

Comment

The Ascent of Man?

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Anyone who cares about the moral and social implications of genomics, genetic engineering and biotechnology should read Michael J. Sandel's article, 'The Case Against Perfection', in the April 2004 issue of *The Atlantic Monthly*. Sandel, the Anne T. and Robert M. Bass Professor of Government at Harvard University (where he teaches moral philosophy), is one of the deepest thinkers of this generation. He is a member of The President's Council on Bioethics, which George W. Bush established to make recommendations concerning stem-cell research, among other issues. In this essay, with characteristically clear and penetrating analysis, he argues that "the genomic revolution has induced a kind of moral vertigo", and that we are right to be troubled by such issues as human cloning and genetic engineering for improved human characteristics and performance. He dissects four examples of the use of our new-found power of biotechnology: muscle enhancement; memory enhancement; growth-hormone treatment; and reproductive technologies that allow parents to choose the sex and some genetic traits of their children. In each case, he concludes that such use is morally objectionable.

Strong words, but he defends them with tight logic and a thorough examination of the history and purpose of the technology. His grasp of the science is sound, and he manages for the most part to skirt the use of religious principles, which he acknowledges vary from religion to religion (and even within religions - consider the views of fundamentalist Christians versus those of more 'moderate' Protestants on the subject of abortion), relying instead on pitting what he terms "the ethic of willfulness and the biotechnological powers it has spawned" against "the ethic of giftedness". Sandel specializes in finding the inconsistency in moral and ethical arguments and positions - a tactic he uses here to dismiss such familiar grounds as fairness as a basis for prohibiting certain uses of biotechnology - and he makes instead a case that the drive to master nature, including human nature, and to perfect it through the use of technology undermines an appreciation of the gifted - and,

therefore, imperfect - character of human powers and achievements, and prompts us to recognize that not everything in the world is open to whatever use we may desire or devise.

To give you a sense of the flavor of his argument and the elegance of his analysis, I'll quote two passages at length. Concerning muscle enhancement through the use of gene therapy, he writes: "It might be argued that a genetically enhanced athlete, like a drug-enhanced one, would have an unfair advantage over his unenhanced competitors. But the fairness argument against enhancement has a fatal flaw: it has always been the case that some athletes are better endowed genetically than others, and yet we do not consider this to undermine the fairness of competitive sports. From the standpoint of fairness, enhanced genetic differences would be no worse than natural ones, assuming they were safe and made available to all. If genetic enhancement in sports is morally objectionable, it must be for reasons other than fairness."

Later, discussing reproductive technologies, he states: "Some see a clear line between genetic enhancement and other ways that people seek improvement in their children and themselves. Genetic manipulation seems somehow worse - more intrusive, more sinister - than other ways of enhancing performance and seeking success. But, morally speaking, the difference is less significant than it seems. Bio-engineering gives us reason to question the low-tech, high-pressure child-rearing practices we commonly accept. The hyperparenting familiar in our time represents an anxious excess of mastery and dominion that misses the sense of life as a gift. This draws it disturbingly close to eugenics... Was the old eugenics objectionable only insofar as it was coercive? Or is there something inherently wrong with the resolve to deliberately design our progeny's traits... But removing coercion does not vindicate eugenics. The problem with eugenics and genetic engineering is that they represent a one-sided triumph of willfulness over giftedness, of dominion over reverence, of molding over beholding."

All very closely reasoned, yet something in it makes me uneasy. Part of my uneasiness stems from the inherent subjectivity of any purely moral argument. Sandel doesn't just assume, though, that giftedness is a better ethic than willfulness, he tries to prove it by showing that willful transformation of human characteristics through biotechnology would erode three key features of our moral landscape: humility; a sense of being only partially responsible for our talents and performance; and solidarity. Yet I don't think the examples he gives succeed in establishing that these virtues are better than the alternatives (hubris, expectations of responsibility that cannot be met in practice, and selfishness). In the end, he takes it for granted that we will share his belief that they are. I happen to feel that way, so this leap of faith didn't really bother me that much. What did trouble me was a sense that something important was missing.

What that is can best be understood in light of Sandel's linking of genetic engineering with eugenics. Few ideas are apt to provoke as much moral outrage as efforts to improve humanity through selective breeding. But the history of eugenics is more complex than its treatment in this essay, which focuses on the coercive eugenics of the Nazi regime and the rising market for eggs and sperm from preselected donors. And that history is instructive. Eugenics, as defined by the American Bioethics Advisory Commission, is the study of methods to improve the human race by controlling reproduction. The word was coined in 1883 by Francis Galton, a cousin of Charles Darwin. Galton believed that social differences reflected differences in innate endowment, and that misguided charity encouraged the 'unfit' to bear more children, which upset the mechanism of natural selection - a mechanism that, left to operate properly, would lead to the continual improvement of the human race. He therefore sought to encourage the "most fit" - that is, members of the middle and, especially, upper classes - to bear more children, a process he likened to "artificial selection" and which he called "eugenics" (Greek for *good birth*). Galton's followers included George Bernard Shaw and Julian Huxley in England, and Ralph Waldo Emerson and President Theodore Roosevelt in the United States.

