Man* ([1874] 1997) he began to develop an evolutionary approach to human morality. Those interested in the interface between science and religion are likely to be familiar with the attempts to explain the evolution of morality that have followed Darwin's initial efforts. Indeed, this is one of the areas most ripe for a clash between religious and scientific worldviews. Whether or not such a clash is inevitable

John Teehan is Assistant Professor of Philosophy at Hofstra University. His mailing address is Roosevelt Hall, School for University Studies, 130 Hofstra University, Hempstead, NY 11549; e-mail SUSJPT@Hofstra.edu. A version of this paper was presented at the Human Behavior and Evolution Society Annual Conference held at University College of London in June 2001.

or even appropriate (see, for example, Gould 1999) is not my concern here. What I discuss is how evolutionary theory affects the way we understand the roles of reason and emotion in moral philosophy. The impact is significant, I believe, for an evolutionary understanding of these issues shifts moral philosophy away from approaches based on dualistic or transcendent assumptions and toward naturalism.

It is characteristic of several important moral traditions that reason and emotion are distinct and typically conflicting elements of the moral self—and in the conflict between reason and emotion, philosophers have, with few exceptions, sided with reason. The emotions distract us and cloud our thinking. They cause us to be partial rather than impartial spectators; they direct our energies toward the mundane and fleeting and away from the ideal and eternal. From Plato, through the scholastics, to Immanuel Kant, and in a significant number of religious systems, the emotions were to be battled and exiled from the life of those seeking the Good. If not exiled they at least had to be beaten into subservience to sovereign reason, which had no true need of them but which could make use of them from time to time.

This attitude, however, has been undergoing revision, and the importance of the emotions to moral reasoning is gaining a greater appreciation, even among philosophers (de Sousa 1987; Sherman 1990; 1997; Oakley 1994). It seems clear that as philosophers begin to reevaluate the nature of the emotions and to reintegrate them into moral theory they must necessarily work with those studying the emotions from a scientific standpoint. Whatever else they may be, the emotions are clearly physiologically based. Manipulate the levels of certain neurotransmitters in the brain through the administration of psychotropic drugs and you manipulate the emotions; stimulate certain sections of the brain and you can revive an emotion-laden memory; surgically excise a part of the brain and you can physically impair the experience of certain emotions. These claims have profound implications for the way we understand ourselves but are neither new nor controversial. Discovering actual neural networks that go into producing an emotion is certainly a recent accomplishment, but seeing the emotions as physically based is ancient news. In fact it is the very physicality of the emotions that leads to their banishment (for the most part, at least in any positive role) from philosophy.

It can be argued that recent advances in understanding the biochemistry and neurophysiology of the emotions do nothing to mitigate a dualistic metaphysics of the self, since it is the empirical nature of the emotions that distinguishes them from the rational elements of the self and justifies their subjugation. However, given the recent work of researchers such as Antonio Damasio (1994) and Joseph LeDoux (1996) that suggests that emotions play a crucial, perhaps essential, role in reasoning, the dualistic position is increasingly implausible. Furthermore, there is a larger context

into which these approaches fit that offers no such possible accommodation for dualism, and that is the evolutionary perspective. To take an evolutionary view of human beings is to see us as another species of animal occupying a place on the continuum of life, not floating somewhere above it.² This view pictures the emotions and reason as evolved responses to a variety of environmental pressures that provide us—or at least provided our ancestors—with some advantage in the struggle to survive and reproduce. In this article I describe, in general terms, just such a Darwinian picture of emotion and reason and then consider its impact on moral philosophy. In proceeding with this evaluation I focus in detail on the philosophy of Kant, for two reasons: one, by focusing specifically on a particular moral theory we avoid drawing merely vague or general conclusions; and two, by choosing Kant we are testing the conclusions against one of the more powerful moral philosophies, which, though secular in intent and execution, shares deep affinities with a religious approach to ethics.

