

FUTURE PERFECT?

God, Medicine and Human Identity

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2006
T & T CLARK INTERNATIONAL

Chapter 1

PERFECT HUMANS OR TRANS-HUMANS?

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Perfection through science: is this a realistic goal? Whether realistic or not, should the striving for perfection provide an ethical vision or guide? For John Wesley, Christian perfection is possible in this life through the work of the Holy Spirit within a loving heart. Can medical science replace the Holy Spirit?

What counts as perfection? Wesleyan Methodists and Christians more generally aim at cultivating a loving and caring disposition: 'pure love reigning alone in the heart and life, this is the whole of scriptural perfection'.¹ What would count as perfection for medical science? Would the perfection toward which medical therapy aims be a state of good health? Would the perfection toward which genetic or other physical enhancement aims be excellence, or superiority? Would transhumanism give up on human perfection as too restrictive and strive for a supra-human perfection?

What role does a vision of perfection play? In Christian perfection, the vision of a loving heart draws the person of faith toward increased caring, toward transformation from selfishness to selflessness. In medical therapy, the vision of good health directs the steps to be taken by doctor and patient. In considering enhancement, the vision or model of the excellent or superior person suggests genetic or other biological alterations that could produce this effect. In assessing the emerging concept of transhumanism, visions of good health and enhanced capacities carry our imaginations beyond what we previously thought were within the range of finite human existence.

With these questions and prospects in mind, I would like to examine carefully three forms of visioning that lead to transformation through medical science: therapy, enhancement and transhumanism. All depend upon an image of who we are and who we would like to become. Enhancement and transhumanism each add an element of the fabulous, an element of excellence or superiority that takes us beyond good health. Do they require an implicit image of perfection? Or, is the mere striving for partial betterment sufficient to energize and direct the relevant medical sciences?

The track we will follow will be that of genetic or other biological interventions as they pass through therapy, enhancement and transhuman projections. When we switch to the ethical and theological tracks, we find little or no controversy surrounding therapy; mild caution regarding enhancement; and rejection of at least the extreme forms of transhumanism.

¹ John Wesley, *A Plain Account of Christian Perfection* (London: Epworth, 1952), p. 52.

One of the problems associated with enhancement and transhumanism is that they risk promising too much. They promise to make us into fabulous human beings, in the latter case even something posthuman. They promise transformation, and transhumanism even promises transformation leading to a new level of perfection. Tacitly, they risk assigning science the job of providing the equivalent of salvation. Our risk is that our generation might be tempted to ask of science what only God can deliver: God may be able to deliver perfection. Science cannot.

The God of the Bible is a God of transformation. The Easter resurrection of Jesus announces God's promise of a radical transformation yet to come: the eschatological new creation. In anticipation of the new creation, Jesus performed miracles of healing. We might call his healing 'eschatological therapy'. Those healed experienced transformation as today's effect of tomorrow's renewal. Built right into the Christian world-view is the vision of a coming new creation accompanied by a ministry of healing in today's broken world. Any Christian ethic should embrace transformation aimed at healing, to be sure.

As we move from eschatological vision to bioethics, we need to distinguish between promises peculiar to God and those we can realistically assign to medical science. Ultimate transformation and perfection belong to God's agenda. Striving for wellbeing and even flourishing belong on the human agenda, and this includes advancing scientific research as a means to that end. Knowing the difference between a vision of perfection and our appropriate striving will require wisdom and prudence.

Wisdom and prudence are what Celia Deane-Drummond offers. Her virtue approach to ethics is 'eschatological in orientation; it explores through a particular theological telos, what might be the good end for humanity'.² With the ultimate end envisioned, she then commits herself to honouring wisdom, which is 'an expression of the eternal mind of God, while at the same time affirming what can be known in creaturely existence'.³ From wisdom emerges her virtue ethic. She follows Thomas Aquinas by placing prudence in special relation to the other cardinal virtues: justice, fortitude and temperance. Prudence is the application of wisdom to human affairs; and ethics counts as such a human affair. 'The ability of prudence to be still, to deliberate well, is a quality desperately needed in the frenzied search for new methods and techniques in biological science that are considered to have particular usefulness for humanity'.⁴

My proposal is that Christian deliberation over speculations regarding the next advances in neurocognitive research affirm at the level of assumption that transformation on behalf of improved human flourishing is attuned to God's eschatological promise; and, in addition, I propose that we invoke wisdom and prudence in assessing what is realistic about the promises of medical advance. I will conclude that therapy is an uncontroversial divine mandate, that transhumanism is unrealistic, and that enhancement deserves continued ethical monitoring and sorting out.

2 Celia E. Deane-Drummond (ed.), *Brave New World? Theology, Ethics, and the Human Genome* (London and New York: T & T Clark International, 2003), p. 235.

3 Celia E. Deane-Drummond, *The Ethics of Nature* (Oxford: Blackwell, 2004), p. 20.

4 Drummond, *Ethics of Nature*, p. 14.

1. From Therapy to Enhancements

For the sake of this discussion, I would like to distinguish three terms, *therapy*, *enhancement* and *transhumanism*. The first two are commonplace in medicine and bioethics. By 'therapy' we mean healing, the addressing of a pathology for purposes of restoring health. By 'enhancement' we refer to medical measures that improve an individual's functioning or improve the human species beyond what had previously been thought to be its norm. Therapy is a response to a pathology, whereas enhancement initiates an improvement without reference to a pathology.

Therapy restores health. What is meant by health? The World Health Organization holds that 'health is a state of complete physical, mental, and social well being and not merely the absence of disease or infirmity'.⁵ The late Pope John Paul II offers a similar definition. 'From a Christian perspective, then, health envisions optimal functioning of the human person to meet physiological, psychological, social, and spiritual needs in an integrated manner'.⁶ Although such definitions may open themselves to ambiguity, the end or goal of therapy or cure gains some helpful specificity.

