

# Beyond Therapy: Biotechnology and the Pursuit of Happiness

## [Table of Contents](#)

The President's Council on Bioethics  
Washington, D.C.  
October 2003  
[www.bioethics.gov](http://www.bioethics.gov)

## Chapter One

### Biotechnology and the Pursuit of Happiness: An Introduction

What is biotechnology for? Why is it developed, used, and esteemed? Toward what ends is it taking us? To raise such questions will very likely strike the reader as strange, for the answers seem so obvious: to feed the hungry, to cure the sick, to relieve the suffering—in a word, to improve the lot of humankind, or, in the memorable words of Francis Bacon, “to relieve man’s estate.” Stated in such general terms, the obvious answers are of course correct. But they do not tell the whole story, and, when carefully considered, they give rise to some challenging questions, questions that compel us to ask in earnest not only, “What is biotechnology for?” but also, “What should it be for?”

Before reaching these questions, we had better specify what we mean by “biotechnology,” for it is a new word for our new age. Though others have given it both narrow and broad definitions,<sup>1</sup> our purpose—for reasons that will become clear—recommends that we work with a very broad meaning: the processes and products (usually of industrial scale) offering the potential to alter and, to a degree, to control the phenomena of life—in plants, in (non-human) animals, and, increasingly, in human beings (the last, our exclusive focus here). Overarching the processes and products it brings forth, biotechnology is also a *conceptual and ethical outlook*, informed by progressive aspirations. In this sense, it appears as a most recent and vibrant expression of the technological spirit, a desire and disposition rationally to understand, order, predict, and (ultimately) control the events and workings of nature, all pursued for the sake of human benefit.

Thus understood, biotechnology is bigger than its processes and products; it is a form of human empowerment. By means of its techniques (for example, recombining genes), instruments (for example, DNA sequencers), and products (for example, new drugs or vaccines), biotechnology empowers us human beings to assume greater control over our lives, diminishing our subjection to disease and misfortune, chance and necessity. The techniques, instruments, and products of biotechnology—like similar technological fruit produced in other technological areas—augment our capacities to act or perform effectively, for many different purposes. Just as the automobile is an instrument that confers enhanced

powers of “auto-mobility” (of moving *oneself*), which powers can then be used for innumerable purposes not defined by the machine itself, so DNA sequencing is a technique that confers powers for genetic screening that can be used for various purposes not determined by the technique; and synthetic growth hormone is a product that confers powers to try to increase height in the short or to augment muscle strength in the old. If we are to understand what biotechnology is for, we shall need to keep our eye more on the new abilities it provides than on the technical instruments and products that make the abilities available to us.<sup>ii</sup>

This terminological discussion exposes the first complication regarding the purposes of biotechnology: the fact that means and ends are readily detached from one another. As with all techniques and the powers they place in human hands, the techniques and powers of biotechnology enjoy considerable independence from ties to narrow or specific goals. Biotechnology, like any other technology, is not for anything in particular. Like any other technology, the goals it serves are supplied neither by the techniques themselves nor by the powers they make available, but by their human users. Like any other means, a given biotechnology once developed to serve one purpose is frequently available to serve multiple purposes, including some that were not imagined or even imaginable by those who brought the means into being.

Second, there are several questions regarding the overall goal of biotechnology: improving the lot of humankind. What exactly is it about the lot of humankind that needs or invites improvement? Should we think only of specific, as-yet-untreatable diseases that compromise our well-being, such ailments as juvenile diabetes, cancer, or Alzheimer disease? Should we not also include mental illnesses and infirmities, from retardation to major depression, from memory loss to melancholy, from sexual incontinence to self-contempt? And should we consider in addition those more deep-rooted limitations built into our nature, whether of body or mind, including the harsh facts of decline, decay, and death? What exactly is it about “man’s estate” that most calls for relief? Just sickness and suffering, or also such things as nastiness, folly, and despair? Must “improvement” be limited to eliminating these and other evils, or should it also encompass augmenting our share of positive goods—beauty, strength, memory, intelligence, longevity, or happiness itself?

Third, even assuming that we could agree on which aspects of the human condition call for improvement, we would still face difficulties deciding how to judge whether our attempts at improving them really made things better—both for the individuals and for the society. Some of the goals we seek might conflict with each other: longer life might come at the price of less energy; superior performance for some might diminish self-esteem for others. Efforts to moderate human aggression might wind up sapping ambition; interventions aimed at quieting discontent might flatten aspiration. And, unintended consequences aside, it is not easy to say just how much less aggression or discontent would be good for us. Once we go beyond the treatment of disease and the pursuit of health, there seem to be no ready-made or reliable standards of better and worse available to guide our choices.

As this report will demonstrate, these are not idle or merely academic concerns. Indeed, some are already upon us. We now have techniques to test early human embryos for the presence or absence of many genes: shall we use these techniques only to prevent disease or also to try to get us “better” children? We are acquiring techniques for boosting muscle strength and performance: shall we use them only to treat muscular dystrophy and the weak muscles of the elderly or also to enable athletes to attain superior performance? We are gradually learning how to control the biological processes of aging: should we seek only to diminish the bodily and mental infirmities of old age or also to engineer large increases in the maximum human lifespan? We are gaining new techniques for altering mental life, including memory and mood: should we use them only to prevent or treat mental illness or also to blunt painful memories of shameful behavior, transform a melancholic temperament, or ease the sorrows of mourning? Increasingly,

these are exactly the kinds of questions that we shall be forced to face as a consequence of new biotechnical powers now and soon to be at our disposal. Increasingly we must ask, “What is biotechnology for?” “What should it be for?”

