DARWINISM AND DETERMINISM

by Michael Ruse

Abstract. Does Darwinism generally, and human sociobiology in particular, lead to an unwarranted (and possibly socially offensive) determinism? I argue that one must separate out different senses of determinism, and that once one has done this, a Darwinian approach to human nature can be seen to shed important light on our intuitions about free will, constraint, and control.

Keywords: Darwinism; determinism; free will; human sociobiology.

Charles Darwin's great work *On the Origin of Species* was published in 1859. Only now, however, are we starting to appreciate and explore the full implications of Darwin's message: that all organisms including ourselves are the product of a long, slow natural process of evolution brought on primarily by the mechanism of natural selection. It is true, indeed, that Darwin himself appreciated the significance of his work. Particularly in his later publication *Descent of Man* (1871), Darwin showed how he thought his theory impinges upon the most distinctive facets of our natures—including our claim to be moral beings. Yet for many reasons—the incompleteness of the theory, outside hostility, and especially in this century the growth of the social sciences—few felt ready or able to respond to the full challenge and opportunity shown by the *Origin*.

Hence, even as the twentieth century draws to an end, most people are quite indifferent to their evolutionary origins. Although in the intellectual community there are few if any who take literally the story of Genesis, the general presumption is that humans are distinct and unique, as if we were in fact the favored creation of a good god some 6,000 years ago rather than modified monkeys. Homo sapiens is thought to be beyond biology in all important respects.

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Fortunately, this prenineteenth-century attitude is crumbling beneath its own inadequacy. A growing number of scholars from both the sciences and the humanities are starting to realize that a biological approach to Homo sapiens need not be threatening and negative. It can be positively liberating. I am among that number, and in various publications written both separately and jointly with Edward O. Wilson I have tried to state the case for evolution by example. In particular, in light of the most recent developments of evolutionary theory (especially the application of the theory to social behavior, so-called sociobiology), we have tried to confirm and extend Darwin's own thesis about the key to human moral behavior lying ultimately in the mechanism of natural selection. We pride ourselves that this case can now be made with some conviction. (See Ruse 1984; 1986a; 1986b; Ruse & Wilson 1985; 1986. See also Wilson 1975; 1978. We think—and certainly hope—that the reader will see some evolution in the claims made in these various writings.)

However, these are still early days. On the one hand, one expects and receives vigorous criticism from those who still hold dearly to human uniqueness. On the other hand, however successful the central case may be, there remain many implications to be explored and elaborated. In this discussion I intend to bring together these two points, looking at a subject that must sooner or later be discussed by anyone who presumes to write on morality. I refer to the problem of free will and determinism. This is a matter which is of central concern to anyone who thinks about *right* and *wrong* and questions of moral responsibility.

Perhaps not surprisingly, those who criticize sociobiology generally and its application to morality in particular have been loud in their accusations of illicit "deterministic" thinking (e.g., Lewontin et al. 1984; Kitcher 1985). My aim, however, is positive rather than negative; so rather than attempting a line-by-line response I shall reply implicitly. I believe that a biological approach to morality throws very significant light on our precritical intuitive thinking about freedom and determinism, greatly carrying forward our understanding in this area. At the same time I can link my insights with important conclusions established by thinkers from earlier times.

Human Evolution

Let me begin with the essential scientific background. Many more organisms are born than can possibly survive and, more importantly, reproduce. This sets up a "struggle" for resources. The winners in the struggle (by definition the *fitter*) tend to have features not possessed by the losers. Given enough time and enough generations, this ongoing differential reproduction—christened by Darwin, in analogy with the

work of the breeders, "natural selection"—leads to full-blown change or evolution. What must be noted is that the thus-produced organisms do not simply exist in any old fashion. They function in ways directed to the end of successful survival and reproduction. They are organized showing frequently intricate "adaptations" (Ayala & Valentine 1979; Ruse 1982).

Obviously, selection demands a constant supply of new organic variations—raw material—or the evolutionary process would soon grind to a halt. Also it is assumed that there is some kind of stability in the reproduction mechanism; otherwise, a variation conferring fitness (i.e., making its possessor better suited for the struggle) might simply vanish from sight. Fortunately, these and other requirements are known to be true. As a complement within the evolutionary picture to Darwinian selection, they are explained fully in the theory of heredity (genetics) developed in the past century. One of the triumphs of the life sciences in the past three decades has been the introduction of molecular theories and techniques into our understanding of the ways in which variations are produced and transmitted. It is now known that the unit of heredity, the gene, is a complex macromolecule, DNA. Of importance to evolutionism is the fact that genetically based variations appear randomly—not in the sense of being uncaused (in fact much is known of these causes), but in the sense of not appearing to be dictated by needs. There is no direction or teleology of this kind in the story of evolution (Ayala 1985).

Everything we know of our own biological past fits in the above sketch. Indeed, although there are still many gaps, we now know enough that we have passed beyond simply making Homo sapiens consistent with the tale of evolution through selection. We have become strong positive support for the overall story (Isaac 1983; Jerison 1982). The ancestors of the great apes appeared approximately ten million years ago with the future gorilla line diverging a short time later. Our line split from that of the chimpanzees a mere six million years ago (Pilbeam 1984). This fact can be inferred from the incredible genetic similarities between us and our hairy cousins. To place matters in perspective we should note that evolution started over three and one-half billion years ago; thus we have been at one with the chimpanzees for very much more than 99 percent of life's history. If we had not done the classification ourselves, we would be in the same genus as the great apes (Ayala & Valentine 1979).

