

The Transhuman Agenda

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Part One: The Transhuman Agenda

As the Human Fertilization and Embryology Bill progresses through parliament, Edward Lloyd assesses the pace at which science fiction is becoming reality.

There are two contrasting ways of countering the threat of global warming — Pro-Growth and No Growth.

The Pro-Growth or Cornucopian route is championed by numerous economists ranging from Julian Simon and Bjorn Lomborg to Larry Summers and Nigel Lawson. They all advocate increasing the output of the global economy so that we have sufficient wealth to buy our way out of the problems the economy causes, through the development of nuclear energy, information technology, genetic engineering and more advanced technofixes. It is the approach favoured by George Bush, Gordon Brown and all free market economists, who recognize that capitalism will collapse if the economy doesn't grow.

The No Growth or Gandhian approach tailors human needs to the limits imposed by the environment, by reducing conspicuous consumption, localizing economies and relying on renewable energy. This doesn't rule out change or evolution, and so it should perhaps be called Slow Growth. This is a proven way of life that protected the environment comparatively well up until about 1800. However it is by no means certain that it will meet the expectations of a global population which has swelled to many times its previous size, thanks to 200 years of profligate fossil fuel use.

The struggle between these two ideologies can be witnessed daily in the media, for example in disputes over whether or not to build a third runway at Heathrow, an extra lane on the M25, or another round of nuclear power stations. No/Slow Growth supporters argue that rapid economic growth has so far failed to reduce emissions, and that if ever it does so, it will be late and at the expense of people in poor countries. Free market economists respond that their opponents are Luddites who want us to return to a society when life was nasty, brutish and short.

Given that, in its own terms, capitalism has been fairly successful over the last 50 years, we can hardly discount the possibility that it will be the cornucopians who will triumph. Yet, so far, few advocates of No Growth have attempted any analysis of what kind of society we will be living in if they do. Suppose that some cheap, clean and abundant form of energy is developed which enables governments to deal with global warming, and the global economy to keep on expanding ad infinitum — what will our world be like then?

Few people in the UK green movement give thought to this matter, probably because the threat of global warming is so alarming and so imminent that it seems fruitless to look further ahead. But if capitalism does cope successfully with the environmental problems it has caused, beyond lies an economic and technological trajectory that will make climate change look like a storm in a teacup. For the scientists and economists confidently mapping out this future, global warming is an irrelevance.

A Dubious Prophet

The resistance to this long-term trajectory has been perfunctory and championed by a dubious prophet. Exactly ten years ago, in May 1998, Ted Kaczynski was sentenced to life imprisonment in a Colorado penitentiary for conducting an 18 year letter bomb campaign in which three people more or less connected with high tech industries died, and a number of others were injured. Kaczynski's demand was that his manifesto, *Industrial Society and Its Future*, should be published in prominent US newspapers¹. It duly was published, in the *New York Times* and the *Washington Post* amongst others, in the hope that somebody would be able to identify the writer. That is indeed what happened: Kaczynski's brother recognized the style and reported his suspicions to the police.

It is customary, when quoting Kaczynski approvingly, to take pains to distance oneself from his terrorist activities. I will let readers make up their own minds about the ethics of his actions, just as they can make up their own minds about the moral responsibility of the scientists mentioned later in this article who carry out research for the US military, an organization which has bombed 21 countries since the second world war, and caused innumerable civilian deaths.

Kaczynski's 30,000 word manifesto starts out unpromisingly with a peevish attack on "leftists" (socialists, minority rights activists etc). This is followed by a lengthy chunk of pop psychology explaining how in industrial society the "effort needed to satisfy biological needs has been trivialized" and replaced by various surrogate activities whose purpose is to give people the sense of fulfilment they would otherwise lack. Typical surrogate activities include sports, art, scientific research or conspicuous consumption. None of this commentary is particularly wacky, and some of Kaczynski's observations are quite acute. But the reader may well start to wonder why he thought it was worth waging an 18 year bombing campaign to propagate it.

It is not until past the middle of the manifesto that Kaczynski has something more important to say:

"Suppose the industrial system survives the crisis of the next several decades. That being accomplished, it does not appear that there would

¹ FC, *Unabomber Manifesto: Industrial Society and Its Future*, Jolly Roger Press 1995. Several versions are on the internet.

be any further obstacle to the development of technology, and it would presumably advance towards its logical conclusion, which is complete control over everything on Earth, including human beings and all other important organisms ... Human freedom mostly will have vanished, because individuals and small groups will be impotent vis-a-vis large organizations armed with supertechnology and an arsenal of advanced psychological and biological tools for manipulating human beings, besides instruments of surveillance and physical coercion.”

He then continues, in this much quoted passage:

“What kind of system will it be? We will consider several possibilities. First let us postulate that the computer scientists succeed in developing intelligent machines that can do all things better than human beings can do them. In that case presumably all work will be done by vast, highly organized systems of machines and no human effort will be necessary. Either of two cases might occur. The machines might be permitted to make all their own decisions without human oversight, or else human control over the machines might be retained.”

Kaczynski goes on to describe these two scenarios in greater detail. Kaczynski’s bombing campaign, and the publication of his manifesto, successfully stimulated soul-searching analysis throughout the US media. Predictably representatives of the liberal establishment and most points to the near left made efforts to disassociate themselves from his actions and his views. Alexander Cockburn in *The Nation* accused him of “homicidal political nuttiness” and of peddling “a rotted out romanticism of the individual and of nature”. *Earth First!* felt compelled to issue an ultimatum under the heading “*Earth First! is Not the Unabomber*” and called him a “lone sociopath.” The *Washington Post*, less liable to guilt by association, carried the non-committal headline “*Unabomber Manifesto Not Particularly Unique*”, which is a dismissive way of saying “*Unabomber’s Views Supported by Others*”.

What was more surprising was that an influential sector of the very scientific community which Kaczynski had been targeting started suggesting that he might have a point. As an ex-Harvard PhD, he was after all, one of them. The executive editor of *Wired* magazine, mouthpiece of Silicon Valley’s digital elite, noted some method in his madness.

“This guy is a nerd. He is one of us. The [manifesto] is structured like a doctoral thesis, or those computer science papers with numbered graphs. Very tidy. Like the bombs.”

