THE DILEMMA OF SCIENCE AND MORALS

by Gunther S. Stent

Ever since the sixteenth century, when Francis Bacon put forward the then novel creed that science provides a hope for a better world, there have arisen conflicts between science and morals. But right from the very start of modern science and with the case of its founder, Galileo, these conflicts were always resolved in favor of science in the long run. By the end of the nineteenth century the triumph of science over traditional, and particularly religious, morals seemed so complete that God was found to be dying. Faith in God came to be replaced by scientism, or the belief that ethical insights, formerly based on metaphysical concepts, could now be derived from objective scientific knowledge. One brand of scientism in particular, namely, dialectical materialism, was to find wide acceptance as a twentieth-century ersatz religion. But despite the seeming hegemony of scientism in the everyday life of contemporary secular societies, there not only still arise some troublesome conflicts between science and morals but the credibility of the Baconian creed of salvation through science is itself fast losing ground in its Western heartland. This latter-day growth of antiscientific attitudes is as serious as it is surprising because, far from its reflecting the views of ignorant rabble-rousers or religious zealots, it is occurring among the young intellectuals of the New Left. That is to say, it has infested the minds of the very group that would ordinarily furnish the recruits for the next generation of scientists. Alarmed by this development, the Old Guard has been defending the Baconian creed by means of righteous sermons. But these sermons have little effect; their language of indignant reason does not reach the ears of the young infidels and does no more than preserve the courage of the true believers.

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Much of the attack on science by the New Left, as well as its defense by the Old Guard, is preoccupied with the so-called misuses of science in war and in peace—with the killing and maiming of defenseless civilians, with the control and exploitation of subject peoples, and with the despoilment and pollution of the earth by the technological fruits of modern research. The Old Guard, of course, deplores these misuses as much as the New Left. But in the view of the former it is wrong to blame science only for our problems while ignoring its contributions to our welfare. The way to avert these misuses, so the sermons usually proclaim, is not to stop doing science but to give them political and scientific remedy. Anyhow, how will we ever be able to feed the hungry of the world and to cure cancer if we turn away from science now?

In my opinion, these discussions rarely consider a deeper cause of the contemporary decline of the Baconian creed, which is philosophically more troublesome than the misuses, inasmuch as it has no remedy, even in principle. I am referring here to the moral difficulties which have arisen from some applications of science which, far from being meant to kill or enslave people or to destroy nature, are intended to augment human welfare and which nevertheless have sinister implications. It is to this latter category that some of the present and proposed applications of human biology belong. Despite their overt philanthropic intent, these applications seem monstrous and evoke the specter of Doctors Strangelove and Frankenstein. The thesis that I shall try to develop in this essay is that the moral dilemma posed by benevolent science (in contrast to its malevolent applications) is not so much that science sometimes conflicts with ethics as that the growth of scientific insights and the power that has developed from them have made it evident that the ensemble of traditional Western metaphysics and morals which spawned science in the first place is inconsistent.

Contradiction in Western Moral Tradition

According to Isaiah Berlin, the contradictory character of the Western moral tradition was discovered, or at least plainly stated, by Machiavelli a century before Galileo even opened the door to modern science. Berlin expresses the view that Machiavelli is one of the great enigmas of Western letters.[1] For at least four centuries now, there has been a debate about just what it was that Machiavelli had intended to convey in *The Prince* and the *Discourses,* despite the fact that he was a most lucid writer. How is it that, although Machiavelli's text is perfectly clear, people continue to argue about what it is supposed to mean? Moreover, his writings have earned Machiavelli an ecumenical

and everlasting hatred of men representing the whole spectrum of religious, philosophical, and political thought. How is it that his publication of a bit of advice to a Renaissance prince has managed to offend Catholics and Protestants, autocrats and democrats, reactionaries and revolutionaries across the centuries? Berlin's answer to these questions is that Machiavelli published a most disturbing insight which no ideologue who has a plan, no man who has a dream, can really accept, to wit, that the ensemble of our aims is inconsistent. Hence, the City of God cannot be realized on earth, not because of the frailties or imperfections of man but because that City is meant to satisfy mutually incompatible goals. The pope, Martin Luther, Frederick the Great, Karl Marx, and Bertrand Russell all may differ in their vision of the City of God and/or in how to go about building it, but they all share essentially the same ethical system and the fervent belief that such a thing as an ideal society can exist. No wonder that Machiavelli's subversive message that no such society is possible has made him appear as the Devil incarnate.