Even though good health may be pursued with passionate hopes for a cure, and even though therapy's achievement results in joy, good health is not a form of enhancement. To be healthy, we assume, is to exist at the norm, to live as our bodies were originally designed to live. Despite the joy good health brings to the healthy person, we would want everyone in our neighbourhood to benefit from the same level of wellbeing.

Enhancement is distinguished from therapy here because it involves efforts to make someone not just healthy, but better than healthy. More than offering a cure, enhancement optimizes attributes or capabilities beyond what good health requires. The goal might even be to raise an individual from standard up to peak levels of performance. If therapy via genetic intervention would bring an individual up to what is average or normal, then enhancement would bring an individual beyond the average or norm up to a level of excellence above others. Eric Juengst defines enhancement this way: 'The term *enhancement* is usually used in bioethics to characterize interventions designed to improve human form or functioning beyond what is necessary to sustain or restore good health'.⁷

The US President's Council on Bioethics (COB) defines *human gene therapy* as directed genetic change of human somatic cells to treat a pathological situation, a genetic disease or defect.⁸ By *human genetic enhancement* the COB refers to

5 My background study of genetic therapy and enhancement has been pursued as part of a larger research project, 'Altering Nature', at Rice University on a grant from the Ford Foundation, with Andrew Lustig as Principal Investigator. The team researching enhancement issues includes Karen Labacqz, Crawford Cronwell, Bernard Lo and Estuardo Aguilar, along with me serving as chair.

6 http://policy.who.int/egbin/om_isapi.dll?hit:sp:heading=&int:base=basico&gump=Relations%20with%20NGOs&sofpage=Document42#JUMPPDEST_Relations%20with%20NGOs.

7 Pope John Paul II, 'The Ethics of Genetic Manipulation', *Origins* 13.23 (1983), p. 385.

8 E.T. Juengst, 'What Does Enhancement Mean?', in Erik Parens (ed.), *Enhancing Human Traits: Ethical and Social Implications* (Washington, DC: Georgetown University Press, 1998), p. 20.

9 'Staff Background Paper: Human Genetic Enhancement', US Bioethics Council, 2002.

the use of genetic knowledge and technology to bring about improvements in the capacities of living persons or future generations.

2. *From Enhancement to Transhumanism*

Beyond enhancement, the open arms of transhumanism seem to be welcoming us. 'Transhumanism is the view that humans should (or should be permitted to) use technology to remake human nature,' write Heidi Campbell and Mark Walker.¹⁰ Through genetic technology, information technology and nanotechnology transhumanists believe the possibility exists for us to greatly enhance the healthy lifespan of persons, increase intelligence, and make ourselves happier and more virtuous. The key is to recontextualize humanity in terms of technology. This leads to a vision of a posthuman future characterized by a merging of humanity with technology as the next stage of our human evolution. *Posthuman* refers to who we might become if transhuman efforts achieve their goals. We are on the brink of becoming more than human, say the transhumanists.

For transhumanists, death should become voluntary. Immortality should become an option. Once we advance to the posthuman future, we will no longer be required to die. Immortality will belong to our definition as posthumans. Now, how do we get from here to there?

One step toward taking us from our present mortal human state to a posthuman immortal state is to build upon a key assumption, namely, that who we are as persons is centered in our brain activity. Transhumanism assumes that intelligence as a pattern of brain activity is the home of our personhood. It is the cognitive code or information pattern that is definitive. We are, what we think, so to speak. Therefore, to improve the human situation we may improve on biological function insofar as it enhances cognitive function; and, if necessary, we might even transfer cognitive function into a machine. The goal of transhumanism is to download the contents of human consciousness onto a vast computer network and, via the network, achieve a kind of disembodied yet intelligent immortality. As a machine, we could enjoy perfections that the limits of biology prevent us from attaining.

Anne Foerst explains. She founded and directed the 'God and Computers Project' at MIT's Artificial Intelligence Laboratory in the mid 1990s. She worked in the field of robotics, with AI entities known as 'Cog' and 'Kismet'. Trained in both theology and computer science, she found her MIT colleagues believing 'that humans are nothing but meat machines that carry a computer in their head. As soon as we have decoded the program that runs on the wetware of the brain, we

Bioethics (December 2002), www.bioethics.gov/. The term 'enhancement' as currently used in genetics was introduced by W. French Anderson, 'Human Gene Therapy: Scientific and Ethical Considerations', *The Journal of Medicine and Philosophy* 10 (1985), pp. 275-91.

10 Heidi Campbell and Mark Walker, 'Realigning and Transhumanism: Introducing a Conversation', *Journal of Evolution and Technology* 14.2 (August 2005), p. 1. See Nick Bostrom, *Home page* 2005, www.nickbostrom.com/trn/vallheim.html.

can download it into the hardware of a computer and live forever. This is the major belief of a movement that calls itself *transhumanism* or *extropianism*.¹¹

The postulated sequence goes something like this. First, AI researchers will simulate human intelligence in a computer, in a robot. Second, humans and machines will merge step by step, replacing portions of our brains with mechanical parts. Third, AI researchers will reduce existing human intelligence to a pattern of information processing and download this into a computer or a robot. This will constitute an evolutionary advance, actually a leap forward that could lead to cybernetic immortality – that is, immortal intelligent life in a machine that gets constant backups.

Ray Kurzweil predicts that by the end of the 21st century human beings will attain cybernetic immortality. Up until now, he says, our mortality has been tied to the longevity of our hardware. So, when our hardware crashes, our thought processes crash with it. When we instantiate ourselves in our computational technology, our software and hence our immortality will no longer be dependent on the survival of our body. Our immortality will be contingent on our being careful to make frequent backups.¹²

How likely is this to come to pass? Noreen Herzfeld, a computer scientist and theologian at St John's University in Collegeville, Minnesota, has tracked earlier projections of AI achievements since the 1950s. The record is dismally poor. Goals have not been reached even now in the early 21st century, despite enormous progress in computer development. No computer yet in existence can be deemed intelligent. 'While computing in general has advanced dramatically in the last fifty years, advances in AI have been limited. Neural networks remain at a level far below the complexity of the human brain. Current research in neuroscience suggests that the workings of the brain are far more complicated than was initially supposed and may not be capturable in neural net technology as we currently conceive it.'¹³

In all three – therapy, enhancement and transhumanism – we employ scientific research and medical technology to intervene in our natural processes to attain a certain end. The end for the first two is improved biological functioning. The end of the third is improved cognitive functioning with or without a biology.

