

# Humanity 2.0

*Transhumanists believe that human nature's a phase we'll outgrow, like adolescence. Someday we'll be full-fledged adult posthumans, with physical and intellectual powers of which we can now only dream. But will progress really make perfect?*

*by Carl Elliott*

**A**t the front of the conference room, Robert Bradbury of the Aevos Corporation is talking about immortality. He's showing us PowerPoint slides, with scientific graphs and charts. He's telling us about an artificial replacement for the human genome and about eliminating the need for a heart by replacing all the cells in the body with "vasaloid" systems. Immortality is probably not in the

cards, Bradbury tells us, but once we eliminate all diseases it will be possible for us to live for 2,000 years. When we get rid of all the other hazards of living, we'll be looking at a life span of 7,000 years. Unless, of course, we happen to be over 40 years old already, in which case these technologies will come too late for us. Bradbury recommends that those of us past 40 look seriously into cryonics. If we have our

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heads frozen, we can be resurrected at some time in the future by our benevolent, superintelligent descendants. As Bradbury speaks, I remember the cemetery across from the Yale University campus that I passed on my way to the seminar. Carved into stone on the front gates were the words “The Dead Shall Be Raised.”

I’ve come to Yale for an intensive introductory seminar on transhumanism. The term *transhuman* is shorthand for *transitional human*, a stage along the way to becoming *posthuman*. A posthuman, according to the World Transhumanist Association, is “a being whose basic capacities so radically exceed those of present-day humans as to no longer be unambiguously human by our current standards.” Nobody really knows exactly what posthumanity will be like, but transhumanists are certain that it will be a big improvement over the current model. Transhumanists embrace cryonics, nanotechnology, cloning, psychopharmacology, genetic enhancement, artificial intelligence, brain chips, robotics, and space colonization. In fact, they embrace virtually any conceivable technology aimed at “redesigning the human condition.”

Like many of my fellow seminar participants, I’m here out of curiosity. What little I know about transhumanism I learned many years ago from Ed Regis’s brilliant, quirky book *Great Mambo Chicken and the Transhuman Condition* (1990). *Mambo Chicken* was an affectionate but skeptical portrait of what Regis called “science slightly over the edge.” The heroes of *Mambo Chicken* were not especially interested in ordinary scientific grunt work. They had much grander plans. They wanted to download their minds onto computer disks, manipulate matter at the atomic level, colonize interstellar comets in private rockets. The title of the book refers to chickens that muscled up to Schwarzenegger-like proportions after gravity specialists at the University of California, Davis, spun them around in accelerators for six months. On the whole, the scientists in Regis’s book were less interested in creating superchickens than in creating superhumans. They chafed at human mortality and the limitations of their own brains. “Why should we be restricted to human nature?” asked

one researcher in *Mambo Chicken*. “Why shouldn’t we go beyond?”

Why indeed? In the 13 years since *Mambo Chicken* was published, transhumanism has blossomed into something new—part subculture, part academic discipline, part social movement. In 1998, philosophers Nick Bostrom and David Pearce established the World Transhumanist Association (WTA). Transhumanists have become increasingly visible in the media, often for their outspoken advocacy of all things technological: In a memorable encounter last year, transhumanist Max More, co-founder of the Extropy Institute, debated University of Virginia bioethicist Jonathan Moreno on CNN’s *Crossfire* about the ethics of cryonically freezing the head of baseball great Ted Williams. The seminar I’ve enrolled in at Yale is part of a larger conference, cosponsored by the WTA, called *Transvision 2003*. The theme of the conference is “The Adaptable Human Body: Transhumanism and Bioethics in the 21st Century.” (I did not attend the larger conference, but the presentations are available online at [www.transhumanism.org](http://www.transhumanism.org).)