THE SOCIAL MIND

Of particular relevance here is that many of our more complex emotions seem to have arisen as a result of our evolution as social animals. Survival and successful reproduction for social animals means more than merely being able to avoid dangerous predators; it means being able to negotiate the social context in such a way as to minimize conflict while maximizing personal success—a success that often depends upon the cooperation of the group. The foundation of moral experience, even for Kant ([1797] 1991, 200–201), is formed by those emotions that allow us to identify with and care for others. It is of no small import to a naturalistic morality that these emotional capabilities are found not solely in the human domain but in virtually all the higher social animals, and most prevalently in those animals closest to us, the great apes (see De Waal 1996; De Waal and Flack 2000).

This observation about our evolutionary next of kin leads to the key point of the argument. There is in nature an apparently strong (though not perfect) correlation between sociality, complex emotional nature, and intelligence. The more complex the social life of a species, the more highly evolved its emotional sensitivities and the greater its intelligence. It is becoming apparent that the evolution of the human brain was spurred on, at least in part, by an increasing need to deal with the demands of social living.³

From this perspective reason and emotion are not the eternal combatants of most dualistic philosophies but are both the end result of an evolutionary strategy for successfully managing such social demands. They are at least partners in this endeavor—but it is also plausible that they are much more.⁴

The fundamental concept for this position is the apparently essential nexus of sociality, complex emotions, and intelligence. We are, as Aristotle saw, social animals. Humans everywhere live in groups; and not only have we always done so, but we are evolved from a long line of social animals and share this sociality with all our closest evolutionary kin. But as ants and bees demonstrate, sociality is not a sufficient cause for the development of higher intelligence. What seems to be requisite is a complex and yet fluid set of social relationships. Ants and bees are highly regimented creatures, by evolutionary design. Queen-ness, drone-ness, and worker-ness are not qualities won or lost through social competition. They are qualities genetically set before birth. For ants, the ability to mate well (and often) and successfully raise offspring is not dependent upon success in maneuvering through the social hierarchy. Ability to form and maintain alliances, to distinguish between enemy and friend, and to contribute to the social good without undue cost to personal good are skills absolutely foreign to these creatures—but they are essential to higher social animals. These are not simple skills. They require the ability to make fine distinctions between members of a group, to remember past offenses and anticipate future rewards. They require the ability to identify with others in order to predict their responses to our actions and in order to coordinate our actions with theirs in a group project. These abilities are just not found in animals lacking higher intelligence. A highly complex cerebral cortex is necessary to carry out these highly complex social functions.

It may be countered that this account fits in well with a very different view of intelligence and sociality. That is, rather than implying a move from sociality to higher intelligence, why not use this scenario to support a Hobbesian move from autonomous individual to member of society via rational self-interest? The reason this does not work is that evolutionary theory forces us to think in terms of a continuum, even when it comes to intelligence. It is not something possessed or not, in an absolute sense. It is a function of living creatures that has, like every other function, evolved in response to environmental pressures.⁵ So we must ask what the environmental pressures were that spurred on the evolution of higher intelligence. One answer appears to be, as I have already suggested, increasing social complexity. But, if increasing social complexity is a source of increasing intellectual abilities, then increased intellectual abilities cannot explain the *origins* of society—though of course greater cognitive abilities, in turn, allow for more complex socialization. That our social nature predates our rational nature is also attested by our evolutionary lineage. We share higher intelligence only with our closest kin; we share sociality far across the mammalian class. The glue to sociality in mammals, and so in humans, is not reason but emotion. Maternal care, infantile dependency, sexual passion, fear of others, fear in general—these, and others, are the motives that forge social bonds. Intelligence comes along later, as an evolutionary development answering (in part) the needs of animals attempting to better handle the emotional entanglements of complex social living.