And in 2003, in another famous article in *Wired*, entitled “*Why the Future Doesn’t Need Us*”, Bill Joy, head of Sun Microsystems argued that there was merit as well as method. Quoting the passage cited in the box above, he concluded:

“Kaczynski’s actions were murderous and, in my view, criminally insane. He is clearly a Luddite, but simply saying this does not dismiss his argument; as difficult as it is for me to acknowledge, I saw some merit in the reasoning in this single passage. I felt compelled to confront it.”

Bill Joy came across the passage, not through reading the manifesto itself, but in book entitled *The Age of Spiritual Machines*, by another computer company executive, Ray Kurzweil, who admits: “I was surprised how much of Kaczynski’s manifesto I agreed with.” Kurzweil has since published an updated version of his earlier book entitled *The Singularity is Near*, in which his response to Kaczynski, and to all who share fears about machines controlling humans, can be paraphrased as follows:

“You’re right, but you have barely seen the half of it. The advances made by machines will go far further than you imagine. Humans will not merely be controlled by machines, they will become machines. It won’t be as bad as you suggest, in fact it will be wonderful. Anyway, resistance is futile, so you might as well learn to like it.”

Kurzweil is one of a growing swarm of cybertechnicians and theorists who call themselves as “transhumanists”, “posthumanists” or “extropians” (ie they defy entropy). There is a bubbling subculture of them out on the web, on sites with names like “transutopia” or “anarcho-transhumanism.com” or even “transhumanism.meetup.com”, which welcomes browsers who want to “meet other local transhumanists” with a picture of half a dozen middle-aged Americans sitting round a table in a bar.

But however cranky transhumanists may appear, they should not be underestimated. The pioneers mapping out this brave new world are either at top notch universities, working for the US military, or running cutting edge research and development corporations — and in some cases all three. Marvin Minsky, veteran artificial intelligence futurologist, is at the Massachusetts Institute of Technology (MIT) where he has received funding from the US Defence Advanced Research Projects Agency (DARPA); Eric Drexler, who put nanotechnology on the map with his 1992 book *Engines of Creation*, is at Stanford University; Hans Moravec runs the Robotics Institute at Carnegie Mellon University where he carries out work for DARPA; Ray Kurzweil has founded a number of companies specializing in computer speech recognition and is a member of the US Army Science Advisory Group; Rodney Brooks, author of *Flesh and Machines*, is Panasonic Professor of Robotics at MIT and runs a company called I-Robot which manufactures military robots for DARPA ... and so on. Nearly all are American. The UK’s leading transhumanists are rather effete by comparison: Nick Bostrom is in the faculty of philosophy at Oxford University and David Pearce, a transhumanist vegan, is also an Oxford philosopher.

Most of these guys go to extremes in their own particular field. In this article I have focused particularly on Kurzweil because his books provide a thorough and far-reaching synthesis of all these “converging technologies”. They are written in a popular

style, often blatantly sensationalist, but they are also copiously referenced, and by no means stupid.

GNR: The Transhumanist Programme

Transhumanists anticipate the development and convergence of an array of technologies which can be grouped under three headings: Genetics, Nanotechnology and Artificial Intelligence (Robotics), or GNR for short. Convergence means that the distinction between biology, chemistry and mechanics — between live tissue (G), dead matter (N) and information (R) — will become increasingly blurred and finally disappear altogether. Kurzweil reckons that the convergence of this trinity will culminate in what he calls the “singularity”, occurring around 2045 when “the non-biological intelligence created in that year will be one billion times more powerful than all human intelligence today.”

Of the three, genetics, although it is currently the most debated, holds the least long-term promise. Recent advances in genetics include growing meat in test tubes from cloned animal muscle tissue; manipulating the germline to produce designer babies with disease resistance or enhanced intelligence; slowing down the ageing process by growing replacement or enhanced spare body parts from cloned human tissue.

However once techniques of this kind reach maturity, according to Kurzweil:

“limits will be encountered in biology itself. Although biological systems are remarkable in their cleverness, we have also discovered that they are dramatically suboptimal. I’ve mentioned the extremely slow speed of communication in the brain, and robotic replacements for our blood cells which could be thousands of times more efficient than their biological counterparts. Biology will never be able to match what we will be capable of engineering once we fully understand biology’s principle of operation. The revolution in nanotechnology, however will ultimately enable us to design and rebuild, molecule by molecule, our bodies and brains and the world with which we interact.”

By 2030 Kurzweil reckons we will have artificial organs which will outperform “the heart, lungs, red and white blood cells, platelets, pancreas, thyroid and all the hormone producing organs, kidneys, bladder, liver, lower oesophagus, stomach, small intestines, large intestines and bowel.” Nanobots — nano-sized pre-programmed robots — will be circulating through our body repairing ageing parts and regulating the genetic code. Aside from the skeleton, all that is left at this point are “skin, sex organs, sensory organs, mouth and upper oesophagus and brain” — in short, the organs of sensory and intellectual consciousness which require more sophisticated engineering before they can be satisfactorily replaced.

As well as manipulating proteins in what remains of the human body, nanobots will also be employed as “assemblers” manipulating carbon and other molecules to fabricate absolutely anything we need out of dirt cheap feedstock. The problem here is that so many of these tiny robots will be required (literally trillions) that they will have to be self-replicating — ie programmed to assemble carbon copies of themselves. In other words they are analogous to a life form, and it is here that the famous “gray goo” scenario, first postulated by Drexler, and popularized in Bill Joy’s article, comes into play:

“‘Plants’ with ‘leaves’ no more efficient than today’s solar cells could out-compete real plants, crowding the biosphere with an inedible foliage. Tough omnivorous ‘bacteria’ could out-compete real bacteria. They could spread like blowing pollen, replicate swiftly, and reduce the biosphere to dust in a matter of days.”

Kurzweil, like most transhumanists, admits this is a threat and advocates that nanobots should only be programmed to replicate on feedstock not found in the natural environment — which presumably would add to their expense.

