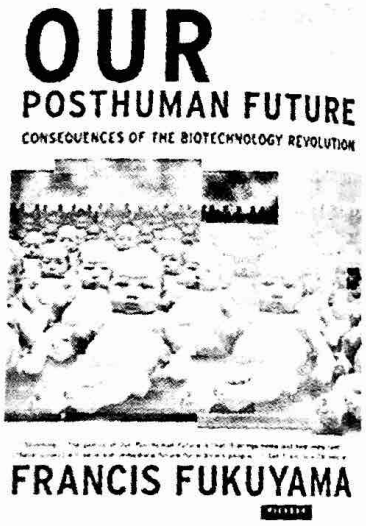
FRANCIS FUKUYAMA



Francis Fukuyama holds a B.A. in classics from Cornell University and a Ph.D. in political science from Harvard University. He is Olivier Nomellini Senior Fellow at the Freeman Spogli Institute for International Studies at Stanford University. As a prominent neoconservative thinker, Fukuyama signed letters to both President Bill Clinton (in 1998) and President George W. Bush (in 2001) advocating the overthrow of Saddam Hussein (at the time, the president of Iraq). However, Fukuyama ultimately disapproved of the 2003 invasion of Iraq, writing publicly that neoconservative ideas had changed and were no longer supportable. Fukuyama is the author of multiple books of political philosophy advocating liberal democracy, including his 2006 publication *America at the Crossroads*, which deals directly with his departure from the neoconservative agenda.

In *Our Posthuman Future: Consequences of the Biotechnology Revolution* (2002), Fukuyama updates an earlier proposal. Fukuyama had, in his book *The End of History and the Last Man* (1992), suggested that the history of humanity is an ideological struggle that is pretty much settled now, with liberal democracy as the eventual and destined end point, an argument he clarified in *America at the Crossroads*, stating that modernization is what wins the ideological struggle and that liberal democracy is merely one of the outcomes of modernization. In *Our Posthuman Future*, he reexamines this argument, taking into account the potential effects of biotechnology on liberal democracy. Now that human behavior can potentially be modified and DNA can be manipulated, Fukuyama asks, how will a political order based on natural equality survive?

In "Human Dignity," a chapter from *Our Posthuman Future*, Fukuyama examines the idea of "Factor X," an "essential human quality . . . that is worthy of a certain minimal level of respect" (p. 186) regardless of our varying individual characteristics, such as skin color, looks, or social class. Modern science, particularly the science of genetic engineering, Fukuyama claims, tends to disagree with the very idea of an essential human quality like Factor X. From this scientific perspective, human beings are the end result of genetic accidents and environmental influences. Fukuyama, however, finds merit in Pope John Paul II's assertion that science can't fully explain how human beings emerge from simple components. If that assertion is correct, Fukuyama speculates, what does this imply about science's ability to understand other complex systems? What does this mean for the future of human consciousness and political systems? In "Human Dignity," Fukuyama asks the reader to consider what happens to the idea of universal human equality when genetic engineering can be used to "improve" human genes.

Given the seemingly inevitable progress of science, which undoubtedly will influence you throughout your life, what does it mean to be human, and how can we preserve the qualities that make us so?

TAGS: ***human dignity, morality, biotechnology, ethics, civil rights***

Questions for Critical Reading

1. The idea of a "Factor X" plays a central role in Fukuyama's essay. As you read this text, locate quotations where Fukuyama defines this term and then provide a definition of the concept in your own words.
2. Do humans have an "essence"? Locate passages from Fukuyama that support your analysis. Does he think there is a human essence? What quotations make his position clear? You will need to read his text closely and critically to determine his position.
3. As the title of this selection suggests, Fukuyama is centrally concerned with the concept of human dignity in this chapter. Define *human dignity*, using quotations from Fukuyama that support your definition.

Human Dignity

> Is it, then, possible to imagine a new Natural Philosophy, continually conscious that the "natural object" produced by analysis and abstraction is not reality but only a view, and always correcting the abstraction? I hardly know what I am asking for. . . . The regenerate science which I have in mind would not do even to minerals and vegetables what modern science threatens to do to man himself. When it explained it would not explain away. When it spoke of parts it would remember the whole. . . . The analogy between the *Tao* of Man and the instincts of an animal species would mean for it new light cast on the unknown thing, Instinct, by the only known reality of conscience and not a reduction of conscience to the category of Instinct. Its followers would not be free with the words *only* and *merely*. In a word, it would conquer Nature without being at the same time conquered by her and buy knowledge at a lower cost than that of life.
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> —C. S. LEWIS, *THE ABOLITION OF MAN*[1]

According to the Decree by the Council of Europe on Human Cloning, "The instrumentalisation of human beings through the deliberate creation of genetically identical human beings is contrary to human dignity and thus constitutes a misuse of medicine and biology."[2] Human dignity is one of those concepts that politicians, as well as virtually everyone else in political life, like to throw around, but that almost no one can either define or explain.

Much of politics centers on the question of human dignity and the desire for recognition to which it is related. That is, human beings constantly demand that others recognize their dignity, either as individuals or as members of religious, ethnic, racial, or other kinds of groups. The struggle for recognition is not economic: What we desire is not money but that other human beings respect us in the way we think we deserve. In earlier times, rulers wanted others to recognize their superior worth as king, emperor, or lord. Today, people seek recognition of their equal status as members of formerly

disrespected or devalued groups—as women, gays, Ukrainians, the handicapped, Native Americans, and the like.[3]

The demand for an equality of recognition or respect is the dominant passion of modernity, as Tocqueville* noted over 170 years ago in *Democracy in America*.[4] What this means in a liberal democracy is a bit complicated. It is not necessarily that we think we are equal in all important respects, or demand that our lives be the same as everyone else's. Most people accept the fact that a Mozart or an Einstein or a Michael Jordan has talents and abilities that they don't have, and receives recognition and even monetary compensation for what he accomplishes with those talents. We accept, though we don't necessarily like, the fact that resources are distributed unequally based on what James Madison called the "different and unequal faculties of acquiring property." But we also believe that people deserve to keep what they earn and that the faculties for working and earning will not be the same for all people. We also accept the fact that we look different, come from different races and ethnicities, are of different sexes, and have different cultures.

Factor X

What the demand for equality of recognition implies is that when we strip all of a person's contingent and accidental characteristics away, there remains some essential human quality underneath that is worthy of a certain minimal level of respect—call it Factor X. Skin color, looks, social class and wealth, gender, cultural background, and even one's natural talents are all accidents of birth relegated to the class of nonessential characteristics. We make decisions on whom to befriend, whom to marry or do business with, or whom to shun at social events on the basis of these secondary characteristics. But in the political realm we are required to respect people equally on the basis of their possession of Factor X. You can cook, eat, torture, enslave, or render the carcass of any creature lacking Factor X, but if you do the same thing to a human being, you are guilty of a "crime against humanity." We accord beings with Factor X not just human rights but, if they are adults, political rights as well—that is, the right to live in democratic political communities where their rights to speech, religion, association, and political participation are respected.