It is informative to bring in Kant at this point, because he directly considers the natural function of reason. Kant states, sounding ever so much the evolutionist, "In the natural constitution of an organic being . . . let us take it as a principle that in it no organ is to be found for any end unless it is also the most appropriate to that end and the best fitted for it" ([1785] 1964, 62). He goes on to discuss the "preservation" or "welfare," in other words the "happiness," of such an organic being. He writes, "In that case nature would have hit on a very bad arrangement by choosing reason in the creature to carry out this purpose. For all the actions he has to perform with this end in view, and the whole rule of his behavior, would have been mapped out for him far more accurately by instinct; and the end in question could have been maintained far more surely by instinct than it ever can be by reason" (p. 63).

Concluding, then, that reason plays no natural function, Kant assigns it a nonnaturalistic function: producing a moral will. He thereby creates the groundwork for the separation of morality from any emotionally satisfying conception of happiness. But if evolution is right about the function of reason, Kant is wrong. So, to the extent that the above account of the evolution of higher intelligence is correct, Kant is incorrect. Reason is one of the means nature has provided us in our struggles to live, and live well. Interestingly, even though Kant is ultimately wrong about the natural function of reason, he is on target in much of what he says in this passage. Higher intelligence is from an evolutionary perspective a very recent event and is still, by all accounts, a relatively rare phenomenon. Nature works very effectively in providing for the welfare of living things without the use of reason. Indeed, the most ubiquitous form of life on the planet (and by that fact, according to a strictly evolutionary logic, the most successful) is bacteria—a strikingly nonintelligent form of life. So, Kant is correct in that instinct is by far nature's most favored means for self-preservation.

However, as the challenges to self-preservation and self-replication vary drastically across species, so too must the means for meeting those challenges. The unique demands of life in a complex social setting require unique responses. Rather than being functionally cut off from human welfare and happiness, reason is the tool that enables us to pursue a specifically human well-being (just as chimp intelligence allows them to pursue a uniquely chimp well-being, and so on). Therefore, rather than seeing reason having "its own peculiar kind of contentment" (Kant [1785] 1964, 64), it would be much closer to the mark to claim with David Hume that "Reason is, and ought only to be the slave of the passions, and can never pretend to any other office than to serve and obey them" (Hume [1739] 1978, 415). If we can forgive the rhetorical excess of Hume's statement,6 we have here a valid evolutionary view of reason, ethics, and the emotions.

We are emotional beings whose striving for well-being, in a highly complex social environment, is enhanced by the means of reason. Reason does not have its own kind of contentment, if by that is meant a nonemotional one. Reason has no function apart from answering the needs that arise from the rich context of human desires and needs and passions.

It is important that this position not be interpreted as some Romantic glorification of Emotion to the detriment of Enlightenment Reason. In fact, such a position is as much a mistake as the view it seeks to denounce. From an evolutionary perspective we must see reason and emotion as physiologically related functions of a highly complex organism—evolutionary strategies with the same end. This is the position that seems the inescapable conclusion of contemporary research into the emotions and intelligence, and this is the conclusion I claim is conceptually incompatible with transcendent ethical systems, such as Kant's.

KANT'S ETHICS REVISITED

What significance does this hold for Kantian ethics? It is clear that for Kant the heart of morality is duty and not human well-being. Not that Kant is oblivious to human happiness; indeed, he says that reason demands it as a reward for virtue. However, Kant is clearly willing to sacrifice human happiness in this life to the demands of duty (another point of kinship with many religious ethical systems), that duty being to act in accord with the law of pure practical reason. While empirical conditions can and do come into play as we consider how to fulfill our duties, they have no role in establishing the moral grounding of our actions. Kant states, "We ought never... to make principles depend on the special nature of human reason . . . we ought rather to derive our principles from the general concept of a rational being as such" ([1785] 1964, 79). Some pages later he states, "the proper worth of an absolutely good will, a worth elevated above all price, lies precisely in this-that the principle of action is free from all influence by contingent grounds" (p. 93). Our moral dignity as persons lies solely in this, that we are able to act on principles derived from the concept of pure reason—that is, reason uncontaminated by anything empirical.