11 Anne Foerst, *God in the Machine: What Robots Teach Us About Humanity and God* (New York: Dutton, 2004), p. 43.

12 Ray Kurzweil, *The Age of Spiritual Machines* (New York: Viking, 1999), chapter 6. Ian Barbour is slow to grant the assumption that we can transfer human consciousness to silicon. 'I suspect that it will turn out that conscious awareness requires forms of organized complexity or properties of neural cells and networks that have no parallels in silicon-based systems. I do not think we can exclude the possibility of conscious computers on metaphysical grounds, but there may be empirical grounds for the impossibility of computer consciousness... I am willing to leave this question open.' Ian G. Barbour, 'Neuroscience, Artificial Intelligence, and Human Nature', in Robert John Russell, Nancy Murphy, Theo C. Meyering and Michael A. Arbib, *Neuroscience and the Person: Scientific Perspectives on Divine Action* (Vatican City State and Berkeley, CA: Vatican Observatory and Center for Theology and Natural Sciences, 1999), p. 266.

13 Noreen L. Herzfeld, *In Our Image: Artificial Intelligence and the Human Spirit* (Minnneapolis: Fortress Press, 2002), pp. 72-73.

3. Health and Enhancement: A Blurry Line?

When we compare the first two, we can see that the line between good health and enhancement might be difficult to draw, especially if both seek to optimize functioning in an integrated manner. The distinction is blurry, not sharp. According to the World Council of Churches, 'there is no absolute distinction between eliminating "defects" and "improving" heredity. Correction of mental deficiency can move imperceptibly into enhancement of intelligence, and remedies of severe physical disabilities into enhancement of prowess.'¹⁴

Despite the blurry line, 'therapy' seems to garner approval while 'enhancement' is greeted with moral suspicion. Francis Fukuyama speaks for many: 'One obvious way to draw red lines is to distinguish between therapy and enhancement, directing research toward the former while putting restrictions on the latter.'¹⁵ Geneticist W. French Anderson holds that 'we should not step over the line that delineates treatment from enhancement.'¹⁶ Both therapy and enhancement require altering our bodies; yet the motive of healing seems distinguishable from that of enhancement.

The line between enhancement and transhumanism can also be blurry. Neuroscientists are currently employing chip lithography to create silicon neuronal chips. These silicon chips have furrows cut in them so that, when implanted in the human brain, actual neurons will grow in such a way that their dendrites and axons interact to create new input and output patterns. The merging of machine and brain could enhance thought, perhaps carrying a person beyond mood alteration or executive improvement to an advance in calculation ability.

Curiously, experiments with computers are going the opposite direction. Because DNA is the single best information storage system yet discovered, scientists are experimenting to see if they can create DNA computers with storage capacities that will leap ahead of anything we have created synthetically. We are technologizing the organic world while organicizing the technological world. Whether inside or outside the human brain, calculation capacity is on the verge of a quantum leap forward.

Bioethicist Paul Wolpe finds these developments astonishing yet promising. 'The point of all this is that we really are becoming some kind of cyborg, some kind of posthuman in the sense that for the first time in history we really are going to incorporate our synthetic technologies into the very physiology of our being – with major, though not necessarily entirely undesirable, consequences.'¹⁷ Arthur Caplan denies that these developments will make us posthuman; rather,

14 World Council of Churches, *Manipulating Life: Ethical Issues in Genetic Engineering* (Geneva: World Council of Churches, 1982), p. 7.

15 E. Fukuyama, *Our Posthuman Future* (New York: Farrar, Straus and Giroux, 2002), p. 208.

16 W. F. Anderson, 'Genetics and Human Malleability', *Healthings Center Report*, 20 (February 1990), p. 24.

17 Paul Root Wolpe, 'Neurotechnology, Cyborgs, and the Sense of Self', in *Neuroethics: Mapping the Field*, Dana Foundation Conference Proceedings, San Francisco, 13–14 May 2002 (New York: Dawn Press, 2002), p. 164.

he celebrates their enhancement of our humanity. We should applaud 'the new knowledge the brain sciences are providing to try to improve, enhance, and otherwise move toward optimization of our brains'.¹⁸

Ethicists who anticipate developments in neurocognitive enhancement identify four ethical issues.¹⁹ First, safety. What might be the long-term biological effects of interventions now via either neurotechnology or psychopharmacology? Will today's Ritalin children tomorrow confront premature cognitive decline? Second, coercion. If neurocognitive enhancement becomes widespread, might we confront situations where people are pressured to enhance their cognitive abilities? Will employers pressure employees, or courts pressure convicts? Third, distributive justice. More than likely, the upper economic classes will benefit more from brain enhancement than those unable to afford such medical opportunities. Is this just? Fourth, personhood and intangible values. Will neurocognitive alterations intersect with what we believe makes us persons? Will it make difficult our ability to envision what it means to be healthy and whole? Will it dull us from appreciating and valuing human life even with its imperfections?

4. Theology and the Ethics of Enhancement

The challenges of enhancement and transhumanism are knocking on religion's door. Will that door open or remain shut? Heidi Campbell and Mark Walker present transhumanism in terms of its salvific potential. Technology is becoming a rival to religious promise. The transhumanist vision is compelling, they say, because it touches 'on a desire for a life that overcomes the brokenness of this world, a place where pain and suffering are eliminated. This is a longing that is articulated in many religious traditions, those that subscribe to a distinctive eschatological belief in a future where humanity is perfected and transformed.'²⁰ We are on the brink of a technological eschatology, they assume. What might theologians have to say about this?