## **I. The Golden Age: Enthusiasm and Concern**

By all accounts, we have entered upon a golden age for biology, medicine, and biotechnology. With the completion of (the DNA sequencing phase of) the Human Genome Project and the emergence of stem cell research, we can look forward to major insights into human development, normal and abnormal, as well as novel and more precisely selected treatments for human diseases. Advances in neuroscience hold out the promise of powerful new understandings of mental processes and behavior, as well as remedies for devastating mental illnesses. Ingenious nanotechnological devices, implantable into the human body and brain, raise hopes for overcoming blindness and deafness, and, more generally, of enhancing native human capacities of awareness and action. Research on the biology of aging and senescence suggests the possibility of slowing down age-related declines in bodies and minds, and perhaps even expanding the maximum human lifespan. In myriad ways, the discoveries of biologists and the inventions of biotechnologists are steadily increasing our power ever more precisely to intervene into the workings of our bodies and minds and to alter them by rational design.

For the most part, there is great excitement over and enthusiasm for these developments. Even before coming to the practical benefits, we look forward to greatly enriched knowledge of how our minds and bodies work. But it is the promised medical benefits that especially excite our admiration. Vast numbers of people and their families ardently await cures for many devastating diseases and eagerly anticipate relief from much human misery. We will surely welcome, as we have in the past, new technological measures that can bring us healthier bodies, decreased pain and suffering, peace of mind, and longer life.

At the same time, however, the advent of new biotechnical powers is for many people a cause for concern. First, the scientific findings themselves raise challenges to human self-understanding: people wonder, for example, what new knowledge of brain function and behavior will do to our notions of free will and personal moral responsibility, formed before the advent of such knowledge. Second, the prospect of genetic engineering, though welcomed for treatment of inherited genetic diseases, raises for some people fears of eugenics or worries about “designer babies.” Psychotropic drugs, though welcomed for treatment of depression or schizophrenia, raise fears of behavior control and worries about diminished autonomy or confused personal identity. Precisely because the new knowledge and the new powers impinge directly upon the human person, and in ways that may affect our very humanity, a certain vague disquiet hovers over the entire enterprise. Notwithstanding the fact that almost everyone, on balance, is on the side of further progress, the new age of biotechnology will bring with it novel, and very likely momentous, challenges.

While its leading benefits and blessings are readily identified, the ethical and social concerns raised by the march of biotechnology are not easily articulated. They go beyond the familiar issues of bioethics, such as informed consent for human subjects of research, equitable access to the fruits of medical research, or, as with embryo research, the morality of the means used to pursue worthy ends. Indeed, they seem to be more directly connected to the ends themselves, to the uses to which biotechnological powers will be put. Generally speaking, these broader concerns attach especially to those uses of biotechnology that go “beyond therapy,” beyond the usual domain of medicine and the goals of healing, uses that range from the advantageous to the frivolous to the pernicious. Biotechnologies are already available as instruments of bioterrorism (for example, genetically engineered super-pathogens or drugs that can destroy the immune

system or erase memory), as agents of social control (for example, tranquilizers for the unruly or fertility-blockers for the impoverished), and as means to improve or perfect our bodies and minds and those of our children (steroids for body-building or stimulants for taking exams). In the first two cases, there are concerns about what others might do to us, or what some people, including governments, might do to other people. In the last case, there are concerns about what we might voluntarily do to ourselves or to our society. People worry both that our society might be harmed and that we ourselves might be diminished in ways that could undermine the highest and richest possibilities for human life.

Truth to tell, not everyone who has considered these prospects is worried. On the contrary, some celebrate the perfection-seeking direction in which biotechnology may be taking us. Indeed, some scientists and biotechnologists have not been shy about prophesying a better-than-currently-human world to come, available with the aid of genetic engineering, nanotechnologies, and psychotropic drugs. “At this unique moment in the history of technical achievement,” declares a recent report of the National Science Foundation, “improvement of human performance becomes possible,” and such improvement, if pursued with vigor, “could achieve a golden age that would be a turning point for human productivity and quality of life.”<sup>1</sup> “Future humans—whatever or whoever they may be—will look back on our era as a challenging, difficult, traumatic moment,” writes a scientist observing present trends. “They will likely see it as a strange and primitive time when people lived only seventy or eighty years, died of awful diseases, and conceived their children outside a laboratory by a random, unpredictable meeting of sperm and egg.”<sup>2</sup> James Watson, co-discoverer of the structure of DNA, put the matter as a simple question: “If we could make better human beings by knowing how to add genes, why shouldn’t we?”<sup>3</sup>

Yet the very insouciance of some of these predictions and the confidence that the changes they endorse will make for a better world actually serve to increase public unease. Not everyone cheers a summons to a “post-human” future. Not everyone likes the idea of “remaking Eden” or of “man playing God.” Not everyone agrees that this prophesied new world will be better than our own. Some suspect it could rather resemble the humanly diminished world portrayed in Aldous Huxley’s novel *Brave New World*, whose technologically enhanced inhabitants live cheerfully, without disappointment or regret, “enjoying” flat, empty lives devoid of love and longing, filled with only trivial pursuits and shallow attachments.