The contradiction to which Machiavelli drew attention is not, as has often been alleged incorrectly by commentators on *The Prince* and the *Discourses*, between morality and politics but between two incompatible systems of ethics that form part of the Western cultural heritage. One of these, which Berlin terms "Christian," envisages morality as being based on "ultimate values sought for their own sakes—values recognition of which alone enables us to speak of crimes or morally to justify and condemn anything."[2] The other system of ethics, which Berlin terms "pagan," derives its authority from the fact that man is a social animal who lives in communities. In the pagan system there are no ultimate values, only communal purpose, and hence here moral judgments are relative rather than absolute. Or, more simply stated, the two mutually incompatible aims projected into the City of God are freedom and justice for the individual, on the one hand, and law and order for the body politic, on the other. From this insight of Machiavelli it follows, according to Berlin, "that the belief that the correct, objectively valid solution to the question of how men should live can in principle be discovered is itself, in principle, not true."[3]

But what is the source of the belief in an objectively valid set of ethics in the first place? It is the doctrine which in one version or another has dominated Western thought since Plato "that there exists some single principle that not only regulates the course of the sun and the stars, but prescribes their proper behavior to all animate creatures."[4] Central to this doctrine is the notion of God, or His atheistic equivalent, Eternal Reason, "whose power has endowed all things and creatures each with a specific function; these functions are

elements in a single harmonious whole and are intelligible in terms of it alone. . . . This unifying monistic pattern is at the very heart of traditional rationalism, religious and atheistic, metaphysical and scientific, transcendental and naturalistic, which has been characteristic of Western civilization. It is this rock, upon which Western beliefs and lives have been founded, that Machiavelli seems, in effect, to have split open."[5]

To illustrate the ethical contradictions to which he drew attention, Machiavelli provided some concrete examples from politics, statecraft, and warfare of classical antiquity and Renaissance Italy. In this essay, I present some examples from modern science in order to try to show that Machiavelli's discovery can also illuminate its troublesome and equivocal moral role.

The first example we might consider concerns the teaching of evolution in the public schools, which evidently has come a long way from the days of the Scopes Monkey Trial in Tennessee half a century ago. In 1972 the Curriculum Commission of the California State Board of Education held hearings in response to the demand of some Christian fundamentalist groups that in the officially approved biology textbooks the biblical account of Creation ought to be presented on an equal footing with the Darwinian view as an explanation of the origin of life and of the species. Although much of the argument before the Commission pertained to the question of whether the theory of evolution is merely an unproven speculation, as alleged by the fundamentalists, or a solidly documented scientific proposition, as claimed by the biologists, the deeper point at issue was religious freedom. For the fundamentalists held that a Christian child in a tax-supported school has as much right to be protected from the dogmas of atheism as an atheist child has to be protected from prayer. Hence, it would follow that the classroom teaching of Darwinism as the only explanation of biocosmogony is an infringement of the religious freedom of Christian parents to raise their children in the faith of their choice. This argument seems completely justified, whether or not it is true as claimed in pro-Darwinian testimony at the hearings by liberal, apologist clergymen that one can be a good Christian without taking the biblical account of Genesis all that literally. After all, the fundamentalist faith *is* to take the Bible literally. But the inference that follows from admitting the justice of the fundamentalist claim is not that biology texts should give Genesis equal time with evolution. Rather, it is to be concluded that no public school system can operate effectively in a heterogeneous social setting without having its curriculum prejudice the minds of the pupils against the cherished beliefs of some of the citizens. In other words, in this case the ultimate

Christian ethical aim of freedom and individual rights has to give way to the pagan aim of mounting a pedagogically effective society.

A second example is provided by recent radical criticisms directed against involuntary confinement of persons in mental hospitals and, indeed, against the very concept of insanity. For instance, Thomas S. Szasz has argued that mental illnesses are not genuine diseases and that psychiatry is not a bona fide medical specialty.[6] One of the two main arguments put forward by Szasz in support of this proposition (the other we shall consider later) is that a medical patient can only be a person who voluntarily assumes that role and a physician can only be a person who gives treatment with the consent of his patient. Since, according to Szasz, psychiatric treatment is chiefly involuntary (overtly or covertly), insane persons are not really ill and psychiatrists are not really physicians. Psychiatric practice must, therefore, be disavowed since "in a free society, the fact that a person has an illness or that an illness be attributed to him—regardless of whether that illness is bodily or mental, literal or metaphorical—does not, and cannot, by itself justify imposing medical treatment on him against his will."[7] Indeed, "one of our most precious rights . . . is the right to be ill—that is, the right to reject treatment, the right to die unmolested by interventions imposed on us by the state acting through its medical (or psychiatric) agencies."[8]