The final and most profound element in the triune convergence is artificial intelligence. AI has two main competitive advantages over human intelligence: it is potentially far more powerful; and it can be uploaded onto another machine. Whereas the average human being, wishing to learn Latin for example, has to spend hours if not years learning to conjugate regular and irregular verbs in past, present, future and subjunctive tenses, a computer can upload the whole of Kennedy’s Latin Primer, the Aeneid, Caesar’s Gallic Wars and everything else ever written in the language in a matter of seconds. The brain has the edge over the computer only because it’s three dimensional architecture allows it to work with many more connections, giving it intuitive skills which make it more effective at recognizing patterns, for example in facial character, speech or patterns.

The transhumanists’ initial answer is to copy the structure of the brain by a process they call “reverse engineering”. This involves scanning and mapping the structure of the brain by “sending billions of nanobots through its capillaries” and copying it into “synthetic neural equivalents” which “can be run on a computational substrate that is already far faster than neural circuitry.” Once computers achieve a human level of intelligence, they will necessarily soar past it, because nonbiological knowledge can be shared so quickly and easily.

The biological body, however, no matter how successfully enhanced, can never be more than “a second-class robot” .The final solution is to upload the human brain and consciousness — personality, memory, history, neuroses and all — so as to:

“reinstantiate those details into a suitably powerful computational substrate ... The reinstantiated mind will need a body, since so much of our

thinking is directed toward physical needs and desires. By the time we have the tools to capture and re-create a human brain with all of its subtleties, we will have plenty of options for twenty-first century bodies for both non-biological humans and biological humans who avail themselves of extensions to our intelligence. The human body version 2.0 will include virtual bodies in completely realistic virtual environments, nanotechnology-based physical bodies, and more.”

Or, as Hans Moravec puts it, “a person may sometimes exist without a physical body, but never without the illusion of having one.” And Kurzweil again:

“There will be no distinction between human and machine or between physical and virtual reality. If you wonder what will remain unequivocally human in such a world, it’s simply this quality: ours is the species that inherently seeks to extend its physical and mental reach beyond current limitations.”

Landscapes of the Future

As humanity progresses down the path leading to transcendent nano-consciousness, the world as we know it becomes increasingly irrelevant. Human activity is gradually transformed, in Moravec’s words

“from grossly physical homesteading of raw nature, to minimum-energy quantum transaction of computation. The final frontier will be urbanized, ultimately into an arena where every bit of activity is a meaningful computation: the inhabited portion of the universe will be transformed into cyberspace.”²

The cities of the transhumanist future will be built not on real estate but virtual estate. Struggles against corporate or state enclosure will no longer focus just on land, but be fought around the architecture of cyberspace, in defence of the so-called “creative commons”. The landscapes of the future will not be where we engage with nature for our survival, but the backdrop to an unending sequence of multi-media computer games, a geek’s paradise. With this barren end to human endeavour in view, it becomes easier to understand why Kaczynski is so worked up about “surrogate activities”.

It also explains why transhumanists are not exercised about global warming. The energy needed to power such minute information transactions is negligible, the feedstock required no more complex than a pile of atoms. Solar cells, says Drexler, will be “as cheap as newspaper and as tough as tarmac.” What matter if the Earth’s biodiversity is reduced by global warming to a desert of hot bare rock as it was at the end of

² Hans Moravec, “Pigs in Cyberspace”, *Extropy*, Winter/Spring 1993.

the Permian age? That is a perfect environment for nanobot assemblers. Besides, the more degraded our biological environment becomes, through climate change or other catastrophe, the less human resistance there will be to a concerted attempt to conquer the nano-frontier.

To most of us, this sounds like the collective suicide of our biological species (along with the demise of a good many others) and it fleshes out the paradox delineated by C S Lewis in 1944 in his essay *The Abolition of Man*:

“The final stage is come when Man by eugenics, by pre-natal conditioning and by an education and propaganda based on perfect applied psychology, has obtained full control over himself. Human nature will be the last part of Nature to surrender to Man. The battle will then be won ... But who, precisely will have won it? ...”

“We are always conquering Nature, because ‘Nature’ is the name for what we have, to some extent, conquered. The price of conquest is to treat a thing as mere Nature. Every conquest over Nature increases her domain. The stars do not become Nature till we can weigh and measure them: the soul does not become Nature till we can psychoanalyse her. The wresting of powers from Nature is also the surrendering of things to Nature ... Man’s conquest of Nature turns out, in the moment of its consummation, to be Nature’s conquest of Man.”³

There are other more modern critics of various elements of the transhumanist agenda — Francis Fukuyama and Bill McKibben for example⁴ — but Lewis still offers the most distilled explanation of the revulsion which many people feel towards scientists who want to sacrifice humanity in their bid to play at being God.

Science Fact or Fiction?

Should take all this seriously? We have seen it all before in innumerable futurist and cyberpunk novels, and to their fans it is old hat. Is the transhumanist agenda really just third rate science fiction, dressed up as future fact? The US military and Ivy League colleges can no doubt afford to pay geeks to publish their techno-fantasies for no other reason than to provoke frissons and chatter amongst the scientific establishment.

Still more incredible is the claim from the likes of Ray Kurzweil, Max More and Hans Moravec that our transubstantiation into virtual reality will be achieved around the middle of this century. Kurzweil predicts that the “profound and disruptive transformation in human capability” which he terms the “singularity” will occur in 2045. He argues, with the aid of dozens of graphs, that the development of technology follows an

³ *The Abolition of Man* is available at <http://www.columbia.edu/cu/augustine/arch/lewis/abolition1.htm>

⁴ F. Fukuyama, *Our Posthuman Future*, Profile 2002; Bill McKibben, *Enough*, Bloomsbury, 2003.

accelerating exponential curve. For example the number of bits of magnetic data that could be bought for a dollar has increased by an order of magnitude every five years or so since 1950. In 1990 a dollar would buy you a megabyte; in 1995 10 megabytes, in 2000 well over 100 megabytes, and in 2005 about 10,000 megabytes. If our capabilities increase at this logarithmic rate, Kurzweil argues, then within 40 years our universe will be “transformed into exquisitely sublime forms of intelligence.”

These extrapolations are not entirely convincing. In reality anything can happen. The first unmanned spacecraft was Sputnik 1 in 1957. The first man in space, Yuri Gagarin, blasted off only four years later in 1961. After another eight years, in 1969, Neil Armstrong stepped onto the moon. Since then, 39 years have elapsed, and humans have trod no further. In this case, the exponential curve has been in the opposite direction.

