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Adventure! Comedy! Tragedy! Robots! How bioethicists learned to stop worrying and embrace their inner cyborgs

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Sometimes, when I am talking to a person who is planning to freeze his head in a vat of liquid nitrogen when he dies, or who is debating the merits of creating a race of human-chimpanzee hybrids, or who is earnestly telling me about the pluses and minuses of living for eternity as a disembodied sequence of binaries on a computer main frame, my first impulse is to look directly into his eyes. What I'm looking for, I think, is a kind of twinkle: a raised eyebrow, the hint of a wink, something to let me know that he understands that he might come across as a little eccentric. It's not that I am uninterested in conjecture and speculation. I teach philosophy for a living, and the standard philosophy syllabus includes matter-of-fact articles about brains in vats, beetles in boxes, and your moral duties should you wake up one morning and find yourself connected to a life-support machine with a dying violinist. But a rational conversation in a philosophy classroom might, in another context, be a sign of incipient psychosis. So when someone wants to debate with me the democratic rights of robots, I want first to establish that he can pass a Mental Status Exam.

I had something like this kind of impulse when I read the new book by James Hughes, *Citizen Cyborg*, a spirited and slightly unhinged defense of our future as posthumans.(1) Hughes is a University of Chicago-trained sociologist, a bioethicist and health policy lecturer at Trinity College in Connecticut, and the Secretary of the World Transhumanist Association, a futurist society whose mission is to promote technologies aimed at improving the human species. Hughes envisions the creation of a new breed of beings whose powers and aspirations far outstrip the puny capacities that we are stuck with now. Reproductive cloning, cryonic preservation, genetic engineering, life-extension technologies: you name it, the transhumanists want it, and they think it is coming soon, if only the religious conservatives and Luddites will get out of the way. Hughes confidently tells us that it will not be long before we are communicating mind-to-mind via brainjacks, reviving brain-dead patients with neural stem cell implants, uplifting the brain capacities of dolphins so that we can reason and communicate with them, and having children by way of artificial wombs. He looks forward to the day when we can genetically engineer centaurs, unicorns and elves.

Hughes is not making this stuff up. He has plenty of inspiration in the world of science and medicine. Hans Moravec of the Robotics Institute at Carnegie Mellon

University famously predicted in the 1980s that it is only a matter of time before we can download the contents of our minds onto computers, and then copy ourselves to insure our immortality.(2) Joseph Rosen, a plastic surgeon and bioengineer at Dartmouth, has spoken seriously of medically-enhanced soldiers and the reconstruction of human legs into limbs capable of kangaroo leaps. In Mark Dery's 1996 book, *Escape Velocity*, Rosen said, 'There is nothing in *Neuromancer* that with enough funding and enough people I couldn't do in one of my laboratories.'(3) Terry Hambrecht, the director of the National Prosthesis Program at the National Institute of Neurological Disorders and Stroke, speculated a decade ago in *Omni* about the possibility of neurally-enhanced supranormal people who could use neural prostheses to communicate directly with computers.(4) Several years later, that feat was actually accomplished in monkeys.

What makes *Citizen Cyborg* unusual is Hughes's attitude towards the scientists from whom he draws his inspiration. The more interesting books in the techno-celebratory genre, such as Brian Alexander's *Rapture: How Biotech Became the New Religion* (5) or Ed Regis's cult classic, *Great Mambo Chicken and the Transhuman Condition*,(6) are written with a kind of knowing wink to the reader, as if to say: 'You and I both know how nutty this all sounds, but hear me out anyway. Some of it may actually pan out.' This kind of ironic detachment is largely absent from *Citizen Cyborg*. It is not just that Hughes sounds as if he really believes that, say, in just a couple of decades scientists will be 'cloning and growing fully functional genitalia' for transsexual surgery, but that he betrays no sense that a reader might find some of his predictions far-fetched. Which can make it all sound a little more deranged and cult-like than it needs to be.

Yet the questions Hughes raises are neither unimportant nor purely philosophical. *Citizen Cyborg* carries the subtitle: *Why democratic societies must respond to the redesigned human of the future*, which is a pretty good summary of Hughes's concerns. What is so special about human beings anyway? Why not seize evolution by the genes and steer it in the direction we like? Perhaps with some inspired gene-tweaking we could live longer, happier, more intelligent lives. That thought certainly occurred to the distinguished British biologist JBS Haldane, who proposed just such an idea in his 1923 essay, 'Daedalus, or Science and the Future'.(7) Eighty years later, a time when postmodern theorists are celebrating the plasticity of identity, when cyberfeminists, gender warriors and radical body modifiers are taking a big stick to time-hardened social categories, and when progressive politicians are responding to the question of embryonic stem cell research with a loud 'Yes Yes Yes', the time may be right for another transhumanist manifesto.