Szasz's argument, like that of the fundamentalists, seems completely justified: Involuntary treatment, just as involuntary unilateral exposure to Darwinism, is incompatible with a free society. But here, too, the conclusion that follows is not that psychiatric practice ought to be disavowed but that Szasz's free society is not a workable proposition. Szasz himself seems to realize this since he would require prior consent only for the treatment of "conscious adults," thus permitting pediatrics, the treatments of which are mostly given without the patient's informed consent, to remain with the realm of legitimate medicine. Evidently, Szasz is willing to grant that in the case of children the faculty of consent is immature and that therefore others must decide the wisdom of medical treatment for them. But once having tacitly admitted that point, one is completely unreasonable to assert that there can be no abnormal persons whose chronological age and physiological state place them within the class of "conscious adults" but whose faculty of consent, for one reason or another, failed to reach maturity. Such persons, like children, are subjected to involuntary treatment simply because society looks after the welfare of those of its members who are unable to take care of themselves. Maybe Szasz is right in saying that the right to be ill and to die unmolested is one of our most precious rights, but, precious as it may be,

the free exercise of that right is not possible in a functional society. Szasz is probably right, furthermore, in thinking that psychiatric practice is incompatible not only with a free but also with a just society. For while persons declared mentally ill can be subjected to involuntary psychiatric treatment without having done anyone any harm, they also can escape the normal process of criminal justice if they *have* done others great harm. In other words, we see once more that the ultimate ethical aims of freedom and justice are in conflict with the practical social aim of communal purpose.

It is not only the Christian system of ethics which is founded on the rock that Machiavelli split open. For the monistic doctrine of an orderly universe created by God which operates by natural law and which reason can discover is also the metaphysical foundation of Western science. A Western scientist is a man who believes in God, for without this belief it would be futile to try to discover His laws. A convenient demonstration of the need for the belief in God—which the majority of contemporary scientists undoubtedly would deny, of course—was provided when Einstein affirmed his unwillingness to accept the philosophical implications of the quantum mechanical uncertainty principle in his famous dictum "God does not play at dice." Though Einstein was probably half-joking when he used God's name in this connection, the fact remains that it would have required a cumbersome circumlocution (such as "hidden variables") to express exactly the same sentiment without reference to God. Now, whereas one may reasonably doubt that Christian absolutist ethics have been more helpful than pagan relative ethics in the search for the good life, science spawned by the very same doctrine as the Christian ethics of God's lawful universe has evidently been gloriously successful. Since Galileo gave it its start, modern science has gone a long way in showing that nature is indeed accessible to reason and that, by the understanding thus obtained, man can gain extensive mastery over natural events. Thus, even though the monistic doctrine has so far received little confirmation from its application to the ethical domain, the excellent service it has rendered to modern science seems to provide for its validation. But finally, in our day, the enormous progress in science has brought to light that the doctrine of the lawful universe also embodies epistemological conflicts for science.

The epistemological contradiction that has come to light with the growth of modern physics was a major philosophical concern of Niels Bohr.[9] He pointed out that "as the goal of science is to augment and order our experience, every analysis of the conditions of human knowledge must rest on considerations of the character and scope of our means of communication. Our basis [of communication] is, of

course, the language developed for orientation in our surroundings and for the organization of human communities. However, the increase of experience has repeatedly raised questions as to the sufficiency of concepts and ideas incorporated in daily language."[10] These concepts include the elementary dimensions of space, time, and mass, in terms of which scientists describe the events for which explanations are sought. As was pointed out by Kant, the meanings that these terms have for us are not inferred from experience; being intuitive, or a priori, they are brought to rather than inferred from experience. Accordingly, the models which modern science offers as explanations of reality are pictorial representations built on these a priori concepts. This procedure was eminently satisfactory as long as explanations were sought for phenomena that are commensurate with the events that are the subject of our everyday experience (give or take a few orders of magnitude). But this situation began to change when, at the turn of this century, physics had progressed to the stage where problems could be studied involving either tiny subatomic or immense cosmic events on scales of time, space, and mass billions of times smaller or larger than those of our direct experience. Now, according to Bohr, "there arose difficulties of orienting ourselves in a domain of experience far from that to the description of which our means of expression are adapted."[11] For it turned out that the description of phenomena in this domain in ordinary, everyday language leads to contradictions or mutually incompatible pictures of reality. In order to resolve these contradictions, time, space, and mass had to be denatured into generalized concepts whose meaning no longer matched that provided by intuition. Eventually, it also appeared that the intuitive notion of cause and effect, central to the concept of natural law, is not a useful one for giving account of events at the atomic and subatomic level. All of these developments were the consequence of the discovery that the rational use of intuitive linguistic concepts to communicate experience actually embodies hitherto unnoticed presuppositions. And it is these presuppositions which lead to contradictions when the attempt is made to communicate events outside the experiental domain. Now, whereas the scope of science was enormously enlarged by recognizing the pitfalls of everyday language and denaturing the intuitive meaning of some of its basic concepts, a heavy price had to be paid. For, although it became possible to provide an ever more exhaustive and unified explanation of experience, that explanation came to resemble less and less the Platonic universe whose metaphysical acceptance inspired the whole enterprise of modern science in the first place. We have been duped, for if God *does* play at dice, He is not doing His job.

