ISCAST
Christianity & Science in Conversation

Discussion Papers

Humanity 2.0?

Christian Perspectives on Transhumanism

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0.1 Acknowledgements

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0.3 **Foreword**

Rev. Dr Chris Mulherin (ISCAST Executive Director)

ISCAST–Christianity and Science in Conversation is an organisation committed to promoting constructive conversations between Christian faith and the sciences. Through a variety of initiatives—ranging from speaking engagements with students to academic publications—ISCAST seeks to encourage thoughtful engagement with issues at the intersection of science, technology, and faith. Our mission is not to dictate beliefs but to provide resources that help people, especially Christians, think carefully and critically about important cultural and ethical challenges.

Transhumanism raises important questions about human dignity, technological advancement, and the future of humanity. This ISCAST Discussion Paper encourages Christians, and others, to carefully consider these issues.

This paper is the result of a collaborative effort by a dedicated group of volunteers, coordinated by Paul Sheehan, each bringing their own perspectives and expertise to the discussion. As you read, you will notice that the voices and styles differ from chapter to chapter, reflecting the diversity of thought that exists within Christian and scientific communities. Each chapter is meant to encourage readers to think critically and engage deeply with the issues at hand.

In the spirit of promoting dialogue, this paper does not advocate for a particular stance. Instead, our goal is to help people understand the complex intersection of technology, faith, and ethics—particularly in the context of transhumanism. The authors have not arrived at a consensus but offer a variety of viewpoints, allowing readers to explore the nuances and form their own conclusions. It is our hope that this document will spark thoughtful conversation and provide a foundation for further reflection.

We thank all the contributors for their hard work in producing this document, and we hope it will serve as a valuable resource for anyone seeking to navigate these important and timely discussions.

Chapter 1

Introduction

By Paul Sheehan

In 2023, the Vatican stressed the urgent need to commence understanding the moral implications associated with new technologies such as artificial intelligence (AI) and those that seek to enhance the human condition.[1] The emergence of these enhancing technologies has opened the door for the first time to the possibility of radically changing the human person, to move human attributes beyond their current state. Referred to as *transhumanism*, it is a modern technologically-driven philosophy that seeks human enhancement for the benefit of all people. According to the contemporary transhumanist proponent Max More, transhumanism has its origins in Enlightenment humanism,[2] but extends beyond it since human nature is seen as "just one point along an evolutionary pathway," which we can manipulate to our own purpose.[3] In the Transhumanist Declaration (TD), the primary author, Nick Bostrom, states that "we seek personal growth beyond our current biological limitations."[4] Encapsulated in this statement is the transhumanist and post-humanist desire to utilise technology to enhance human lifespan, cognition, and emotion, based on the assumption that the freedom to enhance these capacities would inevitably lead to the benefit of all persons, without risk to human dignity.

The TD, coauthored by an international group of proponents of transhumanism, was first formulated in 1998, the same year that the World Transhumanist Association (known today as Humanity+) was created.[5] The TD has undergone several revisions since its original formulation, but it has always emphasised the right

1 Courtney Mares, "Pope Francis Asks Pontifical Academy for Life to Study Ethics of Emerging Technologies," *National Catholic Register*, February 20, 2023, https://www.ncregister.com/cna/pope-francis-asks-pontifical-academy-for-life-to-study-ethics-of-emerging-technologies.

2 It was Francis Bacon who first prioritised a science of empiricism over a priori reasoning. Thanks to the Enlightenment, there was a shift from "the idea of human nature as being defined by God-given immortal souls inhabiting flesh, to the view that we are rational minds emerging out of and transforming nature." James Hughes, "Transhumanism and Personal Identity," in *The Transhumanist Reader: Classical and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future,* ed. Max More and Natasha Vita-More (Wiley-Blackwell, 2013), 227.

3 Max More, "The Philosophy of Transhumanism," in *The Transhumanist Reader: Classical and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future,* ed. Max More and Natasha Vita-More (Wiley-Blackwell, 2013), 4. More believes that "the utterly unique status of human beings has been superseded by an understanding that we are part of a spectrum of biological organisms and possible non-biological species of the future" (10).

4 Nick Bostrom et al., "The Transhumanist Declaration (2.4)," World Transhumanist Association, July 2, 1998, https://web.archive.org/web/19980702105748/http://www.transhumanism.com/declaration.htm.

5 More, "The Philosophy of Transhumanism," 12.

of humans to enhance themselves in pursuit of better wellbeing. The original TD advocates, based on a "moral right,"[6] for the freedom for all people to utilise technology to enhance their own cognitive and physical capacities. It is within this context of a moral right, and in relation to solidarity and dignity for all people including future generations, that transhumanists seek to utilise technology to evolve humanity beyond our essential biological constitution. Under the assumption that the impact of technology is inevitable, it advocates for responsible management of risks associated with new technologies, to overcome human limitations, including ageing and suffering, and to prevent human extinction.[7] Such technological enhancement includes radical life extension, mood enhancement, moral enhancement, and mind uploading in the pursuit of a utopian world that seeks eradication of disease, death, and mortality.

The term "transhumanism" was first used by Sir Julian Huxley in a 1950 essay about the human species being able to transcend itself:

> We need a name for this new belief. Perhaps transhumanism will serve: man remaining man, but transcending himself, by realizing new possibilities of and for human nature … the human species will be on the threshold of a new existence … It will at last be consciously fulfilling its real destiny.[8]

More recently, in 2003, Bostrom defined transhumanism as follows:

> (1) The intellectual and cultural movement that affirms the possibility and desirability of fundamentally improving the human condition through applied reason, especially by developing and making widely available technologies to eliminate aging and to greatly enhance human intellectual, physical, and psychological capacities.
>
> (2) The study of the ramifications, promises, and potential dangers of technologies that will enable us to overcome fundamental human limitations, and the related study of the ethical matters involved in developing and using such technologies.[9]

This understanding of transhumanism is founded in the modern approach to reason, which assumes that science and technology offer the highest form of knowledge and have the potential to radically increase our control over nature, including that of our own human

6 Bostrom et al., "The Transhumanist Declaration (2.4)."

7 The 1998 version also calls for the wellbeing of "all sentience, including humans, non-human animals, and any future artificial intellects, modified life forms, or other intelligences to which technological and scientific advance may give rise." Bostrom et al.