The main problem with Kant's ethic, from an evolutionary perspective, is found here—in the conceptions of reason and humanity unconnected to any empirical or natural grounding. The concept of "rational being as such" has no counterpart in an evolutionary understanding of rationality. This is not to say that we cannot have a general theory of rationality separate from the peculiarities of any specific evolutionary history. We can talk about the development and functions of rational thinking rather than the development and function of, say, cetacean intelligence or primate intelligence. But this is not the metaphysical account that Kant has in mind; he

wants the concept of "rational being as such" to be free from *any* empirical considerations. This makes no sense from an evolutionary perspective. It would require an ontological discontinuity, and the entire evolutionary perspective is predicated on the denial of just such a discontinuity. That there are rational beings at all is dependent on a series of contingent historical occurrences, and in order to understand what it means to be a rational being we need to be attentive to these contingent facts.

Here we get to the crux of the matter. We need to set out precisely the nature of the conflict between Kant and an evolutionary position. In a certain way the two views are compatible (even if not complementary). Evolutionary theory offers an empirical explanation for the origin of the various organic phenomena. It aspires to a comprehensive explanation of ultimate causes—though ultimate empirical causes. This is a project that Kant not only allows but commends. In the third Critique he writes, "Our authority to try to explain all natural products in merely mechanical terms is intrinsically quite unlimited. . . . Therefore, it is reasonable, even praiseworthy, to try to explain natural products in terms of natural mechanism as long as there is some probability of success" (Kant [1790] 1987, 303). The last clause in this passage is significant; "as long as there is some probability of success" is not intended to limit the scope of evolutionary investigations, which is "quite unlimited," but rather indicates the proper area of concern—phenomena. As long as evolutionary explanations do not pretend to explain the intelligible substrate of phenomena, Kant has no quarrel with them.

It is intriguing to note the similarity of Kant's stand to the recent pronouncement of Pope John Paul II (1996) on the compatibility of evolution and religious belief. As long as evolution restricts itself to explaining the development of physical existence and takes no stand on spiritual matters (such as ensoulment) then, the Pope declares, there is no conflict. Evolutionary theorists can reply to Kant, as they reply to the Pope, that this is a perfectly acceptable accommodation. The most that evolution can say in regard to noumenal reality or souls is, à la Laplace, "we have no need for such hypotheses." So, why then the appearance of conflict? The problem arises because both spiritual and noumenal concepts carry with them practical implications. It is just here, the practical implications of noumena, that conflicts with evolutionary thinking arise.

Let us turn to the issue of human reason. Evolution says that this is an adaptation that appears in the historical survival struggle of the Homo lineage. Contemporary neuroscience suggests that reasoning is a process that is physically dependent and inextricably intertwined with emotional processes. From this perspective there is no need to posit pure practical reason. Kant agrees, there is no such need, from this phenomenal perspective, but there is another perspective—the noumenal. No matter how successful a phenomenal explanation may be, it is limited. It is never possible

to believe that we have arrived at the absolute truth; there is an ineliminable sphere of unknowability. To this, a philosophically sophisticated evolutionist must assent. This is the "empty" concept of noumena which sets the boundary for scientific knowing, developed in the first *Critique*, and it is consistent with an evolutionary view of human reason.

However, Kant in the second *Critique* allows practical reason to extend noumenal concepts—they can be treated (though not known) as having positive content. We can view ourselves as belonging to an intelligible realm as well as a phenomenal one; we can see our actions as free *and* caused; we can view reason as pure *and* practical. So, aside from seeing ourselves as physical beings, making emotionally determined, practical decisions, we may also legitimately view ourselves as intelligible beings freely following the dictates of pure reason. We may do so, but the question that I believe must be asked is, Why would we do so?