Ethical Contradiction Exposed by Scientific Advances

Though the the growth of modern physics has been responsible for recognition of the deep epistemological contradictions inherent in the doctrine of the orderly universe accessible to reason, it is the growth of modern biology that has brought to light the moral contradictions inherent in the correspondent system of ethics. To appreciate the nature of these moral contradictions, we must give brief consideration to the concept that is altogether central to the Platonic ethics of which we are the heirs, namely, the *soul.*[12] Belief in the soul has been as essential for Western morality as belief in natural law has been for Western science, the metaphysical source of both being, of course, God. The modern formulation of the problem of the soul is due to Descartes. Descartes laid the philosophical foundations for physiology (and particularly neurophysiology) by advancing the fruitful notion that the bodies of humans and animals can be regarded as machines. But since moral principles obviously do not apply to machines but do apply to humans, humans must be more than automata in human shape. The extra something that makes men more than automata is the soul, an agency that is not itself part of the body. It is from their incorporeal soul that men derive both the freedom of and the responsibility for action, without belief in which there can be no Christian ethics. For the purpose of dealing with the intersection of morals and human biology, nothing has thus far replaced the Cartesian body-soul dualism, scientistic mumbo jumbo about "objective" ethical systems based on tautological evolutionary arguments notwithstanding. (That few contemporary biologists would admit to a belief in the soul proves only that many of them resemble Molière's Monsieur Jourdain, who did not realize that he was speaking prose.)

Szasz's essay provides a handy illustration of the fact that the Cartesian dualism is very much alive today and remains the (unstated) metaphysical premise of medical ethics. Szasz's second main argument in support of the proposition that mental illnesses are not genuine diseases and psychiatrists not bona fide physicians is that insanity is not attributable to "an abnormality or malfunctioning of [the] body. . . . Strictly speaking, . . . disease and illness can affect only the body. Hence there can be no such thing as mental illness. The term 'mental illness' is a metaphor."[13] At first sight it seems quite incredible that Szasz could claim that the abnormal behavioral symptoms associated with insanity do not derive from a malfunctioning of the body. Does he, a professor of psychiatry in the State University of New York, not know that complex aspects of human behavior are generated by an organ of the body called the brain, that the advances

of neuroanatomy and neurophysiology of the past century have provided extensive insights into just how the brain manages to do its work, and that certain well-defined abnormalities or malfunctions of that organ produce psychological deficits? I imagine that Szasz does know all this, but the moral implications of that knowledge are simply unacceptable. In fact, Szasz makes plain the philosophical source of his moral rejection of psychiatric practice by accusing Freud, whom he holds (falsely) responsible for creating the metaphor "mental illness" in the first place, of a "systematic strategy for reifying and personalizing pseudomedical labels, and for stigmatizing and depersonalizing persons."[14] Szasz evidently holds to the Platonic doctrine which informed Descartes: that the "real" person, the free and responsible agency, is not the body but the incorporeal soul. And since the soul is incorporeal, abnormalities or behavioral deficits ordinarily associated with insanity cannot be bodily ills and hence are outside the realm of medicine. Thus, to treat insane people as if they were sick is, according to Szasz, to confuse medicine with morals: "Hence, if and insofar as it is deemed that 'mental patients' endanger society, society can, and ought to, protect itself from the 'mentally ill' in the same way it does from the 'mentally healthy'—that is by means of the criminal law."[15] Though in his polemic Szasz seems to ignore completely the insights into the workings of the human brain brought by neurology and psychology, he has nevertheless seen more clearly than many other writers the basic dilemma. And that is that the biological reification of the soul, the dissolution of the Cartesian dualism, is incompatible with the maintenance of Western ethics.