Moreover when Kurzweil makes short term predictions, he is often wrong. In 2005 he wrote:

“by the end of this decade, computers will disappear as distinct physical objects, with displays built in our eyeglasses, and electronics woven in our cloth providing full-immersion visual virtual reality. Thus ‘going to a website’ will mean entering a virtual-reality environment — at least for the visual and auditory senses — where we can directly interact with products and people. Although the simulated people will not be up to human standards — at least not by 2009 — they will be quite satisfactory.”

Well it’s 2008 and we are still some way off from all of this. No doubt it will come one day, but Kurzweil is either carried away by his own enthusiasm, or else considers that the best way to sell futurology is to compress the time frame so that readers sense that they might be affected within their lifetime.

But just because Kurzweil and other enthusiasts like to exaggerate, that does not mean that the transformation which they foresee will not occur eventually. Technology over the last decades may not have advanced towards “the singularity” at the speed that some transhumanists have anticipated but it is still moving in that direction at a brisk pace. The mapping of the human genome was completed in 2000, several years ahead of schedule (in sharp contrast to football stadiums and the like), “because DNA scanning technology grew at a double exponential rate” and at a lower cost than estimated. In the following year the number of patent applications in the field of cloning and stem cell research increased 300 per cent. The list of recent GNR developments on page 17 shows that humanity is advancing steadily towards transhumanist goals. There are tens of thousands of research scientist around the world working on such projects. The majority of them at present are in the United States, but in another decade there will be many more in China and India. We may not be rushing headlong at the speed which some hope for, but we are not exactly dawdling.

“Democratic Transhumanism”

The other reason why the transhumanist project needs to be taken seriously is that a second wave of commentators is emerging who are making the transhumanist agenda more palatable to a dominant liberal agenda that shuns extremists. James Hughes, author of the book *Citizen Cyborg* is an example. Whereas Drexler, Moravec, Kurzweil and the like revel in their role of maverick visionaries, Hughes couches his arguments in the language of liberal academia. He advocates “democratic transhumanism” as a middle way between the excesses of libertarian capitalist extropians and the “left-wing bio-Luddites”. He reassures us that:

“Transhuman technologies can radically improve our quality of life and we have a fundamental right to use them to control our bodies and our minds. But to ensure these benefits we need to democratically regulate these technologies and make them equally available in free societies.”

Hughes relies heavily on a specious form of politically-correct moral blackmail also advanced by the animal rights theorist Peter Singer (not to mention Hollywood sci-fi). It runs like this: Scientists will soon have the power to create or breed cyborgs — new life forms which are imbued with a high level of consciousness. To destroy, eat, enslave or discriminate against such sentient beings, were they alive, would be “human racist” (Singer’s word is “speciesist”, but “human racist” sounds more reprehensible). Since it is racist to prevent ethnic groups reproducing, it is “human racist” to prevent cyborgs being created.

The reverse argument is that it is precisely for this reason that reproductive human genetic modification should be stopped. The ability to reproduce sexually draws a clear line between one species and another — one of the few clear lines in nature — and it defines unambiguously what is human. Once we blur or destroy that line, in a biological world which runs on species eating and exploiting each other, we deal ourselves an ethical dilemma that no human (least of all a scientist) is sufficiently wise, or impartial, or authoritative to resolve.

Hughes doesn’t subscribe to the “singularity”, and the tone of the book suggests that he is wary of the more madcap proposals of extreme transhumanists. But a careful reading shows that he anticipates most of the developments that Kurzweil advocates, on only a slightly longer time scale. Technological advances, he says will be “sudden and dramatic”, and he expects uploading of the human brain onto computers to occur “somewhere between 2050 and 2100”. In fact Hughes’s book is more disturbing than Kurzweil’s precisely because it is further removed from science fiction. Its tone of politically correct moderation is designed to soften up policy-makers into accepting as safe and normal, what would once have been regarded as wacky. Next to appear will be text-books on transhumanism for undergraduates, which will give a “balanced” appraisal of the pros and cons and encourage fudged “non-extreme” conclusions that lead us further down the slippery slope.

Meanwhile, those who stand to benefit from the advance of the transhumanist agenda, the Frankenstein scientists and the cowboy corporations, are pushing, pushing, pushing at the boundaries of public opinion and policy. Those boundaries haven't yet been reached in the nano and robotics fields yet, but they are steadily being breached on the human genetics front. As the Human Fertilization and Embryology Bill winds its way through the UK parliament, one scientist after another has been wheeled out to state the case for stem cell research and animal/human embryos, while the only opposition comes from the right to life lobby, whose understanding of the long term social and indeed spiritual issues at stake is close to zero. No MP has come forward with a secular critique of the Bill's measures.

Those of us who believe that it is not the mission of humanity to conquer the universe, but to co-evolve with the other species who share with us this special and wonderful planet, ought to be taking more notice and kicking up more of a fuss. Every step that gives scientists more control over nature and reproduction is a step towards the dire new world that the prophets of transhumanism have mapped out for us.

Part Two: Slow Evolution is Co-evolution

Steps Towards an Anti-Transhumanist Manifesto.

Part 1 of this article, published in *The Land* 5, described how advances in the converging technologies — genetic engineering, nanotechnology and robotics (GNR) — are taking humanity down a road that leads, ultimately, to the obsolescence of the human race. Whilst we may not believe the most outspoken advocates of transhumanism, who maintain that humanity as we know it will transubstantiate into a race of computer-driven cyborgs by the second half of this century, the accelerating pace of developments in fields such as stem cell technology, animal human embryos, artificial organs, nanotechnics, military robots, brain-computer interface and virtual reality are worrying to those who prefer to see humanity remain a biological species co-evolving with the natural world.

The second part of this article is preoccupied with one main question: why (Unabomber, Ted Kaczynski aside) is there relatively little resistance to the spread of these technologies? The question is all the more perplexing because there is one sector of the GNR armoury which has met with spirited opposition. Large parts of the world, including the UK and most of Europe, remain free of genetically modified crops, mainly as a result of popular resistance. In Britain, despite the best efforts of the government, an unlikely alliance of direct action environmentalists and Daily Mail readers has ensured that “Frankenstein foods” have been kept out of our fields and, for the most part out of our shops.