The circle of beings to whom we attribute Factor X has been one of the most contested issues throughout human history. For many societies, including most democratic societies in earlier periods of history, Factor X belonged to a significant subset of the human race, excluding people of certain sexes, economic classes, races, and tribes and people with low intelligence, disabilities, birth defects, and the like. These societies were highly stratified, with different classes possessing more or less of Factor X, and some possessing none at all. Today, for believers in liberal equality, Factor X etches a bright red line around the whole of the human race and requires equality of respect for all of those on the inside, but attributes a lower level of dignity to those outside the boundary. Factor X is the human essence, the most basic meaning of what it is to be

* Tocqueville: Alexis de Tocqueville (1805–1859): French political thinker and historian best known for his two-volume book *Democracy in America* (1835 and 1840), which examined changing social conditions in American society [Ed.].

human. If all human beings are in fact equal in dignity, then X must be some characteristic universally possessed by them. So what is Factor X, and where does it come from?

So what is Factor X, and where does it come from?

For Christians, the answer is fairly easy: It comes from God. Man is created in the image of God, and therefore shares in some of God's sanctity, which entitles human beings to a higher level of respect than the rest of natural creation. In the words of Pope John Paul II, what this means is that "the human individual cannot be subordinated as a pure means or a pure instrument, either to the species or to society; he has value per se. He is a person. With his intellect and his will, he is capable of forming a relationship of communion, solidarity, and self-giving with his peers . . . It is by virtue of his spiritual soul that the whole person possesses such dignity even in his body."[5]

Supposing one is not a Christian (or a religious believer of any sort), and doesn't accept the premise that man is created in the image of God. Is there a secular ground for believing that human beings are entitled to a special moral status or dignity? Perhaps the most famous effort to create a philosophical basis for human dignity was that of Kant,* who argued that Factor X was based on the human capacity for moral choice. That is, human beings could differ in intelligence, wealth, race, and gender, but all were equally able to act according to moral law or not. Human beings had dignity because they alone had free will—not just the subjective illusion of free will but the actual ability to transcend natural determinism and the normal rules of causality. It is the existence of free will that leads to Kant's well-known conclusion that human beings are always to be treated as ends and not as means.

It would be very difficult for any believer in a materialistic account of the universe—which includes the vast majority of natural scientists—to accept the Kantian account of human dignity. The reason is that it forces them to accept a form of dualism—that there is a realm of human freedom parallel to the realm of nature that is not determined by the latter. Most natural scientists would argue that what we believe to be free will is in fact an illusion and that all human decision making can ultimately be traced back to material causes. Human beings decide to do one thing over another because one set of neurons fires rather than another, and those neuronal firings can be traced back to prior material states of the brain. The human decision-making process may be more complex than that of other animals, but there is no sharp dividing line that distinguishes human moral choice from the kinds of choices that are made by other animals. Kant himself does not offer any proof that free will exists; he says that it is simply a necessary postulate of pure practical reason about the nature of morality—hardly an argument that a hard-bitten empirical scientist would accept.

Seize the Power

The problem posed by modern natural science goes even deeper. The very notion that there exists such a thing as a human "essence" has been under relentless attack by modern science for much of the past century and a half. One of the most fundamental

*Kant: Immanuel Kant (1724–1804), German philosopher best known for *The Critique of Pure Reason* (1781); he was concerned with questions of how we can know what we know [Ed.].

assertions of Darwinism* is that species do not have essences.[6] That is, while Aristotle† believed in the eternity of the species (i.e., that what we have been labeling "species-typical behavior" is something unchanging), Darwin's theory maintains that this behavior changes in response to the organism's interaction with its environment. What is typical for a species represents a snapshot of the species at one particular moment of evolutionary time; what came before and what comes after will be different. Since Darwinism maintains that there is no cosmic teleology guiding the process of evolution, what seems to be the essence of a species is just an accidental by-product of a random evolutionary process.

In this perspective, what we have been calling human nature is merely the species-typical human characteristics and behavior that emerged about 100,000 years ago, during what evolutionary biologists call the "era of evolutionary adaptation"—when the precursors of modern humans were living and breeding on the African savanna. For many, this suggests that human nature has no special status as a guide to morals or values because it is historically contingent. David Hull, for example, argues,

> I do not see why the existence of human universals is all that important. Perhaps all and only people have opposable thumbs, use tools, live in true societies, or what have you. I think that such attributions are either false or vacuous, but even if they were true and significant, the distributions of these particular characters is largely a matter of evolutionary happenstance.[7]

The geneticist Lee Silver, trying to debunk the idea that there is a natural order that could be undermined by genetic engineering, asserts,

> Unfettered evolution is never predetermined [toward some goal], and not necessarily associated with progress—it is simply a response to unpredictable environmental changes. If the asteroid that hit our planet 60 million years ago had flown past instead, there would never have been any human beings at all. And whatever the natural order might be, it is not necessarily good. The smallpox virus was part of the natural order until it was forced into extinction by human intervention.[8]

This inability to define a natural essence doesn't bother either writer. Hull, for example, states that "I, for one, would be extremely uneasy to base something as important as human rights on such temporary contingencies [as human nature]. . . I fail to see why it matters. I fail to see, for example, why we must all be essentially the same to have rights."[9] Silver, for his part, pooh-poohs fears about genetic engineering on the part of those with religious convictions or those who believe in a natural order. In the future, man will no longer be a slave to his genes, but their master:

> Why not seize this power? Why not control what has been left to chance in the past? Indeed, we control all other aspects of our children's lives and identities

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* Darwinism: Shorthand for naturalist Charles Darwin's idea of evolution by natural selection, the concept that only the species best adapted to their environment survive [Ed.].

† Aristotle: Greek philosopher and enormously important figure in Western thought. Aristotle (384–322 BC) was a student of Plato and a teacher of Alexander the Great [Ed.].

through powerful social and environmental influences and, in some cases, with the use of powerful drugs like Ritalin and Prozac. On what basis can we reject positive genetic influences on a person's essence when we accept the rights of parents to benefit their children in every other way?[10]

Why not seize this power, indeed?

Well, let us begin by considering what the consequences of the abandonment of the idea that there is a Factor X, or human essence, that unites all human beings would be for the cherished idea of universal human equality—an idea to which virtually all of the debunkers of the idea of human essences are invariably committed. Hull is right that we don't all need to be the same in order to have rights—but we need to be the same in some one critical respect in order to have *equal* rights. He for one is very concerned that basing human rights on human nature will stigmatize homosexuals, because their sexual orientation differs from the heterosexual norm. But the only basis on which anyone can make an argument in favor of equal rights for gays is to argue that whatever their sexual orientation, *they are people too* in some other respect that is more essential than their sexuality. If you cannot find this common other ground, then there is no reason not to discriminate against them, because in fact they are different creatures from everyone else.

Similarly, Lee Silver, who is so eager to take up the power of genetic engineering to "improve" people, is nonetheless horrified at the possibility that it could be used to create a class of genetically superior people. He paints a scenario in which a class called the GenRich steadily improve the cognitive abilities of their children to the point that they break off from the rest of the human race to form a separate species.

Silver is not horrified by much else that technology may bring us by way of unnatural reproduction—for example, two lesbians producing genetic offspring, or eggs taken from an unborn female fetus to produce a child whose mother had never been born. He dismisses the moral concerns of virtually every religion or traditional moral system with regard to future genetic engineering but draws the line at what he perceives as threats to human equality. He does not seem to understand that, given his premises, there are no possible grounds on which he can object to the GenRich, or the fact that they might assign themselves rights superior to those of the GenPoor. Since there is no stable essence common to all human beings, or rather because that essence is variable and subject to human manipulation, why not create a race born with metaphorical saddles on their backs, and another with boots and spurs to ride them? Why not seize *that* power as well?