The answer for Kant is a moral one. Without this conception of ourselves as freely choosing to follow the demands of pure reason, we are nothing more than sophisticated animals, slavishly following the demands of foreign forces (that is, phenomenal desires and needs). This is the meaning of heteronomy, which is what we are left with if we deny the intelligible self. There would then be no unqualified good, no universal laws, no categorical imperative. But again we must interject a why—Why do we need an unqualified good and universal law? It is vital to focus on the form of this question: the issue is not, Is a categorical imperative possible?—Kant has already shown that it is theoretically possible—the issue is, Why do we need a categorical imperative? Kant claims that this question is unanswerable: "... it is wholly impossible to explain how and why the *universality* of a maxim as a law—and therefore morality—should interest us" (Kant [1785] 1964, 128). He quickly offers, however, that this interest is connected to the fact that the law has "sprung from our will as intelligence and so from our proper self" (p. 129; emphasis added). Here, I believe, we have come full circle. We are interested in viewing ourselves noumenally— "qua intelligence"—because without this perspective there is no autonomy and no moral law. But our interest in the moral law derives from the fact that the law is an expression of our "proper" noumenal self. Now, I do not intend to charge Kant with fallacious reasoning in establishing either concept. This may be an example of a virtuous, rather than vicious, circle, for once you enter upon this path you find a beautifully coherent conception of morality and the self. But again we must ask, Why enter upon this path?

As he himself admits, there is no theoretically compelling reason to do so, and so the answer must be practical. But a practical decision needs to be defended, and Kant does present such a defense. The reason for entering upon the noumenal path is based on the consequences of following the phenomenal path. If we view reason from an evolutionary perspective we find that it is intimately involved in the contingent pursuits of life and so

is intimately involved with our emotional nature. Nature has endowed us with reason as a means to achieving well-being. To take this phenomenal path rather than the noumenal path is to make happiness, rather than metaphysical freedom, the goal of morality. For Kant this means the impossibility of morality—the "euthanasia . . . of all morals" ([1797] 1991, 183). We can here, again, connect Kant to the religious position expressed by the Pope, who asserts that any theory that reduces humans to merely natural creatures is not "able to ground the dignity of the person" (1996).

Now, if this were true, there would be quite a compelling reason to take Kant's path. But why must this be so? Why must a naturalistic approach to morality be a death knell to morals? I believe the answer for Kant (and in all likelihood, not just for Kant) lies in his conception of the emotions—a decidedly nonevolutionary view. We now need to consider why Kant believed the emotions promised such disastrous consequences for morality, and then we must assess whether an evolutionary view of the emotions supports such a dire assessment. If it does, Kant's reasoning for taking the noumenal path opened by his critical philosophy stands.

AFTER DARWIN

Kant has an almost Hobbesian view of our emotional nature. The end of all emotional behavior, for Kant, is the good or happiness of the individual. He writes, "Now happiness is a rational being's consciousness of the agreeableness of life which without interruption accompanies his whole existence, and to make this the supreme ground for the determination of choice constitutes the principle of self love. Thus all material principles . . . are entirely of one kind. Without exception they belong under the principle of self-love or one's own happiness" (Kant [1788] 1993, 20–21). Therefore, reason guided by the emotions seeks only selfish pleasure, and a Benthamite view of pleasure at that. Kant claims that for the person whose will is determined by pleasure, "it is all the same to him through what kind of representation he is affected. The only thing he considers in making a choice is how great, how long-lasting, how easily obtained, and how often repeated this agreeableness is" ([1788] 1993, 22).

With this view of the emotional nature of humans it is no wonder that Kant strove to lift humanity above nature. How can a naturalistic ethics be anything but a "war of all against all," constrained only by the contingencies of our own vulnerabilities?

Given the Kantian account of humans as emotional beings sketched here, we can see that selfish, inconsiderate, even monstrous attitudes may follow. However, evolution sketches a different account. Our emotional nature, like our intellectual nature, was not implanted in us pre-formed, nor did it develop in isolation. The evolution of our emotional nature is tied up with our evolution as social beings. Our well-being, our happiness,

as social beings requires to varying degrees the well-being of those around us. This is not to imply that we are selfless altruists. Because our own survival has an evolutionary priority, our altruism will be ultimately grounded in self-love. But this principle of self-love will have an altruistic component nonetheless. A naturalistic psychology may provide an adequate grounding for an ethics that goes beyond egoism. The immoral logic that seems to follow from a naturalistic ethic (preferring the satisfaction of our own desires to all other considerations) is the result of Kant's misconceiving the emotions. No evolutionist could propose such a view.