Bioethicists have begun writing about so-called enhancement technologies—medical interventions aimed not at curing illness but at improving human traits and capacities. For the most part, these interventions fall squarely within the realm of the possible: cosmetic surgery, synthetic growth hormone for short children, psychoactive medications, such as Ritalin and Prozac, and “lifestyle drugs,” such as Viagra, Propecia, and Botox. Many enhancement technologies are too pedestrian to interest the transhumanists, but they make an exception for genetic medicine—the possibility of genetically enhancing human beings. Now that the human genome has been mapped and Dolly has been cloned, many transhumanists are starting to ask, “Why not use the tools of genetics to make ourselves smarter, healthier, and longer-lived?”

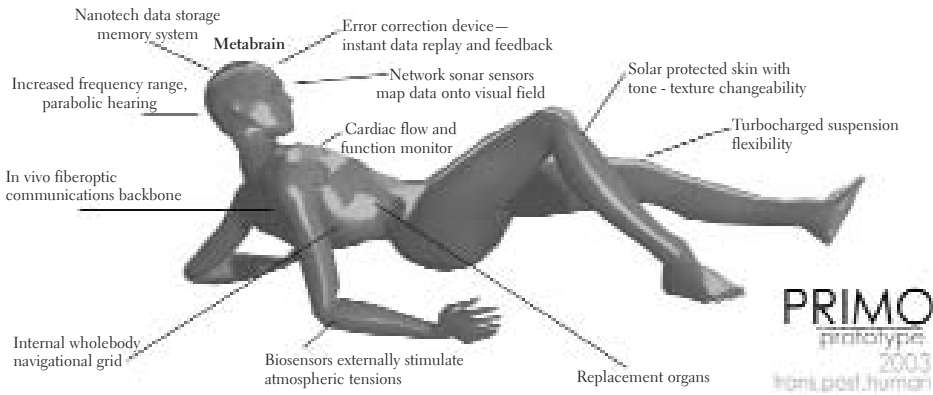
At first, I was inclined to dismiss the transhumanists. They sounded more than slightly over the edge. Later, I wondered whether I was being unfair. Weren’t remarkable things being done in neuroscience and the genetics of

>CARL ELLIOTT teaches philosophy and bioethics at the University of Minnesota. His latest book is *Better Than Well: American Medicine Meets the American Dream* (2003). Copyright © 2003 by Carl Elliott.

aging? Didn't many of these transhumanists have impressive degrees from elite universities? While a Ph.D. is no guarantee of wisdom (as Saul Bellow once remarked, the world is full of high-IQ morons), it does have a way of making strange ideas seem somewhat more plausible. The transhumanism seminar seemed worth the price of admission, especially when the transhumanists offer, in the words of WTA cofounder Pearce in his book *The Hedonistic Imperative*, "sights more majestically beautiful, music more deeply soul-stirring, sex more exquisitely erotic, mystical epiphanies more awe-inspiring, and love more profoundly

who've never seen them before. "If every physical and chemical invention is a blasphemy," Haldane wrote, "every biological invention is a perversion."

Most transhumanists are not as eloquent as Haldane, but their sentiments are much the same. In transhumanist thought, there's nothing natural, and certainly nothing good, about confinement to a flesh-and-blood body that expires after three score years and ten. We can do much better than that. And if we were not so squeamish, we *would* do better. Transhumanists believe they have simply learned to put aside the ordinary human



*This piece of digital art, by Natasha Vita-More, depicts a pan(post?)sexual, transposthuman prototype. It's been featured on the Transhumanist Arts website and is the official logo for transhumanist culture.*

intense than anything we can now properly comprehend." Besides, I have a weakness for groups with manifestoes.

I began to wonder: Who are the transhumanists? Fanatics? Visionaries? Trekkies with tenure? Should we be paying attention?



“There is no great invention, from fire to flying, which has not been hailed as an insult to some god,” wrote the great British biologist J. B. S. Haldane in his 1923 essay “Daedalus, or Science and the Future.” For people who see science as a way of improving the human condition, the “natural order” is nothing more than a barrier to human progress. As Haldane observed, new developments in biology always look unnatural and indecent to people

aversion to novelty in favor of technology-assisted human progress. As Eliazer Yudkowsky of the Singularity Institute for Artificial Intelligence—established to hasten the day when technology will create smarter-than-human intelligence in human beings—put it in his paper at Yale, “In transhumanism, this special ‘yuck’ reaction is missing, and such technologies are just an ordinary part of the natural universe.”