## II. The Case for Public Attention

Despite the disquiet it arouses, the subject of using biomedical technologies for purposes “beyond therapy” has received remarkably little public attention. Given its potential importance, it is arguably the most neglected topic in public bioethics. No previous national bioethics commission has considered the subject, and for understandable reasons. The realm of biotechnology “beyond therapy” is hard to define, a gray zone where judgment is, to say the least, difficult. Compared with more immediate topics in bioethics, the questions raised by efforts to “improve on human nature” seem abstract, remote, and overly philosophical, unfit for public policy; indeed, many bioethicists and intellectuals believe either that there is no such thing as “human nature” or that altering it is not ethically problematic. The concerns raised are complicated and inchoate, hard to formulate in general terms, especially because the differing technologically based powers raise different ethical and social questions: enhancing athletic performance with steroids and genetic selection of embryos for reproduction give rise to different concerns. Analysis often requires distinguishing the primary and immediate uses of a technology (say, mood-elevating drugs to treat depression or memory-blunting drugs to prevent post-traumatic stress disorder) from derivative and longer-term uses and implications (the same drugs used as general mood-brighteners or to sanitize memories of shameful or guilty conduct). Speculation about those possible implications, never to be confused with accurate

prediction, is further complicated by the fact that the meaning of any future uses of biotechnology “beyond therapy” will be determined at least as much by the goals and practices of an ever-changing society as by the technologies themselves. Finally, taking up these semi-futuristic prospects may seem a waste of public attention, especially given the more immediate ethical issues that clamor for attention. Some may take us to task for worrying about the excesses and abuses of biotechnology and the dangers of a “brave *new* world” when, in the present misery-ridden world, millions are dying of AIDS, malaria, and malnutrition, in part owing to the *lack* of already available biomedical technologies.

Yet despite these genuine difficulties and objections, we believe that it is important to open up this subject for public discussion. For it raises some of the weightiest questions in bioethics. It touches on the ends and goals to be served by the acquisition of biotechnical power, not just on the safety, efficacy, or morality of the means. It bears on the nature and meaning of human freedom and human flourishing. It faces squarely the alleged threat of dehumanization as well as the alleged promise of “super-humanization.” It compels attention to what it means to *be* a human being and to be *active as* a human being. And it is far from being simply futuristic: current trends make clear how the push “beyond therapy” and “toward perfection and happiness” is already upon us—witness the growing and increasingly acceptable uses of cosmetic surgery, performance-enhancing drugs, and mood- or attention-altering agents.<sup>iii</sup> Given the burgeoning research in neuroscience and the ever-expanding biological approaches to psychiatric disorders and to all mental states, it seems clear that the expected new discoveries about the workings of the psyche and the biological basis of behavior will surely increase both our ability and our desire to alter and improve them. Decisions we are making today—for instance, what to do about sex selection or genetic selection of embryos, or whether to prescribe behavior-modifying drugs to preschoolers, or how vigorously to try to reverse the processes of senescence—will set the path “beyond therapy” for coming generations. And fair or not, the decisions and choices of the privileged or *avant-garde* often will pave the way that others later follow, in the process sometimes changing what counts as “normal,” often irreversibly.

Taking up this topic is, in fact, responsive to the charge President Bush gave to this Council, formed by executive order “to advise the President on bioethical issues that may emerge as a consequence of advances in biomedical science and technology.” Among the specific functions set forth in connection with our mission, the Council was instructed in the first place “to undertake fundamental inquiry into the human and moral significance of developments in biomedical and behavioral science and technology,” and then “to explore specific ethical and policy questions related to these developments.” Anticipating, as we do, the arrival of technological powers that are likely to affect profoundly the nature, shape, and content of human experience, human character, and human society, we believe that it is highly desirable that we try to articulate as best we can their likely “human and moral significance.”

The Council has not only the mandate but also the opportunity to take a more long-range view of these matters. Unlike legislators caught up in the demands of pressing business, we have the luxury of being able carefully and disinterestedly to consider matters before they become hotly contested items for public policy. Unless a national bioethics council takes up this topic, it is unlikely that anyone else in public life will do so. And if we do not prepare ourselves in advance to think about these matters, we shall be ill prepared to meet the challenges as they arrive and to make wisely the policy decisions they may require.

### III. Defining the Topic

Having offered our reasons for taking up the topic, we need next to define it more carefully and to indicate how we mean to approach it. As already suggested, the “beyond therapy” uses of biotechnology on human

beings are manifold. We shall not here consider biotechnologies as instruments of bioterrorism or of mass population control. The former topic is highly specialized and tied up with matters of national security, an area beyond our charge and competence. Also, although the practical and political difficulties they raise are enormous, the ethical and social issues are relatively uncomplicated. The main question about bioterrorism is not what to think about it but how to prevent it. And the use of tranquilizing aerosols for crowd control or contraceptive additions to the drinking water, unlikely prospects in liberal democratic societies like our own, raise few issues beyond the familiar one of freedom and coercion.

Much more ethically challenging are those “beyond therapy” uses of biotechnology that would appeal to free and enterprising people, that would require no coercion, and, most crucially, that would satisfy widespread human desires. Sorting out and dealing with the ethical and social issues of such practices will prove vastly more difficult since they will be intimately connected with goals that go with, rather than against, the human grain. For these reasons, we confine our attention to those well-meaning and strictly voluntary uses of biomedical technology through which the user is seeking some improvement or augmentation of his or her own capacities, or, from similar benevolent motives, of those of his or her children. Such use of biotechnical powers to pursue “improvements” or “perfections,” whether of body, mind, performance, or sense of well-being, is at once both the most seductive and the most disquieting temptation. It reflects humankind’s deep dissatisfaction with natural limits and its ardent desire to overcome them. It also embodies what is genuinely novel and worrisome in the biotechnical revolution, beyond the so-called “life issues” of abortion and embryo destruction, important though these are. What’s at issue is not the crude old power to kill the creature made in God’s image but the attractive science-based power to remake ourselves after images of our own devising. As a result, it gives unexpected practical urgency to ancient philosophical questions: What is a good life? What is a good community?

#### IV. Ends and Means

Such a dream of human perfectibility by means of science and technology has, in fact, been present from the start of modern science in the seventeenth century. When René Descartes, in his famous *Discourse on Method*, set forth the practical purpose for the new science he was founding, he spoke explicitly of our becoming “like masters and owners of nature” and outlined the specific goals such mastery of nature would serve:

This is desirable not only for the invention of an infinity of artifices which would enable us to enjoy, without any pain, the fruits of the earth and all the commodities to be found there, but also and principally for the conservation of health, which is without doubt the primary good and the foundation of all other goods in this life.