8 Julian Huxley, "New Bottles for New Wine: Ideology and Scientific Knowledge." The Journal of the Royal Anthropological Institute of Great Britain and Ireland 80, no. 1/2 (1950): 7–23, 17. https://doi.org/10.2307/2844485. In Paschal Corby's opinion, Huxley "looks to the possibilities of science and technology as a means of rationalizing hope." Paschal Corby, The Hope and Despair of Human Bioenhancement: A Virtual Dialogue Between the Oxford Transhumanists and Joseph Ratzinger (Pickwick Publications, 2019), 4–5.

9 Nick Bostrom, "The Transhumanist FAQ—A General Introduction (Version 2.1)," World Transhumanist Association, 2003, 4, https://nickbostrom.com/views/transhumanist.pdf.

nature in particular. It is within this epistemological worldview that the transhumanist goal to enhance ourselves has found popularity. In contrast to a Christian understanding of human flourishing, which prioritises justice, sacrifice, and mercy, transhumanists tend to look to technology as offering salvation, and, on that basis, they promote a vision for what constitutes a "good life" founded in concepts of super-longevity, super-intelligence, and super-wellbeing. Super-longevity refers to a significant extension of human life beyond what would otherwise constitute a "typical" lifespan. Super-wellbeing includes enhancement of physical attributes such as speed, endurance, and strength. Super-intelligence seeks cognitive enhancements such as concentration, memory, and intellectual skills; uploading consciousness to a storage device (probably in "the cloud"); and includes a desire for moral enhancement. There are also efforts to use technology to create spiritual enhancements through the employment of psychedelics, hallucinogenics, and neurostimulation.

> **"Technological enhancement is not necessarily opposed to the Christian worldview and its recommendations for a good life."**

More recently, transhumanist thought has leveraged off the explosion in computing technology and artificial intelligence. Prominent transhumanist advocate Ray Kurzweil has argued that computers will pass the Turing test in 2029, consisting of a "conversation" with a computer over a number of hours during which a sophisticated human judge will be unable to identify whether the conversation is with another human or a machine.[10] Kurzweil has also predicted that the exponential growth of computer power would culminate in a "technological singularity" by the year 2045,[11] at which point our idea of what is important in life will be permanently altered. More traces this idea of a technological singularity back to 1958 in a conversation between the mathematicians Stanislaw Ulam and John von Neumann in which they discuss how the rapid development of technology appears to be converging towards some sort of singularity, after which what is considered a "normal life" will radically change.[12]

Faced with the possibilities of such new technological realities that are promoted by transhumanism, many Christians are wary, especially of those technologies have the potential to radically alter our current way of life and what we accept as "normal," suggesting that we are at risk of "playing God." However, technological enhancement is not necessarily opposed to the Christian worldview and its recommendations for a good life. Christianity proposes that we are stewards of God's creation and therefore possess a responsibility towards that creation, in which we are both the recipients of life as a gift from God and also caretakers of that creation. Gareth Jones, an emeritus professor of anatomy with an interest in the relationship between science and faith, argues that technology can be responsibly used to enhance humanity if employed in such a way that is

10 Ray Kurzweil, *The Singularity is Near: When Humans Transcend Biology* (Penguin Group, 2005), 165.

11 Kurzweil, *The Singularity is Near,* 120.

12 Stanislaw Ulam, "John von Neumann 1903–1957," *Bulletin of the American Mathematical Society* 64, no. 3, pt. 2 (May 1958): 1–49, cited in More, "The Philosophy of Transhumanism," 12.

consistent with the teachings of Christ. There are even some Christian transhumanists who assume that God works not only through the process of evolution, but also through the development of technology. According to Jones, the aim of such Christian transhumanists are

> to focus on that which is transcendent; pursue greater coherence of mentality, physicality, and spirituality; and seek the betterment of the world. They seek to use science and technology to accomplish these ends. Their assumption is that God works through technology and also through evolution.[13]

However, it is equally tempting to adopt these new transhumanist technologies without due consideration of the moral implications. The problem is not necessarily technology itself, but rather the challenge for moral discernment to keep pace in a world of rapid technological development. Although technology, as a creative art, undoubtedly has a place in human creativity, so too does appropriate moral discernment to determine how technological developments should be used and in what situations they become unethical. On that basis, Michael J. Sandel, an American political philosopher from Harvard, observes that

> when science moves faster than moral understanding, as it does today, men and women struggle to articulate their unease. In liberal societies, they reach first for the language of autonomy, fairness, and individual rights. But this part of our moral vocabulary does not equip us to address the hardest questions posed by cloning, designer children, and genetic engineering. That is why the genomic revolution has induced a kind of moral vertigo. To grapple with the ethics of enhancement, we need to confront questions largely lost from view in the modern world—questions about the moral status of nature, and about the proper stance of human beings toward the given world.[14]

This paper will therefore explore the claims of transhumanism and its apparently admirable goal of improving ourselves through technological enhancement. For the purposes of this discussion, transhumanism will be defined as follows:

> *The intellectual, philosophical, and cultural movement that affirms the possibility and desirability of fundamentally improving the human condition, especially by developing and making widely available technologies to eliminate ageing and to greatly enhance human cognitive, physical, and moral attributes.*

This definition is based on Bostrom's definition of transhumanism, but removes the words "through applied reason" from his original

Although technology, as a creative art, undoubtedly has a place in human creativity, so too does appropriate moral discernment to determine how technological developments should be used and in what situations they become unethical.

13 Gareth Jones, "The Transhumanist Vision: Technological Bliss or Tragic Misadventure?" *Perspectives on Science and Christian Faith,* 72, no. 2 (June 2020): 97.

14 Michael J. Sandel, *The Case Against Perfection: Ethics in the Age of Genetic Engineering* (Harvard University Press, 2007), 9.

statement so as not to imply that reason is somehow contrary to faith or that reason is solely the application of the scientific method. The definition also uses the terms "cognitive," "physical," and "moral," instead of "intellectual," "physical," and "psychological," which, in the opinion of the authors of this paper, better represent the overall human capability and mental functioning. The term "attributes" is also used in preference to "capacity," since it suggests a qualitative improvement rather than a quantitative one.

