

Sorry, But Your Soul Just Died

by Francis Fukuyama

Three excerpts from his 2002 book *Our Posthuman Future*

A decade ago Francis Fukuyama shook the world of ideas with his assertion that we had reached the end of history. Now he has looked into the future and doesn't like what he sees. In these three extracts from Our Posthuman Future he argues that science runs the risk of destroying humanity as we know it

I was born in 1952, right in the middle of the American baby boom. For any person growing up as I did in the middle decades of the 20th century, the future and its terrifying possibilities were defined by two books, George Orwell's *Nineteen Eighty-Four* (first published in 1949) and Aldous Huxley's *Brave New World* (published in 1932).

The two books were far more prescient than anyone realised at the time, because they were centred on two different technologies that would in fact emerge and shape the world over the next two generations. *Nineteen Eighty-Four* was about what we now call information technology: central to the success of the vast, totalitarian empire that had been set up over Oceania was a device called the telescreen, a wall-sized flat-panel display that could simultaneously send and receive images from each individual household to a hovering Big Brother. The telescreen was what permitted the vast centralisation of social life under the Ministry of Truth and the Ministry of Love, for it allowed the government to banish privacy by monitoring every word and deed over a massive network of wires. *Brave New World*, by contrast, was about the other big technological revolution about to take place, that of biotechnology. Bokanovskification, the hatching of people not in wombs but, as we now say, in vitro; the drug soma, which gave people instant happiness; the Feelies, in which sensation was simulated by implanted electrodes; and the modification of behavior through constant subliminal repetition and, when that didn't work, through the administration of various artificial hormones were what gave this book its particularly creepy ambience.

With at least a half century separating us from the publication of these books, we can see that while the technological predictions they made were startlingly accurate, the political predictions of *Nineteen Eighty-Four* were entirely wrong. The year 1984 came and went, with the US still locked in a cold war struggle with the Soviet Union. That year saw the introduction of a new model of the IBM personal computer and the beginning of what became the PC revolution. As Peter

Huber has argued [in his *Orwell's Revenge*], the personal computer, linked to the internet, was in fact the realisation of Orwell's telescreen. But instead of becoming an instrument of centralisation and tyranny, it led to just the opposite: the democratisation of access to information and the decentralisation of politics. Instead of Big Brother watching everyone, people could use the PC and internet to watch Big Brother, as governments everywhere were driven to publish more information on their own activities.

Just five years after 1984, in a series of dramatic events that would earlier have seemed like political science fiction, the Soviet Union and its empire collapsed, and the totalitarian threat that Orwell had so vividly evoked vanished. People were again quick to point out that these two events - the collapse of totalitarian empires and the emergence of the personal computer, as well as other forms of inexpensive information technology, from TVs and radios to faxes and email - were not unrelated. Totalitarian rule depended on a regime's ability to maintain a monopoly over information, and once modern information technology made that impossible, the regime's power was undermined. The political prescience of the other great dystopia, *Brave New World*, remains to be seen. Many of the technologies that Huxley envisioned, such as in vitro fertilisation, surrogate motherhood, psychotropic drugs, and genetic engineering for the manufacture of children, are already here or just over the horizon. But this revolution has only just begun; the daily avalanche of announcements of new breakthroughs in biomedical technology and achievements such as the completion of the human genome project in the year 2000 portend much more serious changes to come.

Of the nightmares evoked by these two books, *Brave New World's* always struck me as more subtle and more challenging. It is easy to see what's wrong with the world of *Nineteen Eighty-Four*: the protagonist, Winston Smith, is known to hate rats above all things, so Big Brother devises a cage in which rats can bite at Smith's face in order to get him to betray his lover. This is the world of classical tyranny, technologically empowered

but not so different from what we have tragically seen and known in human history.

In *Brave New World*, by contrast, the evil is not so obvious because no one is hurt; indeed, this is a world in which everyone gets what they want. As one of the characters notes, "The Controllers realised that force was no good," and that people would have to be seduced rather than compelled to live in an orderly society. In this world, disease and social conflict have been abolished, there is no depression, madness, loneliness, or emotional distress, sex is good and readily available. There is even a government ministry to ensure that the length of time between the appearance of a desire and its satisfaction is kept to a minimum. No one takes religion seriously any longer, no one is introspective or has unrequited longings, the biological family has been abolished, no one reads Shakespeare. But no one (save John the Savage, the book's protagonist) misses these things, either, since they are happy and healthy.