Eugenics for Galton was a positive process: nothing was to be done to stop the lower classes from procreating; rather, the birth rate of the upper classes was to be increased. As the idea spread, however, it became transformed. The eugenics movements in the United States, Germany, and Scandinavia soon favored 'negative eugenics', which advocated preventing the least able from breeding - in some cases through enforced sterilization. Lest anyone think that such notions have been permanently consigned to the garbage heap of history where they belong, in 1995 China passed a law that states, in part, "Physicians shall, after performing the premarital physical check-up, explain and give medical advice to both the male and the female who have been diagnosed with certain genetic disease of a serious nature which is

considered to be inappropriate for child-bearing from a medical point of view; the two may be married only if both sides agree to take long-term contraceptive measures or to take ligation operation for sterility." A BBC survey in 1993 found that 91% of Chinese geneticists believed that couples who carried the same disease-causing genetic mutation should not be allowed to have children. More than three-quarters also believed that governments should require premarital tests to detect carriers of hereditary disease, and even supported the routine genetic testing of job applicants by employers. There was also strong backing for the genetic testing of children to see if they are susceptible to problems such as alcoholism.

So, Sandel may be right to raise the spectre of eugenics in the era of the genomics revolution. But for me, the most interesting thing about the history of eugenics is its connection with Darwinism. Not only were Galton and Darwin blood relatives, it was Darwin's theory of "natural selection" (not, it should be noted, "survival of the fittest" - that phrase, which Darwin never used, was coined later by psychologist Herbert Spencer) that led Galton to suggest that the high birth rate among the lower classes was interfering with the normal process of human evolution. Is it even possible to interfere with the normal evolutionary process? And if so, haven't we already done so? Evolution: that, I think, is what's missing from Sandel's argument. The most important single word in modern biology occurs exactly twice in the essay, in a discussion of a quote from biologist Robert Sinsheimer: "We can be the agent of transition to a whole new pitch of evolution." Sandel agrees that "it may even be the case that the lure of that vision played a part in summoning the genomic age into being... But that promise of mastery is flawed. It threatens to banish our appreciation of life as a gift, and to leave us with nothing to affirm or behold outside our own will." But he never challenges, or discusses at all, the assumption that we can now affect our own evolutionary changes, or asks whether there are scientific, as opposed to moral, reasons why we should or should not do so.

I think there are. At least two scientific arguments could be made in favor of the notion that we should consider intervening in our own evolution. One is that, because of technological progress, evolution has effectively stopped for *Homo sapiens*, and because that is a bad thing, biologically speaking, we must undertake to continue it ourselves. The other is that we have already been interfering with our own evolution, unwittingly, for at least a century, and in order to correct the damage we've done and avoid further damage, we need to intervene deliberately now. The first argument is an old one. It's based on the assumption that what governs much of the evolutionary process is the fitness of the individual for the environment - 'environment', in this case, meaning predominantly the climate and infectious diseases. According to this viewpoint, our technology now largely insulates us from the effects of climate, and antibiotics plus

advances in public health have eliminated infectious disease as an agent of evolutionary change, at least in the developed world. Thus, human evolution, in a biological sense, has ceased. Since evolution is what keeps a species from stagnation and eventual decay, it is imperative that we now take charge of continuing the process artificially as best we can.

I'm not sure I buy the underlying assumptions. Global warming, for example, may represent a level of climate change to which our technology cannot make us immune. And infectious disease appears to be making a comeback all over the world, driven by a mobile, increased human population and the spread of resistance. Besides, I can think of many organisms that don't appear to have changed much in millions of years, and they seem to be doing just fine now - the crocodile and the mosquito, for example. But even if we grant all the assumptions, there is no objective evidence about the cessation of human evolution. Genomics, I think, is ideally poised to provide such evidence. DNA samples from *Homo sapiens* over the past two centuries can be gathered and analyzed. Comparative genomics and proteomics with our closest primate relatives should also be informative in this regard. How fast, genetically speaking, did the human race evolve over the past 10 million years or so, and has that rate changed? Definitive conclusions may be hard to come by, but any data will be better than what we have now, which is simply speculation.

The second argument, that modern medicine and changes in our social structures have already interfered with the normal course of evolution, is close to Galton's original hypothesis, which as far as I know has never been scientifically tested. It has several new flips now, though. For example, we could argue that improvements in human nutrition and economic prosperity have combined to increase not only the average height but also the average weight of the human population. Epidemic obesity is clearly bad for society, but what about the homogenization of other characteristics like height? We assume everyone getting taller is better, but how do we know? The same genome-driven scientific studies referred to earlier should shed light on these questions. Evolutionary biologists can contribute too, especially to a general discussion of just what hybrid vigor really means.

It's not obvious to me in any case, even if one of these two arguments turns out to have a factual basis, that it necessarily follows that we should manipulate our characteristics so as to restart, or restore, the process of evolution in *Homo sapiens*. Implicit in that conclusion is that we would know what we were doing, that any such deliberate tinkering would benefit our species in an evolutionary sense. I am not convinced that we understand the mechanisms and workings of evolution well enough to do that safely - but again, that is something about which only evolutionary biologists can speak with any authority. Sandel's thesis, for all its persuasiveness, does not let them speak.

Moral arguments are an important part of this whole discussion, of course, but sometimes they leave no place for scientists to weigh in as scientists, to offer evidence on what the facts are and whether those facts suggest certain courses of action to be desirable or undesirable. If the human race is indeed about to engage in a great debate about how - or in some cases whether at all - our new powers of biology are to be used on ourselves, then I think it is imperative that biologists provide a candid and objective assessment of what the available data tell us about human evolution. Ultimately, the decisions that follow from this debate must be made by humanity in general, and it may be that moral arguments will - and perhaps should - carry the day. Or perhaps the romantic vision of the quest for perfection, however unattainable, will prove to be irresistible. I don't know how all this will turn out in the end. But I do know that the discussion should not be undertaken in the absence of the information that only we can provide. Besides, our unique abilities as a species to integrate both objective and subjective factors into our course of action; to ask and try to answer questions that have both moral implications and factual issues; and to be skeptical and adventurous at the same time - aren't those gifts too?