The remainder of the paper will explore the origins of transhumanist thought, describe both existing and proposed enhancement technologies, discuss the ethical issues associated with human enhancement, and provide a Christian theological and moral critique of transhumanism. Chapter 2 explores the metaphysics and epistemology of transhumanist philosophy and discusses its primary aims under the categories of super-longevity, super-intelligence, and super-wellbeing. Chapter 3 provides a brief overview of the recent history of transhumanism, including some of the more ancient beliefs that make fertile the philosophical ground upon which transhumanist claims rest. Chapter 4 outlines existing technologies that can be described as transhumanist and how they are being used. Chapter 5 explores the more speculative technologies that many claim will one day bring about the transhumanist vision. Chapter 6 describes the perspectives of those Christians who are open to some of the ideas proposed by transhumanism, and it includes a description of the Christian Transhumanist Association. Chapter 7 explores the impact of technology on the human person from a Christian perspective. Finally, Chapter 8 describes some of the ethical concerns that potentially arise from the transhumanist desire to enhance humanity, and it provides both a philosophical analysis and Christian theological critique of transhumanist philosophy.

Chapter 2

Transhumanist Beliefs and Philosophical Foundations

By Paul Joiner

2.1 Introduction

Initial interactions with the world of transhumanism, for many people, seem to be an exciting mix of discovery, fear, visions of possible futuristic utopias and dystopias, and a new re-evaluation of what an individual finds valuable in their present state of existence. This excitement has provided the inspiration for many science fiction explorations in recent years. Moving beyond this initial excitement about the promises of transhumanism requires making a more careful investigation of the philosophical foundations of the beliefs, thoughts, commitments, and assumptions of the transhumanist movement. This chapter intends to provide a starting point for such an investigation.

The transhumanist movement in recent times includes many different perspectives beyond what can meaningfully be covered here. Therefore, this chapter will primarily focus on those that may be considered long-term key figures in the movement, such as Nick Bostrom, Max More, Natasha Vita-More, James Hughes, Ray Kurzweil, and Anders Sandberg. While these voices are influential in the transhumanist movement, their perspectives require an examination of whether their various views are necessary or contingent elements of transhumanism.

This chapter will also discuss the beliefs of influential transhumanists in relation to three categories of life-changing innovation—super-longevity, super-intelligence, and super-wellbeing—and will discuss different transhumanist assumptions regarding these categories as they relate to various philosophical disciplines. Before considering these categories, this chapter will discuss foundational philosophical commitments relating to metaphysical and epistemological questions.

2.2 Metaphysics

Transhumanist philosophers do not tend to comment on metaphysical ideas in isolation or promote a specific metaphysical perspective as necessary to a transhumanist perspective. However, transhumanist metaphysical foundations tend to assume a materialist viewpoint and often centre on concepts of selfhood and the philosophy of mind, and the associated philosophical problems within these areas. One clear

example of this is the question of the nature of consciousness and the possibilities this may have for intersecting with technology in particular virtual interfaces. One exception to this materialist narrative is the few transhumanist commentators that advocate for the "simulation hypothesis" view, which considers our reality or lived experience to be the product of a computer simulation, somewhat like the vision we famously encounter in the popular movie, *The Matrix*. This view has been developed and argued for most notably by Nick Bostrom. While the simulation hypothesis is related to transhumanism, as it revolves around questions of technology, consciousness, and our lived experience, one does not imply or follow from the other. Outside of those positing the simulation hypothesis, More states that, "with few exceptions, transhumanists describe themselves as materialists, physicalists, or functionalists … they believe that our thinking, feeling selves are essentially physical processes."[15] A functionalist understanding of the nature of the self means that, "the self has to be instantiated in some physical medium but not necessarily one that is biologically human."[16] On that basis, More says,

> transhumanism could be described by the term "eupraxophy," coined by secular humanist Paul Kurtz, as a type of nonreligious philosophy of life that rejects faith, worship, and the supernatural, instead emphasizing a meaningful and ethical approach to living informed by reason, science, progress, and the value of existence in our current life.[17]

The apparent thinness of this view is the distinct lack of any metaphysical foundation provided by transhumanists and, indeed, most materialists in general, for the reality of reason and the value of progress, meaning, ethics, and existence.

"Transhumanist metaphysical foundations tend to assume a materialist viewpoint and often centre on concepts of selfhood and the philosophy of mind, and the associated philosophical problems within these areas."

2.3 Epistemology

More differentiates between an understanding of transhumanism as "trans-humanism," and as "transhuman-ism." The former term emphasises the Enlightenment-humanism philosophy and the consequential preference for progress and individual will to create "better futures" based on reason, technology, and the scientific method, rather than faith.[18] The latter term, however, emphasises the way transhumanism goes beyond humanism in both means and ends to improve human nature via the application of technology "to overcome limits imposed by our biological and genetic heritage."[19]

15 Max More, "The Philosophy of Transhumanism," in *The Transhumanist Reader: Classical and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future*, ed. Max More and Natasha Vita-More (Wiley-Blackwell, 2013), 3–17.

16 More, "Philosophy of Transhumanism," 7.

17 More, 4.

18 More, 4.

19 More, 4.

The epistemological assumptions of the transhumanist movement are mostly connected to an understanding of transhumanism as "trans-humanism," which focuses on the rationalist commitment that is carried on from the Enlightenment. More therefore suggests that most transhumanists identify as strong rationalists, and that "a healthy legacy of the humanist roots of transhumanism is its commitment to scientific method, critical thinking, and openness to revision of beliefs."[20] Thus, despite "transhumanists' epistemological views varying widely,"21 rationalism seems to be not only dominant in transhumanist thought, but also most easily understood as following on from popular transhumanist motivations.

For example, many transhumanists hold a teleology of progress which serves as an epistemic justification for much of the transhumanist vision for our future; however, it can be difficult to gain clarity on what progress means and entails in this commitment. Progress is not ensured by technological development, since, as More suggests, "transhumanism does not entail any belief in the inevitability of progress."[22] Progress is also a continual process for More, who says that transhumanism is thus "a continual process and not about seeking a state of perfection."[23] Furthermore, the epistemological foundation of what defines progress for humanity seems to be found most commonly in basic, biological, health-related outcomes, which may not be robust enough to guide humanity into this transhumanist future.

More defends the critical rationalism his transhumanist thought rests upon by arguing that critical rationalism rejects self-evident concepts or intellectual intuition "in favour of the view that nothing is justified or beyond question. There are no foundations to knowledge."[24] If progress is not inevitable, yet continual, and therefore has no resolution, and there is no foundational epistemic reality to progress, then the difficulty in gaining a clear definition of progress from a transhumanist perspective would seem to be problematic for establishing a coherent transhumanist epistemology more generally.