The aim of this book is to argue that Huxley was right, that the most significant threat posed by contemporary biotechnology is the possibility that it will alter human nature and thereby move us into a "posthuman" stage of history. This is important because human nature exists, is a meaningful concept, and has provided a stable continuity to our experience as a species. It is, conjointly with religion, what defines our most basic values. Human nature shapes and constrains the possible kinds of political regimes, so a technology powerful enough to reshape what we are will have possibly malign consequences for liberal democracy and the nature of politics itself.

It may be that, as in the case of *Nineteen Eighty-Four*, we will eventually find that biotechnology's consequences are completely and surprisingly benign, and that we were wrong to lose sleep over it. It may be that the technology will in the end prove much less powerful than it seems today, or that people will be moderate and careful in their application of it. But one of the reasons I am not quite so sanguine is that biotechnology, in contrast to many other scientific advances, mixes obvious benefits with subtle harms in one seamless package.

Nuclear weapons and nuclear energy were perceived as dangerous from the start, and therefore were subject to strict regulation from the moment the Manhattan Project created the first atomic bomb in 1945. Observers like Bill Joy have worried about

nanotechnology - that is, molecular-scale self-replicating machines capable of reproducing out of control and destroying their creators. But such threats are actually the easiest to deal with because they are so obvious. If you are likely to be killed by a machine you've created, you take measures to protect yourself. And so far we've had a reasonable record in keeping our machine under control.

There may be products of biotechnology that will be similarly obvious in the dangers they pose to mankind - for example, superbugs, new viruses, or genetically modified foods that produce toxic reactions. Like nuclear weapons or nanotechnology, these are in a way the easiest to deal with because once we have identified them as dangerous, we can treat them as a straightforward threat.

The more typical threats raised by biotechnology, on the other hand, are those captured so well by Huxley, and are summed up in the title of an article by novelist Tom Wolfe, *Sorry, but Your Soul Just Died*. Medical technology offers us in many cases a devil's bargain: longer life, but with reduced mental capacity; freedom from depression, together with freedom from creativity or spirit; therapies that blur the line between what we achieve on our own and what we achieve because of the levels of various chemicals in our brains. Consider the following three scenarios, all of which are distinct possibilities that may unfold over the next generation or two.

The first has to do with new drugs. As a result of advances in neuropharmacology, psychologists discover that human personality is much more plastic than formerly believed. It is already the case that psychotropic drugs such as Prozac and Ritalin can affect traits like self-esteem and the ability to concentrate, but they tend to produce a host of unwanted side effects and hence are shunned except in cases of clear therapeutic need. But in the future, knowledge of genomics permits pharmaceutical companies to tailor drugs very specifically to the genetic profiles of individual patients and greatly minimise unintended side effects. Stolid people can become vivacious; introspective ones extroverted; you can adopt one personality on Wednesday and another for the weekend. There is no longer any excuse for anyone to be depressed or unhappy; even "normally" happy people can make themselves happier without worries of addiction, hangovers, or long-term brain damage. In the second scenario, advances in stem cell research allow scientists to regenerate virtually any tissue in the

body, such that life expectancies are pushed well above 100 years. If you need a new heart or liver, you just grow one inside the chest cavity of a pig or cow; brain damage from Alzheimer's and stroke can be reversed. The only problem is that there are many subtle and some not-so-subtle aspects of human ageing that the biotech industry hasn't quite figured out how to fix: people grow mentally rigid and increasingly fixed in their views as they age, and try as they might, they can't make themselves sexually attractive to each other and continue to long for partners of reproductive age. Worst of all, they just refuse to get out of the way, not just of their children, but their grandchildren and great-grandchildren. On the other hand, so few people have children or any connection with traditional reproduction that it scarcely seems to matter.

In a third scenario, the wealthy routinely screen embryos before implantation so as to optimise the kind of children they have. You can increasingly tell the social background of a young person by his or her looks and intelligence; if someone doesn't live up to social expectations, he tends to blame bad genetic choices by his parents rather than himself. Human genes have been transferred to animals and even to plants, for research purposes and to produce new medical products; and animal genes have been added to certain embryos to increase their physical endurance or resistance to disease. Scientists have not dared to produce a full-scale chimera, half human and half ape, though they could; but young people begin to suspect that classmates who do much less well than they do are in fact genetically not fully human. Because, in fact, they aren't.