The bioethicist Peter Singer, whose appointment to Princeton University caused great controversy because of his advocacy of infanticide and euthanasia under certain circumstances, is simply more consistent than most people on the consequences of abandoning the concept of human dignity. Singer is an unabashed utilitarian: He believes that the single relevant standard for ethics is to minimize suffering in the aggregate for all creatures. Human beings are part of a continuum of life and have no special status in his avowedly Darwinian worldview. This leads him to two perfectly logical conclusions: the need for animal rights, since animals can experience pain and suffering as well as humans, and the downgrading of the rights of infants and elderly people who lack certain key traits, like self-awareness, that would allow them to anticipate

pain. The rights of certain animals, in his view, deserve greater respect than those of certain human beings.

But Singer is not nearly forthright enough in following these premises through to their logical conclusion, since he remains a committed egalitarian. What he does not explain is why the relief of suffering should remain the only moral good. As usual, the philosopher Friedrich Nietzsche was much more clear-eyed than anyone else in understanding the consequences of modern natural science and the abandonment of the concept of human dignity. Nietzsche had the great insight to see that, on the one hand, once the clear red line around the whole of humanity could no longer be drawn, the way would be paved for a return to a much more hierarchical ordering of society. If there is a continuum of gradations between human and nonhuman, there is a continuum within the type human as well. This would inevitably mean the liberation of the strong from the constraints that a belief in either God or Nature had placed on them. On the other hand, it would lead the rest of mankind to demand health and safety as the only possible goods, since all the higher goals that had once been set for them were now debunked. In the words of Nietzsche's Zarathustra, "One has one's little pleasure for the day and one's little pleasure for the night: But one has a regard for health. 'We have invented happiness,' say the last men, and they blink."[11] Indeed, both the return of hierarchy and the egalitarian demand for health, safety, and relief of suffering might all go hand in hand if the rulers of the future could provide the masses with enough of the "little poisons" they demanded.

It has always struck me that one hundred years after Nietzsche's death, we are much less far down the road to either the superman or the last man than he predicted. Nietzsche once castigated John Stuart Mill as a "flathead" for believing that one could have a semblance of Christian morality in the absence of belief in a Christian God. And yet, in a Europe and an America that have become secularized over the past two generations, we see a lingering belief in the concept of human dignity, which is by now completely cut off from its religious roots. And not just lingering: The idea that one could exclude any group of people on the basis of race, gender, disability, or virtually any other characteristic from the charmed circle of those deserving recognition for human dignity is the one thing that will bring total obloquy on the head of any politician who proposes it. In the words of the philosopher Charles Taylor, "We believe it would be utterly wrong and unfounded to draw the boundaries any narrower than around the whole human race," and should anyone try to do so, "we should immediately ask what distinguished those within from those left out."[12] The idea of the equality of human dignity, deracinated from its Christian or Kantian origins, is held as a matter of religious dogma by the most materialist of natural scientists. The continuing arguments over the moral status of the unborn (about which more later) constitute the only exception to this general rule.

The reasons for the persistence of the idea of the equality of human dignity are complex. Partly it is a matter of the force of habit and what Max Weber once called the "ghost of dead religious beliefs" that continue to haunt us. Partly it is the product of historical accident: The last important political movement to explicitly deny the premise of universal human dignity was Nazism, and the horrifying consequences of the Nazis' racial and eugenic policies were sufficient to inoculate those who experienced them for the next couple of generations.

But another important reason for the persistence of the idea of the universality of human dignity has to do with what we might call the nature of nature itself. Many of the grounds on which certain groups were historically denied their share of human dignity were proven to be simply a matter of prejudice, or else based on cultural and environmental conditions that could be changed. The notions that women were too irrational or emotional to participate in politics, and that immigrants from southern Europe had smaller head sizes and were less intelligent than those from northern Europe, were overturned on the basis of sound, empirical science. That moral order did not completely break down in the West in the wake of the destruction of consensus over traditional religious values should not surprise us either, because moral order comes from within human nature itself and is not something that has to be imposed on human nature by culture.[13]

All of this could change under the impact of future biotechnology. The most clear and present danger is that the large genetic variations between individuals will narrow and become clustered within certain distinct social groups. Today, the "genetic lottery" guarantees that the son or daughter of a rich and successful parent will not necessarily inherit the talents and abilities that created conditions conducive to the parent's success. Of course, there has always been a degree of genetic selection: Assortative mating means that successful people will tend to marry each other and, to the extent that their success is genetically based, will pass on to their children better life opportunities. But in the future, the full weight of modern technology can be put in the service of optimizing the kinds of genes that are passed on to one's offspring. This means that social elites may not just pass on social advantages but embed them genetically as well. This may one day include not only characteristics like intelligence and beauty, but behavioral traits like diligence, competitiveness, and the like. 20

The genetic lottery is judged as inherently unfair by many because it condemns certain people to lesser intelligence, or bad looks, or disabilities of one sort or another. But in another sense it is profoundly egalitarian, since everyone, regardless of social class, race, or ethnicity, has to play in it. The wealthiest man can and often does have a good-for-nothing son; hence the saying "Shirtsleeves to shirtsleeves in three generations." When the lottery is replaced by choice, we open up a new avenue along which human beings can compete, one that threatens to increase the disparity between the top and bottom of the social hierarchy.

What the emergence of a genetic overclass will do to the idea of universal human dignity is something worth pondering. Today, many bright and successful young people believe that they owe their success to accidents of birth and upbringing but for which their lives might have taken a very different course. They feel themselves, in other words, to be lucky, and they are capable of feeling sympathy for people who are less lucky than they. But to the extent that they become "children of choice" who have been genetically selected by their parents for certain characteristics, they may come to believe increasingly that their success is a matter not just of luck but of good choices and planning on the part of their parents, and hence something deserved. They will look, think, act, and perhaps even feel differently from those who were not similarly chosen, and may come in time to think of themselves as different kinds of creatures. They may, in short, feel themselves to be aristocrats, and unlike aristocrats of old, their claim to better birth will be rooted in nature and not convention.

Aristotle's discussion of slavery in Book I of the *Politics* is instructive on this score. It is often condemned as a justification of Greek slavery, but in fact the discussion is far more sophisticated and is relevant to our thinking about genetic classes. Aristotle makes a distinction between conventional and natural slavery.[14] He argues that slavery would be justified by nature if it were the case that there were people with naturally slavish natures. It is not clear from his discussion that he believes such people exist: Most actual slavery is conventional—that is, it is the result of victory in war or force, or based on the wrong opinion that barbarians as a class should be slaves of Greeks.[15] The noble-born think their nobility comes from nature rather than acquired virtue and that they can pass it on to their children. But, Aristotle notes, nature is "frequently unable to bring this about."[16] So why not, as Lee Silver suggests, "seize this power" to give children genetic advantages and correct the defect of natural equality?

The possibility that biotechnology will permit the emergence of new genetic classes has been frequently noted and condemned by those who have speculated about the future.[17] But the opposite possibility also seems to be entirely plausible—that there will be an impetus toward a much more genetically egalitarian society. For it seems highly unlikely that people in modern democratic societies will sit around complacently if they see elites embedding their advantages genetically in their children.