Relatively little has been said by Christian theologians and ethicists on the specific topics of brain enhancement through genetic intervention, neurosurgery, or pharmacology, let alone transhumanism. However, the more general question of enhancement has been raised on occasion. We will look here at the question of therapy versus enhancement in Eastern Orthodox ethics, Roman Catholic moral theology, and Protestant thought.

Eastern Orthodox theologians place their ethics within the framework of eschatological perfection, perfection understood as union with God. 'The Christian must place health care, the amelioration of suffering, and the postponement of death within the pursuit of holiness,' writes Tristram Engelhardt.²¹ Within such

18 Arthur Caplan, 'No Brainer: Can We Cope with the Ethical Ramifications of New Knowledge of the Human Brain?', in *Neuroethics: Mapping the Field*, p. 97.

19 Martha J. Barah *et al.*, 'Neurocognitive Enhancement: What Can We Do and What Should We Do?' *Nature Reviews* 5 (May 2004), pp. 421–25. www.nature.com/reviews/neuro.

20 Campbell and Walker, 'Religion and Transhumanism', p. 2.

21 H. Tristram Engelhardt, Jr., *The Foundations of Christian Bioethics* (Liss: Swets & Zeitlinger, 2000), p. 354.

a framework, John Breck can celebrate the potential benefit from genetic engineering (GE) for purposes of therapy; but he is more than merely cautious at the prospect of using genetic intervention for purposes of enhancement and eventually eugenics. 'The line between therapeutic and eugenic techniques is difficult to draw,' he writes. 'While theoretically it is possible for GE to replace *homo sapiens* with a superior *homo novus*, such "enhancement technology" is far in the future... Nevertheless, the potential for "improving" on God's blueprint for human life is such that serious ethical questions must be addressed here and now, by the Churches as well as by public and private regulatory bodies.'²² If the Orthodox are cautious about biological enhancement, they are likely to be even more reticent when confronted with transhumanism.

Roman Catholic theologians are also less than likely to advance an ethic supporting enhancement or posthumanism. A recent International Theological Commission working for the Vatican's Congregation for the Doctrine of the Faith has published a thorough discussion of Christian anthropology, *Communion and Stewardship: Human Persons Created in the Image of God*. It celebrates what it calls the 'biogenetic characteristics' that allegedly make each person unique. To modify a person's genetic code, regardless of motive, would infringe on a person's identity, says the commission.

Changing the genetic identity of man as a human person through the production of an in/frahuman being is radically immoral. The use of genetic modification to yield a superhuman or being with essentially new spiritual faculties is unthinkable, given that the spiritual life principle of man – forming the matter into the body of the human person – is not a product of human hands and is not subject to genetic engineering.²³

The logic seems to be this: genetically designing a posthuman is immoral because it is impossible and, if it were possible, it would still be immoral because it compromises human identity.

Significant here is that Catholic caution regarding enhancement would arise not from the technologies themselves, but from an understanding of what human excellence means. Catholics are leery of using medicine for enhancement because efforts at enhancement are so obviously bound up with value choices. A Protestant writing in a Catholic journal, Donal O'Mathuna, says 'In making a person taller medicine promotes the belief that short people are of lesser value and that height is significant in achieving the good life.'²⁴ Some of the values which might guide enhancement are questionable from a Christian perspective: 'Physical health is not the ultimate priority in Christian eyes.'²⁵ In short, if the *telos* or proper end of

human life is the development of a relationship with God and the cultivation of those excellences or virtues necessary for living in community, then even some forms of suffering can be seen as serving those ends. Not all suffering should automatically be removed from human life. 'Attempting to remove the trials and difficulties of life by genetic enhancement might derail the very ways in which God wants to shape our characters.'²⁶

Is there wiggle room here? Pope John Paul II did not explicitly forbid genetic enhancement. What needs to be protected is human identity and dignity; and if enhancement could render this protection perhaps it would not be *prima facie* illicit. James Walter comments: 'experiments that are not strictly directed toward therapy but are aimed at improving the human biological condition (enhancement) can be justified, at least in part, on the grounds that the experiments respect the human person by safeguarding the identity of the person as one in body and soul (*corpore et anima unus*).'²⁷

Just how much should we expect from enhancement or related improvements? Might we become unrealistic? Celia Deane-Drummond is sceptical about the use of 'salvific language' on the part of scientists pressing for genetic enhancement of human intelligence.²⁸ Too much is being promised here. Not only are expectations raised above what reality can possibly deliver; extravagant promises rely on values that are impatient with our humanity; that take us beyond our natural human state. What Deane-Drummond would propose is a virtue ethic drawn from an appropriation of wisdom. 'The theological motif we need to recover as an appropriate response to the new biology is that of wisdom. Such wisdom... offers guidance about life based on the practical historical reality stemming from everyday problems and issues.'²⁹ Wisdom 'would encourage caution on the part of humans rather than impulsive action'.³⁰ Caution and prudence are called for, not prohibition.

Turning to the Protestants, American evangelical bioethicist, C. Ben Mitchell, sets the issue up this way: 'I want to reserve healing for restoration of lost capacities, and enhancement for improving on the species, or on the statistical norm.'³¹ Interestingly, we find within American evangelical circles attempts to connect the blurry line between therapy and enhancement with the fall in the Garden of Eden. Would medical interventions that seek to restore what was lost in the fall count as therapy? Would the lengthening of life or even the overcoming of death count as therapy; or would it count as enhancement? This is not easy to sort out theologically.

If, for instance, one holds that physical death and aging are a result of the Fall, then it would appear that a genetic battle against aging and death could be

22 J. Breck, *The Sacred Gift of Life: Orthodox Christianity and Bioethics* (Crestwood, NY: St Vladimir's Seminary Press, 1998), p. 195.

23 *Communion and Stewardship: Human Persons Created in the Image of God*, para. 91. The Vatican, International Theological Commission, Congregation for the Doctrine of the Faith, www.vatican.va/roman_curia/congregations/cdf/it/it_doc/commen/wr_con_cdf/it.doc.