Take cryonics, for example. Cryonics firms such as the Alcor Life Extension Foundation in Arizona will freeze the bodies or heads of people who've been declared dead, in the hope that they can be revived (or as transhumanists put it, “reanimated”) at some point in the distant future, when technological progress has made it possible to reverse the diseases or injuries that “deanimated” them. The father of cryonics was

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Robert Ettinger, a professor of physics and mathematics at Highland Park Community College in Michigan and author of the book *The Prospect of Immortality* (1964). Ettinger marshaled every piece of scientific evidence he could find about the prospect of reviving frozen bodies, and many readers found the evidence convincing. Of course, others found the notion of deep-freezing their severed heads in vats a little grotesque. But defenders of cryonics replied (not unreasonably) that it was no less grotesque than being embalmed and buried. In any case, they were willing to put aside their squeamishness for the possible payoff. *The Prospect of Immortality* went through nine editions and was translated into four languages. Ettinger became a major media figure, and the cryonics movement was launched.

To many outsiders, the evidence that cryonics will actually work has never looked especially convincing. Indeed, cryonics, like other cultural products of the 1960s, might well have faded away—had it not been defended by Eric Drexler in *The Engines of Creation* (1986). His was the first book on nanotechnology, the manipulation of matter on the smallest possible scale. Drexler envisioned submicroscopic devices capable of manipulating molecules, or even atoms, to precise specifications. If we could just write the correct programs, nanotechnology would allow us to build or rebuild virtually anything, from the bottom up. After all, this is what biological organisms do; the programs are written into their DNA. Drexler devoted a chapter to explaining how nanotechnology could make cryonics a legitimate scientific possibility. With tiny assemblers, we could repair all the cells in a deanimated body and bring the dead back to life.

*The Engines of Creation* has been enormously important for transhumanists, and no wonder. Raising the dead is only one of the miracles promised by nanotechnology, and it's not even the most astonishing. Once we have complete control over matter itself, Drexler argued, we can do virtually anything permitted by the laws of nature. We can end disease by repairing damaged cells. We can get rid of world hunger by making food out

of plentiful ingredients such as dirt and sunshine. No more poverty, no more unpleasant labor, no more pollution. Precisely when all this will happen is a matter on which transhumanists disagree. What's important is that Drexler made such a persuasive case that it *could* happen. (It hasn't hurt the cause that nanotechnology is now being hailed as the Next Big Thing, attracting venture capital, government funding, and attention in prestigious scientific journals.)

For many transhumanists, nanotechnology is the key to our posthuman future. With nanotechnology, for instance, we could scan the structure of our brains atom by atom, preserve all the neural patterns responsible for our personal identities, and re-create those structures on artificial hardware. In effect, we could upload our minds to computers and make copies of ourselves down to every memory, every last personality quirk, every last hope and prejudice and desire. Then we could design new and better bodies, or simply live on as information patterns in computer networks, like ghosts in a vast machine.

Once we had uploaded ourselves onto computers, the possibilities would expand tremendously. We could make backup copies of ourselves, and re-boot if our original selves were to die. We could transmit ourselves over high-speed networks at the speed of light (which would be very convenient, the WTA points out, if we colonize space). We could live in simulated environments where the ordinary laws of physics were suspended. We could radically upgrade our intelligence, like computer software, and become superintelligent. Hans Moravec of the Mobile Robot Laboratory at Carnegie Mellon University laid out the basics of uploading in his book *Mind Children* (1988). In a mere 50 years, Moravec predicted, we'll be able to upload our minds onto computers, turn ourselves into robots, and live forever.