Two major events occurred since our own line, the hominids, broke away to evolve separately. First, we rose up on our back legs and walked. Second, from about four million years ago, our brains grew three to four times in size, from that of chimpanzees (they were not

chimpanzee brains!) to the present capacity of about 1400cc. With the growth of brain size came a corresponding growth of intellectual ability which can be inferred from the use and type of tools. Why there was a strong selective pressure for such a thinking capacity is still in part an open question. For the Darwinian this capacity could never have "just happened." It could not be an inevitable growth upwards; there had to be some good reason. Thanks to detailed work of paleoanthropologists and others firm answers are starting to develop. It seems fairly clear that cooperation was a significant factor in human prehistory as our ancestors roamed the plains of Africa hunting, gathering, and scavaging especially on the carcasses of large mammals. Large mammals represent a valuable source of protein; thus, the intelligence required to pinpoint and utilize them properly would be of great adaptive value in life's struggles. However, large brains have costs, for instance in increasing the hazards of childbirth and in requiring much parental attention to offspring, but apparently for our ancestors the costs were worth it (Lovejoy 1981).

Our fully developed linguistic ability is probably a recent phenomenon depending for its full capacity upon certain necessary changes in the structure of our throats and mouths (Lieberman 1984). The appearance of Homo sapiens is usually dated from around 500,000 years ago; but full speech as we know it may have come only with the demise of the Neanderthals, a human subspecies, and the rise of modern humans, Homo sapiens sapiens, some 30,000 years ago. Be this as it may, it is from about the latter date that we can trace the explosive growth of a fully developed culture—an explosive growth which leads to modern humans living in today's societies.

Epigenetic Rules

Have we evidence suggesting that biology remains important to us as the twentieth century draws to a close? Is there reason to think that we humans reflect our evolutionary past? Do we work through and because of various adaptations which proved their worth in the struggle for existence even though modern civilization may have softened or at least altered life's traditional demands? At one level we are obviously still biological beings. We eat, drink, sleep, defecate, copulate according to nature's needs. Moreover, in a world where so many go to bed hungry it is surely presumptuous to imply that the struggle has entirely lost its grip in this respect. Yet, what of those things which we tend to think of as specifically human? What of those things we think separate us from the animals? At the ultimate limit what of our thinking—about the world and about ourselves?

The truth seems to be that the human mind (which we take to be an entirely natural reflection of the material brain) is not a *tabula rasa*. It is not some kind of all-purpose computer which exists and is able to guide us through life—any life which we might happen to find ourselves living. On the contrary, the mind is constrained or governed by various innate dispositions which are idiosyncratically human. These have been put into place by natural selection because those proto-humans who thought in such ways were fitter than those proto-humans who did not (Lumsden & Wilson 1981; 1983; 1985).

The innate dispositions, known technically as epigenetic rules, are at two levels. The primary dispositions process the raw information absorbed from the external world. For example, we see colors according to certain (human) universally shared categories. Likewise, we discriminate tastes in various biologically fixed ways. The adaptive virtues of this latter disposition hardly need stressing. The human who instinctively recognizes and prefers sweet things to sour or rotten things is at a clear advantage to the human whose palate is indifferent to tastes.

At the secondary level the epigenetic rules generally serve as guides to action, and they help us to organize our thoughts and desires, and to make sense of the information from without. The rules probably play a key role when we think mathematically. There are no Platonic forms of number that exist in some supersensible world and await our rational intuition. Rather, innately, we think in terms of symbol and quantity because such a way of thought proved its adaptive worth. The secondary rules also are most important socially. For example, virtually all societies have brother-sister incest barriers of some sort (van den Berghe 1983). That there are such obstacles to close mating needs no defense from a Darwinian for there is massive evidence that severe inbreeding leads to horrendously deleterious biological effects. It is in our biological interests that we do not breed with those with whom we have the greatest opportunity—and natural selection has seen to it that we positively do not want to.

Not all of the epigenetic rules play as vital a role now as when they were first formed although mathematical ability—not to mention incest avoidance—still have their uses. The point is that humans in their perceiving, thinking, and acting still have their roots firmly in the soil of their evolutionary past. Natural selection formed us and left its mark.

Evolutionary Ethics

Ethics, the study of morality, is about right and wrong, good and bad. It is about caring for people and why you should or ought to care for people. It is about harming other people and why this is unacceptable behavior. It is about saints and sinners.

There is a long history of attempts to put ethics on a sound evolutionary basis. At least there is a long history of failed attempts to put ethics on a sound evolutionary basis. Unfortunately, the reasons for these failures are obvious in the eyes of most biologists (i.e., those concerned with evolution) and of most philosophers (i.e., those concerned with ethics). On the one hand, evolution seems to preach a doctrine of selfishness, the very antithesis of proper moral behavior. Evolution says that unless you are prepared to go out and grind the other fellow into the ground, he will grind you into the ground. "Nice guys finish last," and for that reason evolution has seen to it that we are not nice. On the other hand, even if you could show that morality was a human adaptation, it would tell you nothing of the value of morality. We want to be good, perhaps. Yet why should we be good other than for the sake of expediency—which seems a very bad reason indeed.

Things *have* moved on. The science of evolution has developed and can now be seen in a new light (in important respects the rediscovered light of the *Descent of Man*). The moral philosophy likewise has been recast and now attempts something which is at once more modest and more ambitious (although again in important respects it must be seen in the rediscovered light of earlier writings). Morality can now be viewed as a natural outgrowth of the evolutionary process; once this is recognized the answers to important questions about its nature and status fall readily into place (Ruse 1986a).

The empirical case for the evolution of morality—a capacity within humans for genuine sentiments of right and wrong—begins with today's understanding of the exact nature of natural selection. Contrary to the belief of many post-Darwin evolutionists (although not Darwin himself), natural selection can never promote adaptations which are of benefit to the group at the expense of the individual. Any cooperation or working together must rebound ultimately to the benefit of the individuals involved rather than residing at some higher level of payoff, whether to the population, the species, or an even larger unit (Dawkins 1976).