We may now consider the ethical conflicts surrounding two applications of human genetics. One of these is the very troublesome matter, at least for present-day American society, of the heritability of intelligence and in particular of the problem whether there exist significant racial differences in intelligence genotype. On the one hand, it seems reasonable to think that if there is a significant variation in the genetic contribution to intelligence between individuals, or between racial groups, then this factor ought to be taken into account in the organization of society. But, on the other hand, the mere acknowledgment of the existence of this factor, let alone taking it into account in social action, seems morally inadmissible, a scientistic underpinning of racist ideology. An excellent exposition of this problem was recently provided by W. Bodmer and L. L. Cavalli-Sforza, who show that the heritability of intelligence, unlike extrasensory perception and telepathy, is a genuine scientific proposition.[16] First, it is possible to obtain a meaningful measure of intelligence through IQ tests, at least insofar as the concept of intelligence applies to the capac-

ity to succeed in the society in whose contextual setting the tests are given. Second, there do exist significant differences in IQ between individuals and between social and racial subgroups. Third, it is possible, at least in principle, to perform studies that can ascertain the relative contribution of genetic and environmental factors to the observed differences in IQ. Bodmer and Cavalli-Sforza find that there is sufficient evidence at present to make it very likely that within a socioeconomically homogeneous group heredity does make a significant contribution to extant differences in IQ. When it comes to the considerably lower mean IQ of American blacks, however, they conclude not only that the currently available data are inadequate to ascertain whether this fact is attributable mainly to hereditary or mainly to environmental differences, but "that the question of a possible genetic basis for the race IQ differences will be almost impossible to answer satisfactorily before the environmental differences between U.S. blacks and whites have been substantially reduced. . . ."[17] Finally, "[since] for the present at least, no good case can be made for [studies on racial IQ differences], either on scientific or practical grounds, we do not see any point in particularly encouraging the use of public funds for their support. There are many more useful biological problems for the scientist to attack."[18]

In my opinion, this recommendation, which trivializes the problem scientifically, amounts to taking the easy way out from a serious dilemma. What if, as Bodmer and Cavalli-Sforza admit could be true, there does exist a significant genetic contribution to the mean IQ differences found between blacks and whites? They think that this "should not, in a genuinely democratic society free of race prejudice, make any difference."[19] But if the races really differed hereditarily in intelligence, then racism would not be a "prejudice" but a true perception of the world and one of which a rational society ought to take account. For instance, in this case, the black-white disparities in socioeconomic levels would not reflect discrimination at all but merely an underlying biological reality. And hence the aim of an egalitarian, multiracial society would be just another unattainable, utopian dream. We thus encounter another Machiavellian contradiction between the two incompatible ethical systems of our heritage. The pagan ethics of communal purpose, which science serves, would demand that every effort be made to ascertain whether the member races of a multiracial society do in fact differ hereditarily in their intelligence. But the Christian ethics of ultimate values, which inspire science, holds racism to be an absolute evil in that it is subversive of the fundamental concept of the freedom and responsibility of the human soul. Hence, these ethics demand an uncompromisingly hard

line against research on race intelligence. Since there must not be any hereditarily determined racial differences in intelligence, research that entertains the possibility of such differences is a priori evil.

The second ethically troublesome application of human genetics I shall consider concerns the purposeful manipulation of the human genotype. In a recent essay, evidently informed by the Baconian creed of scientific optimism, Bernard D. Davis provides an excellent summary overview of the practical possibilities and philosophical implications of human genetic engineering.[20] First, Davis finds that some New Left scientists have excessively dramatized the threat posed by the possible application to the human genome of recent molecular genetic developments, mainly in order to persuade the public of the need for radical change in our government. But this exaggeration of the dangers imminent in genetic research is not likely to make the revolution; it will merely "contribute to an already distorted public view. . . . Indeed, irresponsible hyperbole on the genetic issue has already influenced the funding of research."[21] Davis holds that, though some danger does exist from possible unwise and even malevolent applications of genetics, this danger is very small compared with the immense potential benefits. In any case, only a rather limited range of genetic manipulations, such as the repair of single-gene defects and the predetermination of sex, are realistic possibilities for the foreseeable future. By contrast, most of the more fanciful projects for the directed modification of polygenic traits, particularly those pertaining to psychological function, Davis thinks "will remain definitely in the realm of science fiction."[22] Thus, there is little reason to wax alarmed over the imminent dangers of genetic engineering.