It is all the more curious then that genuinely Frankenstein activities — genetic modifications of humans for example by cloning human embryos, growing body parts, or creating organisms whose genetic make up is part human part animal (chimeras) — have been allowed to proceed, more or less without a murmur. Direct activists have sabotaged just about every GM crop trial that has taken place in the UK; but the Roslin Institute, which produced Dolly the cloned sheep and now conducts research into chimeric embryos, has remained unscathed. The UK Human Fertilization and Embryology Act, which opens the door to human/animal embryos, designer babies, saviour siblings and fatherless children has sailed through parliament without a hint of opposition from the green movement.

This discrepancy in attitudes towards crop and human bioengineering has not gone unnoticed by some biotech advocates, for example Dennis Avery of the Hudson Institute:

“There is a furore now over biotechnology in farming. Europe, which has more food than it needs, is trying to block the use of biotechnology for Africa and Asia, which have less food than they need. We are told that biotechnology in food is ‘playing God.’ (The same critics seem to believe that the use of biotechnology to cure genetic diseases for First World children is just fine.) Genetically engineered ‘golden rice’ can prevent the Vitamin A deficiency that causes blindness and even death for millions of small children in low-income rice cultures.”¹

The species of emotional blackmail detectable here is common to arguments levelled both against those who oppose genetic engineering of plants and those who oppose genetic engineering of humans. But Avery is wrong to suggest that it is inconsistent or hypocritical to oppose GM crops whilst supporting human biotech. This is because while there is little doubt that biotech medicine can cure sick people, there is very considerable doubt whether GM crops carry any benefits for poor farmers. Take the much publicized Golden Rice argument which is hauled onto stage by Ray Kurzweil, Bjorn Lomborg and virtually every other advocate of biotechnology. None of them dare to pose the primary question: why are people who are getting enough rice not getting enough Vitamin A? The most widely acknowledged reason is that poor people’s diets have become less varied as a result of industrial monoculture, and “their diet has been reduced to rice and nothing else.”²

It is not hard to find Third World peasants who want their neighbourhood and lands to stay GM free — for example the members of the Brazilian Landless Workers Movement (MST) who protested against Syngenta’s GM research in the state of Paraná (see page 19). The Ethiopian, Tewolde Egzhiaber, wrote an article criticizing the Golden Rice argument entitled: “Using the South to Promote Genetic Engineering in Europe”.³

It is harder to find people who argue that biotechnology doesn’t benefit sick individuals (although there is understandable resistance from deaf people and dwarves to the screening of embryos to eliminate genes for deafness and dwarfism). And it is harder still to look a diseased or disabled person in the face, especially if it is a friend or a loved one, and say, “well there may be a cure but I don’t think you should have it.”

It was for this reason that when, in June 2007 the US House of Representatives debated the Stem Cell Research Enhancement Act, the democrat Speaker, Nancy Pelosi

¹ Denis T Avery, Leading a 21st Century Global Triumph for the Environment, UC Berkeley Commencement Address, 21 May 2000, <http://www.cgfi.org/2000/05/21/dennis-averys-uc-berkeley-commencement-ad...>

² P Rossett, letter to The Nation, 16 July 2001; cited at <http://www.globalpolicy.org/socecon/tncs/2002/biotech.htm>

³ Tewolde Behran Gebre Egzhiaber, “Using the South to Promote Genetic Engineering in Europe —Once Again!”, in Ellen Hickey and Anurhada Mittal, Voices from the South: The Third World Debunks Corporate Myths on Genetically Engineered Crops, Food First and Pesticide Action Network, http://www.foodfirst.org/en/store/book/Voices_from_the_South

wheeled disabled children into the House to be photographed being hugged by democrat politicians. The only politicians who can withstand that sort of emotional pressure are the kind who believe that God, in his wisdom and mercy, has ordained that 14 day embryos should not be murdered. Both Senate and Congress passed the Act, which authorized federal funding for embryo stem cell research, but it was vetoed by President Bush — a further triumph for the biotechnologists since most people in the world conclude that if Bush opposes stem cell research, then it must be OK. One of President Obama’s first acts will be to remove Bush’s veto. In her speech to the House, Nancy Pelosi announced that “science is a gift of God to all of us, and science has taken us to a place that is biblical in its power to cure, and that is the embryonic stem cell research.”⁴

The question this prompts is “where will science take us next?” or, for a shorter answer, where will it not take us? In the past year scientists have given us face transplants, artificial hearts which are part machine and part animal, and the test-tube culture of a complete windpipe — where do we stop? Do we pursue ever more “biblical” cures for human imperfections to the point where we are all living as long as Methuselah, and we are so perfectly artificial that we are no longer human? And if so, where do we put all these extra billions of humans who refuse to die, and what do we feed them on — nanofood?

Scientists milk the emotional persuasiveness of medical cure for all it is worth, habitually assuring us that their research is for the benefit of humanity, when it is plain that what drives most of them is their thirst for knowledge or acclaim. If saving lives were their main objective, their time and funding would be better spent providing people with clean water, promoting condoms or inventing a cheaper malaria net. There is a refreshing strain of Machiavellian honesty in this statement from James Watson, renowned for his discovery of DNA and his racist outbursts:

“I think we can talk principles forever, but what the public wants is not to be sick. And if we make them not sick, they’ll be on our side.”⁵

Watson is no doubt right and we can expect medical applications to be in the vanguard of biotechnological progress, while doubters remain mute through deference to the disadvantaged. Unfortunately a species whose evolutionary strategy is based on developing ever more technologically sophisticated cures for diseased individuals is favouring the survival of the unfittest, and stepping down a road that points towards biological extinction.

⁴ Jeff Zeleny, “House Votes to Expand Stem Cell Research, Jeff Zeleny”, NY Times, 8 June 2007.

⁵ Cited in Bill McKibben, *Enough: Genetic Engineering and the End of Human Nature*, Bloomsbury, 2003, p126.

I Sing the Body Eclectic

One of the main problems is that, as US environmentalist Bill McKibben puts it, “the line between repair and enhancement is too murky to be meaningful.” We may start by growing replacement livers in test tubes, manufacturing prosthetic hearts or artificial blood, or weeding out genes that cause Alzheimers or obesity, and all for strictly remedial reasons. But since, especially in a capitalist market, there will be every incentive for developing these technologies to the highest standards, they will eventually outperform the biological originals. Synthetic blood will provide oxygen more efficiently than real blood; kids with selected genes will outperform their school-mates in the classroom and on the sports field; obesity solutions will allow you to eat as much as you want of whatever food you like — as long as you can afford it.