Of course, not everyone may want to spend eternity this way. It's a matter of individual choice, and transhumanists insist on the universal moral right to decide for oneself. That's an important part of the WTA's Transhumanist Declaration. But should you decide to become a robot, an information pattern, or any other kind of sentient life,

you can count on the transhumanists to advocate for your well-being.



As I take my seat at the seminar, the first thing that strikes me is the gap between the grand transhumanist vision and the concrete reality of our surroundings. For all the talk about immortality and superintelligent robots, there's no getting around the fact that we're sitting in the basement of a college dormitory. On the list of seminar participants I see a mix of activists, academics, journalists, and computer specialists. We all seem to be glancing furtively at one another's name tags, trying to figure out which participants are the true believers and which are just voyeurs. Our introduction to transhumanism will be delivered by Nick Bostrom, president of the WTA and a member of the philosophy faculty at Oxford University. According to the syllabus that's been distributed, Bostrom's credentials include a background in cosmology, mathematical logic, and standup comedy.

My most pressing question is the one I never actually ask: Do transhumanists actually *believe* all this? Life spans of 7,000 years? Mind uploads? Colonizing space and living forever as robots? As the day wears on, the answer becomes clear. Yes, they do. I had wondered whether these were simply philosophical thought experiments, but the transhumanists at the front of the conference room speak of space colonization and radical life extension as if the technologies to achieve these things were just around the corner. When, a few weeks after the seminar, I asked James Hughes, the secretary of the WTA, about the plausibility of these technologies, he replied by email, "Well, we certainly do like to talk about them, like philosophers do, but we also think they are quite real. We differ widely on the time frame, however."

Maybe so, but it takes a certain naiveté not to realize that an audience unfamiliar with transhumanism might be a little surprised by matter-of-fact references to, say, the economic consequences of becoming a robot. I was curious to find out whether other non-transhumanists had the same reaction. One

scholar, who spoke on condition of anonymity, characterized the transhumanists as "a lot of young, pasty, lanky, awkward . . . white males talking futuristic bullshit, terribly worried that we will take their toys away." William Grey, a philosopher from the University of Queensland in Australia who attended the conference, said, "Overall, I've never seen such a collection of highly intelligent people whose views (at least to me) are just barking mad."

More than one outsider I corresponded with compared the meeting to a support group. I was struck more by its religious overtones. The transhumanists have their sacred texts, *The Engines of Creation* and *Mind Children* among them. They have communal gatherings, which usually occur online. They have a set of beliefs about resurrection and the afterlife, couched in the language of cryonics and computers. They divide the world into believers and infidels (the "bio-Luddites"), and they call on one another to evangelize—or, as they often put it, "spread our memes." Many transhumanists believe that we're approaching an apocalyptic end-time they call "The Singularity," a convergence of technological developments that will push the rate of change so dramatically that the world could be transformed beyond recognition. The WTA states that if The Singularity comes, it will probably be caused by the creation of self-enhancing, superintelligent beings.

If the religious elements also sound like science fiction, there's a good reason. The concept of The Singularity comes from Vernor Vinge's novel *Marooned in Realtime* (1986). Arthur Clarke wrote about mind uploading in *The City and the Stars*, first published in 1956. Robert Ettinger got the idea for cryonics from a story called "The Jameson Satellite" by Neil R. Jones, published in a 1931 issue of the science-fiction magazine *Amazing Stories*. In that story, a man specifies in his will that, when he dies, his body is to be shot into space, where it will be frozen and preserved. Millions of years later, he's thawed out by robots and given a mechanical body so that he can live forever.

Transhumanists resent the religious comparisons, and, to be fair, most of those at the

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seminar seemed no more like cult members than your average Amway representative. James Hughes rightly points out that social interaction among transhumanists occurs mainly online, and, for that reason, their social ties to one another are a lot weaker than those of church members. In any case, many transhumanists are openly hostile to organized religion. For example, when I asked Hughes what he thought of the Raelians, a sect that believes the human race was created by aliens, he replied, “Religious nut jobs, but no more or less irrational or absurd than the Abrahamic faiths, and a lot less dangerous.”