Coupled with this theoretical realization about the functioning of selection has come the empirical discovery of the wide extent that animals actually cooperate and work together in the wild (Wilson 1975; Maynard Smith 1978). To use the term that evolutionists have appropriated, "altruism" is a pervasive biological phenomenon. Note that the term *altruism* as used here is a metaphor. Thus used, it simply means cooperation, perhaps at cost to oneself. There are no implications of intention, of wanting to do good, or even of consciousness.[1]

Today's evolutionists have been able to build a number of highly plausible models which explain and predict "altruism" entirely from an

individual selectionist perspective. One model, "kin selection," explains cooperation in terms of the biological benefits that accrue to an individual whenever close relatives reproduce (Hamilton 1964). Another model, "reciprocal altruism," emphasizes the need of each of us for help at various times and the consequently favorable cost-benefits of being prepared to offer help in return (Trivers 1971).

These and other models are a triumph of modern evolutionary studies as they have been confirmed repeatedly while shedding new light on all kinds of puzzling phenomena. Yet, what relevance is all of this to humans and to their being literally altruistic—persons subject to and recognizing right and wrong? The place to begin is with the fact that we humans are almost uniquely in need of "altruism." Although its origin undoubtedly lay in a cause-and-effect feedback process, the truth is that the modern human on one's own would be practically helpless. We have neither weapons of attack nor means of defense. We are not particularly mobile nor particularly agile. We are neither too large to threaten nor too small to be overlooked. Thus, we need each other to survive and reproduce, and others need us.

How have we satisfied this need for "altruism"? The social insects, for example the ants, are highly "altruistic." They are in effect programed to work together harmoniously. They are unthinking cooperators. Yet, this is not our way and it is not difficult to see why this is not our way. Blind "altruism" is an excellent policy as long as nothing goes wrong. However, let there be the slightest disruption, for example a change in environment, and an organism can slip straight into maladaptive behavior and die. To the queen ant the loss of a few hundred offspring is an acceptable cost. To the human being who necessarily puts so much effort into the raising of even one child, the price of programed cooperation is simply too high.

Another way in which human "altruism" might have been achieved lies at the other extreme—an extreme often favored by writers of science fiction. We might have evolved into supercalculating machines able and willing always to work out our own biological interests before making any move. In such a case we would indeed be truly selfish, for every action would be weighed entirely from the perspective of self-gain. However, we have clearly not taken this option—at least not as a general strategy. Reasons are fairly obvious. Apart from the technical details of producing such a brain capable of making such powerful calculations, a being thus endowed would probably be far too slow for real life. Better a "quick and dirty" solution than one which is perfect but which takes weeks to arrive.

To be "altruistic" humans had to move somewhere between the two extremes; here it is time to recall the importance of the (secondary)

epigenetic rules, those innate dispositions which inform our thinking and guide our actions. Simply, our thesis is that among the epigenetic rules are those which incline us to cooperation with our fellow humans. It is the rules which make us "altruistic." Yet what form do the rules have? How do they make themselves known to us? My claim is that the rules make us help each other by making us think we *ought* to help each other! In other words, to achieve "altruism" (in the biological sense) our biology makes us altruistic (in the moral sense).

However, is this genuine altruism—true morality? Are we not rather scheming to achieve our own ends even though putting on a facade of niceness? My response is that although we humans are undoubtedly hypocrites (some of us most of the time and most of us some of the time), we are also genuinely moral. In order for us to break out of our naturally selfish mode natural selection has imbued us with thoughts of right and wrong, good and bad. Stating the matter cynically, we work better when we do things because we think it is right to do such things than when we do things because we conciously see them to be in our evolutionary interests. Although I have dealt with these questions in detail elsewhere let it be emphasized that I am not trying to slide over David Hume's law—the irreducibility of "ought" and "is"—by pretending that there are no real differences between "ought" and "is" statements. It is crucial to my thinking that there are differences. That which gets us to break out of our selfish cocoon is the "oughtness" or morality (see Ruse 1986a; 1986b).

So much for the empirical case. Turning now to the sorts of questions which interest philosophers and related students of human behavior, what does the evolutionary account tell us of the nature of morality? Perhaps even more importantly, what does the account tell us of the status of morality? Even if we grant that we now know how the moral capacity came into being. Why should anyone take morality seriously? Why should we think it to be true?

As far as the actual nature of morality is concerned the scenario I have just sketched focuses upon beings whose moral content would be remarkably similar to those being discussed in recent years by moral philosophers. Morality, as I see it, involves a balance of interests of which we may be (and probably are) quite blind. Humans cooperate because there is more benefit for them if they do than if they do not. This is the ultimate reason, not the proximate reason. Consider the ideas of today's leading moral theorist, John Rawls (1971). He argues that we ought to be just, and to be just we ought to be fair. How do we get fairness? What is its content? Rawls invites us to think ourselves into the "original position," "behind the veil of ignorance." We all want to get as much out of life and society for ourselves as we possible can, but

we are to suppose that we do not know what role or status in society we actually will have. If we knew we were to be female, beautiful, and intelligent, we would maximally reward beautiful, intelligent females. Yet, what if we be male, ugly, and stupid?

In order to avoid the bad consequences Rawls thinks society ought to be balanced, handing out goods and making demands according to our needs and abilities. It seems to me that this is very much in line with the thinking patterns of beings whose evolution I have just sketched. Speaking anthropomorphically (i.e., using the metaphor of design that all Darwinians use when they are thinking about adaptations), we are all in this life together. How can we get the most out of it given that others likewise have such aims, and how must we protect against being one of nature's unfortunates else we simply be exploited? The answer seems to be in being animals with Rawlsian sentiments, that is, in being animals which think that one ought to be just where this cashes out in terms of fairness. Where Wilson and I go beyond Rawls is in showing that evolution actually simulates the original position, whereas Rawls is left lamely saying that it is "hypothetical," thus leaving the origins of morality in limbo.

Somewhat more controversially I argue that our empirical claims have implications about the status of morality. Traditional evolutionary ethics attempts to justify morality simply on the grounds that it—or the human capacity for morality—evolved. This is clearly wrong. Value finds no foundation of this kind within Darwinian theory. Perhaps humans have certain aggressive tendencies because of their biology. This is no justification of warfare. As Thomas Henry Huxley (1894), Darwin's great supporter, pointed out, at this level morality consists in opposing nature rather than in quietly acquiescing in its demands.