Toward the end of his life, Thomas Jefferson wrote, "The general spread of the light of science has already laid open to every view the palpable truth, that the mass of mankind has not been born with saddles on their backs, nor a favoured few booted and spurred, ready to ride them legitimately, by the grace of God." The political equality enshrined in the Declaration of Independence rests on the empirical fact of natural human equality. We vary greatly as individuals and by culture, but we share a common humanity that allows every human being to potentially communicate with and enter into a moral relationship with every other human being on the planet. The ultimate question raised by biotechnology is: What will happen to political rights once we are able to, in effect, breed some people with saddles on their backs, and others with boots and spurs?

Extract 2

Where will the advances in mood altering drugs such as Prozac and Ritalin lead?

Self-esteem is a trendy psychological concept, something Americans are constantly being told they need more of. But it refers to a critical aspect of human psychology, the desire all people have for recognition. Socrates, in Plato's Republic, argued that there are three distinct parts of the soul, a desiring part, a rational part, and what he labelled *thymos*, a Greek word usually translated as "spiritedness". *Thymos* is the prideful side of the human personality, the part that demands that other people recognise one's worth or dignity. Human beings, with their memory, learning, and enormous capacity for abstract reasoning, are able to direct the struggle for recognition to ideologies, religious beliefs, tenure at universities, Nobel prizes, and myriad other honours. What is significant, however, is that the desire for recognition has a biological basis and that that basis is related to levels of serotonin in the brain.

It is for this reason that a drug such as Prozac looks so politically consequential. Hegel argues, with some justice, that the entire human historical process has been driven by a series of repeated struggles for recognition. Virtually all human progress has been the by-product of the fact that people were never satisfied with the recognition they received; it was through struggle and work alone that people could achieve it. Status, in other words, had to be earned. But now along comes the American pharmaceutical industry, which through drugs like Zoloft and Prozac can provide self-esteem in a bottle by elevating brain serotonin.

There are clearly millions of people in the world who are clinically depressed and whose feelings of self-worth fall far below what they should be. For them, Prozac and related drugs have been a godsend. But low levels of serotonin do not demarcate a clear pathological condition, and the existence of Prozac opens the way for what Peter Kramer, author of *Listening to Prozac*, famously labeled cosmetic pharmacology: that is, the taking of a drug not for its therapeutic value but simply because it makes one feel "better than good." If a sense of self-esteem is so crucial to human happiness, who would not want more of it? And so the path is opened toward a drug that in certain ways looks uncomfortably like the soma of Aldous Huxley's *Brave New World*. If Prozac appears to be some type of happiness pill, Ritalin has come to play the role of an overt instrument

of social control. It is used today to treat a syndrome known as attention deficit-hyperactivity disorder, or ADHD, a "disease" commonly associated with young boys who have trouble sitting still in class.

There is of course a simpler explanation, which is that ADHD isn't a disease at all but rather just the tail of the bell curve describing the distribution of perfectly normal behaviour. Young human beings, and particularly young boys, were not designed by evolution to sit around at a desk for hours at a time paying attention to a teacher, but rather to run and play and do other physically active things. The fact that we increasingly demand that they sit still in classrooms, or that parents and teachers have less time to spend with them on interesting tasks, is what creates the impression that there is a growing disease.

Ritalin is a central nervous system stimulant that is chemically related to such controlled substances as methamphetamine and cocaine. Its pharmacological effects are very similar to those of the latter drugs, increasing attention span, creating a sense of euphoria, building short-term energy levels, and allowing greater focus. If used to excess, Ritalin can have side effects similar to those of methamphetamine and cocaine, including insomnia and weight loss. This is why doctors prescribing Ritalin to children recommend periodic "drug holidays."

There is a disconcerting symmetry between Prozac and Ritalin. The former is prescribed heavily for depressed women lacking in self-esteem; it gives them more of the alpha-male feeling that comes with high serotonin levels. Ritalin is prescribed largely for boys who do not want to sit still in class because nature never designed them to behave that way. Together, the two sexes are gently nudged towards that androgynous median personality, self-satisfied and socially compliant, that is the current politically correct outcome in American society.

The neuropharmacological wave of the biotech revolution has already come crashing down around us. It has already produced a pill that looks like soma and a pill for socially controlling children, pills that appear to be far more effective than early childhood socialisation and Freudian talk therapies of the 20th century ever were. Their use has spread to millions and millions of people around the world, with much controversy over their potential long-term health consequences for the body, but almost no argument over what they imply

about conventional understanding of identity and moral behaviour.