Or is it? The irony of all this theoretical techno-celebration is that it is being played out against a real-world background of corporate medical corruption: class action lawsuits, angry whistleblowers, fraud penalties, illegal kickbacks, suppressed research data and mysterious deaths in clinical trials. In the past several years alone we have seen a headline-making conflict of interest scandal at the National Institutes of Health in the USA;(8) a congressional investigation of the FDA for toadying to the pharmaceutical industry and silencing agency dissenters;(9) a non-stop series of news stories about Medicaid fraud, ghostwritten journal articles and illegal drug marketing;(10-12) and perhaps most disturbing of all, a series of prescription drug recalls and belated 'black-box warnings' that surpasses anything we have seen in years.(13-15) The gap between the fantasy world of medical enhancement and the real world of American free-market medicine could not be more dramatic. The pharmaceutical industry has transformed itself into the world's most profitable business and the transhumanists are calling for more and more medical enhancement. Yet 45 million uninsured Americans cannot even get access to basic medical care.

All of which raises the question: exactly what sort of future are we headed toward anyway? And who, if anyone, can we trust as our guides?

One recent answer comes from fiction. The gray, bleak world of free-market medicine provides the setting for David Gilbert's new novel, *The Normals*, a work of comic fiction that, even as it pushes the boundaries of believability, feels far more grounded in reality than Hughes' non-fiction manifesto.(16) Billy Schine is an underemployed young Harvard graduate who is drifting along as a temp worker in the 1990s while his former classmates ride the dot-com boom to riches. Billy's menial wages do not go very far towards paying back his Harvard student loans, and when his debt is turned over to a mysterious, mob-like collection agency, he decides to make some quick cash by volunteering as a research subject in a clinical trial. He enrols as a 'normal

volunteer' in a Phase 1 toxicity study of an atypical anti-psychotic drug called Allevatrox. After a three-hour van ride to the corporate research facility with an assortment of street people and out-of-work actors, Billy settles in for 14 days of blood drawings, institutional meals and experimental medication.

Life at Hargrove Anderson Medical is not so bad. At least being a research volunteer gives Billy a sense of purpose. He is serving science, which feels more satisfying than freeloading off his girlfriend. In fact, life inside the research facility is often less depressing and alienating than life on the outside. As Billy lines up for the daily feed-and-bleeds and listens to his fellow normals trade human guinea pig stories, he gets late-night phone calls from his father, Abe, who spends his evenings in an airport bar, sitting next to two wise-cracking animatronic robots programmed to provide solitary barflies with a sense of false camaraderie. On the television news, Billy and the normals follow the story of Chuck Savitch, a Wisconsin man who is dying of a brain tumor, and whose MRI bears a striking resemblance to the Shroud of Turin. The house where Savitch lives has been transformed into a pilgrimage site. His yard is covered with homemade crosses and candles. Television networks battle one another for exclusive interviews. The neighbors sell parking space in their driveways.

Billy has no illusions about Hargrove Anderson Medical. He understands that it is a commercial enterprise. He realizes that the normal volunteers are not really 'volunteers' at all but paid conscripts for the pharmaceutical testing business. If anything, Billy is obsessed with commerce, and the way that the commercial sphere threatens to overtake and consume every other aspect of American life. As his Harvard classmates make money hand over fist, Billy keeps an eye on the national debt clock in Manhattan and wonders when the payback will come. He imagines the sermons: 'We are all collateral, all compounded by interest, all pursued by a higher lender. Remit now!'

The Normals conveys a far darker vision of contemporary medical research than *Citizen Cyborg*. Not so long ago, medical research was widely thought of as a humanitarian enterprise, conducted by university scientists and clinicians in pursuit of knowledge. In those days it was still possible to think of healthy participants in clinical trials as selfless heroes, sacrificing their own interests in order to advance science. That picture was always a little idealistic and self-serving, but today it is so hopelessly outdated that it seems almost quaint. Medical research has become big business. It has moved out of universities and into the corporate sector with entities such as Contract Research Organizations—for-profit businesses that recruit, study and pay research subjects for pharmaceutical and biotechnology companies. Corporate research studies have become a magnet for people like Billy Schine, who have healthy bodies, a tolerance for risk, plenty of time on their hands and an empty bank account. (As a cartoon in *Guinea Pig Zero*, a Philadelphia 'zine for research volunteers, puts it: 'No more fast food work for me. I've got a career in *science*!')