Against the traditionalist I argue that evolution *explains* (not justifies) morality in the sense of showing where it came from. Furthermore, once such an explanation is given, one sees that the traditional call for justification is mistaken. There can be no ultimate support for morality in the sense of reasoned absolute foundations. (My position is close to that of the late John Mackie 1977; 1978; 1980. One moral philosopher who has explicitly linked evolution and ethics in the way I suggest is Jeffrie Murphy 1982.)

I am not saying that morality does not exist; nor am I preaching subjectivity and relativism. Morality is part of the makeup of ourselves and of our fellow humans. If there were not a shared morality that is binding, then some of us would be suckers and soon selected out of existence. Yet I do say that the moral capacity is no more than an adaptation like hands and teeth and penises and vaginas. I recognize that the human tendency is to think that morality is more than a mere

adaptation—that it is an insight into objective reality; but I recognize also that we are practically bound to think this, otherwise we would not be altruists, and hence not "altruists." However, as all Darwinians know, our surface emotions are very poor guides to what is truly the case.

I shall say no more about my views now, except to note that my position on morality—known technically as *moral skepticism*—has a distinguished philosophical heritage. In particular, although no evolutionist, the great eighteenth-century Scottish philosopher David Hume (1978) argued for a very similar perspective: "vice and virtue . . . may be compar'd to sounds, colours, heat and cold, which . . . are not qualities in objects, but perceptions in the mind" (Hume 1978, 469). Hence: "Morality, therefore, is more properly felt than judg'd of" (Hume 1978, 470). Keeping this historical point in mind we can now go on to explore some of the consequences of our claims about humans and their morality.[2]

Three Kinds of Determinism

It was Aristotle who most clearly stated that morality presupposes and demands some sort of freedom—some sort of ability and opportunity to put one's will into play. The prisoner locked away in his cell can hardly be held responsible for the riot going on outside. Likewise the man thrown overboard to lighten the raft may merit our pity but if he went kicking and screaming he hardly merits our moral approbation as did Captain Oats when he left the tent on Robert Scott's ill-fated return from the South Pole. (We who threw the unfortunate overboard, however, are another matter.)

As Aristotle also realized matters are somewhat (a great deal!) more complex than this. The person in chains is unambiguously excused from moral responsibility. However, what about the person in the grip of some strong emotion? Do we want to excuse him/her from moral responsibility, and if so why, and if not why not? We certainly seem to think that not everyone is responsible for his/her actions. The idiot, for instance. Yet, what about the drunkard or the schizophrenic?

To state the matter mildly you might think that my biological approach to human nature exacerbates the problems of human freedom. Critics certainly think so and have argued the point loudly and at length! If everything about us is a function of the forces of evolution—the units of heredity (the genes) as gathered by natural selection—and if we are programed to survive and reproduce, then what hope is there of freedom? We are machines determined by our biology to go through life doing what we do with no more moral standing than any other machine (taken in its own right), namely none (Kitcher 1985).

Furthermore, matters are not helped much by popular accounts of human sociobiology, which are frequently illustrated by pictures of people with clockwork keys in their backs or (a favorite) suspended like marionettes from genes overhead (often graphically put in the form of a DNA molecule). At the very least we are like the poor fools in an Italian tragic opera buffeted by the forces of fate beyond our sight and control. We can take no credit and deserve no blame for our acts, which is perhaps just as well for, as has just been seen, our central thesis is that morality is an illusion.

I will say no more about this final charge. The very essence of my case is that morality is not an illusion; it exists and is genuine. What is illusory is the objective referent that people think morality has; however, that is entirely another matter. Here I want to concentrate on the charge that my approach in important, vital respects circumscribes human freedom, thus making genuine moral choice impossible. Indeed, in the eyes of some critics, I am opening the way for the acquiescence in, if not positive endorsement of, all kinds of vile social attitudes and policies.

Understanding the opposite to freedom being in some general sense "determinism," my reply is that my position is not in some peculiar or offensive way deterministic. Further, I argue that charges are generally based on confusions or worse. When these confusions are sorted out, I have much of importance to say on the whole question of freedom and determinism. Emphatically, what is not the case is that my approach denies the possibility of genuine moral thought and behavior.

I want to distinguish three main senses of determinism. I shall discuss each one in turn. Once various ideas have been separated, matters will become much clearer.

Causal determinism. First, there is the whole question of *causation*: its bearing on the free will question in general and on my biological perspective in particular. The general argument is straightforward and well known. The world around us seems not to be one of randomness and chaos with things happening in a haphazard manner. Rather, events are ordered, subject to regularities which hold "anywhere and anywhen" (Smart 1963). These regularities expressed by scientists as laws of nature apparently represent necessary connections obtaining between the world's object or events, so-called causes and effects. Given the causes, then the effects must happen. Humans seem to fall within the causal nexus. Everything we do and think is cause of future events and, more significantly, effect of past events. This being true, we are obviously determined in our thoughts and actions. Hence, we have no genuine freedom and morality is a facade.

At this particular level the charge is that my Darwinian approach simply drives yet one more nail into the coffin of causal determinism within which lies the corpse of free will. I argue that humans are products of their biology, and that this biology still shows its effects in what we think and do. We accept that which we call morality because natural selection makes us do so, and because we accept that which we call morality we are led to behave "altruistically." Bob Geldorf cares for the unfortunate of Africa because his ancestors had that which enabled them to out-reproduce other would-be humans. This is no genuine morality—just the endless waves of struggle and reproduction, success and failure.