Something of a watershed in human evolution was passed recently when paralympic champion sprinter Oscar Pistorius applied to compete in the Beijing able-bodied olympic games on his “Cheetah” (was the pun intended?) carbon fibre legs. The International Association of Athletics Federations (IAAF) refused him permission on the grounds that:

“Pistorius was able to run with his prosthetic blades at the same speed as the able bodied sprinters with about 25 percent less energy expenditure. As soon as a given speed is reached, running with the prosthetics needs less additional energy than running with natural limbs.”⁶

The IAAF was overruled by the Court of Arbitration for Sport, but Pistorius anyway failed to qualify for the South African olympic team, though he went on to win three gold medals in the paralympics. However, within a few years paralympic athletes might well be regularly outperforming able-bodied athletes. If bionic competitors are allowed in the olympics, within a couple of decades the entire event might be dominated by technologically or genetically enhanced athletes. On the other hand, if Pistorius and his successors are kept out then the able bodied olympics will gradually be eclipsed by the paralympics (though the able-bodied olympics might fight back by allowing the use of performance-enhancing drugs).

Disabled people are also likely to be setting the pace for advances in cyborg developments, particularly through the development of brain-computer interfaces, which enable a paralysed human to control a computer (and hence machinery) simply by thinking about it. Stephen Hawking, with his computerized voice-box is the iconic advocate of such technologies, but the paraplegic journalist John Hockenbury has provided more detailed reports of the advances. To date, scientists have managed to link a

⁶ Olympics Ban for ‘Blade Runner’ Pistorius, Agence France Presse, 14 Jan, 2008, <http://afp.google.com/article/ALeqM5jcZY03w05q01-sMCiNwGpMTiiUkQ>; For a legal discussion of sport and transhumanism, see G Wolbring, “Oscar Pistorius and the future nature of Olympic, Paralympic and other sports”, (2008) 5:1 SCRIPTed 139: <http://www.law.ed.ac.uk/ahrc/script-ed/vol5-1/wolbring.asp>

patient's brain directly to a computer so that it can command the position of a cursor on a computer screen; another invention enables disabled people to stand erect on two wheels by conveying the natural balancing mechanism in their brain directly to the wheelchair's computer.

Hockenbury believes that disabled people are in the vanguard of human evolution:

“Bodies are perhaps a somewhat arbitrary evolutionary solution to issues of mobility and communication. By this argument the brain has no particular preference for any physical configuration as long as functionality can be preserved ... The brain-body-machine interface doesn't seem to need the body as much as we believe it does. For those open to the possibility, the definition of human includes a whole range of biological-machine hybrids of which I am one ... We hybrids are part of a universal redrafting of the human design specification.”⁷

Genetic and robotic advances for medical purposes are likely to continue without opposition for some time, because we sympathise with the predicament of the people they are designed to help. The danger is that we may soon find that the disabled have become more capable than ordinary humans, who, to survive in a competitive society, would then themselves need to become similarly enhanced. If we want to assure the viability and future of the human biological species we need to draw some lines before we reach this point. However disabled “hybrids” like Hockenbury are likely to object, using arguments like this one from the Cyborg Liberation Front:

“To relinquish the rights of a future being merely because he, she, or it has a higher percentage of machine parts than biological cell structure would be racist toward all humans who have prosthetic parts.”⁸

Well, arguably, it would be not racist, but speciesist, and it is interesting that the man who gave the world that ungainly word, animal rights activist Peter Singer, has weighed into the dispute advocating that reproductive genetic enhancement should be dispensed fairly by the government, for example by means of a state-run lottery. It is, I suppose, vaguely reassuring for future biological humans that at least some transhumanists are, like Singer, vegans.⁹

⁷ John Hockenberry, “The Next Brainiacs”, *Wired*, Aug 2001, www.wired.com/wired/archive/9.08/assist_pr.html

⁸ Natasha Vita-More cited in Erik Baard, “Inside the Movement for Posthuman Rights”, *The Village Voice*, July 30 — August 5, 2003.” <http://www.kurzweilai.net/meme/frame.html?main=/articles/art0611.html>

⁹ Peter Singer, “Shopping at the Genetic Supermarket”, in S Song, Y Koo & D Macer (eds.), *Asian Bioethics in the 21st Century*, Tsukuba, 2003, pp143-156.

Decentralization

There is another factor which may explain why GM crops have been widely and semi-successfully opposed by the green left, whereas GM humans and other aspects of the GNR project have so far been let off fairly lightly. GM crops from the start have been propagated by a small number of trans-national corporations, such as Monsanto and Bayer, who have honed in on the technology specifically because of the opportunities it offers for them to establish an oligopoly over world seed supplies. It is as much their attempt to take control over people's land and livelihoods as any environmental risk, that has provoked resistance from peasants in the Third World and Europe.

Most of the other applications of GNR, have been developed on a more decentralized basis. Innovations in nanotech and human biotech have come out of relatively small research departments run by small companies or universities, though that may change when the technologies become more established. But it is in the field of information technology that (notwithstanding Microsoft and Google) decentralization, or networking, has become not merely a modus operandi but an end in itself.