Indeed, this is one of the few things in a politics of the future that people are likely 25
to rouse themselves to fight over. By this I mean not just fighting metaphorically, in the sense of shouting matches among talking heads on TV and debates in Congress, but actually picking up guns and bombs and using them on other people. There are very few domestic political issues today in our rich, self-satisfied liberal democracies that can cause people to get terribly upset, but the specter of rising genetic inequality may well get people off their couches and into the streets.

If people get upset enough about genetic inequality, there will be two alternative courses of action. The first and most sensible would simply be to forbid the use of biotechnology to enhance human characteristics and decline to compete in this dimension. But the notion of enhancement may become too powerfully attractive to forgo, or it may prove difficult to enforce a rule preventing people from enhancing their children, or the courts may declare they have a right to do so. At this point a second possibility opens up, which is to use that same technology to raise up the bottom.[18]

This is the only scenario in which it is plausible that we will see a liberal democracy of the future get back into the business of state-sponsored eugenics. The bad old form of eugenics discriminated against the disabled and less intelligent by forbidding them to have children. In the future, it may be possible to breed children who are more intelligent, more healthy, more "normal." Raising the bottom is something that can only be accomplished through the intervention of the state. Genetic enhancement technology is likely to be expensive and involve some risk, but even if it were relatively cheap and safe, people who are poor and lacking in education would still fail to take advantage of it. So the bright red line of universal human dignity will have to be reinforced by allowing the state to make sure that no one falls outside it.

The politics of breeding future human beings will be very complex. Up to now, the Left has on the whole been opposed to cloning, genetic engineering, and similar biotechnologies for a number of reasons, including traditional humanism, environmental concerns, suspicion of technology and of the corporations that produce it, and fear of

eugenics. The Left has historically sought to play down the importance of heredity in favor of social factors in explaining human outcomes. For people on the Left to come around and support genetic engineering for the disadvantaged, they would first have to admit that genes are important in determining intelligence and other types of social outcomes in the first place.

The Left has been more hostile to biotechnology in Europe than in North America. Much of this hostility is driven by the stronger environmental movements there, which have led the campaign, for example, against genetically modified foods. (Whether certain forms of radical environmentalism will translate into hostility to human biotechnology remains to be seen. Some environmentalists see themselves defending nature from human beings, and seem to be more concerned with threats to nonhuman than to human nature.) The Germans in particular remain very sensitive to anything that smacks of eugenics. The philosopher Peter Sloterdijk raised a storm of protest in 1999 when he suggested that it will soon be impossible for people to refuse the power of selection that biotechnology provides them, and that the questions of breeding something "beyond" man that were raised by Nietzsche and Plato could no longer be ignored.[19] He was condemned by the sociologist Jürgen Habermas, among others, who in other contexts has also come out against human cloning.[20]

On the other hand, there are some on the Left who have begun to make the case 30
for genetic engineering.[21] John Rawls argued in *A Theory of Justice* that the unequal distribution of natural talents was inherently unfair. A Rawlsian should therefore want to make use of biotechnology to equalize life chances by breeding the bottom up, assuming that prudential considerations concerning safety, cost, and the like would be settled. Ronald Dworkin has laid out a case for the right of parents to genetically engineer their children based on a broader concern to protect autonomy,[22] and Laurence Tribe has suggested that a ban on cloning would be wrong because it might create discrimination against children who were cloned in spite of the ban.[23]

It is impossible to know which of these two radically different scenarios—one of growing genetic inequality, the other of growing genetic equality—is more likely to come to pass. But once the technological possibility for biomedical enhancement is realized, it is hard to see how growing genetic inequality would fail to become one of the chief controversies of twenty-first-century politics.

Human Dignity Redux

Denial of the concept of human dignity—that is, of the idea that there is something unique about the human race that entitles every member of the species to a higher moral status than the rest of the natural world—leads us down a very perilous path. We may be compelled ultimately to take this path, but we should do so only with our eyes open. Nietzsche is a much better guide to what lies down that road than the legions of bioethicists and casual academic Darwinians that today are prone to give us moral advice on this subject.

To avoid following that road, we need to take another look at the notion of human dignity, and ask whether there is a way to defend the concept against its detractors that is fully compatible with modern natural science but that also does justice to the full meaning of human specificity. I believe that there is.

In contrast to a number of conservative Protestant denominations that continue to hold a brief for creationism, the Catholic Church by the end of the twentieth century had come to terms with the theory of evolution. In his 1996 message to the Pontifical Academy of Sciences, Pope John Paul II corrected the encyclical *Humani generis* of Pius XII, which maintained that Darwinian evolution was a serious hypothesis but one that remained unproven. The pope stated, "Today, almost half a century after the publication of the Encyclical, new knowledge has led to the recognition of the theory of evolution as more than a hypothesis. It is indeed remarkable that this theory has been progressively accepted by researchers, following a series of discoveries in various fields of knowledge. The convergence, neither sought nor fabricated, of the results of work that was conducted independently is in itself a significant argument in favor of this theory."[24]

But the pope went on to say that while the church can accept the view that man is descended from nonhuman animals, there is an "ontological leap" that occurs somewhere in this evolutionary process.[25] The human soul is something directly created by God: Consequently, "theories of evolution which, in accordance with the philosophies inspiring them, consider the mind as emerging from the forces of living nature, or as a mere epiphenomenon of this matter, are incompatible with the truth about man." The pope continued, "Nor are they able to ground the dignity of the person."

The pope was saying, in other words, that at some point in the 5 million years between man's chimplike forebears and the emergence of modern human beings, a human soul was inserted into us in a way that remains mysterious. Modern natural science can uncover the time line of this process and explicate its material correlates, but it has not fully explained either what the soul is or how it came to be. The church has obviously learned a great deal from modern natural science in the past two centuries and has adjusted its doctrines accordingly. But while many natural scientists would scoff at the idea that they have anything to learn from the church, the pope has pointed to a real weakness in the current state of evolutionary theory, which scientists would do well to ponder. Modern natural science has explained a great deal less about what it means to be human than many scientists think it has.

Parts and Wholes

Many contemporary Darwinians believe that they have demystified the problem of how human beings came to be human through the classical reductionist methods of modern natural science. That is, any higher-order behavior or characteristic, such as language or aggression, can be traced back through the firing of neurons to the biochemical substrate of the brain, which in turn can be understood in terms of the simpler organic compounds of which it is composed. The brain arrived at its present state through a series of incremental evolutionary changes that were driven by random variation, and a process of natural selection by which the requirements of the surrounding environment selected for certain mental characteristics. Every human characteristic can thus be traced back to a prior material cause. If, for example, we today love to listen to Mozart or Beethoven, it is because we have auditory systems that were evolved, in the environment of evolutionary adaptation, to discriminate between certain kinds of sounds that were necessary perhaps to warn us against predators or to help us on a hunt.[26]

The problem with this kind of thinking is not that it is necessarily false but that it is insufficient to explain many of the most salient and unique human traits. The problem lies in the methodology of reductionism itself for understanding complex systems, and particularly biological ones.