In reply to the charge of endorsing causal determinism I plead guilty! In a sense the thesis that the world is bound by cause and effect is not a proposition of science. It is rather a metaphysical presupposition of the possibility of doing science. Unless you think the world is regular, you can hardly attempt to explain the world in terms of those regularities. Yet, the thesis is not unreasonable. As science succeeds, it justifies the presumption. There is a circle here, not of the vicious variety but of the feedback type. The more you learn of actual causes and effects, the more it is reasonable to assume apparent anomalies will someday likewise fall beneath cause and effect. (I will here ignore all points about quantum mechanics and statistical regularities. Essentially, they leave my argument untouched.)

Everything upon which I have drawn and towards which I argue supposes and supports the thesis that Homo sapiens lies absolutely and entirely within the causal network. I presume that it does and the presumption pays confirming dividends. The science on which I base my case says this: humans evolved according to the usual causal laws of biology. The science/philosophy which I extract says this: the deepest aspects of the human personality are natural in origin and working. We apprehend goodness causally. We are good causally. We fail to be good causally. If I am correct in what I argued in the earlier sections of this discussion, causal determinism triumphs again.

However, what I would argue is that none of this is in any sense a true threat to freedom and morality! On the contrary, the genuinely free will does not exclude causal determinism, it demands it! Consider for a moment an unambiguously good act: Mother Teresa tending a dying man, and doing so (as we suppose she does) simply because it is right. What is going on here? Why does she wipe his fevered brow? Because she thinks it will comfort him and because (thanks to her beliefs) she wants to do it. Yet why does she want to comfort him? Ultimately she does because of factors in her past such as the moral training of her parents and her church. Whether this training is uniquely enough is, of course, where disputes come in. The point is that her past does play a

role, and the more you understand Mother Teresa the more it looks like a determining role.

All of this is starting to look very much like a causal situation, and it looks a lot more like one when you consider the alternative. Mother Teresa wipes the dying man's face but this action is the effect of nothing. Physically it just happened like the roll of the dice coming up six. (This roll is not uncaused but it gives the idea of an uncaused event.) You might perhaps say that although she wiped the face because of her beliefs, this provided "reasons" rather than "causes" of her actions. Yet unless you allow that in some sense reasons (or beliefs) can act as causes, you are left with the mysterious behavior of Mother Teresa—at the physical level, at least. More than this, you are left with acts for which she deserves no moral credit. Suppose your hand moves, uncaused, and pushes the bank robber's gun out of the way. Why should you get credit? Credit is merited only when behavior follows from past decisions, acts, beliefs, and so forth.

The result of all this is that morality positively presupposes a causal nexus, within which we all lie. Hence, in endorsing a causally deterministic view of humanity I am certainly not *per se* eliminating the possibility of freedom and morality. (This is not yet saying that my particular view leaves room for morality.) I might add as I bring this subdiscussion to a close that I know I am hardly being original in arguing that freedom and morality presuppose a causal perspective. Technically, my position is known as soft-determinism or compatibilism. Its most persuasive exponent was Hume in his *Treatise of Human Nature*. Given that my general approach to morality is Humean in spirit, it comes as no surprise to me that we should still be following in his intellectual footsteps.

Biological determinism. The second sense of determinism is more distinctively *biological* in nature and may be thought to pose a special threat to a position like mine. To lay out this charge we start with the claim that biology, specifically evolution through natural selection, led to human nature. Not only did it lead to the human universals such as linguistic ability; it also led to human differences, for example, those between black and white, male and female, bright and stupid. Furthermore, the implication if not the explicit claim is that these features are fixed absolutely. Blacks like rhythm and crime, whites do not. Males like fighting and sex, females do not. The brights like poetry, the stupids like pushpin. This is the way nature made us, and this is the way it has to be.

Clearly says the critic we have determinism here, and a most offensive kind it is, too. All sorts of prejudices—white, male, Anglo-Saxon,

Protestant prejudices—are being dressed up as science and forced down the listener's throats. Moreover, quite apart from the unpleasant moral implications of such a view—blacks, women, and the less gifted are being labelled innately inferior—the very possibility of genuine morality itself is being thrown out of the window. Rape, for instance, is being condoned as part of male nature and thus excusable on account of its unavoidability. Conversely, blacks are regarded as less than full moral beings because of their biological propensity to violence. We lock them up not because they merit punishment but because they are wild animals that need to be caged.

In order to counter fears like these just expressed, we must untangle two separate threads running through the critique. On the one hand, there is the claim that biology determines human nature including differences between natures. On the other hand, since biological determination in itself hardly threatens morality, there has to be the claim that aspects of human nature are such as to make genuine free choice impossible (as if we are all clockwork toys). Alternatively, there has to be the claim that aspects of certain human natures, presumably biologically determined human natures, are such as to make genuine free choice impossible for these people (as if they alone are clockwork toys). Claims of this second kind I will leave for now because they fall within the domain of the third kind of determinism I will discuss. Here I will concentrate on the first claim—the heart of the charge of biological determinism—although take note that even if it be true, genuine morality may still be possible. Despite having a strong sexual drive, you can still be a moral being. This holds true whether the drive be a function of your genes or of an excess of *Playboy*s in your youth.

What about the charge of biological determinism? Are humans what they are as a function of their genes? Do we have our physical, behavioral, and mental features willy nilly? The answer, as any biologist knows or should know, is yes—and no (Bateson 1983). On the one side, we are what we are because of our biology. We are bipedal, we have large brains, we are rational because of our particular genetic constitution as put in place by natural selection. You cannot make a silk purse out of a sow's ear. You cannot make a human being out of a sow's genes. There is no reason to think that the human mind innately (i.e., from a biological point of view) is a blank sheet waiting to be written on anew in each generation. We have a natural tendency or disposition to be moral just as we have a natural tendency to walk on two legs. In this sense our morality is determined for us.

Yet, on the other side, we are what we are because of our biology *in conjunction with the environment*. Asparagus is green; if you grow it in the dark, it is white. Dogs are friendly; if you beat and starve them, they are

vicious. Scotsmen are as tall as Englishmen; if you feed them simply on oats they are runts. As well-known, long-term study has shown how in this century, thanks to improved nutrition, the height and physique of the Scots has improved dramatically (Dobzhansky 1962).