Prozac and Ritalin are only the first generation of psychotropic drugs. In the future, virtually everything that the popular imagination envisions genetic engineering accomplishing is much more likely to be accomplished sooner through neuropharmacology. A class of drugs known as benzodiazepines may be used to affect the gamma-aminobutyric acid (GABA) system, to reduce anxiety, help maintain restful but active wakefulness, and produce adequate sleep in a shorter period, without the side-effects of sedation. Acetylcholine system enhancers may be used to improve the ability to learn new facts, retain knowledge, and improve factual recall. Dopamine system enhancers may be used to increase stamina and motivation. Finally, it may be possible to manipulate the endogenous opiate system to decrease sensitivity to pain and increase the threshold of pleasure. We don't have to await the arrival of human genetic engineering to foresee a time when we will be able to enhance intelligence, memory, emotional sensitivity, and sexuality, as well as reduce aggressiveness and manipulate behaviour in a host of other ways. The issue has already been joined with the current generation of psychotropic drugs, and will be put into much sharper relief with those shortly to come.

Extract 3

What happens when people can live to 150?

The medical profession is dedicated to the proposition that anything that can defeat disease and prolong life is unequivocally a good thing. The fear of death is one of the deepest and most abiding human passions, so it is understandable that we should celebrate any advance in medical technology that appears to put death off. But people worry about the quality of their lives as well - not just the quantity. Ideally, one would like not merely to live longer but also to have one's different faculties fail as close as possible to when death finally comes, so that one does not have to pass through a period of debility at the end of life.

While many medical advances have increased the quality of life for older people, many have had the opposite effect by prolonging only one aspect of life and increasing dependency. Alzheimer's disease - in which certain parts of the brain waste away, leading to loss of memory and eventually dementia - is a good example of this, because the likelihood of getting it rises proportionately with age. At age 65, only one person in

a hundred is likely to come down with Alzheimer's; at 85, it is one in six. The rapid growth in the population suffering from Alzheimer's in developed countries is thus a direct result of increased life expectancies, which have prolonged the health of the body without prolonging resistance to this terrible neurological disease.

There are in fact two periods of old age that medical technology has opened up, at least for people in the developed world. Category one extends from age 65 until sometime in one's 80s, when people can increasingly expect to live healthy and active lives, with enough resources to take advantage of them. Much of the happy talk about increased longevity concerns this period, and indeed the emergence of this new phase of life as a realistic expectation for most people is an achievement of which modern medicine can be proud.

The second phase of old age, category two, is much more problematic. It is the period that most people currently reach by their 80s, when their capabilities decline and they return increasingly to a childlike state of dependency. This is the period that society doesn't like to think about, much less experience, since it flies in the face of the ideals of personal autonomy that most people hold dear.

The social impact of ever increasing life expectancies will depend on the relative sizes of these two groups, which in turn will depend on the "evenness" of future life-prolonging advances. The best scenario would be one in which technology simultaneously pushes back parallel ageing processes - for instance, by the discovery of a common molecular source of ageing in all somatic cells, and the delaying of this process throughout the body. Failure of the different parts would come at the same time, just later; people in category one would be more numerous, and those in category two less so.

The worst scenario would be one of highly uneven advance, in which, for example, we found ways to preserve bodily health but could not put off age-related mental deterioration. Stem cell research might yield ways to grow new body parts. But without a parallel cure for Alzheimer's, this wonderful new technology would do no more than allow more people to persist in vegetative states for years longer than is currently possible.

An explosion in the number of people in category two might be labeled the "national nursing home scenario", in which people routinely live to be 150 but spend the last 50 years in a state of childlike dependence on caretakers.

There are a number of unanswerable questions about what life in this kind of future would be like, since there have never in human history been societies with median ages of 60, 70, or higher. What would such a society's self-image be? If you go to a typical airport newsstand and look at the people pictured on magazine covers, their median age is likely to be in the low 20s, the vast majority good-looking and in perfect health. For most historical human societies, these covers would have reflected the actual median age, though not the looks or health, of the society as a whole. What will magazine covers look like in another couple of generations, when people in their early 20s constitute only a tiny minority of the population?

Will society still want to think of itself as young, dynamic, sexy, and healthy, even though the image departs from the reality that people see around them to an even more extreme degree than today? Or will tastes and habits shift, with the youth culture going into terminal decline?