24 Donal P. O'Mathuna, 'Genetic Technology, Enhancement, and Christian Values', *The National Catholic Bioethics Quarterly* 2.2 (Summer 2002), p. 283.

25 Mathuna, 'Genetic Technology', p. 284.

26 Mathuna, 'Genetic Technology', p. 295.

27 James J. Walter, 'Catholic Reflections on the Human Genome', *The National Catholic Bioethics Quarterly* 3.2 (Summer 2003), pp. 275–86 (281).

28 Deane-Drummond, *Brave New World?*, p. 29.

29 Celia E. Deane-Drummond, *Creation Through Wisdom: Theology and the New Biology* (Edinburgh: T. & T. Clark, 2000), p. 234.

30 Celia E. Deane-Drummond, *Biology and Theology Today* (London: SCM Press, 2001), p. 117.

31 C. Ben Mitchell, 'Defining "Better"', *Christianity Today* 48.1 (January 2004), p. 43.

justified, and therefore qualify as therapy... However, more recent shifts in theological thinking, not immune to the profound influence of evolutionary theory where both aging and death are an *integral* part of how we humans have come to be, have resulted in a rejection of the idea that physical death was introduced into the world by Adam's sin.³²

In the latter case, life extension through genetic engineering would count as enhancement.

Several centrist Protestant ethicists note how difficult it is to draw the line between therapy and enhancement. Yet, some ethicists still believe it is possible to specify a baseline of human functioning that is part of the intended order of creation. When someone falls below this baseline, genetic interventions are called therapy or correction. When an intervention would move someone above the baseline, it is called enhancement. Paul Ramsey has argued strenuously for an 'exact' and limited meaning of the term 'genetic therapy', precisely so that it could not be used for enhancements that treat only desires.³³ If we would intervene in our own genetic code to improve on human nature, we would usurp what rightfully belongs solely to God. We would be playing God. Ramsey is remembered for having penned these lines in 1970: 'Men ought not to play God before they learn to be men, and after they have learned to be men they will not play God.'³⁴ Such an action would constitute human pride or *hubris*.³⁵

Leroy Walters and Julie Gage Palmer have asserted that 'disease and disability' are 'evils that should be overcome as quickly and efficiently as possible'.³⁶ While all children of short stature may experience pain or discrimination, the question of whether there is a physiological basis for the short stature is taken to be morally relevant for policy purposes. 'We are attempting to draw a sharp line between *bona fide* illness... and physical traits that can lead to discouragement or discrimination or both...'³⁷ They approve genetic enhancement for children of short stature who have hormone deficiencies, but not for children of short stature who do not have hormone deficiencies.

James C. Peterson is one of the most thoughtful Protestants to take up the issue of enhancement. The line between therapy and enhancement is blurry, he admits. 'The problem is both with the indistinctness of the line and with the rationale for holding it. There is no adequate conceptual distinction between cure of disease and enhancement of capacity that would allow us to make a principled argument for cure of disease that would not over time also allow genetic intervention for

enhancement.'³⁸ Peterson works with an anthropology and ethic of creative love. 'If human beings are called to develop themselves, purposeful and direct enhancement of capacity could be appropriate, or according to some even required.'³⁹

5. Transhumanism and the Question of Embodied Identity

All the above theological discussion pertains to the human body. We find theologians making two assumptions regarding our identity. First, who we are as a person is embodied. Second, changes in the body, even if resulting in changes in the mind, do not risk a loss of identity. Beyond the therapy and even beyond the enhancement, our transformed self will still be our self. When we travel the path from therapy and enhancement toward transhumanism, however, these two assumptions do not travel with us. Theologians will eventually need to consider the implications of neuroscience aiming at transhumanism.

Curiously, the assumption at work in transhumanism is that human intelligence and hence human personhood can become disembodied. This is by no means a return to substance dualism and belief in a metaphysical or spiritual entity; yet, it is still curiously akin to pre-modern beliefs in disembodied intelligent existence. Information patterns have simply replaced the disembodied soul.

Old-fashioned body lovers object. 'Modern transhumanism is a statement of disappointment', writes Brian Alexander. 'Transhumans regard our bodies as sadly inadequate, limited by our physiology, which restricts our brain power, our strength and, worst of all, our life span. Transcendence will not be found in the murky afterlife of the usual religions, but in technological and biological improvement.'⁴⁰

Objections come from at least two allied directions, from science and from theology. Scientifically, we are becoming increasingly convinced that brains and hence minds are embodied, perhaps even communal. Despite the significant role played by our genetic inheritance, we are learning that during our childhood years our brain functioning is itself developing; environmental factors have a decisive impact on brain development as well as formation of the human self. Brains, bodies and the environment are in constant interaction. The transhuman proposals are based on the confidence that the human mind can be explained wholly by a computational functionalist approach; is the assessment of Gregory Peterson. 'While there are important reasons to consider such a possibility, it is by no means certain... Is a downloaded version of me the same me? ... We have become increasingly aware that the mind is intimately connected to physical states. We are not simply disembodied reasoning machines but persons in a bodily and communal context.'⁴¹

38 James C. Peterson, *Genetic Turning Points: The Ethics of Human Genetic Intervention* (Grand Rapids, MI: Eerdmans, 2001), p. 252.

39 *Ibid.*, p. 288.

40 Brian Alexander, *Rapture: How Biotech Became the New Religion* (New York: Basic Books 2003), p. 51.

41 Gregory R. Peterson, *Misgiving God: Theology and the Cognitive Sciences* (Minneapolis: Fortress Press, 2003), p. 218.

32 'Todd T. Daly, 'Therapy vs. Enhancement: The Problem Posed by Anti-Aging Technologies', 2005, The Center for Bioethics and Culture Network, [www.theccc.org/research_display.php?id=199](http://www.theccc.org/research/display.php?id=199).

33 Paul Ramsey, 'Genetic Therapy: A Theologian's Response', in Michael Hamilton (ed.), *The New Genetics and the Future of Man* (Grand Rapids, MI: Eerdmans, 1972).