2.4 Desired Enhancements

Having commented on the philosophical foundations of transhumanism, attention is now turned to the outcomes transhumanists seek through technological enhancement and the beliefs that they hold to justify why these outcomes are desirable. The desired outcomes of influential transhumanists are commonly divided into three categories, *super-longevity*, *super-intelligence,* and *super-wellbeing*. This section will discuss the different assumptions transhumanists

20 More, 6.

21 More, 6.

22 More, 4.

23 More, 5.

24 More, 6.

make as they relate to various philosophical disciplines in reference to each of these categories.

Super-longevity

Living for extended periods of time, or indeed living forever, has captured the imagination throughout human civilisation. Nick Bostrom says, "the quest for immortality is one of the most ancient and deep-rooted of human aspirations,"[25] which seems clear from reading almost any collection of ancient texts. Commonly held ideas of living a good life do not tend to include living a short life, and for an individual to live well and into old age tends to be seen as of great value. We have a natural tendency to protect life and we look to remain alive for as long as possible, provided that life is lived with some sense of quality. For these reasons, the transhumanist promise of super-longevity is initially attractive. As transhumanists exhibit charts detailing the rise of human life expectancy with advances in medical technology, it is understandable that we would be excited about the possibility of continuing, or even accelerating this rise. The idea of celebrating a two-hundredth or one-thousandth birthday is a dream that could come true if technology progresses in the way transhumanists envision.

> **Living for extended periods of time, or indeed living forever, has captured the imagination throughout human civilisation.**

Bostrom and philosopher Rebecca Roache argue there is an increasing expectation that life expectancy will rise as technology develops further, noting that "there has been roughly a tripling of life expectancy for humans in the last few thousand years."[26] They go on to suggest that with "anti-aging and rejuvenation medicine,"[27] potentially capable of eliminating ageing altogether, life expectancy "would then be around 1,000 years."[28] These arguments suggest that technological development has achieved great things in the past and will continue to do so into the future. Thus, although More states that "transhumanism does not entail any belief in the inevitability of progress,"[29] it would seem reasonable to suggest that the plausibility of the transhumanist vision does at least depend on a concept of progress with respect to longevity, and given the necessary allowances and funding, such progress should be regarded as possibly inevitable. As discussed earlier, the definition of progress from a transhumanist perspective seems to lack clear attributes and the question needs to be asked, *is the ambiguous sense of progress referred to in the transhumanist vision the kind of progress we ultimately value?*

The ethical questions raised by the idea of super-longevity are significant, and the possibility of ethical progress seems uncertain.

25 Nick Bostrom, "The Transhumanist FAQ—An Introduction (Version 2.1)," World Transhumanist Association, 2003, 35–36, https://nickbostrom.com/views/transhumanist.pdf.

26 Nick Bostrom and Rebecca Roache, "Ethical Issues in Human Enhancement," in *New Waves in Applied Ethics*, ed. Jesper Ryberg, Thomas Petersen, and Clark Wolf (Palgrave Macmillan, 2008), 3.

27 Bostrom and Roache, "Ethical Issues in Human Enhancement," 4.

28 Bostrom and Roache, 4.

29 More, "Philosophy of Transhumanism," 4.

More states that "transhumanists disagree over the metaethical basis of transhumanist values far more than they differ over basic matters of metaphysics and epistemology,"[30] which may provide little confidence regarding a moral basis for transhumanist visions of the future. Some transhumanists consider human enhancement as a "fundamental right,"[31] which has a deontological foundation that More suggests is typical among transhumanists:

> In addressing moral and ethical concerns, transhumanists typically adopt a universal standard based not on membership in the human species but on the qualities of each being. Creatures with similar levels of sapience, sentience, and personhood are accorded similar status.[32]

The concerns related to personal identity are also worth considering while looking to understand the transhumanist position. The idea and nature of the self has been highly contentious throughout the history of philosophy, particularly over the last few centuries, as transhumanists are well aware. Hughes suggests that "since Hume, radical Enlightenment empiricists have challenged the traditional Enlightenment presumption of the self-existence of a discrete, persistent self and independent rational person."[33]

More states, "transhumanists's commitment to technologically-mediated transformation naturally generates great interest in the nature and limits of the self,"[34] and he suggests that there is a strong consensus among transhumanists that the "simple Cartesian view of the mind or self … is unsupportable."[35] More does not give an indication that there is a strong positive consensus among transhumanists about the nature and the existence of the self, yet most discussions seem to follow fairly naturally from physicalist assumptions.

Transhumanist writer Marc Geddes also considers the question of the self among transhumanists in his analysis of super-longevity. Geddes considers the possibility that an "individual might worry that if they lived long enough, he would cease to be 'himself' and become someone else."[36] Worries like these are important to consider as we investigate the merits of transhumanism. For example, one of the most fundamental ways we function as a self in relation to other

30 More, 6.

31 Patrick. D. Hopkins, "Is Enhancement Worthy of Being a Right?," in *The Transhumanist Reader: Classical and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future*, ed. Max More and Natasha Vita-More (Wiley-Blackwell, 2013), 345.

32 More, "Philosophy of Transhumanism," 13.

33 James Hughes, "Transhumanism and Personal Identity," in *The Transhumanist Reader: Classical and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future*, ed. Max More and Natasha Vita-More (Wiley-Blackwell, 2013), 227.

34 More, "Philosophy of Transhumanism," 7.

35 More, 7.

36 Marc Geddes, "An Introduction to Immortalist Morality," in *The Scientific Conquest of Death: Essays on Infinite Lifespans,* ed. Bruce Klein and Sebatian Sethe (Libros en Red, 2004), 248.

selves socially is as a person of a certain approximate age. Our expectations of others and their behaviours will be informed significantly by the perceived age of the other. Therefore, we should consider the possibility of a world of anti-ageing, reversing symptoms of ageing, and radical life extension seriously, as our concept of our self in relation to some of the most important relationships that shape our definitions of ourselves will be altered significantly.

Philosopher Bernard Williams suggests that super-longevity and immortality would diminish the value of the life and selfhood of the individual because "death gives the meaning to life."[37] In contrast, Bostrom and Roache suggest that we may "derive meaning and a sense of cohesion from the projects we pursue during our lifetimes,"[38] which are held within the context of our current life expectancy. However, this does not suggest that a person with an extended life expectancy cannot form new projects that would provide meaning within this new lifespan. It is possible therefore that new forms of important relationships and interactions that are significant for forming self-identity could emerge in a transhumanist future.