But, as the sequel makes clear, he has more than health in mind:

For even the mind is so dependent on the temperament and on the disposition of the organs of the body, that if it is possible to find some means that generally renders men *more wise and more capable than they have been up to now*, I believe that we must seek for it in medicine. . . . [W]e could be spared an infinity of diseases, of the body as well as of the mind, and *even also perhaps the enfeeblement of old age*, if we had enough knowledge of their causes and all the remedies which nature has provided us. (Emphasis added.)<sup>4</sup>

Descartes foresaw a new medicine, unlike any the world had known, that would not only be able effectively

to conserve health, but might also improve human bodies and minds beyond what nature herself had granted us: to make us wiser, more capable and competent, and perhaps even impervious to aging and decay—in a word, to make us healthy and happy, indefinitely. Owing to the powers now and soon to be available to us, Descartes's dream no longer seems a mere fantasy.

What exactly are the self-augmenting capabilities that we are talking about? What kinds of technology make them possible? What sorts of ends are they likely to serve? How soon will they be available? They are powers that potentially affect the capacities and activities of the human body; the capacities and activities of the mind or soul; and the shape of the human life cycle, at both ends and in between. We already have powers to prevent fertility and to promote it; to initiate life in the laboratory; to screen our genes, both as adults and as embryos, and to select (or reject) nascent life based on genetic criteria; to insert new genes into various parts of the adult body, and perhaps someday also into gametes and embryos; to enhance muscle performance and endurance; to alter memory, mood, appetite, libido, and attention through psychoactive drugs; to replace body parts with natural organs, mechanical organs, or tissues derived from stem cells, perhaps soon to wire ourselves using computer chips implanted into the body and brain; and, in the foreseeable future, to prolong not just the average but also the maximum human life expectancy. The technologies for altering our native capacities are mainly those of genetic screening and genetic engineering; drugs, especially psychoactive ones; and the ability to replace body parts or to insert novel ones. The availability of some of these capacities, using these techniques, has been demonstrated only with animals; but others are already in use in humans.

It bears emphasis that these powers and technologies have not been and are not being developed for the purpose of producing improved, never mind perfect or post-human, beings. They have been produced largely for the purposes of preventing and curing disease, reversing disabilities, and alleviating suffering. Even the prospect of machine-brain interaction and implanted nanotechnological devices starts with therapeutic efforts to enable the blind to see and the deaf to hear. Yet the “dual use” aspect of most of these powers—encouraged by the ineradicable human urge toward “improvement,” exploited by the commercial interests that already see vast market opportunities for nontherapeutic uses, and likely welcomed by many people seeking a competitive edge in their strivings to “get ahead”—means that we must not be lulled to sleep by the fact that the originators of these powers were no friends to Brave New World. Once here, techniques and powers can produce desires where none existed before, and things often go where no one ever intended.

## **V. The Limitations of the “Therapy vs. Enhancement” Distinction**

Although, as we have indicated, the topic of the biotechnological pursuit of human improvement has not yet made it onto the agenda of public bioethics, it has received a certain amount of attention in academic bioethical circles under the rubric of “enhancement,” understood in contradistinction to “therapy.”<sup>5</sup> Though we shall ourselves go beyond this distinction, it provides a useful starting place from which to enter the discussion of activities that aim “beyond therapy.”<sup>iv</sup> “Therapy,” on this view as in common understanding, is the use of biotechnical power to treat individuals with known diseases, disabilities, or impairments, in an attempt to restore them to a normal state of health and fitness. “Enhancement,” by contrast, is the directed use of biotechnical power to alter, by direct intervention, not disease processes but the “normal” workings of the human body and psyche, to augment or improve their native capacities and performances. Those who introduced this distinction hoped by this means to distinguish between the acceptable and the dubious or unacceptable uses of biomedical technology: therapy is always ethically fine, enhancement is, at least *prima facie*, ethically suspect. Gene therapy for cystic fibrosis or Prozac for major depression is fine; insertion of

genes to enhance intelligence or steroids for Olympic athletes is, to say the least, questionable.

At first glance, the distinction between therapy and enhancement makes good sense. Ordinary experience recognizes the difference between “restoring to normal” and “going beyond the normal.” Also, as a practical matter, this distinction seems a useful way to distinguish between the central and obligatory task of medicine (healing the sick) and its marginal and extracurricular practices (for example, Botox injections and other merely cosmetic surgical procedures). Because medicine has, at least traditionally, pursued therapy rather than enhancement, the distinction helps to delimit the proper activities of physicians, understood as healers. And because physicians have been given a more-or-less complete monopoly over the prescription and administration of biotechnology to human beings, the distinction, by seeking to circumscribe the proper goals of medicine, indirectly tries to circumscribe also the legitimate uses of biomedical technology. Accordingly, it also helps us decide about health care costs: health providers and insurance companies have for now bought into the distinction, paying for treatment of disease, but not for enhancements. More fundamentally, the idea of enhancement understood as seeking something “better than well” points to the perfectionist, not to say utopian, aspiration of those who would set out to improve upon human nature in general or their own particular share of it.

But although the distinction between therapy and enhancement is a fitting beginning and useful shorthand for calling attention to the problem (and although we shall from time to time make use of it ourselves), it is finally inadequate to the moral analysis. “Enhancement” is, even as a term, highly problematic. In its most ordinary meaning, it is abstract and imprecise.<sup>v</sup> Moreover, “therapy” and “enhancement” are overlapping categories: all successful therapies are enhancing, even if not all enhancements enhance by being therapeutic. Even if we take “enhancement” to mean “nontherapeutic enhancement,” the term is still ambiguous. When referring to a human function, does enhancing mean making more of it, or making it better? Does it refer to bringing something out more fully, or to altering it qualitatively? In what meaning of the term are both improved memory and selective erasure of memory “enhancements”?