34 Paul Ramsey, *Fabricated Man: The Ethics of Genetic Control* (New Haven: Yale University Press, 1970), p. 55.

35 For an analysis of the concept of 'playing God', see Ted Peters, *Playing God? Genetic Determinism and Human Freedom* (London and New York: Routledge, 2nd edn, 2002).

36 Leroy Walters and Julie Gage Palmer, *The Ethics of Human Genetic Therapy* (Oxford and New York: Oxford University Press, 1997), p. 113.

37 *Ibid.*, p. 113.

Christian theology during the modern period has reaffirmed the goodness of the body and jettisoned the substance dualism of the past. 'Transhumanism is in some ways a new incarnation of Gnosticism,' complains Mayo Clinic hematologist and bioethicist, C. Christopher Hook. 'It sees the body as simply the first prosthesis we all learn to manipulate.'⁴² Hook goes on to declare that 'As Christians, we have long rejected the Gnostic claims that the human body is evil. Embodiment is fundamental to our identity, designed by God, and sanctified by the Incarnation and bodily resurrection of our Lord.'⁴³ This theological affirmation of embodied human existence suggests unqualified commitment to therapy, perhaps commitment to enhancement, and scepticism about transhumanism.

What if a transhumanist would provide us with a new body, a simulated replica of our present body for the use of our pattern of information processing? Could we live forever? Would this meet the theological concern for embodiment?

Key to opening the transhuman door to the future is the development of Artificial Intelligence (AI). The link between AI and the transhuman vision is a series of assumptions: (1) what makes us human is our intelligence; (2) intelligence consists of information processing; and (3) the transfer of the pattern for information processing from our brain to a machine is feasible. Further, if we keep the machines in perpetual repair, we can live forever. We will have achieved cybernetic immortality.

Such a promise tantalizes. Tulane physicist Frank Tipler combines AI and cosmology to project an image of a future state of intelligent existence that constitutes immortality. We will create computers in our image, and these computers in turn will create a replica of ourselves; and this replica will persist beyond our death and beyond the death of the universe.

Tipler's method unfolds the religious candy wrapper while setting aside the religious candy inside. Even though he mentions the Easter resurrection of Jesus and the eschatological writings of Paul, he tries to promulgate a strictly secular immortality for techno-sapiens.⁴⁴ Tipler bases his promise on the history of evolutionary progress. Resurrection here will be the result of a future evolutionary event in which life understood as information processing will take hold of its own destiny and create a supra-biological environment for its existence just prior to the moment when the physical world self-destructs.⁴⁵

Tipler addresses a couple of concerns theologians would likely raise here: perfection and identity. First, he is sensitive to the human yearning for perfection. Our present state of existence is not satisfactory. We do not hunger simply for life beyond death. We hunger for salvation. So, without using the term 'salvation', Tipler announces that the perpetuation of our pattern of information processing

within our simulated body will transcend the previous model by eliminating bodily defects such as missing limbs; youth will be substituted for old age; sight for blindness; and so on.

The second concern is whether continuity of identity will be maintained. Tipler answers, yes. Anticipating objections that total death followed by total re-creation denies continuity, Tipler responsively argues that continuity in conscious self-identity is both necessary and possible. Replication is not annihilation. To be resurrected as a replica of one's former self does not deny that it is the same self. The identity of the information patterns within which we are aware of our experience of the world and ourselves seems to be sufficient for Tipler. In sum, what is resurrected is the immaterial form but not the material substance of who we presently are.

An exact replica of ourselves is being simulated in the computer minds of the far future. This simulation of people who are long dead is 'resurrection' only if we adopt what philosophers call the 'pattern identity theory'; that is, the essence of identity of two entities which exist at different times lies in the (sufficiently close) identity of their patterns. Physical continuity is irrelevant.⁴⁶

Is this pattern theory merely another example of platonic body-soul dualism in which a nonmaterial soul is extracted permanently from a material base? No, says Tipler. Tipler's simulation so emulates the physical body that, for all practical purposes, what resurrected souls experience is physically real. According to Tipler, resurrected souls experience themselves in their environment; and this environment is experienced as if it were physical. In a surprising move, Tipler reiterates Bishop William Berkeley's subjective idealism: to be is to be perceived.⁴⁷ If as a computer simulation we perceive physicality, the physicality exists thereby.

Let me ask a theological question: is the replication of a pattern of information processing sufficient? Let me be sympathetic for just a moment. Rather than requiring God to locate and piece together all the molecules of our previous body, could God's task at the resurrection be simplified by merely reassembling the pattern of our body's molecules? Rather than the molecules as matter, might we say that the form is what counts? Could God get by with merely remembering and reincarnating our form or pattern? Tipler is reminiscent of Origen: 'The previous form does not disappear, even if its transition to the more glorious occurs... although the form is saved, we are going to put away nearly [every] earthly quality in the resurrection... [for] "flesh and blood cannot inherit the kingdom" (1 Cor. 15:50).'⁴⁸ For Origen and Tipler the form is saved, but not the substance. Is this sufficient to guarantee continuity of personal identity? I doubt it. Our identity is the product of our biography. Our identity is something gained over time, inclusive of scars embedded in our limbs combined with our remembered

42 C. Christopher Hook, 'The Techno Sapiens are Coming', *Christianity Today* 48.1 (January 2004), p. 38.

43 *Ibid.*

44 Frank J. Tipler, *The Physics of Immortality* (New York: Doubleday, 1994), pp. 305; 309-313.

45 Tipler, *Physics of Immortality*, p. 225.

46 Tipler, *Physics of Immortality*, p. 227.

47 Tipler, *Physics of Immortality*, p. 211.

48 Origen, 'Fragment on Paulin 1:5', cited by Carolyn Walker Bynum, *The Resurrection of the Body in Western Christianity, 200-1336* (New York: Columbia University Press, 1995), p. 64. My original analysis of Tipler can be found in Ted Peters, 'Resurrection: The Conceptual Challenge', in Ted Peters, Robert John Runggall and Michael Welker (eds.), *Resurrection: Theological and Scientific Assessments* (Grand Rapids, MI: Eerdmans, 2002), pp. 297-321.

thoughts. Is there not more to our individual consciousness than information processing, namely, our own information processing informed and influenced by the accumulated history of our bodily functions?