Reductionism constitutes, of course, one of the foundations of modern natural science and is responsible for many of its greatest triumphs. You see before you two apparently different substances, the graphite in your pencil lead and the diamond in your engagement ring, and you might be tempted to believe that they were essentially different substances. But reductionist chemistry has taught us that in fact they are both composed of the same simpler substance, carbon, and that the apparent differences are not ones of essence but merely of the way the carbon atoms are bonded. Reductionist physics has been busy over the past century tracing atoms back to subatomic particles and thence back to an even more reduced set of basic forces of nature.

But what is appropriate for domains in physics, like celestial mechanics and fluid dynamics, is not necessarily appropriate for the study of objects at the opposite end of the complexity scale, like most biological systems, because the behavior of complex systems cannot be predicted by simply aggregating or scaling up the behavior of the parts that constitute them.* The distinctive and easily recognizable behavior of a flock of birds or a swarm of bees, for example, is the product of the interaction of individual birds or bees following relatively simple behavioral rules (fly next to a partner, avoid obstacles, and so on), none of which encompasses or defines the behavior of the flock or swarm as a whole. Rather, the group behavior "emerges" as a result of the interaction of the individuals that make it up. In many cases, the relationship between parts and wholes is nonlinear: That is, increasing input A increases output B up to a certain point, whereupon it creates a qualitatively different and unexpected output C. This is true even of relatively simple chemicals like water: H_2O undergoes a phase transition from liquid to solid at 32 degrees Fahrenheit, something that one would not necessarily predict on the basis of knowledge of its chemical composition.

That the behavior of complex wholes cannot be understood as the aggregated behavior of their parts has been understood in the natural sciences for some time now,[27] and has led to the development of the field of so-called nonlinear or "complex adaptive" systems, which try to model the emergence of complexity. This approach is, in a way, the opposite of reductionism: It shows that while wholes can be traced back to their simpler antecedent parts, there is no simple predictive model that allows us to move from the parts to the emergent behaviors of the wholes. Being nonlinear, they may be extremely sensitive to small differences in starting conditions and thus may appear chaotic even when their behavior is completely deterministic.

This means that the behavior of complex systems is much more difficult to understand than the founders of reductionist science once believed. The eighteenth-century astronomer Laplace once said that he could precisely predict the future of the universe

* The determinism of classical Newtonian mechanics is based in large measure on the parallelogram rule, which says that the effects of two forces acting on a body can be summed as if each were acting independently of the other. Newton shows that this rule works for celestial bodies like planets and stars, and assumes that it will also work for other natural objects, like animals.

on the basis of Newtonian mechanics, if he could know the mass and motion of the universe's constituent parts.[28] No scientist could make this claim today—not just because of the inherent uncertainties introduced by quantum mechanics but also because there exists no reliable methodology for predicting the behavior of complex systems.[29] In the words of Arthur Peacocke, "The concepts and theories . . . that constitute the content of the sciences focusing on the more complex levels are often (not always) logically not reducible to those operative in the sciences that focus on their components."[30] There is a hierarchy of levels of complexity in the sciences, with human beings and human behavior occupying a place at the uppermost level.

Each level can give us some insight into the levels above it, but understanding the lower levels does not allow one to fully understand the higher levels' emergent properties. Researchers in the area of complex adaptive systems have created so-called agent-based models of complex systems, and have applied them in a wide variety of areas, from cell biology to fighting a war to distributing natural gas. It remains to be seen, however, whether this approach constitutes a single, coherent methodology applicable to all complex systems.[31] Such models may tell us only that certain systems will remain inherently chaotic and unpredictable, or that prediction rests on a precise knowledge of initial conditions that is unavailable to us. The higher level must thus be understood with a methodology appropriate to its degree of complexity.

We can illustrate the problematic relationship of parts to wholes by reference to one unique domain of human behavior, politics.[32] Aristotle states that man is a political animal by nature. If one were to try to build a case for human dignity based on human specificity, the capability of engaging in politics would certainly constitute one important component of human uniqueness. Yet the idea of our uniqueness in this regard has been challenged. . . . [C]himpanzees and other primates engage in something that looks uncannily like human politics as they struggle and connive to achieve alpha male status. They appear, moreover, to feel the political emotions of pride and shame as they interact with other members of their group. Their political behavior can also apparently be transmitted through nongenetic means, so that political culture would not seem to be the exclusive preserve of human beings.[33] Some observers gleefully cite examples like this to deflate human feelings of self-importance relative to other species.

But to confuse human politics with the social behavior of any other species is to mistake parts for wholes. Only human beings can formulate, debate, and modify abstract rules of justice. When Aristotle asserted that man is a political animal by nature, he meant this only in the sense that politics is a potentiality that emerges over time.[34] He notes that human politics did not begin until the first lawgiver established a state and promulgated laws, an event that was of great benefit to mankind but that was contingent on historical developments. This accords with what we know today about the emergence of the state, which took place in parts of the world like Egypt and Babylonia perhaps 10,000 years ago and was most likely related to the development of agriculture. For tens of thousands of years before that, human beings lived in stateless hunter-gatherer societies in which the largest group numbered no more than 50 to 100 individuals, most of them related by kinship.[35] So in a certain sense, while human sociability is obviously natural, it is not clear that humans are political animals by nature.

But Aristotle insists that politics is natural to man despite the fact that it did not exist at all in early periods of human history. He argues that it is human language that allows human beings to formulate laws and abstract principles of justice that are necessary to the creation of a state and of political order. Ethologists have noted that many other species communicate with sounds, and that chimpanzees and other animals can learn human language to a limited extent. But no other species has *human* language—that is, the ability to formulate and communicate abstract principles of action. It is only when these two natural characteristics, human sociability and human language, come together that human politics emerges. Human language obviously evolved to promote sociability, but it is very unlikely that there were evolutionary forces shaping it to become an enabler of politics. It was rather like one of Stephen Jay Gould's spandrels,* something that evolved for one reason but that found another key purpose when combined in a human whole.[36] Human politics, though natural in an emergent sense, is not reducible to either animal sociability or animal language, which were its precursors.

Consciousness

The area in which the inability of a reductionist materialist science to explain observable phenomena is most glaringly evident is the question of human consciousness. By consciousness I mean subjective mental states: not just the thoughts and images that appear to you as you are thinking or reading this page, but also the sensations, feelings, and emotions that you experience as part of everyday life.

There has been a huge amount of research and theorizing about consciousness over the past two generations, coming in equal measure from the neurosciences and from studies in computer and artificial intelligence (AI). Particularly in the latter field there are many enthusiasts who are convinced that with more powerful computers and new approaches to computing, such as neural networks, we are on the verge of a breakthrough in which mechanical computers will achieve consciousness. There have been conferences and earnest discussions devoted to the question of whether it would be moral to turn off such a machine if and when this breakthrough occurs, and whether we would need to assign rights to conscious machines.

The fact of the matter is that we are nowhere close to a breakthrough; consciousness remains as stubbornly mysterious as it ever was. The problem with the current state of thinking begins with the traditional philosophical problem of the ontological status of consciousness. Subjective mental states, while produced by material biological processes, appear to be of a very different, nonmaterial order from other phenomena. The fear of dualism—that is, the doctrine that there are two essential types of being, material and mental—is so strong among researchers in this field that it has led them to palpably ridiculous conclusions. In the words of the philosopher John Searle,

> Seen from the perspective of the last fifty years, the philosophy of mind, as well as cognitive science and certain branches of psychology, present a very

* A spandrel is an architectural feature that emerges, unplanned by the architect, from the intersection of a dome and the walls that support it.