Underlying super-longevity's challenges to our view of selfhood are questions concerning our understanding of the mind's relationship to the body. The departure from Cartesian substance dualism in Western philosophy was certainly evident before the origins of transhumanism. Cartesian dualism considered the mind to be immaterial and separate from the physical body, a separation so vast that transhumanist visions of altering the nature and duration of the mind by physical technological means would be a non sequitur. Expanding on the quotation above, More says, "the high level of interest in philosophy and neuroscience among transhumanists has led to a wide acknowledgment that the simple Cartesian view of the mind or self as a unitary, indivisible, and transparent entity is unsupportable."[39] This rejection of Cartesian views is largely in line with the majority of philosophers of mind; however, the form of materialism that seems to be accepted in response to this, is not without its opponents in philosophy of mind. Thomas Nagel, David Chalmers, Evan Thompson, and Philip Goff, to name a few, are famously and continually challenging this popular view. Questions in philosophy of mind are central to transhumanism because the assumption that the mind can be prolonged beyond a "natural" time frame is dependent on certain theories about the mind being true. Such theories are usually materialist or physicalist (for example, identity theory, functionalism, and illusionism).

Ultimately, the transhumanist is committed to the idea that super-longevity will provide a greater number of people an opportunity to live the good life. This position assumes that a longer life is a better life, and that more life is better than less. These may

"It is possible therefore that new forms of important relationships and interactions that are significant for forming self-identity could emerge in a transhumanist future. Underlying super-longevity's challenges to our view of selfhood are questions concerning our understanding of the mind's relationship to the body."

37 Bernard Williams, *Problems of the Self: Philosophical papers 1956-1982*, (Cambridge University Press, 1973), 82.

38 Bostrom and Roache, "Ethical Issues in Human Enhancement," 5.

39 More, "Philosophy of Transhumanism," 7.

seem to be common-sense assumptions; if we had greater lifespans, perhaps more of us would complete our life's ambitions, which, for many people, may sound like having lived the good life. Super-longevity offers the opportunity to achieve things that are not within the possibilities of our current lifespans.

Super-intelligence

Super-intelligence can be defined "as any intellect that greatly exceeds the cognitive performance of humans in virtually all domains of interest." [40] While this includes AI, this discussion is concerned with super-intelligence as it relates to human enhancement.

The amount of information we are exposed to daily would have been unimaginable to the common person half a century ago. Aside from the internet and popular media, the amount of academic output is overwhelming, even within our areas of interest. Many students who find a passion for a discipline within the university are quickly confronted with the realisation that they will never be able to read all the relevant literature within their lifetime. Technology has allowed us to have a vast amount of information accessible to us, and technology may be able to help us obtain and retain it. Super-longevity may provide a person with the extra time to read all the books they have been meaning to read, while super-intelligence may provide us with the ability to read more quickly, understand more, remember more, and gain the eloquence to convey our thoughts in a more sophisticated fashion than we ever thought possible. This is an attractive picture for many, as Sandberg explains:

> We express ourselves through what we transform ourselves into … From an evolutionary perspective it improves the fitness of an intelligent being if that being actively seeks to explore and achieve its potential rather than passively wait until a need or circumstances arise.[41]

Yet, the philosophical foundation of super-intelligence requires investigation beyond this initially attractive picture.

Bostrom argues that humanity has moved through technologically-enabled "growth modes"[42] and revolutions. These episodes of history have been clearly positive for Bostrom, and it seems that we are to assume that future transhumanist revolutions will be positive for humanity. This assumption seems to rest on two ideas: (1) that greater education has caused better moral decision-making and (2) that more education fixes more problems, especially moral problems. These assumptions are not without their difficulties, as many societies around the world experience different levels of access to education,

40 Nick Bostrom, *Superintelligence: Paths, Dangers, Strategies* (Oxford University Press, 2014), 39. Italics original.

41 Anders Sandberg, "Morphological Freedom–Why We Not Just Want It, but Need It," in *The Transhumanist Reader: Classical and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future,* ed. Max More and Natasha Vita-More (Wiley-Blackwell, 2013), 55.

42 Bostrom, *Superintelligence,* 16.

yet it would seem problematic to suggest that the moral decision-making of those in affluent countries with greater levels of education, is superior to those in poorer countries with limited educational resources.

Transhumanists argue that the development of, and access to, technologies that enhance human intelligence, is a moral right. The original Transhumanist Declaration contains a call for "the moral right for those who so wish to use technology to extend their mental and physical capacities and to improve their control over their own lives."[43] Given that "the kind of theory most often constructed to articulate the idea of moral rights is contractualist,"[44] and "contractualist theories goes back, in particular, to Kant,"[45] these Kantian rights are a curious addition to transhumanist ethical discourse because many other ethical justifications for using transhumanist technologies have a distinctive utilitarian nature to them. The appeal to a right to enhancement is also particularly significant in relation to super-intelligence, as transhumanists tend to be committed to the notion that super-intelligence will make for more ethically-enlightened humans. More suggests that "there is no intrinsic value built into the universe,"[46] yet demonstrates confidence in the rational and practical values that he seems to think will be adopted by super-intelligent beings due to the mere identification that they are "conducive to our flourishing."[47] Philosopher and ethicist Patrick D. Hopkins seems to be in disagreement with More on the question of intrinsic values when he states that "choice itself is the highest intrinsic value"[48] in his argument for a right to human enhancement. Hopkins states his confidence in the ethical promise of-transhumanism when he says, "enhancement … is not the repudiation of value, it is the pursuit of value."[49]

Super-intelligence may also impact our personal identity in significant ways. Among properties considered to be attributes that make up our personal identity, we might include our memories, our interests, our skills that we have developed over long periods of time, our perspectives, and our opinions. Such mental properties may all be impacted by developments in super-intelligence. Currently, if person A is a real estate agent who has always wanted to learn to play guitar, and person B knows how to play guitar but has always wanted to understand the housing market better, then these two individuals are able to relate to each other based on these mutual

43 Bostrom et al., "The Transhumanist Declaration (2.4)," World Transhumanist Association, July 2, 1998, https://web.archive.org/web/19980702105748/http://www.transhumanism.com/declaration.htm.