Let me ask an additional question: if the key to cybernetic immortality is replication of the soul's pattern, what would happen in the event of multiple replications? We already know what computer clones are. In principle, the soul's pattern could be replicated many times, not just once. Which pattern would maintain the individual's identity? Does continuity of unique personal identity require some degree of substance uniqueness?

Just how realistic is the Tipler theory, scientifically speaking? Not very, either physically or biologically. John Polkinghorne dubs these ideas as

excessively speculative in the assumptions that they make about physical processes in unexplored circumstances, particularly in Tipler's case. The closing instants of a collapsing universe involve physical processes at energies vastly in excess of those of any regime of which we could claim to have an understanding. . . . The speculations of the physical eschatologists are also chillingly reductionist in tone. Life is equated to the mere processing of information. Only if one believes that humans are no more than computers made of meat could one regard their replacement by computers made of bizarre states of matter as affording a picture of continuing fulfillment.⁴⁹

Just how realistic is cybernetic immortality, philosophically speaking? Although the late philosopher Paul Ricoeur does not address Tipler directly, he says something quite relevant. The very concept of the brain and the very work of neuroscience are products of the human mind. This means the mind has sufficient independence so as to authorize its own self-study, something the brain certainly could not do on its own. 'I propose we adopt the term *substrate* to denote the relation of the body-as-object to the body as it is experienced, and therefore of the brain to the mental.'⁵⁰ By *substrate* Ricoeur means something like Aristotle's material cause. Ricoeur makes this move to challenge the unfounded assumptions of the scientists that the brain is the efficient cause of human mental operations. Neuroscientists over-extend themselves, complains Ricoeur. At best, we can identify a correlation between brain activity and mental activity, but no warrant exists for a causative relationship. 'The brain is the substrate of thought (in the broadest sense of the term) and . . . thought is the indication of an underlying neuronal structure. Substrate and indication would thus constitute the two aspects of a dual relation, or correlation.'⁵¹ Ricoeur puts a fence up against reducing human consciousness and mental activities to the pattern of neuronal functioning. The implication is that even if the pattern of brain function could be replicated, there is no guarantee — not even a likelihood — that the consciousness of the person would be replicated with it.

Just how realistic is cybernetic immortality, theologically speaking? Noreen Herzfeld is critical. 'The assumptions regarding the nature of the human person and of eternal life that underlie the hope of an immortal presence within computers are quite different from those of most Christians. Cybernetic immortality assumes a dualistic understanding of the human person, a conception of eternity as "a long time", and a hubristic faith in human power.'⁵² Cybernetic immortality cannot become a substitute for what Christians understand as resurrection of the body.

What are the ethical implications? Demigration of the body is one implication. Herzfeld continues:

Our finite bodies are an integral part of who we are. The essential nature of the human being always contains two inseparable elements, self-transcending mind and finite creaturely being. The denial of the latter has led to a demigration of both women and the natural environment. Cybernetic immortality leads directly into these twin demigrations. . . . It is notable that cybernetic immortality had been suggested as a possibility only in the writings of rich, white males.⁵³

The cybernetic immortality projected by Frank Tipler represents transhumanism in its most audacious and extreme form. Much more modest forms of integrating human brains and computational machines could fit within the broader categories of therapy or, more likely, enhancement. Instead of thinking of cyborg brains as transhuman, we could think of them simply as fabulously human.

6. Eschatological Transformation and Perfected Human Beings

'Render therefore unto Caesar the things which are Caesar's, and unto God the things that are God's,' says Jesus (Matthew 22.21, KJV). In our case, Caesar is science. Any ethic should begin by distinguishing realistically what belongs in the domain of science from what belongs in the domain of divine promise. Once this distinction has been made, then we can look for the connection. God has promised an eschatological transformation, the advent of the new creation. Our task this side of the new creation is to engage in the much more modest work of transformation in order to improve human health and flourishing.

The eschatological orientation seeks the good in the future, not the past. It presumes the world anticipates its own betterment, that our human condition yearns for redemption. Human enterprises such as scientific research and medical advance contribute to healing and overall human wellbeing. They are attuned to the work of our God of transformation who promises to make all things new. Under the right conditions, science can be considered a godly vocation.

I like to speak of an eschatologically oriented ethic as a 'proleptic ethic', with 'prolepsis' indicating that today's actions anticipate tomorrow's transformation.⁵⁴ A proleptic ethic begins with a vision, a vision of the perfected human being

49 John Polkinghorne and Michael Welker (eds.), *The End of the World and the Ends of God* (Harriburg, PA: Trinity Press International, 2000), p. 33.

50 Jean-Pierre Changeux and Paul Ricoeur, *What Makes Us Think?* Trans. M.B. Dabrowiec (Princeton, NJ: Princeton University Press, 2000), p. 46.

51 Changeux and Ricoeur, *What Makes Us Think?*, p. 47.

52 Herzfeld, *In Our Image*, p. 73.

53 Herzfeld, *In Our Image*, p. 74.

54 Ted Peters, *GOD - The World's Future: Systematic Theology for a New Era* (Minneapolis: Fortress Press, 2nd edn, 2000), chapter 12.

residing in a new creation. 'And God shall wipe away all tears from their eyes; and there shall be no more death, neither sorrow, nor crying, neither shall there be any more pain: for the former things are passed away' (Revelation 21.4, KJV). The Bible's closing apocalypse envisions a total healing. Scientific and medical contributions to human betterment today, modest as they may be, anticipate, and thereby participate in, God's final redemption.