Applying this second point to human thoughts, behaviors, and intentions, we expect to find—indeed we do find—that humans can be altered by their environments including especially their cultures. I refer here to education, social customs, and much more—not forgetting basic nutrition (even in America, for instance, much mental retardation still results from protein starvation). I see no reason to deny the obvious, namely that in their beliefs and behaviors humans are particularly malleable. (I speak now of the effects on development. Adults can be most stubborn.) The Jesuits did not boast for nothing that they could hold and form a person for ever as long as they had him (her?) until his seventh year. I doubt that humans are indefinitely malleable, but I strongly endorse the claim that social change is best effected by education rather than by drastic eugenic programs. Could you "educate" someone to be totally immoral or amoral? This strikes me as an empirical question, not to be answered simply by armchair reflection. I suspect, however, that it might not be as easy as you think; if certain thoughts and behaviors are highly adaptive, biology will make them fairly resistant to outside influences.

Whether or not I am right in what I claim, there is nothing particularly worrisome from a moral standpoint in my position. What of the more troublesome issues about biologically determined differences between people? It cannot be denied that evolutionary theory leads us to expect intraspecific biological variation and that this would extend to human thought patterns and behaviors. Moreover, the evidence from more direct (especially molecularly based) studies of Homo sapiens strongly confirms the existence of widespread biological variation within the species, and in some cases it is certainly known that this variation affects behavior. How much of a general effect this variation has on the various roles that people play in societies (pre and postindustrial) is a highly controversial question. I am reluctant to get too far sidetracked specially since I (with Wilson) have discussed the matter in some detail elsewhere (Ruse & Wilson 1986). It is, however, plausible and strongly backed by a range of studies that many of the various factors (e.g., intelligence) which are loosely related to human success within their groups have a biological component in their causal background (Scarr & Carter-Saltzman 1982).

Perhaps even more controversial than claims about variation in abilities between members of Homo sapiens taken as a whole are claims about variations between groups such as Europeans and black Afri-

cans. It is known from direct studies that most genetic variation spreads across the human species; it is not confined to the gaps between groups (Lewontin 1972). Moreover, it is worth remembering that Darwinians expect systematic variation to be associated with direct adaptive advantage at some point, past or present. It is plausible to link skin color variation to sunlight variation. It is quite another matter to argue plausibly for broad, biologically linked, behavioral variations. They may exist but their expression may be far more subtle than anyone expects. Consider the often noted differences between Western and Eastern drinking practices with Westerners tending to drink far more in less inhibited ways. This may be linked not to oriental genes for abstinence but to the differential ways in which various peoples can synthesize ethyl alcohol. Putting the matter bluntly, the Chinese and Japanese are far more prone to hangovers, although where the adaptive value lies in such matters remains obscure (see Ruse & Wilson 1986).

The dangers of simplistic conclusions about the significance of biological factors in questions of the sort just discussed was underlined by two recent separate reports in the British Press (see *The Times*, 19 & 21 June 1986). According to a ministerial statement in Parliament, on the average blacks (people of African descent) are over *ten* times more likely to go to prison than whites. I would argue that before one starts spinning hypotheses about black innate tendencies to violence, one ought to consider both the appalling social conditions within which many blacks live (and the grotesquely high unemployment) and the attitudes of the overwhelmingly white British police, judiciary, and juries. The virtues of such hesitation was confirmed by the release later in the week of a government-sponsored report detailing how the ratio of black children living in London who are unable to understand over 50 percent of what their teachers say on a daily basis is 79 percent. These children speak and only understand an idiosyncratic mixture of English and Creole.

The terrors of biological determinism have been much exaggerated. This applies even at the one point where there surely are some biologically based attitudinal and behavioral differences between humans, namely those between the sexes (Hinde 1984). Here there really is theory backing empirical findings, or there is much within modern Darwinian thought to suggest that creatures like ourselves will have sexually dimorphic reproductive strategies and that the differences will go beyond the purely physical. Yet, do not conclude that now, at last, we are facing pure biological determinism. The rapid changes between the sexes in Western society in the past two decades speaks most eloquently against this conclusion. At most, to use somewhat

notorious words, "the twig is bent a little" (Wilson 1978). No one is arguing that all is fixed at conception. Most particularly, no one is decrying the virtues of equality of opportunity.

Control determinism. I move now to our third and final sense of determinism, namely that centering on *control.* A great deal of the worrying about freedom and determinism in the context of morality centers on the question, who is in charge? In particular, is it I who am running my life, or my emotions? Let us grant the Humean point that true freedom lies not in some beyond-causation nirvana but in an absence of constraint. The prisoner is not a responsible moral agent, not because he is causally bound but because he is physically bound. The question now centers on the problem of life's straight jackets, particularly those of a psychological or internal nature.

The point at issue is that we all recognize the existence of internal constraints, which sometimes can be so powerful and overwhelming that the individual is not truly free. There is such a great compulsion that the person's actions are determined, and no moral fault (or praise) can be ascribed. We do not blame him or her, or punish him or her. This is something that can be properly done only to a free agent.

Now the worry is that our biological approach pushes the psychological constraint problem to the limit. Thanks to evolution we are so bound by our emotions and feelings that we are truly free in nothing we do. We are automata or marionettes controlled by strings which lead, first to our genes, and then through them to the forces of natural selection working on our would-be ancestors. We are, in fact, little more than large, white ants.