44 Williams, "Contemporary Philosophy," 31.

45 Williams, 31.

46 Max More, *Transhumanism: Towards a Futurist Philosophy*, 1990, https://www.ildodopensiero.it/wp-content/uploads/2019/03/max-more-transhumanism-towards-a-futurist-philosophy.pdf.

47 More, *Transhumanism: Towards a Futurist Philosophy*.

48 Hopkins, "Is Enhancement Worthy of Being a Right?," 348.

49 Hopkins, 351.

interests, and their differing levels of expertise differentiates them. Yet, if a development in super-intelligence allows for each person to download the ability to play guitar and master the housing market, and perhaps even each other's memories relating to those areas, then a significant sense of personal identity—individual differentiation—seems to have been altered or eroded. These matters need to be addressed by transhumanists, because, as Hughes notes, "the transhumanist pursuit of cognitive and physical enhancement fundamentally challenges our presumptions about the Enlightenment understanding of self through radical changes to desire, memory, cognition, and-identity."[50]

"... if a development in super-intelligence allows for each person to download the ability to play guitar and master the housing market, and perhaps even each other's memories relating to those areas, then a significant sense of personal identity—individual differentiation—seems to have been altered or eroded."

These challenges are considered somewhat differently depending upon the theory of personal identity that individual transhumanists adopt. Consistent with most transhumanists, Ray Kurzweil advocates for an idea of the self that is essentially reduced to memories and self-reflection (which aligns with John Locke's philosophy of the self) and what he refers to as a person's "pattern" or psychological configuration.[51] David Hume's bundle theory of the self has been continuously influential; the theory rejects the existence of an enduring substantial self and suggests that we can only observe a sequence of experiences in succession.[52] The influence of bundle theory can also be seen in some transhumanists' thought. Although this view is not equivalent to materialism, it is congruent. Materialism and strong interpretations of materialism, such as identity theory, are popular positions in philosophy of mind among transhumanists, perhaps due to the perception that the scientific method is distinctively congruent with these positions. Yet other views are also present in the thought of influential transhumanists.

While some might say that "ignorance is bliss," transhumanist conceptions of super-intelligence reject that attitude entirely. The-good life for transhumanism includes the diminishing of the sort of ignorance that leads to a medical misdiagnosis, for example. For-transhumanists, ignorance is never a virtue. Yet, access to greater amounts of information may not always lead us to conclude that we are closer to living the good life than we were fifty years ago, and even those who suggest that we are now closer to the good life do not necessarily consider access to greater amounts of information to be the cause.

Super-wellbeing

The Transhumanist Declaration (TD), coauthored by an international group of proponents of transhumanism in 1998, has always emphasised the right of individual humans to enhance themselves in pursuit of better wellbeing. We all look to enhance our wellbeing

50 Hughes, "Transhumanism and Personal Identity," 229.

51 Hughes, 230.

52 Nicholas Bunnin and Jiyuan Yu, *The Blackwell Dictionary of Western Philosophy* (Wiley-Blackwell, 2009), 92.

throughout each day. We heat our houses when it is cold and cool them when it is hot. We look to make sure we are not hungry, thirsty, tired, bored, and so on. The attraction of transhumanist promises of super-wellbeing seems entirely consistent with our current way of life, especially when we consider the amount of technology involved in maintaining our wellbeing in contemporary Western lives. We pursue happiness, and transhumanists understand that there are significant differences in what happiness will look like for different people. Sandberg suggests that

> from the right to seek happiness and the right to life the right of freedom can be derived. If we seek to survive, we must be able to act freely in our own interest. Similarly, since we are different and have different conceptions of happiness (which is after all a deeply personal thing that cannot be separated from the person pursuing happiness) we need freedom to practice these.[53]

“... the transhumanist vision for a future of super-wellbeing is largely focused on an individual pursuit of wellbeing rather than super-wellbeing for humanity as a collective whole.”

Therefore, the transhumanist vision for a future of super-wellbeing is largely focused on an individual pursuit of wellbeing rather than super-wellbeing for humanity as a collective whole.

The pursuit of super-wellbeing brings significant ethical challenges. The issue of “morphological freedom”—the freedom to alter one’s physical and psychological self—is a considerable challenge. Sandberg holds that, “from the right to freedom and the right to one’s own body follows that one has a right to modify one’s body. If my pursuit of happiness requires a bodily change … then my right to freedom requires a right to morphological freedom.”[54] Sandberg’s view demonstrates a severe individualism that goes beyond anything comparable in rights discourse so far. One ethical concern of morphological freedom is the possibility of different individuals and groups altering their personhood to such a degree that solidarity with each other as members of the same species is undermined. This solidarity is a significant part of the foundations of our ethical discourse, which Bostrom acknowledges:

> Within this context of a moral right, and in relation to solidarity and dignity for all people including future generations, the TD asserts, “We seek personal growth beyond our current biological limitations.”[55]

For Bostrom, it is the freedom to explore enhancement ideas that represents the core value justifying transhumanist pursuits.[56] Enhancement is not a therapy for Bostrom; he argues instead that it is an improvement to the “state of an organism beyond its normal healthy state”— something we already do by drinking coffee,

53 Sandberg, “Morphological Freedom,” 56–57.

54 Sandberg, 57.

55 Bostrom et al., “Transhumanist Declaration.”

56 Nick Bostrom, “Transhumanist Values,” *Review of Contemporary Philosophy*, 4, May (2005): 87-101, https://nickbostrom.com/ethics/values.

using make-up, exercising, meditating, and taking supplements.[57] Thus, he argues that, given their capacity to boost mood, which he says is an enhancement,[58] drugs should be used to improve wellbeing, as well as treat diseases.[59] This may seem acceptable because none of these examples alter the personhood of individuals to the degree that could undermine the solidarity found between morally developed human beings. However, alterations that would undermine this solidarity are also entertained by influential transhumanists.