Beyond these largely verbal and conceptual ambiguities, there are difficulties owing to the fact that both “enhancement” and “therapy” are bound up with, and absolutely dependent on, the inherently complicated idea of health and the always-controversial idea of normality. The differences between healthy and sick, fit and unfit, are experientially evident to most people, at least regarding themselves, and so are the differences between sickness and other troubles. When we are bothered by cough and high fever, we suspect that we are sick, and we think of consulting a physician, not a clergyman. By contrast, we think neither of sickness nor of doctors when we are bothered by money problems or worried about the threat of terrorist attacks. But there are notorious difficulties in trying to define “healthy” and “impaired,” “normal” and “abnormal” (and hence, “super-normal”), especially in the area of “behavioral” or “psychic” functions and activities. Some psychiatric diagnoses—for example, “dysthymia,” “oppositional disorder,” or “social anxiety disorder”—are rather vague: what is the difference between extreme shyness and social anxiety? And, on the positive side, mental health shades over into peace of mind, which shades over into contentment, which shades over into happiness. If one follows the famous World Health Organization definition of health as “a state of complete physical, mental and social well-being,” almost any intervention aimed at enhancement may be seen as health-promoting, and hence “therapeutic,” if it serves to promote the enhanced individual’s mental well-being by making him happier.

Yet even for those using a narrower definition of health, the distinction between therapy and enhancement will prove problematic. While in some cases—for instance, a chronic disease or a serious injury—it is fairly easy to point to a departure from the standard of health, other cases defy simple classification. Most human capacities fall along a continuum, or a “normal distribution” curve, and individuals who find themselves

near the lower end of the normal distribution may be considered disadvantaged and therefore unhealthy in comparison with others. But the average may equally regard themselves as disadvantaged with regard to the above average. If one is responding in both cases to perceived disadvantage, on what principle can we call helping someone at the lower end “therapy” and helping someone who is merely average “enhancement”? In which cases of traits distributed “normally” (for example, height or IQ or cheerfulness) does the average also function as a norm, or is the norm itself appropriately subject to alteration?

Further complications arise when we consider causes of conditions that clamor for modification. Is it therapy to give growth hormone to a genetic dwarf, but not to a short fellow who is just unhappy to be short? And if the short are brought up to the average, the average, now having become short, will have precedent for a claim to growth hormone injections. Since more and more scientists believe that all traits of personality have at least a partial biological basis, how will we distinguish the biological “defect” that yields “disease” from the biological condition that yields shyness or melancholy or irascibility?

For these reasons, among others, relying on the distinction between therapy and enhancement to do the work of moral judgment will not succeed. In addition, protracted arguments about whether or not something is or is not an “enhancement” can often get in the way of the proper ethical questions: What are the good and bad uses of biotechnical power? What makes a use “good,” or even just “acceptable”? It does not follow from the fact that a drug is being taken solely to satisfy one’s desires—for example, to increase concentration or sexual performance—that its use is objectionable. Conversely, certain interventions to restore functioning wholeness—for example, to enable postmenopausal women to bear children or sixty-year-old men to keep playing professional ice hockey—might well be dubious uses of biotechnical power. The human meaning and moral assessment must be tackled directly; they are unlikely to be settled by the term “enhancement,” any more than they are by the nature of the technological intervention itself.

## **VI. Beyond Natural Limits: Dreams of Perfection and Happiness**

Reliance on the therapy-versus-enhancement distinction has one advantage in theory that turns out also to be a further disadvantage in practice. The distinction rests on the assumption that there is a natural human “whole” whose healthy functioning is the goal of therapeutic medicine. It sees medicine, in fact, as thoroughly informed by this idea of health and wholeness, taken as the end of the entire medical art. Medical practice, for the most part and up to the present time, appears to embody this self-understanding of its mission. Yet this observation points to the deepest reason why the distinction between healing and enhancing is, finally, of insufficient ethical, and even less practical, value. For the human being whose wholeness or healing is sought or accomplished by biomedical therapy is finite and frail, medicine or no medicine.

The healthy body declines and its parts wear out. The sound mind slows down and has trouble remembering things. The soul has aspirations beyond what even a healthy body can realize, and it becomes weary from frustration. Even at its fittest, the fatigable and limited human body rarely carries out flawlessly even the ordinary desires of the soul. For this reason (among others), the desires of many human beings—for more, for better, for the unlimited, or even for the merely different—will not be satisfied with the average, nor will they take their bearings from the distinction between normal and abnormal, or even between the healthy and the better-than-healthy.

Joining aspirations to overcome common human limitations are comparable aspirations to overcome individual shortfalls in native endowment. For there is wide variation in the natural gifts with which each of

us is endowed: some are born with perfect pitch, others are born tone-deaf; some have flypaper memories, others forget immediately what they have just learned. And as with talents, so too with desires and temperaments: some crave immortal fame, others merely comfortable preservation. Some are sanguine, others phlegmatic, still others bilious or melancholic. When nature dispenses her gifts, some receive only at the end of the line. Yet, one should remember that it is often the most gifted and ambitious who most resent their human limitations: Achilles was willing to destroy everything around him, so little could he stomach that he was but a heel short of immortality.