In my more charitable moments, I want to think that the transhumanists are old-fashioned utopians. Maybe transhumanism represents a high-tech, cyber-savvy version of Robert Owen’s socialist community at New Lanark in 19th-century Scotland, or even the American hippie communes of the 1960s. Hughes, for example, teaches public policy at Trinity College and is writing a book called *Cyborg Democracy: Free, Equal and United in a Post-Human World*. Could the transhumanists be the flip side of the Amish, putting advanced technology to work for a better society? I entertain these thoughts for a while. Then reality hits home, and I remember the transhumanists’ angry, libertarian rhetoric. Most seemed less concerned about building a better society than they were about wanting to be left alone with their computers.

They also seemed bizarrely out of touch with ordinary moral sensibilities. This disconnect became apparent during a presentation by Robin Hanson, an economist at George Mason University. At one point, Hanson told us about a project he had been working on for the Pentagon’s Defense Advanced Research Projects Agency (DARPA). The plan was to use the market as a tool to predict world events, such as terrorist strikes, coups, and assassinations. Traders would use a government-sponsored website to invest money in the likelihood that such events would occur, and the Pentagon—specifically, the Total Information Awareness project headed by John Poindexter—would use the data as a tool to predict future events. The rationale was that if people were willing to put good money on the prospect, say,

of Osama bin Laden’s orchestrating an attack on the World Trade Center, then the possibility that the attack might occur should be taken very seriously.

It was only a few weeks after the seminar that Hanson’s project became headline news and was angrily denounced by senators and representatives, who called it “betting on death.” The project was eventually scrapped because of the public outcry, and Poindexter resigned his post.

What struck me about the reaction of the transhumanists to these events was not simply that they backed the project, but that they seemed unable to grasp why anyone would find it unseemly. Hanson described it without blinking an eye, and then proceeded to a discussion of the economic upheaval that might be caused by mind uploading. When the public opposition later emerged, the transhumanists I contacted were oddly dismissive. The brouhaha was “nonsense,” said Hughes. And Bostrum said that he was “very sad to see such a brilliant and potentially useful idea brutally murdered for cheap political gain.” He characterized the outrage as “smug moral condemnation fortified by complete ignorance of the issue. Our reptilian brain in full action.”



So the question recurs: Should we be paying attention? I think we should. As far over the edge as the transhumanists often appear, they represent a number of ideological strands evident throughout American society. One is a brand of individualistic, libertarian ideology often associated with Silicon Valley. A second is independent, quasi-religious thinking of the sort that sometimes leads to new religious communities, such as the Mormons, but that more often is disguised as disdain toward organized religion. A third is idealistic faith in the power of technology to make the world a better place. To look at the transhumanist movement and its self-identified enemies is to glimpse some of the ideological battlegrounds where the debate over new enhancement technologies will be conducted.

One key issue will be the need to strike a proper balance between idealism and prag-



*Jerry Lemier, president and CEO of the Alcor Life Extension Foundation in Scottsdale, Arizona, stands with a group of clients in the Patient Care Bay, where their bodies and heads are kept in cold-storage suspension.*

matism. The genetic revolution has been a weird combination of media hype, scientific success, and clinical disappointment. That disappointment reached a culmination of sorts several years ago with the death of Jesse Gelsinger in a gene therapy protocol at the University of Pennsylvania. In recent years, the federal government has temporarily shut down federally sponsored research at the University of Pennsylvania, Johns Hopkins University, Duke University, and several other leading academic health centers. Given the enormous growth in clinical medical research (much of which is now being carried out by for-profit corporations), many observers argue that our regulatory system must be radically overhauled if we are to avoid more deaths and injuries.

The safety of research subjects is a crucial concern in genetic enhancement and reproductive cloning. Yet the Yale conference did not include a single presentation on the ethics or regulation of biomedical research.