The idea that our wellbeing has improved throughout history as technology improved has been relatively uncontroversial until recently. The improvements in technology that have led to warm houses, clean water, curing prominent diseases, and so on, are clear. However, the rise of the internet and, with it, social media, has caused some doubt about the effect of technological advancement on our wellbeing—a doubt that refers to our lived experience rather than dystopian fears of technological revolt in the distant future. Transhumanists seem committed to the idea that our wellbeing will always continue to be better, on aggregate, as technology advances. Yet, mental health issues, such as high anxiety and depression, experienced by a growing number of young "digital natives," are significant and intrinsically related to the technology involved in their lives. As More suggests, "transhumanists of multiple varieties share the view that we can make radical changes to the human condition,"[60] and they seem to also share a faith that these radical changes will result, at least for the most part, in an improvement to our wellbeing. It also seems fair to suggest that radical changes to the human condition will also cause significant changes to our personal identity, which may lead some to wonder if it is possible to cause such changes without negatively impacting the wellbeing of a considerable number of people. Hughes explores alterations to our personal identity that have implications for our wellbeing, arguing that "some forms of post-personal identity societies might also be societies that no longer represent the human project … If there is no real self and no real humanity then we are left with the question of whether we want to collectively pretend that we do exist, and if so, to what ends?"[61]

The transhumanist community holds a variety of perspectives about the effect of religion on human wellbeing throughout history. More previously held a clearly negative view on the legacy of religion; he claimed that "apart from the sheer falsity and irrationality of religion, it has had the unfortunate consequence of debasing humanity."[62] However, his position seems to have softened in recent times as he now believes that "it is possible in principle for a transhumanist

57 Bostrom and Roache, "Ethical Issues in Human Enhancement," 1.

58 Bostrom and Roache, 12–13.

59 Bostrom and Roache, 17.

60 More, "Philosophy of Transhumanism," 13.

61 Hughes, "Transhumanism and Personal Identity," 232.

62 More, *Transhumanism: Towards a Futurist Philosophy*.

to hold some religious beliefs."[63] The possibility that religion will have a positive effect on our wellbeing in the future with the help of technological enhancement has been suggested by Patrick D. Hopkins. Hopkins states that "those who seek enhancement are not repudiating the human but are pursuing a species-old interest—more life, more knowledge, more happiness, more aesthetics, more friendship, more play, even more religion."[64]

The transhumanist visions of super-wellbeing seem to many to be the very fulfilment of the good life. Prominent transhumanist Julian Savulescu defines the relationship between the good life and super-wellbeing, stating that what he considers to be the best life is "the life with the most wellbeing."[65] He goes on to consider theories of wellbeing such as "hedonism, desire-fulfillment, and objective list theories," and suggests that each of these are compatible with his definition. There seems to be no room for the possibility of a virtue found in suffering or a life of hardship. For Sandberg,

> technology and morphological freedom go hand in hand. Technology enables new forms of self-expression, creating a demand for the freedom to exercise them. The demand drives further technological exploration. It is not just a question of a technological imperative, but a very real striving of people towards self-actualization.[66]

Some may consider that if the good life is found in self-actualisation through access to technological enhancement, it will be reserved for a lucky few. Bostrom disregards this concern as he does not foresee a transhumanist world in which enhancement is restricted to the elite, but rather advocates for "wide access," the notion that all people must benefit from, and have access to, enhancement.[67] Bostrom rejects as pessimistic the bioconservativism of humanist Leon Kass and political scientist Francis Fukuyama who, among others, suggest that the technological manipulation of human nature is contrary to human dignity.[68] This is unnecessary according to Bostrom who says that there is no empirical evidence that the underprivileged would lose dignity and "posthumans" might even reach greater moral heights.[69] Bostrom also rejects the dystopian visions of global warfare that are commonly considered when imagining gross inequality brought about by technological advances, stating that "global security is the

63 More, "Philosophy of Transhumanism," 8.

64 Hopkins, "Is Enhancement Worthy of Being a Right?," 351.

65 Julian Savulescu, "Procreative Beneficence: Why We Should Select the Best Children," *Bioethics* 15, no. 5/6 (2001): 419.

66 Sandberg, "Morphological Freedom," 58.

67 Nick Bostrom, "A History of Transhumanist Thought," *Journal of Evolution and Technology* 14, no. 1 (2005): 10–11.

68 Nick Bostrom, "In Defense of Posthuman Dignity," *Bioethics* 19, no. 3 (2005): 203–4.

69 Bostrom, "Defense of Posthuman Dignity," 207.

most fundamental and nonnegotiable requirement of the transhumanist project."[70]

2.5 Summary and Implications

The claims of the transhumanist movement are enticing. Yet, as we have seen, a host of philosophical questions are raised, reimagined, and at times taken for granted. The metaphysical questions raised by the transhumanist commitment to materialism (along with materialism's claim to answer all meaningful questions) are considerable. Likewise, More's critical rationalism, like many forms of rationalism, raises significant philosophical questions. Many of these debates will remain within the walls of philosophy departments, yet when these ideas are applied to such transformative possibilities, the inability of critical rationalism to provide a clear understanding of the progress entailed by the transhumanist project, and its commitment to question or reimagine all things, should lead us to consider the metaphysical and metaethical assumptions of transhumanism carefully.

"The metaphysical questions raised by the transhumanist commitment to materialism (along with materialism's claim to answer all meaningful questions) are considerable."

The three categories of transhumanist claims supply us with specific visions of the future that, in isolation, address specific problems in our lived experience, yet each raises an array of philosophical problems. Super-longevity offers us the ability to celebrate a possibly endless number of birthday parties and achieve things we would currently be unable to find the time for. Yet, humanity will be faced with challenges surrounding an ageless society that seem destined to eclipse our current issues. These include questions of motivation and meaning in a seemingly infinite context, and ethical questions relating to equality, quality of life, and resources. These challenges arise due to a population that would continually expand if we were no longer or are infrequently dying while continuing to give birth to children at a similar rate to a pre-transhumanist age.

Super-intelligence offers a utopia free from the ignorance that stunts our progress as a species. The hope is that this push for super-intelligence will lead to societal conformity in which all people will realise that such a transhumanist future is for the benefit of all, thereby overcoming any apprehension previously held.

Greater education and intelligence will certainly settle those disagreements that are solely intellectual; however, many disagreements are not simply a matter of intellectual investigation. In a super-intelligent future, humanity will wrestle with maintaining an individual sense of personal identity and, if disagreement of a political and moral variety persists, society at large will experience a super-intelligent dissonance that could raise greater problems that transhumanists are not currently anticipating having to address. These political and moral divides, which seem as volatile as ever (if not more so, as evidenced by recent global tensions) may be expected to dissolve in a new technologically-enabled Enlightenment;

70 Bostrom, "Transhumanist Values," 10.

however, if this possibility proves to be naive, disastrous outcomes become more likely.