As a result of these infirmities, particular and universal, human beings have long dreamed of overcoming limitations of body and soul, in particular the limitations of bodily decay, psychic distress, and the frustration of human aspiration. Dreams of human perfection—and the terrible consequences of pursuing it at all costs—are the themes of Greek tragedy, as well as of “The Birth-mark,” the Hawthorne short story with which the President’s Council on Bioethics began its work. Until now these dreams have been pure fantasies, and those who pursued them came crashing down in disaster. But the stupendous successes over the past century in all areas of technology, and especially in medicine, have revived the ancient dreams of human perfection. Like Achilles, many of the major beneficiaries of modern medicine seem, by and large, neither grateful nor satisfied with the bounties we have received from existing biomedical technologies. We seem, in fact, less content than we are “worried well,” perhaps more aware of hidden ills we might be heir to, or more worried about losing the health we have than we are pleased to have it. Curiously, we may even be more afraid of death than our forebears, who lived before modern medicine began successfully to do battle with it. Unconsciously, but clearly as a result of what we have been given, our desires grow fat for still further gifts. And we regard our remaining limitations with less equanimity, to the point that dreams of getting rid of them can be turned into moral imperatives.<sup>vi</sup> For these reasons, thanks to biomedical technology, people will be increasingly tempted to try to realize these dreams, at least to some extent: ageless and ever-vigorous bodies, happy (or at least not unhappy) souls, excellent human achievement (with diminished effort or toil), and better endowed and more accomplished children. These dreams have at bottom nothing to do with medicine, other than the fact that it is doctors who will wield the tools that may get them realized. They are, therefore, only accidentally dreams “beyond therapy.” They are dreams, in principle and in the limit, of human perfection.

Not everyone interested in the beyond-therapy uses of biotechnology will dream of human perfection. Many people are more or less satisfied, at least for now, with their native human capacities, though they might willingly accept assistance that would make them prettier, stronger, or smarter. The pursuit of happiness and self-esteem—the satisfaction of one’s personal desires and recognition of one’s personal worth—are much more common human aspirations than the self-conscious quest for perfection. Indeed, the desire for happiness and the love of excellence are, at first glance, independent aspirations. Although happiness is arguably fuller and deeper when rooted in excellent activity, the pursuit of happiness is often undertaken without any regard for excellence or virtue. Many people crave only some extra boost on the path to success; many people seek only to feel better about themselves. Although less radical than the quest for “perfection,” the quests for happiness, success, and self-esteem, especially in our society, may prove to be more powerful motives for an interest in using biotechnical power for purposes that lie “beyond therapy.” Thus, though some visionaries—beginning with Descartes—may dream of using biotechnologies to perfect human nature, and though many of us might welcome biotechnical assistance in improving our native powers of mind and body, many more people will probably turn to it in search of advancement, contentment, and self-satisfaction—for themselves and for their children.

Why should anyone be worried about these prospects? What could be wrong with efforts to improve upon

or perfect human nature, to try, with the help of biomedical technology, to gain better children, higher achievements, ageless bodies, or happy souls? What are the sources of our disquiet?

The answers to these questions cannot be given in the abstract. They will depend on a case-by-case analysis, with special attention to the ends pursued and the means used to pursue them. In some cases, disquiet attaches not only to the individual pursuit of a particular goal, but also to the social consequences that would follow if many people did likewise (for example, selecting the sex of offspring, if practiced widely, could greatly alter a society's sex ratio). In other cases, disquiet attaches mainly to the individual practice itself (for example, drugs that would erase or transform one's memories). Speaking in the abstract and merely for the sake of illustration, concerns can and have been raised about the safety of the techniques used and about whether access to the benefits will be fairly distributed. Regarding the use of performance-enhancing techniques, especially in competitive activities, concerns can be raised about unfair advantage and inauthentic performance. Questions can be raised about coercion, overt and subtle (through peer pressure), should uses of mind-improving drugs become widespread. Other worries include the misuse of society's precious medical resources, the increasing medicalization of human activities, the manipulation of desires, the possible hubris in trying to improve upon human nature, and the consequences for character of getting results "the easy way" through biotechnology, without proper effort or discipline. There is no point here in detailing these further or in indicating additional possible objections. As concerns arise in their appropriate contexts, we shall discuss them further. At the end of this report, we will offer what generalizations seem appropriate. Between now and then, we shall proceed to examine several instances of activities and uses of biotechnical power that look "beyond therapy."

## VII. Structure of the Inquiry: The Primacy of Human Aspirations

We have considered several different ways to organize our inquiry. We could begin from the novel *techniques*: genetic screening, gene insertion, or one or another of the various psychotropic drugs. We could begin with the new *powers* or *capacities* these techniques provide: to select the sex (or other traits) of offspring, to influence mood or memory, or to alter the rate of biological aging. We could begin with the *therapeutic uses* these powers might serve—for example, to treat depression or dwarfism—and look next for the enhancement uses that lie beyond therapy. We could begin with those *aspects of human life* that might be affected: our inborn bodily or psychic capacities, our bodily or psychic activities, or the phases and shape of the life cycle—how we are born, how we die, and how we live in the prime of life. Or we could begin with the *desires and goals* that either drive our pursuit of these techniques or that will enlist the available powers they make possible once they are available: desires for longer life, finer looks, stronger bodies, sharper minds, better performance, and happier souls—in short, with our specific aspirations to improve our lot, our activities, or the hand that nature dealt to us or to our children.

In keeping with our goal of "a richer bioethics"—one that seeks to do justice to the full human meaning of biotechnological advance—we will here proceed in the last of these ways. By structuring the inquiry around the desires and goals of human beings, we adopt the perspective of human experience and human aspiration, rather than the perspective of technique and power. By beginning with long-standing and worthy human desires, we avoid premature adverse judgment on using biotechnologies to help satisfy them. We can also see better how the new technological possibilities for going "beyond therapy" fit with previous and present human pursuits and aspirations, including those well represented in the goals of modern medicine. We will also be able critically to assess the desirability of these goals and the significance of any successes in attaining them. What might the successful pursuit of these goals—longer life, stronger bodies, happier souls, superior performance, better children—using biotechnological means do to both the users and the rest of

society? Why might these consequences matter?