Thus Ray Kurzweil remarks:

“The advent of worldwide decentralized communication, epitomized by the Internet and cell phones has been a pervasive democratizing force. It was not Boris Yeltsin standing on a tank that overturned the 1991 coup against Mikhail Gorbachev but rather the clandestine network of fax machines, photocopiers, video recorders and personal computers that broke decades of totalitarian control of information. The movement toward democracy and capitalism and the attendant economic growth that characterized the 1990s were all fuelled by the accelerating force of these person-to-person communication technologies.”¹⁰

Much the same comments have been made about the anti-globalization riots, particularly Seattle 1999. There are dozens of articles to this effect, for example, one from Naomi Klein which concludes:

“What emerged on the streets of Seattle and Washington was an activist model that mirrors the organic, decentralized, interlinked pathways of the Internet—the Internet come to life.”¹¹

Really? People have been successfully co-ordinating decentralized, anti-totalitarian uprisings and revolutions for as long as anyone can remember — the peasants revolt, the English and French revolutions, the Luddite movement, the Indian independence

¹⁰ Ray Kurzweil, *The Singularity is Near*, Viking, 2005, p. 406

¹¹ Naomi Klein, *Were the DC and Seattle Protests Unfocused?* Naomi Klein website, 10 July, 2001 <http://www.naomiklein.org/articles/2001/07/were-dc-and-seattle-protests-...>

movement, Paris and Prague 1968, and the 1993 anti road protests are some that come to mind — these all managed just as well as the Seattle protesters relying upon the ultimate form of decentralized communication, word of mouth. The insurgents of Seattle used the internet simply because that was becoming the dominant means of communication. If anything, the level of decentralized, co-ordinated direct action has declined in the UK since the internet became widespread in about 2000 — suggesting that dissidents may be content with virtual protest — while the Russians seem to be lurching back towards totalitarianism.

Transhumanists are keen to accentuate the “democratic”, decentralized aspects of the cyberworld partly because the traditional critique of posthumanism has always emphasized the danger that a scientific elite will take control. CS Lewis, in *The Abolition of Man*, predicts that “at the moment, then, of Man’s victory over Nature, we find the whole human race subjected to some individual men” whom he calls “the Conditioners”.¹² Aldous Huxley’s *Brave New World* is much the same. The mid 20th century fear that technology would hand power over to an elite owes much to the Nazis interest in eugenics.

Similarly, in order to counter critics like Jaron Lanier, who warn that the new technologies will create a wealthy elite, transhumanists point to the rapidly falling price of lap-tops and mobile phones which “quickly become so inexpensive as to become almost free”.¹³ Whether state-of-the-art genetic modifications and brain or body enhancements will also become “almost free” is less certain. The logic of capitalism leads one to expect that there will always be new and expensive forms of enhancement at the frontier of technology which will only be affordable to the very rich, and which, once acquired, will help to secure and increase their owner’s superiority and wealth.

But the main reason that transhumanists like to emphasize decentralization is because they are libertarian cornucopians who consider that new technologies will flourish best under a decentralized form of capitalism. They are wary of authority because it might enforce relinquishment of certain technologies. Kurzweil again:

“The only conceivable way that the accelerating pace of advancement on all of these fronts could be stopped would be through a worldwide totalitarian system that relinquishes the very idea of progress.”¹⁴

Most transhumanists therefore tend towards an unregulated, competitive environment in which the battle for the survival of the fittest technology is at its most intense — *Darwin Amongst the Machines*, as a book title puts it.¹⁵ It doesn’t matter who wins because transhumanists are, by definition, always on the side of the winner.

Many green activists and left wing anarchists view the internet, open source software and the “creative commons” as inherently radical forms of organization (even

¹² C S Lewis, *The Abolition of Man*, 1944.

¹³ Kurzweil, *op cit*, p. 469.

¹⁴ *Ibid*, p. 417.

¹⁵ George B Dyson, *Darwin Amongst the Machines*, Helix Books, 1997.

though bodies such as the US National Nuclear Security Agency, IBM and Mitsubishi robotics use the open source operating system Linux). Poor fools: as far as the architects of our future are concerned the medium is the message. Artificial intelligence is its own propaganda, which is why it is spreading like a virus through schools, and why technophiles plan to distribute laptops to kids in the Third World who haven't even got access to clean water. The uptake of increasingly powerful technology, however dissident or luddite the views it may happen to be propagating, serves to further the technological — and ultimately transhumanist — project.

The choices that lie ahead, if we allow the GNR technologies to multiply and evolve, therefore appear to be not that different from those described by Ted Kaczynski in the passage cited in the first part of this paper. Either transhuman progress will be stewarded by a governing elite of “bioethicists” and scientists who will have at their disposal tools for social control beyond the dreams of Hitler or Stalin. Or it will evolve within a decentralized competitive knowledge economy, in which case an elite or superior race may emerge whose power is derived from the accumulation of technological capital. Neither option is appealing whilst the only apparent alternative — some form of decisive relinquishment — will be difficult to achieve.

The Contradictions of Obsolescence

“The forces of change are irresistible” says the robot manufacturer Rodney Brooks. “Resistance is futile.” At best, trans-humanists graciously allow that a few stubborn non-enhanced humans — MOSHes Kurzweil calls them, standing for Mostly Original Substrate Humans — may survive in primitive squalor much as dispossessed indigenous tribes are today permitted to stay on reservations.

Unfortunately the pursuit of technological progress for its own sake does have an inherent advantage over all other ideologies. Throughout history, cultures which opt to evolve at a rate more in tune with their biological surroundings, have been conquered, colonized and absorbed by the technological prowess of aggressive empires. Peasants who see no reason to alter their way of life are cast as backward and ignorant, are squeezed off their land by economic forces, or superseded by their more go ahead offspring.

There is a quotation from Max Planck, founder of quantum physics, which technophiles like to repeat:

“An important scientific innovation rarely makes its way by gradually winning over and converting its opponents. It rarely happens that Saul becomes Paul. What does happen is that its opponents gradually die out and the growing generation is familiarized with the idea from the beginning.”¹⁶

¹⁶ Max Planck, *The Philosophy of Physics*, 1936.

The statement rings true when we look at the ease with which modern children and teenagers adapt to the rapid advance of cybertechnology and virtual reality. In the 1960s and 1970s when cultural norms propagated by people born before the invention of horseless carriages were still partly intact, it was the young who were rebels against the moral authority and presumed wisdom of the old. Now that this worn out cultural fabric has been superseded by an ideology of instant consumption and techno-faddism, it is the young who are conformists, and the old, misfits.

At first sight this shift in status between young and old does not appear to bode well for advocates of technological stasis or a slow pace of evolution. But it is possible to detect in it contradictions that will emerge more strongly if the advance of technology continues to accelerate at even a fraction of the exponential rate that the transhumanists predict.

As the rate of technological change speeds up so does the rate of obsolescence; and as things become obsolete more quickly so too will Planck's "growing generations familiarized with the idea from the beginning." In short, youth will become misfits more quickly, and the number of "old" misfits will increasingly outnumber the youngsters still surfing the technological wave — all the more so since the transhumanists are determined that everybody should live longer. The rate of technological change has long outpaced our rate of biological evolution; but now it outpaces our individual lifespans.