> curious spectacle. The most striking feature is how much of mainstream philosophy of mind of the past fifty years seems obviously false . . . in the philosophy of mind, obvious facts about the mental, such as that we all really do have subjective conscious mental states and that these are not eliminable in favor of anything else, are routinely denied by many, perhaps most, of the advanced thinkers in the subject.[37]

An example of a patently false understanding of consciousness comes from one of the leading experts in the field, Daniel Dennett, whose book *Consciousness Explained* finally comes to the following definition of consciousness: "Human consciousness is *itself* a huge complex of memes (or more exactly, meme-effects in brains) that can best be understood as the operation of a *'von Neumannesque'* virtual machine *implemented* in the *parallel architecture* of a brain that was not designed for any such activities."[38] A naive reader may be excused for thinking that this kind of statement doesn't do much at all to advance our understanding of consciousness. Dennett is saying in effect that human consciousness is simply the by-product of the operations of a certain type of computer, and if we think that there is more to it than that, we have a mistakenly old-fashioned view of what consciousness is. As Searle says of this approach, it works only by denying the existence of what you and I and everyone else understand consciousness to be (that is, subjective feelings).[39]

Similarly, many of the researchers in the field of artificial intelligence sidestep the question of consciousness by in effect changing the subject. They assume that the brain is simply a highly complex type of organic computer that can be identified by its external characteristics. The well-known Turing test asserts that if a machine can perform a cognitive task such as carrying on a conversation in a way that from the outside is indistinguishable from similar activities carried out by a human being, then it is indistinguishable on the inside as well. Why this should be an adequate test of human mentality is a mystery, for the machine will obviously not have any subjective awareness of what it is doing, or feelings about its activities.* This doesn't prevent such authors as Hans Moravec[40] and Ray Kurzweil[41] from predicting that machines, once they reach a requisite level of complexity, will possess human attributes like consciousness as well.[42] If they are right, this will have important consequences for our notions of human dignity, because it will have been conclusively proven that human beings are essentially nothing more than complicated machines that can be made out of silicon and transistors as easily as carbon and neurons.

The likelihood that this will happen seems very remote, however, not so much because machines will never duplicate human intelligence—I suspect they will probably be able to come very close in this regard—but rather because it is impossible to see how they will come to acquire human emotions. It is the stuff of science fiction for an android, robot, or computer to suddenly start experiencing emotions like fear, hope,

* Searle's critique of this approach is contained in his "Chinese room" puzzle, which raises the question of whether a computer could be said to understand Chinese any more than a non-Chinese-speaking individual locked in a room who received instructions on how to manipulate a series of symbols in Chinese. See Searle (1997), p. 11.

even sexual desire, but no one has come remotely close to positing how this might come about. The problem is not simply that, like the rest of consciousness, no one understands what emotions are ontologically; no one understands why they came to exist in human biology.

There are of course functional reasons for feelings like pain and pleasure. If we didn't find sex pleasurable we wouldn't reproduce, and if we didn't feel pain from fire we would be burning ourselves constantly. But state-of-the-art thinking in cognitive science maintains that the particular subjective form that the emotions take is not necessary to their function. It is perfectly possible, for example, to design a robot with heat sensors in its fingers connected to an actuator that would pull the robot's hand away from a fire. The robot could keep itself from being burned without having any subjective sense of pain, and it could make decisions on which objectives to fulfill and which activities to avoid on the basis of a mechanical computation of the inputs of different electrical impulses. A Turing test would say it was a human being in its behavior, but it would actually be devoid of the most important quality of a human being, feelings. The actual subjective forms that emotions take are today seen in evolutionary biology and in cognitive science as no more than epiphenomenal to their underlying function; there are no obvious reasons this form should have been selected for in the course of evolutionary history.[43]

As Robert Wright points out, this leads to the very bizarre outcome that what is most important to us as human beings has no apparent purpose in the material scheme of things by which we became human.[44] For it is the distinctive human gamut of emotions that produces human purposes, goals, objectives, wants, needs, desires, fears, aversions, and the like and hence is the source of human values. While many would list human reason and human moral choice as the most important unique human characteristics that give our species dignity, I would argue that possession of the full human emotional gamut is at least as important, if not more so.

The political theorist Robert McShea demonstrates the importance of human emotions to our commonsense understanding of what it means to be human by asking us to perform the following thought experiment.[45] Suppose you met two creatures on a desert island, both of which had the rational capacity of a human being and hence the ability to carry on a conversation. One had the physical form of a lion but the emotions of a human being, while the other had the physical form of a human being but the emotional characteristics of a lion. Which creature would you feel more comfortable with, which creature would you be more likely to befriend or enter into a moral relationship with? The answer, as countless children's books with sympathetic talking lions suggest, is the lion, because species-typical human emotions are more critical to our sense of our own humanness than either our reason or our physical appearance. The coolly analytical Mr. Spock in the TV series *Star Trek* appears at times more likable than the emotional Mr. Scott only because we suspect that somewhere beneath his rational exterior lurk deeply buried human feelings. Certainly many of the female characters he encountered in the series hoped they could rouse something more than robotic responses from him.

We would regard a Mr. Spock who was truly devoid of any feelings as a psychopath and a monster.

On the other hand, we would regard a Mr. Spock who was truly devoid of any feelings as a psychopath and a monster. If he offered us a benefit, we might accept it but would feel no gratitude because we would know it was the product of rational calculation on his part and not goodwill. If we double-crossed him, we would feel no guilt, because we know that he cannot himself entertain feelings of anger or of having been betrayed. And if circumstances forced us to kill him to save ourselves, or to sacrifice his life in a hostage situation, we would feel no more regret than if we lost any other valuable asset, like a car or a teleporter.[46] Even though we might want to cooperate with this Mr. Spock, we would not regard him as a moral agent entitled to the respect that human beings command. The computer geeks in AI labs who think of themselves as nothing more than complex computer programs and want to download themselves into a computer should worry, since no one would care if they were turned off for good.

So there is a great deal that comes together under the rubric of consciousness that helps define human specificity and hence human dignity, which nonetheless cannot currently be fully explicated by modern natural science. It is not sufficient to argue that some other animals are conscious, or have culture, or have language, for their consciousness does not combine human reason, human language, human moral choice, and human emotions in ways that are capable of producing human politics, human art, or human religion. All of the nonhuman precursors of these human traits that existed in evolutionary history, and all of the material causes and preconditions for their emergence, collectively add up to much less than the human whole. Jared Diamond in his book *The Third Chimpanzee* notes the fact that the chimpanzee and human genomes overlap by more than 98 percent, implying that the differences between the two species are relatively trivial.[47] But for an emergent complex system, small differences can lead to enormous qualitative changes. It is a bit like saying there is no significant difference between ice and liquid water because they differ in temperature by only 1 degree.

Thus one does not have to agree with the pope that God directly inserted a human soul in the course of evolutionary history to acknowledge with him that there was a very important qualitative, if not ontological, leap that occurred at some point in this process. It is this leap from parts to a whole that ultimately has to constitute the basis for human dignity, a concept one can believe in even if one does not begin from the pope's religious premises.