In [Chapter Two](#), we consider the pursuit of “better children,” using techniques of genetic screening and selection to improve their native endowments or drugs that might make them more accomplished, attentive, or docile. In [Chapter Three](#), we consider the pursuit of “superior performance,” using genetic or pharmacologic enhancement, taking the domain of athletics as a specially revealing instance. In [Chapter Four](#), we consider the pursuit of “ageless bodies,” both modest and bold, using either soon-to-be-available genetic interventions to increase the strength and vigor of muscles, or various efforts, somewhat more futuristic, to retard the general processes of biological senescence. In [Chapter Five](#), we consider the pursuit of “happy (or satisfied) souls,” using pharmacologic agents that dull painful memories or that brighten mood. In a final chapter we briefly try to put together what we have learned from the various “case studies.” While each of the separate instances will make our concerns concrete, *the full value of the inquiry requires considering all these instances together and seeing them as part of a larger human project—toward perfection and happiness.*

## VIII. METHOD AND SPIRIT

We conclude this introduction with a few words about the method and spirit of our inquiry. In preparing ourselves for the analysis of the various topics comprising the four middle chapters, we commissioned presentations from a wide array of scientists working or writing in the pertinent fields of biology and biotechnology: preimplantation genetic diagnosis and genetic enhancement ([Gerald Schatten](#) and [Francis Collins](#)); choosing sex of children ([Arthur Haney](#) and [Nicholas Eberstadt](#)); drugs to modify behavior in children ([Lawrence Diller](#) and [Steven Hyman](#)); genetic enhancement of muscle strength and vigor ([H. Lee Sweeney](#)); genetic enhancement of athletic performance ([Theodore Friedmann](#)); aging and longevity research ([Steven Austad](#) and [S. Jay Olshansky](#)); memory, and drugs that might improve or blunt it ([James McGaugh](#) and [Daniel Schacter](#)); and mood-brightening drugs ([Peter Kramer](#) and [Carl Elliott](#)). Drawing on these presentations and on outside reading in the various areas, Council staff prepared working papers on nearly all these topics, and these papers were discussed at some length at eight Council meetings between July 2002 and July 2003. Several Council Members contributed original writings ([Michael Sandel](#) on superior performance, [Gilbert Meilaender](#) on memory, Paul McHugh on “medicalization,” [Leon Kass](#) on the pursuit of perfection).<sup>6</sup> The final report is the product of drafting by Council staff, reviewed and critiqued by all Members of the Council, and rewritten many times.

The final document is not a research report, but an ethical inquiry. It makes no pretense of comprehensiveness; it does not report exhaustively on the literature, scientific or ethical. Rather, it aspires to thoughtful reflection and represents mainly a (partial) distillation of the Council’s own thinking. Not every Member shares every concern here expressed. Different Members care more about different topics. All of us are aware that there are issues not addressed and viewpoints not reflected. Yet, as a Council, we own the document as a whole, offering it as a guide to further thinking on this potentially very important topic.

Each of the four specialized chapters opens with a brief but critical exploration of the goal under consideration (for example, what are “better children” or “happy souls”). In due course we introduce the relevant biotechnologies and the powers they provide for pursuing these goals. We then proceed with our ethical analysis, trying to assess the meaning and possible consequences of pursuing those goals by these means, and considering the implications both for the individuals involved and for the broader society. Because much of what lies “beyond therapy” lies also in the future, our analysis is necessarily speculative, and by raising possible concerns we do not mean to be setting ourselves up as prophets. As we readily

acknowledge, which, if any, of our speculative suggestions regarding possible future consequences turn out to be correct will be a matter, in part, for careful empirical research. At the same time, however, we also insist that figuring out which of them will become a reality is not exactly the main point. Far more important, in our opinion, the human goods and principles discussed here can help shape our thinking across the entire range of technological powers (and the attendant ethical dilemmas) that we are likely to face in the future. By raising the questions we do, and by introducing certain matters of possible concern, we seek to identify exactly the sorts of questions and concerns to which researchers, policy makers, and the public at large should be paying attention.

The spirit of this inquiry is educational. In the first instance, we want to help people sort out fact from fiction, real biotechnological possibilities from merely imaginary ones. We want to clarify the ethical and social issues, both for individuals and the larger society. Precisely because we are taking a long-range view, we are primarily interested in opening up questions, not in issuing moral pronouncements or suggesting legislative or regulatory measures. Our first questions are not “Is this good or bad, right or wrong?” or “Should we allow it?” but rather, “What does and will this mean for us—as individuals, as members of American society, and as human beings eager to live well in an age of biotechnology?” If the questions we raise and the observations we offer strike the reader as conveying a cautionary note, he or she should not mistake this for hostility to biotechnology in general or to its many clearly desirable uses. Neither should anyone be surprised by our concern. The benefits from biomedical progress are clear and powerful. The hazards are less well appreciated, precisely because they are attached to an enterprise we all cherish and support and to goals nearly all of us desire. All the more reason to try to articulate the human goods that we seek to defend and the possible threats they may face.