The obsolescence problem becomes still more embarrassing for the technophiles if genetic enhancement of offspring is introduced. This is Bill McKibben:

"The first child whose genes come at least in part from some corporate lab, the first child who has been 'enhanced' from what came before — that's the first child who will glance over his shoulder and see a gap between himself and human history. But here's the really awful part. He won't be able to imagine himself connected with those who come after him, because, of course by then there will be better upgrades. They'll be Windows 2050 to his Atari. He'll be marooned forever on his own small island."¹⁷

As McKibben points out elsewhere, even two siblings five years apart might find their genes engineered to different standards.

For this reason the biotech industry (if it has any tactical sense) may decide to steer clear of rerogenetic technologies, and efforts are more likely to be concentrated into other technologies which can be retrofitted in mid-life: therapeutic cloning of body parts, advanced prosthetics, nano technologies, robotics, surveillance technologies and virtual realities. The accent will be on "lifelong learning" at an ever increasing intensity. But Luddites can take heart that the older people are, the more resistant they become to learning new tricks, and the more they value culture over innovation. The songs we

¹⁷ McKibben, op cit 5.

remember and love best are the ones we learnt in our youth, so modernizers will have a hard time getting everyone to sing to the same hymnsheet.

Towards a Slow Evolution Manifesto

The problem of accelerating obsolescence may cause the technofixers some systemic problems but these are unlikely to stem the tide of technical advance. Nor is there much sign that government bodies are concerned about the long term prospects. There are no bodies for assessing or regulating either the short or the long term social effects of the nanotechnology, robotics and artificial intelligence industries.

Decisions about genetic engineering of humans are regarded as more sensitive and in the UK are regulated by the UK Human Fertilisation and Embryology Authority (HFEA). But it is hard to find much that they have definitively banned, other than the direct cloning of human individuals. This is a hollow gesture since even transhumanists such as Kurzweil are happy to see it banned. Currently, most attempts to clone mammals fail and about 30 per cent of clones born alive suffer from a debilitating condition, so most geneticists are worried that rogue scientists like Rael, or Severino Antinori will attempt to produce a cloned human, cock it up and give cloning a bad name.¹⁸

Aside from reproductive cloning, wherever the HFEA, have had an opportunity to draw a clear line — for instance prohibiting chimeras or the cloning of human embryos — they have declined to draw it. Current guidelines prohibit modification of the human germline to produce designer babies, but allow designers to screen out embryos with certain genes, and to modify embryos up to 14 days old “for research purposes” — ie to let scientists keep working on the project.

Dave King of Human Genetics Alert comments:

“Regulatory bodies such as the HFEA, even if not actually dominated by scientists and doctors with financial incentives in the technologies they oversee, are nonetheless controlled by a scientific discourse that makes “progress” and medical benefits the ruling ethical consideration and employs a bioethics that is incapable of drawing clear ethical lines. They make decisions on a case-by-case basis, without considering the social effects of the technologies’ long-term trajectories. They appear to conduct serious deliberations on each step, yet they end up justifying the slide down the slippery slope because they can never say ‘no’.”¹⁹

¹⁸ Kurzweil, op cit p. 221.

¹⁹ David King, “Important Changes in UK Law on Reproductive and Genetic Technologies”, Genetic Crossroads, January 26th, 2007. <http://www.biopoliticaltimes.org/article.php?id=3114&&printsafe=1>.

We will only stop humanity marching blindly down the slippery slope that leads toward transhumanism by creating a movement that focuses clearly on the long term dangers, analyses them within their political, economic and ideological context, and kicks up a fuss.

Here are four pointers for action:

- We need to overhaul our vocabulary. We should reclaim the word Luddite, which is used as a term of abuse even by people who have Luddite tendencies, as in “I’m no Luddite but ...” Ditching the term is not an option, as our enemies will continue to use it, so it should be carried with pride. However it needs to be supplemented with a more up-to-date and explicit vocabulary that conveys aims succinctly. For example the term “Slow Evolution” does not imply stasis or backwardness, it chimes with the Slow Food /Fast Food axis, and it implies harmony with the rest of the natural world. “Slow evolution is co-evolution” is the slogan that comes to mind.
- We need to develop a lucid ideological stance, which will explain (a) how the transhuman and technophile agenda is currently linked to neo-liberalism (and could be adopted by neo-fascists); (b) that human wellbeing and happiness have only tenuous links with technological advance; (c) that human society should aspire to co-evolve with our natural world rather than dominate it and (d) how Slow Evolution meshes with other environmental imperatives.
- We should welcome and explore (rather than shun or hide) the contradictions inherent in a Luddite stance. Trans-humanists argue that unbridled technological advance is the natural extension of the process of evolution. Since everything is Nature, it would be foolish to deny this. Rather the slow evolutionist embraces the paradox inherent in the human condition; that we need to restrain human nature to retain human nature. “Nature is what we are put on this earth to rise above” says Katherine Hepburn in *The African Queen*. Yet we can only rise above Nature by declining to rise above her, by abstaining from the pursuit of evolutionary hegemony to its inevitable conclusion; for, to repeat the words of C S Lewis, “Man’s conquest of Nature turns out, in the moment of consummation, to be Nature’s conquest of Man”.²⁰
- We need to use more confrontational tactics. We know from experience that the government pays little attention to public opinion and steam-rollers consultation processes, while the spectre of social disruption makes them react. Non-violent direct action and riot laced with humour are tactics that we know work well. Crop-pulling has been highly effective, so do we now need some test-tube-trashing? Targeting experiments with a high “yuk factor” and low medical benefit, would

²⁰ Op cit 12; and for further investigation of this theme, see part 1 of this article in issue 5 of *The Land* 5, p16.

put the wind up the mad scientists, and would give mainstream bioethicists with luddite sympathies more bite. But we should steer clear of the violent methods used by the Unabomber, and some elements of the animal rights movement. They are morally repulsive to most people, hence divisive, and whatever tactical success Kaczynski may have achieved by alerting the public to the threats from technology is unlikely to be replicated.

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The Land, Issue 5, p. 16. <thelandmagazine.org.uk/articles/transhuman-agenda> &
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