In the introductory seminar, the potential dangers of enhancement technologies got significant attention only once, when Bostrum listed a number of possible threats posed by such technologies, among which he included evolution into oblivion, “simulation shutdown,” and invasion by extraterrestrials. The transhumanist enthusiasm for scientific research represents an extreme version of the kind of idealism that will need to be tempered by an effective system of research regulation.

A second issue will be the relative value of individual versus collective solutions to social problems. Many “enhancement technologies” are more accurately characterized as medical remedies for social stigma. That is, they are technological fixes for the condition of being shy, short, overweight, or small breasted. But these individual solutions have the paradoxical effect of making social problems worse. As Georgetown University philosopher Margaret Olivia Little

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has argued, the more breast augmentations that cosmetic surgeons perform, the more entrenched is the social preference for large breasts; the more “Jewish noses” that surgeons correct, the more reinforced is the social standard that makes Jews seek out surgery in the first place. A better solution would be the one that American individualists often regard as hopeless: fixing the social structures that make so many people ashamed of these aspects of their identities.

Even technologies that unambiguously provide enhancements will raise issues of social justice not unlike those we currently face with ordinary medical technologies (wealthy Americans, for example, get liver transplants, while children in the developing world die from diarrhea). We live comfortably with such inequities, in part because we have so enthusiastically embraced an individualistic ethic. But to an outsider, a country’s expenditure of billions of dollars on liposuction, face-lifts, and Botox injections while many of its children go without basic health care might well seem obscene.

At one point in our seminar, Bostrum listed a number of ideological opponents of transhumanism, including religious conservatives, postmodernists, the writer-activist Jeremy Rifkin, the environmentalist writer Bill McKibben, the bioethicist Leon Kass, and the political theorist Francis Fukuyama. If anything unites such a disparate array of people, it’s not opposition to technology. Rather, it’s a conviction that the social order is critically important to human flourishing. Right-leaning moralists do not have much in common with left-leaning moralists; nor do religious conservatives have much in common with postmodernists. But none of these people believe that an individual is independent of the society in which he or she lives, and, for that reason, they’re uncomfortable with the notion that technologies of profound social consequence should be primarily a matter of individual choice. The technologies call for collective decision making.

**A** final battleground in the debate over enhancement technologies will be the marketplace. Whatever you think of the ethics of these technologies, you must admit that they’re being driven by a

powerful economic engine. For a number of years now, pharmaceuticals has been the most profitable industry in America. Until the early 1980s, the most profitable drugs were those to treat anxiety. Now, according to the National Institute for Health Care Management, the most profitable class of prescription drugs is antidepressants, such as Paxil and Prozac. When Pfizer put Viagra on the market in the late 1990s, it immediately became the fastest-selling drug in pharmaceutical history. It’s a long way from anxiety drugs and impotence remedies to germ-line genetic enhancement, but if the pharmaceutical and biotechnology industries see a way to profit from a new enhancement technology, it’s hard to imagine that they’ll resist.

Is the industries’ power a danger? Whether you think so will depend on what you think of market-driven medicine. Transhumanists are not worried, but then again, neither is the average American. Cosmetic surgery has never been more popular than it is now. But for critics of genetic enhancement, the market represents something far more sinister because it seems to view the world as a place where everything has a price. How will our sensibilities be changed if we start to see our children, our bodies, and our minds as potential objects of consumption? Where does the soul go, once it’s been priced and tagged?

J. B. S. Haldane was an enthusiast for scientific progress because he thought that science was the servant of humanity. Bertrand Russell disagreed. In “Icarus,” his famous response to Haldane’s “Daedalus” essay, Russell wrote that the mistake scientists usually make is to imagine that they will decide how science is used. In fact, he said, science serves whoever holds power. If the people who hold power are evil, then they will use science for evil purposes—and Russell was not impressed with the people who held power. “I am compelled to fear that science will be used to promote the power of dominant groups, rather than to make men happy,” he wrote. “Icarus, having been taught to fly by his father Daedalus, was destroyed by his rashness. I fear that the same fate may overtake the populations whom modern men of science have taught to fly.” □