What this whole is and how it came to be remain, in Searle's word, "mysterious." None of the branches of modern natural science that have tried to address this question have done more than scratch the surface, despite the belief of many scientists that they have demystified the entire process. It is common now for many AI researchers to say that consciousness is an "emergent property" of a certain kind of complex computer. But this is no more than an unproven hypothesis based on an analogy with other complex systems. No one has ever seen consciousness emerge under experimental conditions, or even posited a theory as to how this might come about. It would be surprising if the process of "emergence" didn't play an important part in explaining how humans came to be human, but whether that is all there is to the story is something we do not at present know.

This is not to say that the demystification by science will never happen. Searle himself believes that consciousness is a biological property of the brain much like the firing of neurons or the production of neurotransmitters and that biology will someday be

able to explain how organic tissue can produce it. He argues that our present problems in understanding consciousness do not require us to adopt a dualistic ontology or abandon the scientific framework of material causation. The problem of how consciousness arose does not require recourse to the direct intervention of God.

It does not, on the other hand, rule it out, either. 60

What to Fight For

If what gives us dignity and a moral status higher than that of other living creatures is related to the fact that we are complex wholes rather than the sum of simple parts, then it is clear that there is no simple answer to the question, What is Factor X? That is, Factor X cannot be reduced to the possession of moral choice, or reason, or language, or sociability, or sentience, or emotions, or consciousness, or any other quality that has been put forth as a ground for human dignity. It is all of these qualities coming together in a human whole that make up Factor X. Every member of the human species possesses a genetic endowment that allows him or her to become a whole human being, an endowment that distinguishes a human in essence from other types of creatures.

A moment's reflection will show that none of the key qualities that contribute to human dignity can exist in the absence of the others. Human reason, for example, is not that of a computer; it is pervaded by emotions, and its functioning is in fact facilitated by the latter.[48] Moral choice cannot exist without reason, needless to say, but it is also grounded in feelings such as pride, anger, shame, and sympathy.[49] Human consciousness is not just individual preferences and instrumental reason, but is shaped intersubjectively by other consciousnesses and their moral evaluations. We are social and political animals not merely because we are capable of game-theoretic reason, but because we are endowed with certain social emotions. Human sentience is not that of a pig or a horse, because it is coupled with human memory and reason.

This protracted discussion of human dignity is intended to answer the following question: What is it that we want to protect from any future advances in biotechnology? The answer is, we want to protect the full range of our complex, evolved natures against attempts at self-modification. We do not want to disrupt either the unity or the continuity of human nature, and thereby the human rights that are based on it.

If Factor X is related to our very complexity and the complex interactions of uniquely human characteristics like moral choice, reason, and a broad emotional gamut, it is reasonable to ask how and why biotechnology would seek to make us less complex. The answer lies in the constant pressure that exists to reduce the ends of biomedicine to utilitarian ones—that is, the attempt to reduce a complex diversity of natural ends and purposes to just a few simple categories like pain and pleasure, or autonomy. There is in particular a constant predisposition to allow the relief of pain and suffering to automatically trump all other human purposes and objectives. For this will be the constant trade-off that biotechnology will pose: We can cure this disease, or prolong this person's life, or make this child more tractable, at the expense of some ineffable human quality like genius, or ambition, or sheer diversity.

That aspect of our complex natures most under threat has to do with our emotional 65 gamut. We will be constantly tempted to think that we understand what "good" and "bad" emotions are, and that we can do nature one better by suppressing the latter, by

trying to make people less aggressive, more sociable, more compliant, less depressed. The utilitarian goal of minimizing suffering is itself very problematic. No one can make a brief in favor of pain and suffering, but the fact of the matter is that what we consider to be the highest and most admirable human qualities, both in ourselves and in others, are often related to the way that we react to, confront, overcome, and frequently succumb to pain, suffering, and death. In the absence of these human evils there would be no sympathy, compassion, courage, heroism, solidarity, or strength of character.* A person who has not confronted suffering or death has no depth. Our ability to experience these emotions is what connects us potentially to all other human beings, both living and dead.

Many scientists and researchers would say that we don't need to worry about fencing off human nature, however defined, from biotechnology, because we are a very long way from being able to modify it, and may never achieve the capability. They may be right: Human germ-line engineering and the use of recombinant DNA technology on humans are probably much further off than many people assume, though human cloning is not.

But our ability to manipulate human behavior is not dependent on the development of genetic engineering. Virtually everything we can anticipate being able to do through genetic engineering we will most likely be able to do much sooner through neuropharmacology. And we will face large demographic changes in the populations that find new biomedical technologies available to them, not only in terms of age and sex distributions, but in terms of the quality of life of important population groups.

The widespread and rapidly growing use of drugs like Ritalin and Prozac demonstrates just how eager we are to make use of technology to alter ourselves. If one of the key constituents of our nature, something on which we base our notions of dignity, has to do with the gamut of normal emotions shared by human beings, then we are *already* trying to narrow the range for the utilitarian ends of health and convenience.

Psychotropic drugs do not alter the germ line or produce heritable effects in the way that genetic engineering someday might. But they already raise important issues about the meaning of human dignity and are a harbinger of things to come.

When Do We Become Human?

In the near term, the big ethical controversies raised by biotechnology will not be threats to the dignity of normal adult human beings but rather to those who possess something less than the full complement of capabilities that we have defined as characterizing human specificity. The largest group of beings in this category are the unborn, but it could also include infants, the terminally sick, elderly people with debilitating diseases, and the disabled. 70

This issue has already come up with regard to stem cell research and cloning. Embryonic stem cell research requires the deliberate destruction of embryos, while so-called therapeutic cloning requires not just their destruction but their deliberate creation for research purposes prior to destruction. (As bioethicist Leon Kass notes,

* The Greek root of *sympathy* and the Latin root of *compassion* both refer to the ability to feel another person's pain and suffering.

therapeutic cloning is not therapeutic for the embryo.) Both activities have been strongly condemned by those who believe that life begins at conception and that embryos have full moral status as human beings.

I do not want to rehearse the whole history of the abortion debate and the hotly contested question of when life begins. I personally do not begin with religious convictions on this issue and admit to considerable confusion in trying to think through its rights and wrongs. The question here is, What does the natural-rights approach to human dignity outlined here suggest about the moral status of the unborn, the disabled, and so on? I'm not sure it produces a definitive answer, but it can at least help us frame an answer to the question.

At first blush, a natural-rights doctrine that bases human dignity on the fact that the human species possesses certain unique characteristics would appear to allow a gradation of rights depending on the degree to which any individual member of that species shares in those characteristics. An elderly person with Alzheimer's, for example, has lost the normal adult ability to reason, and therefore that part of his dignity that would permit him to participate in politics by voting or running for office. Reason, moral choice, and possession of the species-typical emotional gamut are things that are shared by virtually all human beings and therefore serve as a basis for universal equality, but individuals possess these traits in greater or lesser amounts: Some are more reasonable, have stronger consciences or more sensitive emotions than others. At one extreme, minute distinctions could be made between individuals based on the degree to which they possess these basic human qualities, with differentiated rights assigned to them on that basis. This has happened before in history; it is called natural aristocracy. The hierarchical system it implies is one of the reasons people have become suspicious of the very concept of natural rights.