In the world of corporate medical research, one of the clearest paths to riches is to develop an 'enhancement technology'—a prescription drug that can be used not just to treat illness, but to enhance ordinary human traits and capacities. When Viagra [sildenafil] was introduced by Pfizer in 1997, it quickly became the most profitable prescription drug in history. The rest of the pharmaceutical industry took careful note. We now have enormously profitable remedies for baldness, wrinkles, shyness and excess weight. Yet while the pursuit of medical enhancement is enormously profitable, it has also produced some of the worst pharmaceutical scandals on record. Wyeth has put aside over $21 billion to settle lawsuits brought on behalf of victims of Fen-Phen [fenfluramine and dexfenfluramine], the diet drug that has been linked to primary pulmonary hypertension and valvular heart disease.(17, 18) Hormone replacement therapy, the fashionable anti-aging technology of the *Feminine Forever* era, has been shown to put women at an increased risk of heart disease, strokes, pulmonary emboli and breast cancer.(19) In the 1970s and early 80s, the most popular prescription drugs in America were anti-anxiety drugs such as Valium [diazepam] and Librium [chlordiazepoxide], which were promoted as pharmaceutical solutions to the stress of modern life. These drugs fell out of favor when they were found to cause physical dependence. In November 2004, David Graham, an FDA whistleblower testifying before the US Congress, named five drugs that he believed were so dangerous that they should be withdrawn from the market. Two of the five were enhancement drugs: Accutane [isotretinoin], the acne drug that has been linked to birth defects, and Meridia [sibutramine], a diet drug which increases blood pressure.(20)

The most dramatic reversal may still be in the works. In his 1993 book, *Listening to Prozac*, the psychiatrist Peter Kramer described the antidepressant Prozac [fluoxetine] as a kind of 'cosmetic psychopharmacology', suggesting that it could be used not merely to make depressed patients well, but to make well people 'better than well'.(21) The pharmaceutical industry enthusiastically agreed. For much of the 1990s, Prozac and the other new antidepressants were the most profitable class of drugs in America. Today these same drugs are embroiled in a very public controversy over their links to suicide and homicide. British health authorities have effectively banned the use of most selective serotonin re-uptake inhibitors (SSRIs) in children, and the FDA has mandated that their packaging include a 'black box' warning label. In 2000 a jury awarded $6.4 million to the family of Donald Schell, a Wyoming man who killed his wife, daughter, granddaughter and himself after a course of Paxil [paroxetine].(22) Last summer, a young woman named Traci Johnson hung herself in the Eli Lilly research facility in Indianapolis after taking Cymbalta [duloxetine], a new antidepressant that the FDA went on to approve several months later.(23)

In a climate like this, it takes an especially driven kind of ideologue to remain optimistic that enhancement technologies are going to fix our social problems. Yet many people seem to believe just that. These are not just members of fringe groups like the transhumanists. Many of them belong to a new generation of academic bioethicists. Scholars such as Gregory Stock, Arthur Caplan, Julian Savulescu, John Harris, Glenn McGee, and Andy Miah celebrate the future that awaits us once we transform ourselves into genetically altered, neurologically enhanced, computer-assisted creatures of the sort found in science fiction novels. Of course, bioethicists are relative latecomers to this discussion, which has been going on in cultural studies and science studies for so long that cyborgs and life in *The Matrix* have started to seem a little *passé*. But then again, until recently bioethicists have generally seen themselves as a bit more grounded in clinical reality.

It was not that long ago that the default stance of bioethics was a suspicion of medical and institutional authority. As new medical technologies appeared in hospitals – organ transplantation, intensive care units, dialysis machines, ventilators and tube feedings – bioethicists asked whether these technologies, even as they advanced technical medical care, were actually a means of dehumanisation. While the technologies got better and better, doctors themselves seemed less and less humane, and patients became more frightened of medicine than ever before. Bioethics emerged as part academic discipline, part social movement, and one of its primary goals was to work for a more compassionate, less technocratic medical practice.

These days that goal seems to be shifting. More and more often we hear from bioethicists who are not just pro-technology but much more fervently pro-technology than the public at large: bioethicists who consult for biotech firms, who work for pharma-funded bioethics centers, who write pro-industry articles, who not only think that pharma and biotech have the solutions to our medical problems but that they have the solution to our social problems too. These writers exhibit the same kind of breathless enthusiasm for biotechnology that others have for, say, the computer revolution, or globalization. These are bioethicists for the *Wired* generation. They genuinely believe that we can build a better society by building better people.

