

Emerging Technologies and the Human Future

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Editor's Note: This Cape Town 2010 Advance Paper has been written by Nigel Cameron and John Wyatt as an overview of the topic to be discussed at the Multiplex session on 'Ethics, Emerging Technologies and the Human Future.' Responses to this paper through the Lausanne Global Conversation will be fed back to the authors and others to help shape their final presentations at the Congress.

What does it mean to be human? In traditional thought there has always been a clear distinction between 'natural' beings, derived from the natural order, and those that were 'artifacts,' a product of human ingenuity and craft. For many centuries our embodied human nature was the last frontier of the natural order. Although human beings could modify and instrumentalise every other aspect of their environment, they could not escape the 'given-ness' of their own humanity.

But the rapid development of emerging technologies is about to create a new and profoundly troubling assault on human identity in the 21st century. This new assault cuts to the quick of our anthropology: it focuses on the fundamental relationship between our artifacts and our own nature, between our manipulative capabilities and our own selves. It was this recognition that drove C.S. Lewis, back in the dark days of 1943, to write his prophetic essay on 'The Abolition of Man,' perhaps the most penetrating statement yet made of the greatest question that will confront the 21st century. The pivotal significance of the Christian belief that we are made in the image of God is about to be tested as never before.

Lewis argued that while technology appeared to extend the human race's ability to control and subdue nature, 'what we call Man's power over Nature turns out to be a power exercised by some men over other men with Nature as its instrument.' There can be no 'increase in power on Man's side. Each new power won by Man is a power over Man as well. Each advance leaves him weaker as well as stronger. In every victory, besides the general who triumphs, he is a prisoner who follows the triumphal car. . . . Human nature will be the last part of Nature to surrender to Man. We shall 'be henceforth free to make our species whatever we wish it to be. The battle will indeed be won. But who, precisely, will have won it? . . . Man's final conquest has proved to be the abolition of Man.'

In other words by taking to ourselves the power to determine our own future, we turn ourselves into creatures of our own design, artifacts of our own manufacture.

Human Dignity and the 'Biotech Century'

The question we face is what to do with the extraordinary new powers that we are taking to ourselves. Developments in human genetics, biotechnology, pharmacology, neuroscience and nanomedicine raise high hopes of cures for terrible diseases, including inherited disorders, cancer and degenerative conditions. Yet as C S Lewis warned, the spectacular promise which these technologies offer, driven in part by a noble desire to combat the destructive consequences of disease, always carries a darker side - the instrumentalisation and manipulation of vulnerable human lives.

We are in the process of gaining unparalleled understanding of the human genome. It is hoped that this new knowledge will lead to precisely targeted drugs and sophisticated new clinical applications. But this explosion in genetic knowledge has also led directly to new and sophisticated means of identifying and destroying embryonic and fetal human beings who carry unwanted genetic variants. This way of dealing with disease by destroying those who carry it offends the consciences of many more than those who call themselves 'pro-life.' It should perhaps be no surprise that in Germany, where they have not forgotten what eugenics means, in vitro fertilisation is perfectly legal, but

embryos must be implanted without quality control.

Reproductive technology has enabled couples to overcome the pain of infertility, but it has also led to the deliberate creation of embryonic human beings for destructive research, and the creation of cloned embryos and even human-animal hybrids. As Oliver O'Donovan warned we have replaced 'the old-fashioned crime of killing babies' with 'the new and subtle crime of making babies to be ambiguously human, of presenting to us members of our own species who are doubtfully proper objects of compassion and love.'

There is a tendency for ethically-conservative religious people to define such debates in 'pro-life' terms, and in the process, despite their intentions, to have the effect of aiding those in the science, business and policy communities who are resistant to calls for ethical limitations in these technologies. By asserting their position on abortion as the paradigm of the agenda, they unwittingly marginalise their position and make it difficult to build common cause with wider forces in the culture who may share many of their concerns 'about particular aspects of the technologies in question; about the need in principle for limits; and about the profound significance of these questions of policy.'

But we make a big mistake if we see discussion of the human future as mainly concerning reproductive and embryo issues, for the most sobering scenarios lie ahead and elsewhere. In the field of neuroscience the emerging technologies are enabling us to monitor, control, manipulate and enhance our brain function. It is becoming increasingly possible to manipulate perception and memory, whether through neuro-pharmacology (including what has been termed 'cosmetic neurology') or cognitive prostheses.

The goal of technology is not only to understand the world but to control it, and neuroscience offers potent new possibilities for social control. Take all the forms of human behaviour which threaten our future 'violence, inter-racial conflict, religious fanaticism, addiction, selfish squandering of the world's resources. At heart these can all be seen as due to malfunctioning of the human brain. If we can only understand how to prevent this faulty cognitive processing, we will be able to usher in a new dawn of social harmony and global peace. By making our own human functioning an object of scientific study 'by objectifying ourselves 'we hope to control ourselves, to achieve self-mastery.

Since so-called 'religious fundamentalism' is regarded as a major source of social and political conflict, it is not surprising that an active area of neuroscience research is into the brain mechanisms which underlie religious beliefs and experiences, and the cognitive processes which lie at the formation of moral beliefs and the resolution of moral conflicts and dilemmas. It does not require much imagination to see the manipulative and coercive possibilities which this knowledge will bring. At the same time, advances in stem cell technology and regenerative medicine enable us to enhance our functioning and extend human life span, and create human-machine interfaces of unparalleled power.