The task of the ethicist, I believe, is to devise middle axioms that connect the grand eschatological vision of a new creation with our quite human responsibilities in the present time. Middle axioms would be theological principles providing ethical support for scientific research and medical technology that contribute to improved therapy and perhaps some degree of enhancement. Theologically, we need to affirm that scientific and technological transformation actually participate in the renewing of our world in a way that is both human and divine. Yet, blanket baptism of anything and everything new would be imprudent, to say the least. Constructing such middle axioms requires wisdom and prudence, what the Aristotelian tradition knows as *phronesis* and hermeneutical philosophers know as *applicatio*. Such application incorporates the unavoidable ambiguity inherent in assessing the practical outcomes of speculative proposals. The task of the ethicist remains: face the ambiguities, invoke wisdom, think prudently, and render the best judgement that finite considerations can produce.

7. Enhancement and Justice

As we turn to our three areas of brain research – therapy, enhancement and transhumanism – my own considered judgement is the following. Therapy or healing is incontrovertibly a divinely appointed ministry as well as a humane enterprise. Transhumanism can be dismissed because it is scientifically and philosophically unrealistic as well as theologically and ethically misdirected. When it comes to enhancement, however, we confront complexities and nuances that may require additional analysis.

When we ponder the standard definition of 'enhancement', we must take note of the competition component. By definition, enhancement seems to require that one individual become superior to others, that one person stands out as being above average. Is enhancement necessarily anti-egalitarian? Could widespread enhancement technologies lead to a new eugenics movement, in which some segments of society benefit and others suffer discrimination? If so, then we must face the justice issue.

In the United States, the National Council of Churches has raised cautions about eugenic programmes.⁵⁵ Similarly, the United Church of Christ in 1989 welcomed the development of genetic engineering *provided* there would be appropriate regulation and 'justice in distribution'.⁵⁶ The United Church of Canada expressed as a general principle that the 'rights of the weaker and the needy' must be protected

in any genetic interventions.⁵⁷ Karen Lebacqz has also warned that expensive advances in medical genetics may be 'no deal for the poor'.⁵⁸

These observations regarding justice uncover the heart of the problem with enhancement in all its forms. If enhancement comes to mean that the capacity of one individual is raised to a level superior to others, the question of justice arises. For the near and medium range future, medical technologies will be expensive. Only some segments of society will be able to afford such medical advances. The financially rich may also become the 'genrich', to use the language of Lee Silver.⁵⁹

Justice is concerned broadly with the idea that each is given her or his due,' writes Deane-Drummond. 'Unlike many other virtues, justice specifically governs relationships with others.'⁶⁰ The aspect of enhancement which draws our ethical scrutiny here is its relationship with others. The risk or threat is not found in improving one's memory or executive capabilities; the justice problem arises due to the relative social status of such a person once this has been accomplished. The threat of injustice is found in the likelihood that privileges will go to the enhanced; and the unenhanced will suffer marginalization.

Professional sports are currently rocked with scandal due to drug-induced physical enhancements.⁶¹ Intuitively, the public knows this is unfair, unjust. We can expect to see legal rules put in place to keep the competition egalitarian. Might such policies be devised to govern genetic and neurocognitive enhancements? Enhancement technology could be parsed accordingly. Does enhancement necessarily lead to social inequality?

Now, we might reverse the logic for a moment. Suppose enhancement for some and not others does in fact lead to social inequality. Let us pose some other justice questions. Should we deny to an individual the opportunity for neurocognitive enhancement simply because others in the community might not have equal opportunity? Should the fear of social or economic injustice be sufficient to warrant denial of increased wellbeing for an individual? Such questions require attention by this generation of theologically guided ethicists.

In light of this, would it be prudent to alter our understanding of 'enhancement' and, thereby, our understanding of the perfect human being? Could we eliminate the social competition component? Rather than work with a standard baseline or human average with regard to memory or executive abilities, could we simply ask what enhancement could mean on a case-by-case basis? Could we think in terms of incremental improvements in individual wellbeing? That is to say, could

57 Audrey Chapman, *Unprecedented Choices* (Minneapolis: Fortress Press, 1999), p. 60.

58 Karen Lebacqz, 'Fair Shares: Is the Genome Project Just?' and 'Genetic Privacy: No Deal for the Poor', in Ted Peters (ed.), *Genetics: Issues of Social Justice* (Cleveland: Pilgrim Press, 1997), pp. 239–54 (239).

59 See L.M. Silver, *Remaking Eden: How Genetic Engineering and Cloning Will Transform the American Family* (New York: Avon, 1998).

60 Deane-Drummond, *Ethics of Nature*, p. 15.

61 American baseball player Jose Canseco describes himself as 'a nearly superhuman athlete' due to his use of steroids and growth hormone. *Mixed* (San Francisco: HarperCollins, 2005), p. 2.

55 Ronald Cole-Turner, *The New Genesis: Theology and the Genetic Revolution* (Louisville, KY: Westminster/John Knox Press, 1993), p. 73.

56 Cole-Turner, *New Genesis*, p. 76.

we devise an ethical principle that would exclude enhancement for competitive purposes but encourage it for individual flourishing? Again, these are questions deserving of attention.

8. *Conclusion*

In summary, here we have followed the track of therapy, enhancement and transhumanism en route to neurocognitive improvement through genetic engineering, neurotechnology and pharmacology. We have assessed the direction this is going in light of a proleptic ethic buttressed by a virtue ethic that emphasizes wisdom and prudence. We have found that the concept of therapy would welcome any advances in neuroscience that could lead to healing of brain and mind. We have found that transhumanism is founded on unsubstantiated assumptions regarding the human person and human intelligence; and that theologically transhumanism confuses ultimate transformation with the more modest possibilities of genuine improvement in human wellbeing.

Finally, we have followed the track of the enhancement train. With regard to the individual, enhancement of mood, memory, or executive capabilities in themselves could lead to an improvement in human wellbeing without raising ethical objections. However, ethical problems arise when enhancement is used to create a fabulous human being who is superior to others in the community and who benefits unjustly from this superiority.

It is my own considered judgement that the risk of injustice is insufficient to slow down or curtail laboratory research on improving neurocognitive capacities. The task of the ethicist should be applied to distribution of the medical benefits so as to meet the standards of social and economic justice.