It is this combination of medicine and the market, and the religious fervor for each, which has made the American debate over medical enhancement so politically complex. Once upon a time, we knew exactly which US political party was on the side of big business. It was the Republicans: the middle-aged men in grey suits and expensive shoes, the party of the corporate boardroom, the old guard conservatives who pulled strings on Wall Street and Madison Avenue and in the Washington lobbying firms. If you caught a glimpse of one of these Republicans, he was likely to resemble Donald Rumsfeld, the former pharmaceutical industry CEO who is now doing his business in Iraq, or Mitch Daniels, the Eli Lilly executive who traded away his pharma perks for a post in the White House budget office and then ran successfully for governor of Indiana.

But the old Republican order has been complicated by the rise of the Religious Right. The new Republicans are not coming out of white shoe law firms and corporate boardrooms. They are coming out of Baptist churches in Texas and Kansas, and on the matter of medical research, they have a single deal-breaker issue on their minds: embryos. To the Religious Right, creating and destroying

an embryo in order to harvest its stem cells sounds far too close to abortion. This presents a problem for the big business of corporate medical research. What is the Republican Party to do, now that its businessmen have decided that embryonic stem cell research is the hot new thing and its right-to-lifers are threatening to bolt?

Matters are no less complicated for the Democrats. The Democratic Left has put aside its worries about corporate power and gotten behind embryonic stem cell research like never before. Its reasoning seems to go like this: if the Bush White House is opposed to embryonic stem cell research, then embryonic stem cell research must be something we want. And so the right-to-life religious fervor of the Right is being matched by a right-to-research religious fervor of the Left, which proclaims stem cell research as the cure for every known malady from Alzheimer's Disease to spinal cord injuries. Meanwhile, the Left is seeing some of its old allies bolt as well—namely, the anti-corporate Greens, who have no patience for old-time Baptist religion but have been stung hard by their battles with Big Agribusiness over genetically modified crops. They argue that if you can't trust big business with agricultural genetics, you cannot trust it with human genetics either. The Greens are motivated primarily by respect for the natural world and suspicion of the corporate world. This translates into a suspicion of using technology to modify humans. If nature is something worthy of respect, they wonder, why not human nature too?

In this respect, James Hughes' *Citizen Cyborg* is politically complicated – and for this reason, rather more interesting than your average postmodern Utopian manifesto. Unlike some transhumanists, who lean toward a kind of libertarian individualism, Hughes is a Leftist. Not only that: he is a movement Leftist, who thinks that the key to the transhuman revolution is to put more lobbyists in Washington, more study groups on college campuses, and more transhumanist intellectuals in the public square. Hughes recognizes that access to basic health care is unjustly distributed in the USA, and he appears genuinely worried about the possibility that enhancement technologies will be unjustly distributed in the same way.

Yet the solutions Hughes proposes are no less fanciful than the enhancement technologies he envisions. To combat the possibility of cruelty, for example, he envisions empathy-enhancing cognitive software. Quoting Spider-Man – 'With great power comes great responsibility' – he proposes that the government be granted licensing authority for superpowers. In the same way that the government can deny handguns to people who refuse a background check, it could refuse a superpower license to those who refuse to be tested for empathy and morality.

The twin villains in *Citizen Cyborg* are Leon Kass and Francis Fukuyama, whom Hughes sees not merely as opponents of progress and enlightenment but as hapless tools of the religious Right. Kass is a professor on the University of Chicago's Committee on Social Thought and a Fellow of the American Enterprise Institute, a right-wing think tank in Washington DC. He is also the Chair of the President's Council on Bioethics, which in late 2003 produced a report on enhancement technologies called *Beyond Therapy*: *Biotechnology and the Pursuit of Happiness*.(24) That report was notable not merely for its elegant, meditative tone (it read less like a committee report than like an especially well-written academic monograph) but also for its gentle skepticism towards the notion of medical enhancement. Fukuyama, a political scientist at Johns Hopkins University and noted social conservative, is also a member of the President's Council on Bioethics. More to the point: he is the author of *Our Posthuman Future*,(25) a rather more dire warning of the future that awaits us once we become the kinds of beings that Hughes celebrates.

Hughes attacks both men mercilessly while subjecting them to his preferred rhetorical techniques: caricature and ridicule. *Citizen Cyborg* contains no shades of gray. Anyone worried about technology is a 'bioLuddite'. Anyone who expresses reservations about a technology wants to have it banned. Every issue is black and white, yes or no, and every discussion is turned into a debate between those who are right and those who are wrong.

Yet Hughes and Fukuyama are not as different from one another as they think. They share a healthy skepticism about the market, and perhaps especially about the capacity of the market to satisfy human needs. Neither of them are scientists, and both vastly overestimate the power of science. They also overestimate the power of the transhumanists. When the journal *Foreign Policy* recently asked a number of public intellectuals to name most dangerous idea in the world today, Fukuyama named 'transhumanism'.(26) This is a little like being asked to name the most dangerous group in the world and giving the answer: 'Klingons'.