There is a strong prudential reason for not being too hierarchical in the assignment of political rights, however. There is, in the first place, no consensus on a precise definition of that list of essential human characteristics that qualify an individual for rights. More important, judgments about the degree to which a given individual possesses one or another of these qualities are very difficult to make, and usually suspect, because the person making the judgment is seldom a disinterested party. Most real-world aristocracies have been conventional rather than natural, with the aristocrats assigning themselves rights that they claimed were natural but that were actually based on force or convention. It is therefore appropriate to approach the question of who qualifies for rights with some liberality.

Nonetheless, every contemporary liberal democracy does in fact differentiate rights 75
based on the degree to which individuals or categories of individuals share in certain species-typical characteristics. Children, for example, do not have the rights of adults because their capacities for reason and moral choice are not fully developed; they cannot vote and do not have the freedom of person that their parents do in making choices about where to live, whether to go to school, and so on. Societies strip criminals of basic rights for violating the law, and do so more severely in the case of those regarded as lacking a basic human moral sense. In the United States, they can be deprived even of the right to life for certain kinds of crimes. We do not officially strip Alzheimer's patients of their political rights, but we do restrict their ability to drive and make financial decisions, and in practice they usually cease to exercise their political rights as well.

From a natural-rights perspective, then, one could argue that it is reasonable to assign the unborn different rights from those of either infants or children. A day-old infant may not be capable of reason or moral choice, but it already possesses important elements of the normal human emotional gamut—it can get upset, bond to its mother, expect attention, and the like, in ways that a day-old embryo cannot. It is the violation of the natural and very powerful bonding that takes place between parent and infant, in fact, that makes infanticide such a heinous crime in most societies. That we typically hold funerals after the deaths of infants but not after miscarriages is testimony to the naturalness of this distinction. All of this suggests that it does not make sense to treat embryos as human beings with the same kinds of rights that infants possess.

Against this line of argument, we can pose the following considerations, again not from a religious but from a natural-rights perspective. An embryo may be lacking in some of the basic human characteristics possessed by an infant, but it is also not just another group of cells or tissue, because it has the *potential* to become a full human being. In this respect, it differs from an infant, which also lacks many of the most important characteristics of a normal adult human being, only in the degree to which it has realized its natural potential. This implies that while an embryo can be assigned a lower moral status than an infant, it has a higher moral status than other kinds of cells or tissue that scientists work with. It is therefore reasonable, on nonreligious grounds, to question whether researchers should be free to create, clone, and destroy human embryos at will.

Ontogeny recapitulates phylogeny. We have argued that in the evolutionary process that leads from prehuman ancestor to human beings, there was a qualitative leap that transformed the prehuman precursors of language, reason, and emotion into a human whole that cannot be explained as a simple sum of its parts, and that remains an essentially mysterious process. Something similar happens with the development of every embryo into an infant, child, and adult human being: What starts out as a cluster of organic molecules comes to possess consciousness, reason, the capacity for moral choice, and subjective emotions, in a manner that remains equally mysterious.

Putting these facts together—that an embryo has a moral status somewhere between that of an infant and that of other types of cells and tissue, and that the transformation of the embryo into something with a higher status is a mysterious process—suggests that if we are to do things like harvest stem cells from embryos, we should put a lot of limits and constraints around this activity to make sure that it does not become a precedent for other uses of the unborn that would push the envelope further. To what extent are we willing to create and grow embryos for utilitarian purposes? Supposing some miraculous new cure required cells not from a day-old embryo, but tissue from a month-old fetus? A five-month-old female fetus already has in her ovaries all the eggs she will ever produce as a woman; supposing someone wanted access to them? If we get too used to the idea of cloning embryos for medical purposes, will we know when to stop?

If the question of equality in a future biotech world threatens to tear up the Left, the Right will quite literally fall apart over questions related to human dignity. In the United States, the Right (as represented by the Republican Party) is divided between economic libertarians, who like entrepreneurship and technology with minimal regulation, and social conservatives, many of whom are religious, who care about a range of issues including abortion and the family. The coalition between these two groups is

usually strong enough to hold up during elections, but it papers over some fundamental differences in outlook. It is not clear that this alliance will survive the emergence of new technologies that, on the one hand, offer enormous health benefits and money-making opportunities for the biotech industry, but, on the other, require violating deeply held ethical norms.

We are thus brought back to the question of politics and political strategies. For if there is a viable concept of human dignity out there, it needs to be defended, not just in philosophical tracts but in the real world of politics, and protected by viable political institutions. . . .

NOTES

1. Clive Staples Lewis, *The Abolition of Man* (New York: Touchstone, 1944), p. 85.
2. Counsel of Europe, Draft Additional Protocol to the Convention on Human Rights and Biomedicine, On the Prohibiting of Cloning Human Beings, Doc. 7884, July 16, 1997.
3. This is the theme of the second part of Francis Fukuyama, *The End of History and the Last Man* (New York: Free Press, 1992).
4. For an interpretation of this passage in Tocqueville, see Francis Fukuyama, "The March of Equality," *Journal of Democracy* 11 (2000): 11–17.
5. John Paul II, "Message to the Pontifical Academy of Sciences," October 22, 1996.
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7. Michael Ruse and David L. Hull, *The Philosophy of Biology* (New York: Oxford University Press, 1998), p. 385.
8. Lee M. Silver, *Remaking Eden: Cloning and Beyond in a Brave New World* (New York: Avon, 1998), pp. 256–57.
9. Ruse and Hull (1998), p. 385.
10. Silver (1998), p. 277.
11. Friedrich Nietzsche, *Thus Spoke Zarathustra*, First part, section 5, from *The Portable Nietzsche*, ed. Walter Kaufmann (New York: Viking, 1968), p. 130.
12. Charles Taylor, *Sources of the Self: The Making of the Modern Identity* (Cambridge, Mass.: Harvard University Press, 1989), pp. 6–7.
13. For a fuller defense of this proposition, see Francis Fukuyama, *The Great Disruption: Human Nature and the Reconstitution of Social Order*, part II (New York: Free Press, 1999).
14. Aristotle, *Politics* I.2.13, 1254b, 16–24.
15. Ibid., I.2.18, 1255a, 22–38.
16. Ibid., I.2.19, 1255b, 3–5.
17. See, for example, Dan W. Brock, "The Human Genome Project and Human Identity," in *Genes, Humans, and Self-Knowledge*, eds. Robert F. Weir and Susan C. Lawrence et al. (Iowa City: University of Iowa Press, 1994), pp. 18–23.
18. This possibility has already been suggested by Charles Murray. See his "Deeper into the Brain," *National Review* 52 (2000): 46–49.
19. Peter Sloterdijk, "Regeln für den Menschenpark: Ein Antwortschreiben zum Brief über den Humanismus," *Die Zeit*, no. 38, September 16, 1999.
20. Jürgen Habermas, "Nicht die Natur verbietet das Klonen. Wir müssen selbst entscheiden. Eine Replik auf Dieter E. Zimmer," *Die Zeit*, no. 9, February 19, 1998.
21. For a discussion of this issue, see Allen Buchanan and Norman Daniels et al., *From Chance to Choice: Genetics and Justice* (New York and Cambridge: Cambridge University Press, 2000), pp. 17–20. See also Robert H. Blank and Masako N. Darrough, *Biological*