The philosopher Daniel Dennett has stated the point well. He quotes the following passage from P. Wooldridge:

> When the time comes for egg laying, the wasp Sphex builds a burrow for the purpose and seeks out a cricket which she stings in such a way as to paralyze but not kill it. She drags the cricket into the burrow, lays her eggs alongside, closes the burrow, then flies away, never to return. In due course, the eggs hatch and the wasp grubs feed off the paralyzed cricket, which has not decayed, having been kept in the wasp equivalent of deep freeze. To the human mind, such an elaborately organized and seemingly purposeful routine conveys a convincing flavour of logic and thoughtfulness—until more details are examined. For example, the Wasp's routine is to bring the paralyzed cricket to the burrow, leave it on the threshold, go inside to see that all is well, emerge, and then drag the cricket in. If the cricket is moved a few inches away while the wasp is inside making her preliminary inspection, the wasp, on emerging from the burrow, will bring the cricket back to the threshold, but not inside, and will then repeat the preparatory procedure of entering the burrow to see that everything is all right. If again the cricket is removed a few inches while the wasp is inside, once again she will move the cricket up to the threshold and re-enter the burrow for a final check. The wasp never thinks of pulling the cricket straight in. On one

occasion this procedure was repeated forty times, always with the same result (Wooldridge 1963, 82; quoted in Dennett 1984, 11).

Then, he characterizes this aspect of the free will problem as the problem of "sphexishness." "The poor wasp is unmasked; she is not a free agent, but rather at the mercy of brute physical causation, driven inexorably into her states and activities by features of the environment outside her control" (Dennett 1984, 11). How do we know that we humans, thanks to our evolutionary background, are not sphex-like, going through the motions with no real control? (The term *sphexishness* is due to Dennett's friend and sometime collaborator Douglas Hofstadter [1982].)

As soon as matters are stated this bluntly, you should at once be starting to feel ill at ease. Remembering back to the discussion about the evolution of morality, *the whole point was that humans are not ant-or-wasp-like*. We are not determined by our genes to do things without thought like machines. Morality opens up a flexibility in humans which enables us to respond according to the situation. It is in this capacity to respond that I believe you can locate all of the freedom it is possible or necessary to have.

In order to make my case, let me elaborate in light of recent philosophical writings on the matter of freedom and determinism (e.g., Frankfurt 1970; Watson 1975; Neeley 1974; and Slote 1980). Freedom according to my conception lies in our being able to control our emotions. We rule them rather than having them rule us. What does this mean exactly? It means (using ideas which return to Plato's *Republic*) that we have the ability to bring our emotions into line with and to the service of other "higher" aims or wishes that we have. Clarifying further, let me distinguish between first-order desires and second-order desires. Taking an example (Plato's), a first-order desire might be to assuage thirst and a second-order desire might be to go on living. The free person is he or she who can use the first-order desire in the service of the second-order desire. This means that one can actually act on the basis of the second-order desire even though there may be other first-order desires or external factors going against it. Knowing that a pond is poisoned, the free person is one who can deny his or her thirst. The uncontrolled person is one who cannot deny the thirst. The nonperson or wanton is one who without second order desires lets his or her first-order desires rule the day.

As thus characterized, there is no question of the ant being free. Even if it has first-order desires (doubtful), it has no second-order desires to guide it. The ant does not say: "Should I help my sister now?" Humans to the contrary are free. Our moral aspirations make up our second-order desires, and our freedom lies in bringing first-order feelings and

emotions to the ends of morality, so we actually do that which is moral. True freedom lies in the fact that there may well be other first-order desires pushing me away from morality. I see a child lying sick, possibly with a contagious infection. I should help, yet I am afraid. Nevertheless, I am sufficiently in control of myself—using other emotions like pity, self-pride, and more—freely to aid the child. The person who is not free is the one whose supreme second-order desire is to help but who is "paralyzed" by fear. (Plato's example in the *Republic* was of Leontius, son of Aglaion, who wanted not to gaze on the executed prisoners but whose base nature proved too much for him. He was "out of control.")

Freedom, therefore, does not lie in choice over our emotions or our goals in life. It may well be that these are thrust upon us. Indeed I accept that there is more than a hint of biological determinism about the fact that we are moral beings at all. The place where freedom enters—making it possible for us to be moral beings—lies in our ability to use our first-order feelings to achieve ends specified in our second-order desires. That is where control and responsibility come into our lives, and everything in the evolutionary account of morality affirms that humans, in this vital respect, are free, moral beings.

The analogy which springs to mind, distinguishing us from the ants, is that focusing on various types of missile. Ants are like missiles with fixed paths. If the goal is stationary, they work perfectly. We are like missiles with guidance systems. We are more difficult to produce but if the goal moves we can respond accordingly. This holds true even though our end remains unchanged (Ruse 1986b).

Note how this analogy brings out the fact that our abilities to use first-order desires to achieve second-order ends are intended to be normal, causally governed mechanisms, as are the guidance mechanisms of missiles. It is worth quoting Dennett on this point:

> Contrary to the familiar vision, *determinism does not in itself "erode control"*. The Viking spacecraft is as deterministic a device as any clock, but this does not prevent it from being able to control itself. Fancier deterministic devices cannot only control themselves; they can evade the attempts of other self-controllers to control them. If we are also deterministic devices, we need not on that account fear that we cannot be in control of ourselves and our destinies.
>
> Moreover, *the past does not control us*. It no more controls us than the people at NASA can control the space ships that have wandered out of reach in space. It is not that there are no causal links between the Earth and those craft. There are; reflected sunlight from the Earth still reaches them, for instance. But causal links are not enough for control. There must also be feedback to inform the controller. There are no feedback signals from the present to the past for the past to exploit. Moreover there is nothing in the past to foresee and plan for our particular acts, even if it is true that Mother Nature—gambling on our general needs and predicaments—did, in effect, design us to fend quite well for

ourselves. Far from it being the case that we are completely under the control of our ancestors or our evolutionary past, it is rather the case that that heritage has tended to set us up as *self*-controllers—lucky us (Dennett 1984, 72).

Implications

Let me make some comments on my position while elaborating and showing its strength.

First, note how readily I can account for the fact that people get out of control. It is all a question of emotions and of whether they can be brought into line. At times of extreme stress, for example, someone may "go over the edge" and lose control of an otherwise governable emotion. Notice also how our basic intuitions are sensitive to various nuances. We may not find the man who kills in a drunken rage guilty of murder. His drink put him out of control. Yet, we might find him guilty of manslaughter and punish him accordingly; he was in control of the situation when he became drunk and he should have known better.