There is one kind of genetic manipulation, straight from the pages of science fiction, however, that Davis thinks may soon become a practical reality. This is the asexual reproduction, or cloning, of mammals, which is likely to be accomplished before long by transfer of somatic diploid nuclei from a single donor animal to enucleated eggs. Out of these eggs will grow a clone of genetically identical individuals, all possessing the genotype of the donor: "There is a considerable economic incentive to develop this procedure, since the copying of champion livestock could substantially increase food production. . . . [And] if the cloning of mammals becomes technically feasible its extension to man will undoubtedly be very tempting, on the grounds that enrichment for proved talent by this means might enormously enhance our culture, while the risk of harm seemed small."[23]

A philosophical point of interest is that the prospect of populating the earth with clones of genetically identical humans is not, in fact,

tempting at all. Why is it that, while it would be fun to have Kant, Beethoven, Bettina von Arnim, Einstein, Picasso, Clark Gable, and Marilyn Monroe living on our block, the thought of having hundreds or thousands of their replicas in town is a nightmare? Davis, too, feels apprehensive about cloning of humans; he fears that the achievements of a replica Tolstoy, Churchill, Martin Luther King, Newton, or Mozart (I drew up my own list of model genotypes before I saw Davis's) might not equal those of their isogenic prototypes. Davis thinks, furthermore, that cloning is likely to create an evolutionary danger, since the reduction in genetic diversity of the human species that would result from replacement of sexual by asexual reproduction would affect adversely its capacity to respond adaptively to sudden environmental changes. This evolutionary argument against cloning, though widely accepted by biologists, lacks logical rigor. For the very mastery over nature that would allow man to change his reproductive mode from the sexual to the asexual would presumably allow him also to make a technological (i.e., phenotypic) rather than a hereditary (i.e., genotypic) adaptive response to any putative environmental change.

No, the almost universal revulsion evoked by the prospect of cloning humans can hardly derive from practical considerations of the kind adduced by Davis. The idea of beholding a horde of look-alike human stereotypes is abhorrent even to people who are quite unaware of and who in fact lack the scientific sophistication to appreciate such arguments. The reason for the horror is, in my opinion, the belief in the uniqueness of the soul. Even though the Platonic soul is incorporeal, it is supposed to fit the body; hence, it is hard to conceive of unique souls inhabiting thousands of identical bodies. In other words, the cloned humans would not seem to be real persons but merely Cartesian automata in human shape.

That our perception of its uniqueness is, in fact, an important element in judging a being as fully human can be readily shown. For instance, the tendency of all members of a foreign race to look alike is a precondition of racism. By being thus depersonalized, the people of another race are deprived of their souls and the racist can make himself comfortable in the belief that these inferior beings are little more than animals. A similar process of depersonalization occurs in war. As is manifest in many accounts of wartime experience, soldiers can suspend the dictates of their private morality more readily in brief encounters with an unknown or even invisible enemy than they can vis à vis a particular member of the enemy camp (especially if he is of the same race) if an opportunity has been afforded to establish the uniqueness of his person. The faceless, homogeneous, and collective

enemy has no soul; he is merely a dangerous beast outside the bounds of morality. Once recognized as a unique individual, however, the enemy acquires a soul, joins the family of man, and comes within the purview of morality. The inverse process applies to the treatment of household pets; the more the individuality of a dog or cat is recognized, the greater the tendency to personify that animal. In other words, here the perception of uniqueness causes the master to endow his pet with a soul and to raise it to the status of honorary human.

We thus encounter one more contradiction inherent in Western aims brought to light by scientific advances. The utopian dreamers of the City of God, from More to Marx, think of their perfect societies not in terms of real men but in terms of angels that embody all of the best and none of the worst human attributes. To my knowledge, diversity has never been considered an important utopian value (at least not outside the scientistic circles that try to derive values from evolutionary considerations). On the contrary, the more alike the angels are in their beauty, goodness, and intelligence, the more perfect is the vision of their society. As long as, due to the vagaries of the sexual reproductive mode, there was not the slightest chance that such angelic populations could actually arise, this seemed to be a believable dream, a hope for a better future. Only now, when advances in genetic and developmental biology have brought the asexual generation of homogeneous angelic populations within technological reach, does it suddenly become clear that this is not the kind of perfect society that we want after all. What we *do* want is the impossible: a perfect society made up of a heterogeneous collection of imperfect, unique souls, warts and all.

Toward a Resolution

These conflicts and contradictions are unlikely to be resolved within the context of the Western tradition. What it would take to solve the dilemma is to abandon belief in God and His natural law and give up the righteous Christian ethical system based on absolute values and adopt instead a wholly relative system of private and social morality. That is, instead of truth and justice, wisdom and harmony would become the primary values. But is this a possible moral basis for a civilized society? It certainly is, since there already exists on earth another great civilization, namely, the Chinese, which has this other basis. Chinese beliefs and lives are not founded on the Platonic rock that Machiavelli split open. And an examination of that other tradition shows what morality and science without God are really like. In the light of the Chinese tradition, dialectical materialism and devout Christianity can be seen to be merely minor variations on the same

Platonic theme: Atheistic scientism is merely old divine wine in new bottles.