To sum up this last argument, Kant presents his path to morality as the only one that can save morality from an easy death. An evolutionary approach to ethics, however, presents the possibility of constructing a naturalistic path to morality that is not subject to the fatal flaws described by Kant. The Kantian path is not the only one to follow.

So we can now reconsider the question I posed earlier: Why follow Kant's path? Rather than argue why we should not, I conclude by arguing for the advantages of choosing a naturalistic path. The most obvious advantage is that a naturalistic path to morality will be (or at least the path we choose should be) based on a sound empirical understanding of human psychology—our emotions, our cognitive processes, and the complex relation between the two. Such a morality, I contend, can aspire to more than moral exhortation, logical analysis of moral language, or the development of abstract rules. It can aspire to presenting us with a realistic and concrete description of our moral life. It can help identify the obstacles and point out the options as we struggle to improve the quality of our lives and of our treatment of others. Choosing a naturalistic path does not mean we do away with exhortation, or logical analysis, or the development of moral rules. It does mean that we carry on the work of moral philosophy in a way that takes into account the whole human being, not some idealized "rational agent" or transcendent self; that we work with a picture of human nature supported by the best findings of science rather than with a priori conceptions; and that our ultimate goal is the improvement of the human condition rather than the logical beauty of theory.

Such a naturalistic ethic will have much to gain from a study of Kant's philosophy, but given a Darwinian understanding of reason and the emotions, a Kantian/transcendent approach to ethics is no longer compelling.

NOTES

- 1. For works on an evolutionary basis for morality see, e.g., Hamilton 1964, 1–52; Williams 1966; Trivers 1971, 35–57; Dawkins 1976; Alexander 1987; Kitcher 1993, 498–516; Midgley 1994; Dennett 1995.
- 2. This is not to imply that I view humans as just any species of life. I do not subscribe to that use of evolution which denies any special status to humanity. It does imply, however, that we do not possess any unique ontological status, and this seems clearly true. I do want to reserve the right to argue for a moral specialness. (I should point out that this is inconsistent with the lesson

James Rachels [1991] believes evolution teaches. I mention this here because Rachels is engaged in a project similar to mine in his book—that is, rather than arguing for the evolutionary origins of morality, starting with evolutionary theory and attempting to draw lessons from it for our understanding of morality.)

- 3. For a good discussion of this topic as well as some problems with it see Byrne 1995, especially chaps. 12–15. For other discussions of the evolution of the brain see Gazzaniga 1992; Barkow, Cosmides, and Tooby 1992; and Dennett 1995, especially chap. 13.
- 4. It is important to point out that this position is based on recent findings of a relatively new field of study. Our understanding of the evolution of intelligence is actually in its infancy. It may turn out that future investigations of nonsocial intelligent animals (such as the squid) and social but relatively nonintelligent creatures (such as bees and ants) will yield a very different account of the evolution of human intelligence.
- 5. I am here taking, clearly, an adaptationist view of the evolution of intelligence. There is a raging debate in evolutionary theory between adaptationists (for example, Richard Dawkins) who view evolution proceeding primarily via the natural selection of adaptive mutations and "pluralists," such as Stephen Jay Gould (I am using his term here—see the *New York Review of Books*, 12 June and 27 June 1997, for his discussion of this term and the debate), who allow greater influence to means other than natural selection. I cannot say whether a nonadaptationist account of intelligence would change my theory, because I cannot imagine what such an account would look like. But I do want to acknowledge the partisanship of my particular take on evolution. For the adaptationist side of this debate see Dennett 1995.
- 6. I view "and ought only to be" as a rhetorical excess rather than a literal expression of Hume's position in order to protect Hume from violating his own is/ought distinction. He criticized others for slipping from statements of fact to statements of values in the course of an argument, and yet here he goes from "is" to "ought" in the same sentence!