Genetic and biological science erodes the traditional distinction between humanity and the animal world. We are merely one primate species amongst many others. On the other hand, emerging technologies erode the distinction between the human and the artifact. We are merely machines made out of carbon instead of silicon. How can we preserve our unique human identity and help to create a genuinely pro-human future in the light of these technological challenges?

As biblical Christians our starting-point remains in the creation narratives of Genesis, where we read that humans are made in the image of God himself 'with a mandate to rule and steward the creation for God 'and in the New Testament, where we read that Jesus Christ is God made flesh 'God himself taking our human form. So Christians are called to treat the human body, with its strange and idiosyncratic design, with special respect. This is the form in which God became flesh. We are neither animals nor machines 'we are humans made in God's image; he has taken that image for his own by joining us in our membership in the species *Homo sapiens*. As we rule and steward the creation 'including the extraordinary possibilities of science and technology 'it is as human beings accountable and responsible to him and stewards of what he has made.

The 'pro-human' cause presents as the great question of the 21st century, as we confront the rapid development of emerging technologies and their offer of powers to aid or undermine our humanness at the most fundamental level.

Key Questions raised by Emerging Technologies

Several sets of questions should be on our minds as we consider policy approaches to these technologies. They intersect but offer different standpoints from which to view and critique both the technologies themselves and the matrix of law and practice within which they are applied. A future that is both pro-technology and pro-human will depend on their answers.

1. Commodification. As our powers extend over our own bodies and the bodies of others, and technologies lead to products and processes, questions of intellectual property will occupy centre-stage. A case in point: in the United States there was a recent debate over whether human embryos could be patented. The biotechnology industry, though its trade group BIO, argued that genetically-engineered human embryos were appropriate subjects of patent claims. How can we protect vulnerable human beings – the modern equivalents of widows, orphans and aliens – from the manipulative possibilities of technology?

2. Eugenics. There is growing pressure for eugenic uses of in vitro fertilisation, not simply to screen out embryos with genetic diseases, but also to select the sex and other 'desirable' inherited characteristics of our future children. And within society, there is corresponding pressure for various forms of genetic discrimination – in employment and insurance, especially. In Christian thought the dignity of a human being resides not in our function or our biological potential, but in what we are, by creation. In the literal words of the eighth psalm, each one of us is 'lacking a very little of God' (Psalm 8:5). Our human dignity is intrinsic, in the way we have been made, in how God remembers us and calls us. How can we preserve and defend the biblical understanding that each human life has a unique and incalculable value because of the indwelling image of God?

3. 'Enhancement.' Whether through genetics or nanotechnology and cybernetics, it is likely that we shall see the development of human enhancements, especially in cognition – in effect blending human and machine through such means as the implanting of brain chips for memory, skills or communication. The logic of such developments is far-reaching, since while they would begin incrementally and through dual-use devices with genuine medical applications (for example, for stroke victims), they would have longer-term impact through compounding both the intelligence and the wealth of a small segment of society, perhaps leading ultimately to a new feudalism in which power of all kinds is concentrated in the hands of 'enhanced' persons.

We should also note the steady growth of 'transhumanism,' a network of science-fiction enthusiasts and outlandish thinkers who deliberately seek radical changes in human nature. They have recently begun to move from the fringes of society into mainstream contexts, and are pressing the idea of radical 'enhancement' in academic and policy-making circles.

In contrast, the resurrection of Christ as a physical human being can be seen as God's vote of confidence in the created human nature. The original design of human beings is not abandoned, despised or marginalised; it is affirmed and fulfilled. In Jesus, the second Adam, we see both a perfect human being – what the original Adam was meant to be – and we see the pioneer, the blueprint for a new type of person – the one in whose likeness a new creation will spring, the first fruits of those who are to come (1 Corinthians 15:20). God declares that for all future time he will sustain, redeem and transform the humanity that was originally made.

The resurrection is God's final and irrevocable 'Yes' to humankind. If we take the biblical doctrines of the incarnation and resurrection seriously, perhaps we should conclude that the physical structure of our human bodies is not something we are free to change without very careful thought. How can emerging technologies with their extraordinary power be used not to manipulate and destroy but to

better fulfill our humanness?

Conclusion

The great issues of ethics and policy that we face are all focused on questions of human dignity and the significance of human nature. Developments in emerging technologies are leading to very great increases in our power over human nature itself. While policy must address a wide range of questions, at the heart of the agenda for the 21st century lies the need to build a policy framework in which ethical principles set the ground-rules for our use of these new powers. In parallel with legislative and regulatory interventions in particular technology areas (for example, in relation to cognitive enhancement, or animal-human chimeras), the intellectual property landscape must be shaped to secure human nature from commodification; and genetic discrimination, itself the obverse of eugenics, must be comprehensively outlawed. A robust approach to each of these questions will enable us to welcome emerging technologies with their extraordinary capacity to enhance not human nature but our capacity to be human, that we may better fulfill our humanness. At the same time, as our recent experience of genetically-modified foods demonstrates, it is not in the interests of the scientific or business communities to develop technologies that are freighted with controversy, and those who would take a lead in the development of pro-human technology policies will find allies in many quarters.

Of course, every application of every new technology will be presented to us as yet another wonderful benefit for human beings that will make life better and easier. The Brave New World question that must always be asked is, at what cost? Lewis's essay on "The Abolition of Man" opens with a potent quotation from John Bunyan's *Pilgrim's Progress*, with which we conclude: "It came burning hot into my mind, whatever he said and however he flattered, when he got me home to his house, he would sell me for a slave."

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