At about the time that Greek philosophers formalized the notion of the lawful universe whose mode of operation is accessible to reason (an idea that they in turn had inherited from the Babylonians) there developed in China the two complementary philosophicoethical systems of Confucianism and Taoism, which have governed life there ever since and still do so in large measure today. Confucianism is a set of down-to-earth ethical guidelines for the proper management of society. Its precepts are based on the fundamental premise that man is a social creature and that, therefore, there is virtue in harmonious social relations. These relations are made harmonious not by obedience to universally valid abstract moral principles such as freedom and justice but by exact adherence to a combination of prescribed etiquette and ritual. Taoism, on the other hand, is a transcendental, personal moral philosophy whose main relevance is for the inner life rather than for social relations. Its precepts are based on the fundamental premise that man is part of Nature and that, therefore, his life must take the path, or tao, of natural events. Man, following the tao, must abjure all striving, distrust reason, and attempt to attain a state in which he is as free from desire and sensory experiences as possible. Neither Confucianism nor Taoism invokes God (whom it does not know anyway) or Eternal Reason as the source of its authority, nor does it posit the existence of any natural law or rights of man. Rather, both systems endeavor to provide for man's harmony with his environment.

Though for the first few centuries of their existence Confucianism and Taoism, one advocating social engagement and the other personal withdrawal, were seen by their respective adherents as being in conflict, a more or less symbiotic relation of these two doctrines eventually developed. In this philosophicoethical symbiosis, the Confucian bureaucracy ran the country while the Taoist intelligentsia provided spiritual and cultural leadership. Taoism, with its focus of attention on Nature, also became the intellectual fountainhead for the development of Chinese science. But since Taoism mistrusts the powers of reason and logic and does not provide for the idea of the laws of nature, the evolution of Chinese science took a course quite different from that of Western science. Joseph Needham epitomized this difference in the following terms: "With their appreciation of the relativism and the subtlety and immensity of the universe, [the Chinese scientists] were groping after an Einsteinian world picture without having laid the foundations for a Newtonian one."[24] Since Taoism regards the workings of Nature to be inscrutable for the theoretical

intellect, Chinese science developed along mainly empirical lines. This empirical development was slow but steady, and by Renaissance times Chinese science and the technology it inspired were considerably more advanced than anything that had been achieved in the West. Indeed, much of pre-Renaissance European science fed on Chinese discoveries that had percolated from East to West. As is well known, many of the key inventions that eventually produced the transformation of medieval into modern Europe, such as gunpowder, movable type, the mechanical clock, the magnetic compass, and the stern post rudder, were of Chinese provenance. But lacking the spiritual incentive to integrate its empirical discoveries into a general theoretical framework, Chinese science remained an intellectually fragmented enterprise. Backward Western science, on the other hand, began its meteoric rise with Galileo's discovery that models built on mathematically expressible natural laws dealing with exactly measurable quantities can give a useful account of reality. Thanks to that discovery, Western science soon left Chinese science far behind. For it turned out that, contrary to the Taoist doctrine, the workings of Nature are not all that inscrutable for the intellect. Provided that the questions one asks of Nature are not too deep, satisfactory answers can usually be found. Difficulties arise only when, as I tried to show earlier in this essay, the questions become too deep and the answers that must be given to these questions are no longer fully consonant with rational thought.

A concrete example of the gulf that still separates Eastern and Western approaches to Nature and its laws was provided in testimony by Hogen Fujimoto, a representative of the Buddhist Churches of America, at the biology textbook revision hearings of the California Curriculum Commission already mentioned. Fujimoto voiced his opposition to the inclusion of the Genesis story in the school texts because this story was contrary to *his* beliefs, namely: "In the complexities of causes and subcauses one cause cannot be isolated, and is hidden within the myriads of subcauses and conditions. For this reason, the one-cause concept such as Divine Creation cannot be accepted by the Buddhists."[25] Although Fujimoto did not seem to object to the retention in the books of Darwinian evolution, he ought to have done so. For both Bible and *Origin of the Species* are informed by the same, in the Far Eastern view, naive idea, namely, that single causes *can* be isolated and that from their isolation there evolves an explanation of the universe. Whether one thinks that God's will or natural selection is the cause of life is, at the Eastern remove from Western doctrines, a comparatively inconsequential detail. Therefore, Buddhist children in the California schools ought to be spared exposure

to the simplistic notion that the universe can be "explained" by rational thought, be it of the biblical or the Darwinian variety. Fujimoto concluded his testimony with the observation that "the question of the beginning is beyond human intellect to grasp and, therefore, should not be incorporated in the school curriculum."[26]