---

## Footnotes

i. These range from “engineering and biological study of relationships between human beings and machines” (*Webster’s II New Riverside University Dictionary*, 1988), to “biological science when applied especially in genetic engineering and recombinant DNA technology” (*Merriam-Webster OnLine Dictionary*, 2003), to “the use of biological processes to solve problems or make useful products” (Glossary provided by BIO, the Biotechnology Industry Organization, [www.bio.org](http://www.bio.org), 2003). In the broader sense of the term that we will follow here, older biotechnologies would include fermentation (used to bake bread and brew beer) and plant and animal hybridization. Newer biotechnologies would include, among others, processes to produce genetically engineered crops, to repair genetic defects using genomic knowledge, to develop new drugs based on knowledge of biochemistry or molecular biology, and to improve biological capacities using nanotechnology. They include also the products obtained by these processes: nucleic acids and proteins, drugs, genetically modified cells, tissues derived from stem cells, biomechanical devices, etc.—in short, any industrially developed, useful agent that can alter the workings of the body or mind.

ii. The importance, for assessing biomedical technologies, of the distinction between (1) the techniques and (2) the powers they make available was first developed nearly thirty years ago in a report from the National Research Council/National Academy of Sciences, *Assessing Biomedical Technologies: An Inquiry into the Nature of the Process* (Committee on Life Sciences and Social Policy, National Academy of Sciences, Washington, D.C., 1975). The report recommended (and illustrated by example) that assessment of biomedical technologies concern itself with implications of both the techniques and the perfected powers they provide. (See pages 1 and 9, and the structure of the analysis in each chapter.) We generally prefer the more energetic word “power,” with its implication of efficacy, to the more prosaic “capacity” or “ability,” but we mean by it nothing ominous or sinister. As we use it, “power” is to be understood as neutral or better, certainly when compared to its opposite, “impotence.” At the same time, however, this term invites us to think about power’s misuse or abuse; such reminders do not shadow the more quiescent near-synonyms, “capacity” or “ability.”

iii. The already widely accepted “beyond therapy” uses of biomedical technologies include: pills for sleep and wakefulness, weight loss, hair growth, and birth control; surgery to remove fat and wrinkles, to shrink thighs, and to enlarge breasts; and procedures to straighten teeth and select the sex of offspring. These practices are already big business. In 2002 Americans spent roughly one billion

dollars on drugs used to treat baldness, about ten times the amount spent on scientific research to find a cure for malaria, a disease that afflicts hundreds of millions of people worldwide.

iv. Our choice of “Beyond Therapy” as the title for this report is meant to acknowledge that this notion offers a good point of entry: it reflects the medical milieu in which the questions arise; it exposes the untraditional goals of the new uses for biotechnical power; it hints at the open-ended character of what lies “beyond” the goal of healing. Yet for reasons that should become clear, the notion of “beyond therapy” does not seem to us to define the royal road to understanding. For this, one must adopt an outlook not only “beyond therapy” but also “beyond the distinction between therapy and enhancement.” One needs to see the topic less in relation to medicine and its purposes, and more in relation to human beings and *their* purposes.

v. According to the *Oxford English Dictionary*, “to enhance,” means “to raise in degree, heighten, intensify”; “to make to appear greater”; “to raise in price, value, importance, attractiveness, etc.” An “enhancement” would designate a quantitative change, an increase in magnitude or degree.

vi. Consider in this connection our attitudes toward organ transplantation. When first introduced into clinical practice some fifty years ago, receiving a life-saving kidney transplant was regarded as a gift, a blessing, a minor miracle, something beyond anything merited or even expected. Today, though the number of such “miracles” increases annually, supply does not equal demand. Expectations have risen to such an extent that people speak and act as if society’s failure to meet the need is in fact the cause of death for those who die before they can be transplanted. Who in 1950 could have thought that he was entitled to have his defective and diseased organs replaced? Will people in 2050 think that they are entitled to have any and all their weakened parts replaced, and not just once?

---

## ENDNOTES

1. National Science Foundation, *Converging Technologies for Improving Human Performance: Nanotechnology, Biotechnology, Information Technology and Cognitive Science*, Arlington, Virginia: National Science Foundation, 2003, p. 6.
2. Stock, G., *Redesigning Humans: Our Inevitable Genetic Future*, New York: Houghton Mifflin, 2002, p. 200. A similar opinion has been voiced by Lee Silver: “[W]e’re going to be able to manipulate and control the genes that we give to our children. It’s just over the horizon. . . . All of these new technologies are going to change humankind as we know it.” (“Frontline” interview, [www.pbs.org](http://www.pbs.org).) See also Silver, L., *Remaking Eden: Cloning and Beyond in a Brave New World*, New York: Avon, 1998. Silver’s enthusiasm for the post-human future is diluted only by his fear that not everyone will have equal access to its enhancing benefits. For an examination and critique of these views, see Fukuyama, F., *Our Posthuman Future: Consequences of the Biotechnology Revolution*, New York: Farrar Straus & Giroux, 2002.
3. James D. Watson, quoted in Wheeler, T., “Miracle Molecule, 50 Years On,” *Baltimore Sun*, 4 February 2003, p. 8A. At a symposium in Toronto in October 2002, Watson went further in his support of enhancement: “Going for perfection was something I always thought you should do. You always want the perfect girl.” (Abraham, C., “Gene Pioneer Urges Human Perfection,” *Toronto Globe and Mail*, 26 October 2002.) The article further quotes Watson’s response to the charge that he wants to use genetics “to produce pretty babies or perfect people”: “What’s wrong with that?” he countered. “It’s as if there’s something wrong with enhancements.”
4. Descartes, *Discourse on the Method of Conducting One’s Reason Well and Seeking Truth in the Sciences*, Part VI, para. 2. Private translation by Richard Kennington.
5. See, for example, Parens, E., ed., *Enhancing Human Traits*, Washington, D.C.: Georgetown University Press, 1998; and Elliott, C., *Better Than Well: American Medicine Meets the American Dream*, New York: Norton, 2003.
6. The transcripts of all the presentations and Council discussions, as well as the texts of the staff working papers and the papers written by Members, are available on the Council’s website: [www.bioethics.gov](http://www.bioethics.gov).

[Next Chapter](#) 