Yet in the end, neither of them seems to understand the mutually reinforcing nature of medical enhancement and the market. The market creates the demand for medical enhancement just as surely as it produces the technologies to satisfy that demand. The market sells us an image of ourselves that tells us all the ways in which we could be happier, and then it sells us the consumer goods that we need to attain that happiness. The market gives us a vast toolkit of items to make us feel self-conscious about the way we look – Hollywood films, celebrity supermodels, fashion magazines, television shows with titles like 'Are You Hot?' – and then it sells us a remedy with cosmetic surgery. The market creates the conditions for depression, alienation, and feelings of personal inadequacy; then it sells us the treatment. If the treatment for our inadequacy is temporary, so much the better; if the prescription needs to be constantly refilled until we die, it is ideal. The circle is complete. Thus we have the genius of consumer capitalism: a vast machine for the creation of alienated lives that simultaneously produces a treatment for the alienation it has created.

References

1. Hughes J. Citizen cyborg: why democratic societies must respond to the redesigned human of the future. New York: Westview Press; 2004.
2. Moravec H. Mind Children: the future of robot and human intelligence. Cambridge: Harvard University Press; 1988.
3. Dery M. Escape Velocity: cyberculture at the end of the century. New York: Grove Press; 1996. p. 286.
4. Snyder D. Repairing the mind with machines: the supernormal possibilities of neural prosthetics. Omni, September 1 1993. [Online], Available: http://www.findarticles.com/p/articles/mi_m1430/is_n11_v15/ai_14142586. 5/4/2005.
5. Alexander B. Rapture: how biotech became the new religion. New York: Basic Books; 2003.
6. Regis E. Great Mambo Chicken and the Transhuman Condition. Woburn, MA: Perseus Books; 1990.
7. Haldane JBS. Daedalus: or, Science and the future: a paper read to the Heretics, Cambridge, on February 4th, 1923. London: K. Paul, Trench, Trubner; 1926.
8. Willman D. Stealth merger: drug companies and government medical research. Los Angeles Times, 7 December 2003.
9. Abbasi K. Is drug regulation failing? BMJ 2004; 329 (7477).
10. Elliott C. Pharma goes to the laundry: public relations and the business of medical education. Hastings Center Report 2004, 34(5): 18-23.
11. Petersen M. AstraZeneca Pleads Guilty in Cancer Medicine Scheme. The New York Times, 21 June, 2003.
12. Petersen M. Court papers suggest scale of drug's use. New York Times, May 30, 2003.
13. Bowe C. Merck under spotlight for 'deal' with US drug regulators. Financial Times, 16 October, 2004.
14. Matthews A. Mood disorder: in debate over antidepressants, FDA weighed risk of false alarm. Wall Street Journal, 25 May, 2004. A1.
15. Washburn J. Undue influence. The American Prospect 2001; 12(14). [Online], Available: http://www.prospect.org/print/V12/14/index.html. 5/4/2004.
16. Gilbert D. The Normals. New York: Bloomsbury; 2004.
17. Fisher D. No deal. Forbes.com, 16 February, 2005. [Online], Available: http://www.forbes.com/business/healthcare/2005/02/16/cx_df_0216wyeth.html. 5/4/2005.
18. Mundy A. Dispensing With the Truth: The victims, the drug companies, and the dramatic story behind the battle over Fen-Phen. New York: St. Martin's Press; 2001
19. Writing Group for the Women's Health Initiative Investigators, Risks and benefits of estrogen plus progestin in healthy postmenopausal women: Principal results from the Women's Health Initiative randomized controlled trial. JAMA 2002; 288: 321–333.
20. Harris G. FDA Failing in drug Safety, official asserts. New York Times, 19 November 2004. Sec A(1), Col 1.
21. Kramer P. Listening to Prozac. London: Fourth Estate; 1994.
22. Healy D. Let them eat Prozac. New York: New York University Press; 2004.
23. Wall JK, Tuohy J. Suicide of Indiana college student changes Eli Lilly's drug study process. Indianapolis Star, 11 February 2004.
24. The President's Council on Bioethics. Beyond therapy: biotechnology and the pursuit of happiness. New York: Regan Books; 2003.
25. Fukuyama F. Our Posthuman Future: consequences of the biotechnology revolution. New York: Farrar, Straus & Giroux; 2002.
26. Fukuyama F. Transhumanism. Foreign Policy 2004; 144: 42-44.