REFERENCES

Alexander, Richard D. 1987. The Biology of Moral Systems. New York: Aldine De Gruyter. Barkow, Jerome H., Leda Cosmides, and John Tooby, eds. 1992. The Adapted Mind: Evolutionary Psychology and the Generation of Culture. Oxford: Oxford Univ. Press.

Byrne, Richard. 1995. The Thinking Ape. Oxford: Oxford Univ. Press.

Damasio, Antonio. 1994. Descartes' Error: Emotion, Reason, and the Human Brain. New York: Avon.

Darwin, Charles. [1859] 1975. On the Origin of Species. Cambridge: Harvard Univ. Press.
——. [1874] 1997. The Descent of Man. Amherst, N.Y.: Prometheus Books.

Dawkins, Richard. 1976. The Selfish Gene. Oxford: Oxford Univ. Press.

Dennett, Daniel. 1995. Darwin's Dangerous Idea. New York: Simon and Schuster.

de Sousa, Ronald. 1987. The Rationality of Emotion. Cambridge: MIT Press.

De Waal, Frans. 1996. Good Natured: The Origins of Right and Wrong in Humans and Other Animals. Cambridge: Harvard Univ. Press.

De Waal, Frans, and Jessica C. Flack. 2000. "'Any Animal Whatever': Darwinian Building Blocks of Morality in Monkeys and Apes." In *Evolutionary Origins of Morality: Cross Disciplinary Perspectives*, ed. Leonard D. Katz, 1–29. Bowling Green, Ohio: Imprint Academic.

Gazzaniga, Michael S. 1992. Nature's Mind. New York: Basic Books.

Gould, Štephen Jay. 1999. Rocks of Ages: Science and Religion in the Fullness of Life. Library of Contemporary Thought. New York: Ballantine.

Hamilton, W. D. 1964. "The Genetical Evolution of Social Behavior," parts I and II. *Journal of Theoretical Biology* 7:1–52.

Hume, David. [1739] 1978. A Treatise of Human Nature. 2d ed., ed L. A. Selby-Bigge. Oxford: Clarendon.

Kant, Immanuel. [1781] 1965. Critique of Pure Reason. Trans. Norman Kemp Smith. New York: St. Martin's.

——. [1785] 1964. Groundwork of the Metaphysics of Morals. Trans. H. J. Paton. New York: Harper and Row.

——. [1788] 1993. *Critique of Practical Reason.* Trans. Lewis Beck White. The Library of the Liberal Arts. New York: MacMillan.

[1790] 1987. Critique of Judgment. Trans. Werner S. Pluhar. Indianapolis: Hackett.
 [1797] 1991. The Metaphysics of Morals. Trans. Mary Gregor. Cambridge: Cambridge Univ. Press.

Kitcher, Philip. 1993. "The Evolution of Human Altruism." *Journal of Philosophy* XC, no. 10:498–516.

LeDoux, Joseph. 1996. The Emotional Brain. New York: Simon and Schuster.

Midgley, Mary. 1994. The Ethical Primate. New York: Routledge.

Oakley, Justin. 1994. Morality and the Emotions. New York: Routledge.

Pope John Paul II. 1996. "Truth Cannot Contradict Truth." Address to the Pontifical Academy of Science.

Rachels, James. 1991. Created from Animals: The Moral Implications of Darwinism. Oxford: Oxford Univ. Press.

Sherman, Nancy. 1990. "The Place of Emotion in Kant's Morality." In *Identity, Character and Morality*, ed. Owen Flanagan and A. O. Rorty, 149–70. Cambridge: MIT Press.

——. 1997. Making a Necessity of Virtue: Aristotle and Kant on Virtue. Cambridge: Cambridge Univ. Press.

Trivers, Robert L. 1971. "The Evolution of Reciprocal Altruism." Quarterly Review of Biology 46 (March): 35–57.

Williams, George C. 1966. Adaptation and Natural Selection: A Critique of Some Current Evolutionary Thought. Princeton: Princeton Univ. Press.