Could it be that some people have more control and that because of evolution this is reflected in a systematic way in Homo sapiens? One suggestion might center on male and female sexual desires. Certainly most societies assume that males are less in control of their emotions than females, and judge them accordingly. "Even the nicest boys are after only one thing. It's not their fault. It's part of their nature, and it's up to you to stop them"! Again, this fits in with what we know of male and female biology. Females simply have to have more control because they get pregnant. Do not misunderstand me. This is not an argument for exonerating the rapist from moral responsibility. Clearly, modern contraceptive technology has lifted some of the reasons for self-restraint although social diseases seem to have brought back reasons for control by both sexes.

One point which has been hovering for some time now should be stressed. I see no inherent reason why first-order emotions brought on by a fairly significant biological component should be less under control than emotions with a more significant environmental causal component. By definition they will not be so amenable to environmental manipulation, but that is another thing. Biological determinism does not imply control determinism. In fact it is too easy to think of cases where the environment brings on emotions quite out of control. Think of the adult systematically starved as a child who is now a compulsive eater.

Second, let us ask about whether morality is our only second-order desire or set of desires. Some argue that it is (Wolf 1980). On biological grounds I doubt this unique status of morality. It seems clear to me that we have other second-order desires, particularly that centering on

self-preservation and reproduction, considered in some broad sense. These can conflict with morality and in serving them one freely does that which is wrong. Such a person is and can be knowingly immoral. The immoral person is one who denies moral goals. The amoral person has no such goals at all.

A variant of the morality-as-unique-goal argument allows that there are other goals but claims that they will always harmonize with morality. Plato, for instance, seems to allow the logically distinct goal of personal satisfaction, but he then argues in the *Republic* that only the truly good person is the truly happy person. Hence wrongdoing is always ultimately a function of ignorance. I doubt that this is always true. Personal well-being and morality may both have their biological functions, but like bipedalism and large-brainness they may (as at childbirth) clash. Doing good may bring peace of mind, but doing wrong may have its compensating pleasures. This is not to say that I think you need not always do good. You should, but because it is good, not because of other payoffs.

Third, there is the question of ignorance. It is clear that knowledge, particularly self-knowledge, is a factor entering into our thinking about freedom and responsibility. Consider homosexuality (Ruse 1987). In days of yore even having homosexual thoughts and desires was thought to be sinful. Today thanks to the advent of psychiatry it is recognized that no responsibility lies at the feet of the person, male or female, with homosexual inclinations. We now see that these are things over which we have no control. The person with homosexual inclinations no more chooses to have these inclinations than the person with heterosexual inclinations.

There is still debate about whether the inclinations are so strong that no guilt should be felt at subsequent acts. Among other things this shows that even with improved knowledge we sometimes find that our first-order desires or inclinations are so strong that we cannot achieve second-order goals. Fortunately, this is not necessarily the end of the matter. Recognizing the first-order desires and their force may be the first move towards bringing them under control. This was the hope of Baruch Spinoza and is certainly the program of Sigmund Freud and his followers. "The truth shall set you free." (It has not gone unnoticed that Spinoza and Freud draw on the same Jewish tradition [MacIntyre 1967].) I hasten to add that I do not intend to suggest that homosexual acts ought to be prescribed, or that they are morally wrong. Nor, indeed, was this the suggestion of Freud.

Fourth and finally, let us ask about our second order desires and goals. Might not these themselves be subject to control, perhaps beneath third-order principles? As noted, we do not (in the normal

course of life) choose our second-order principles; these are thrust upon us (by biology and training and so forth). Indeed, I think this is a strength of the biology-acknowledging position over rival accounts of the origin and nature of morality such as social contract theories. Right is right, and not because we set it up and choose to follow it. However, having said this much, remember that nothing is fixed absolutely by biology or culture—or, if fixed for us, then not for our children. Could it be that we might want to bend our second-order desires to third-order ends, perhaps even wanting to manipulate the second-order through artificial interferences in the normal course of life?

This raises a question about the second-order desires. What is there beyond morality and personal existence? Thus posed, the question probably only becomes meaningful (and then it becomes important) if one distinguishes not so much between morality and something higher but between levels of morality (and personal existence) itself. Thanks to biology we have immediate moral urges—helping individuals and so forth—but thanks to our intellects we see that in the long run such immediate urges may be self-refuting. We want to let all persons have the freedom to determine the number of members in their family, but because of technology the effects will be disastrous—morally and to personal survival. This suggests the need for a second level of control and freedom, between immediate moral urges and more reflective long-term plans. Whether this need can be satisfied is a moot question, but in line with what we have just said about freedom and ignorance, our biological approach is at least a small step towards a fuller understanding.[3]

Conclusion

It will take a long time to work out the full implications of an evolutionary approach to humanity. I trust I have shown that the effort is worth it. New light is thrown on old problems; the best of previous thought is cherished and elaborated (which is what we, as evolutionists, would expect); and the critics can be answered in a constructive manner. Supposed faults turn out to be significant strengths. What more can one ask of any position?

NOTES

1. When I use the term *altruism* in the metaphorical biological sense, I will use quotation marks: "altruism." This will contrast with the term in the literal moral sense which will be used without quotes: altruism.

2. The "skepticism" in "moral skepticism" refers to doubts about ultimate foundations. No one doubts that there is genuine morality or altruism. The whole point is that there is.

3. Of course in a sense we *do* already interfere with second-order principles. Jehovah's Witnesses, for instance, give their children special training (indoctrination) to

make them believe that blood transfusions are immoral. However, this is basically a question of getting the principles right—in one's own opinion. However what if one thinks the principle is a good one yet will lead ultimately to disaster? Here it seems one appeals to a higher level of desire or goal.

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