In my opinion, it is highly significant that Chinese or Far Eastern philosophy is now exerting an ever-growing influence in the West. This influence is no longer confined, as it was only a few years ago, to Zen beatniks, New Left Maoists, transcendental meditation freaks, and other far-out members of the counterculture. Instead, it has reached the very pillars of society. For instance, the sudden concern among solid Establishment-type citizens for the so-called environment is a radical departure from the ancient Western aim of dominating Nature. It represents a Taoist subversion of the Baconian creed and runs counter to the quasi-religious, nineteenth-century belief in progress. It is significant in this connection that even those powerful forces whose economic interests conflict with the ecology movement, such as the petroleum and lumber industries, now feel obliged to pay lip service to the environmental cause and to claim that their unrestricted activities are needed merely for maintenance of the status quo and not, as they had claimed in the past, for progress. Similarly, the recent accommodation of the two superpowers, the United States and the Soviet Union, to end the quarter-century-long cold war is a radical departure from their traditional, righteous, reciprocal crusading fervor to smite the enemy of man. It represents a Confucian subversion of the Christian romantic ethic of the nation as the protector of the true faith and places harmony above ideological truth in international relations. This sudden change is not to be confused with a turn toward the tolerant view that "they have as much right to their opinion as we have to ours," which would still place the new situation within the context of Western ideology. Instead, the U.S.-Soviet rapprochement seems to amount to a frank acceptance of the principle that foreign policy ought to be based not on the perception of good and evil but on the goal of making a livable world.

Most of the well-meaning members of the scientific Old Guard probably welcome these two recent developments in domestic and foreign policy. But there are other epiphenomena of the turn toward the wisdom of the East that are plainly less welcome to them. Among these must be counted the declining governmental support of basic scientific research. In my opinion, this decline is attributable not so much to an ignorance by the authorities of the fact that past support of science has been a social investment with a very high return, or to the New Left propaganda about the misuses of science, as to a sincere

doubt (which, according to reports by recent visitors to China, is shared by the Chinese government) of the Old Guard claim that the amelioration of the present human condition lies in the discovery of further natural laws. Instead, there seems to be a growing belief that what it will take to make the world a better place is to understand man. But whereas the notion of the laws of nature and the methods of modern science are evidently capable of giving a satisfactory account of man's physiology, his psychology does not seem to be accessible to the procedures discovered by Galileo. According to Bohr:

> The inadequacy of the mechanical concept of nature for the description of man's situation is particularly evident in the difficulties entailed in the primitive distinction between soul and body. The problems with which we are confronted here are obviously connected with the fact that the description of many aspects of human existence demands a terminology which is not immediately founded on simple physical pictures. . . . Indeed, the use of words like thought and feeling does not refer to a firmly connected causal chain, but to experiences which exclude each other because of different distinctions between the conscious content and the background which we loosely term ourselves.[27]

This mutual exclusion is, in my opinion, at the root of the Western dilemma of science and morals.

NOTES

1. I. Berlin, "The Question of Machiavelli," *New York Review of Books,* November 4, 1971, pp. 20–32.
2. Ibid., p. 23.
3. Ibid., p. 28.
4. Ibid.
5. Ibid.
6. Thomas S. Szasz, "Mental Disease as a Metaphor," *Nature* 242 (1973): 305–7.
7. Ibid., p. 306.
8. Ibid.
9. Niels Bohr, *Atomic Physics and Human Knowledge* (New York: Science Editions, 1961).
10. Ibid., p. 29.
11. Ibid., p. 35.
12. A. Flew, "Immortality," in *Encyclopedia of Philosophy,* ed. Paul Edwards (New York: Macmillan Co., 1967), 4:139–50.
13. Szasz, p. 305.
14. Ibid., p. 306.
15. Ibid.
16. W. F. Bodmer and L. L. Cavalli-Sforza, "Intelligence and Race," *Scientific American* (October 1970), pp. 19–29.
17. Ibid., p. 29.
18. Ibid.
19. Ibid.
20. B. D. Davis, "Prospects for Genetic Intervention in Man," *Science* 170 (1970): 1279–83.

21. Ibid., p. 1279.
22. Ibid., p. 1280.
23. Ibid., p. 1281.
24. Joseph Needham, *The Grand Titration* (London: George Allen & Unwin, 1969), p. 89.
25. Statement by the Reverend Hogen Fujimoto distributed at the meeting of the California State Board of Education, Sacramento, October 31, 1972.
26. Ibid.
27. Bohr, p. 41.