Super-wellbeing offers a future of completely fulfilled hedonism, whatever that may look like for different individuals. The ethically problematic possibilities are seemingly endless. Just one example, made possible by recent AI innovations, is the possibility of sexual and violent actions, which are currently considered unethical and/or illegal, involving the images of non-consenting individuals in a way seen in "deepfake" technologies applied to produce pornographic material. Such possibilities will only become easier to produce and harder to police. Transhumanist aspirations place much faith in the idea that as we become more intelligent, experience less hardship, and enjoy greater wellbeing, we will become morally enlightened to the point that we are easily able to address or avoid these endless ethical challenges.

Trying to envision these specific transhumanist visions together as a complete transhumanist future is difficult. This chapter has illustrated some of the transhumanist philosophical commitments or assumptions relating to the transhumanist project, as well as highlighted the philosophical problems raised by this discussion—philosophical problems that may well be able to be addressed by transhumanism as we move forward. However, trying to envision what challenges and philosophical problems may emerge from a transhumanist future, while the three directions discussed in this chapter are modifying our society at the same time, seems nearly impossible. In a transhumanist future there will inevitably be emergent technological challenges that we are currently unable to redict.

The future is an exciting and an uncertain place and, whether we are filled with hope or fear, to help better that future, we need to engage with these philosophical commitments and problems as we see technology continue its march into our lives.

"In a super-intelligent future, humanity will wrestle with maintaining an individual sense of personal identity ... In a transhumanist future there will inevitably be emergent technological challenges that we are currently unable to predict."

Chapter 3

The History of Transhumanism

By Hans Weichselbaum

3.1 The Strive to Improve the Human Condition Over the Millennia

There are various ways of laying out the history of human development. The French writer Jean-Pierre Fillard[71] points out that certain milestones that have punctuated the history of humanity have irrevocably "changed man" in his way of life. He suggests that one way of classifying those milestones is by listing the successive discoveries of new kinds of energy available for human exploitation. Each of these steps brought about a new level of comfort and security.

Mastering fire surely must have been a historical step in the evolution of humanity, which probably happened more than 100,000 years ago. Harnessing wind power was essential for navigation and exploration of new lands. The switch from wood to coal and oil paved the way for the development of the steam engine, and later, the internal combustion engine. The use of electric energy as a source of power goes back to the first half of the nineteenth century, and the first nuclear power plant was built in the 1950s.

A similar line of human progress can be drawn up if we focus on major innovations over the last millennia. The earliest pottery made of clay has been dated to around 14,000 BC. The use of metals, copper, tin, and later, iron, facilitated the engineering of tools and machines. A particular milestone was the invention of the printing press in the fifteenth century. Another breakthrough came with the use of electricity, and it was only in 1882 when Thomas Edison built the first coal-fired public power station in London.

Fillard assigns human longevity to the various stages of energy exploitation.[72] Prehistoric humans had a lifespan of around thirty years. On a wider timescale, longevity only improved in very recent history, to thirty-five and forty-five years (steam engine and use of electric energy, respectively), until we reached today's average lifespan of around eighty-five years in the most developed countries.

Up to now we have followed the progress of human development in terms of exploiting new energy sources and inventions, which enabled humans to obtain a more secure and comfortable life.

71 Jean-Pierre Fillard, *Transhumanism: A Realistic Future?* (World Scientific, 2020), 3, https://doi.org/10.1142/11582.

72 Fillard, *Transhumanism*, 5.

The most common way of following human development, however, is a listing of intellectual achievements. The following discussion leans heavily on Nick Bostrom's *A History of Transhumanist Thought*.[73]

3.2 The Quest for Immortality, Starting with the Epic of Gilgamesh

The human desire to acquire new capacities and improve comfort of life is surely as ancient as our species itself. Prehistoric burials can be traced back tens of thousands of years and show us that people were disturbed by the death of a loved one and, despite the common belief of an afterlife, this did not preclude efforts to extend the present life. In the Sumerian Epic of Gilgamesh (ca. 1700 BC) a king sets out on a quest for immortality. After the death of his friend, Enkidu, Gilgamesh learns about a herb that grows at the bottom of the sea, but ultimately his mission failed.[74]

Here we already see a pattern, common to many ancient myths: any attempt to transcend our natural confines is followed by some kind of punishment. In ancient Greek mythology, Prometheus stole the fire from Zeus for the benefit of humanity. As a result, Prometheus was chained and tortured. In another Greek legend, Daedalus transcends human limits by attempting to fly, using wings made of feathers and wax. In due course, his son Icarus flew too close to the sun, which melted the wax, and he was punished by falling into the sea.

One might also see some parallels here with the Garden of Eden, where the tree of knowledge of good and evil is off-limits to humans, entailing a severe punishment. Genesis 2:17 tells us "But of the tree of knowledge of good and evil you shall not eat, for in the day that you eat of it you shall surely die." This indirectly implies the lost treasure of immortality. For its part, Islam does not refer to a tree of "knowledge of good and evil," but rather directly to a "tree of immortality." Here is one translation from Quran 20:120: "But Satan whispered to him, saying, 'O Adam! Shall I show you the Tree of Immortality and a kingdom that does not fade away?'"

Tales about a fountain of youth appear in ancient Greece and then feature prominently among the people of the Caribbean during the Age of Exploration (early sixteenth century). In Eastern culture we find Daoism, going back some 2500 years, with some schools seeking physical immortality by tapping into the forces of nature, and living in perfect harmony with the world.

Alchemy also has its roots in the ancient world, but we associate it mainly with the alchemists of the Middle Ages. While making interesting and often useful discoveries, life extension—one of their goals—remained elusive.

"Up to now we have followed the progress of human development in terms of exploiting new energy sources and inventions, which enabled humans to obtain a more secure and comfortable life. The most common way of following human development, however, is a listing of intellectual achievements."

73 Nick Bostrom, "A History of Transhumanist Thought," *Journal of Evolution and Technology* 14, no. 1 (2005): 1–25, https://nickbostrom.com/papers/history.pdf.

74 Stephen Mitchell, *Gilgamesh, A New English Version* (Free Press, 2004).

Like the ancient Greeks, medieval Christianity had conflicting views on alchemy and its quest of transcending nature, including human nature. On the one hand, we find the anti-experimentalist teachings of Aquinas, who believed that alchemic pursuits were ungodly activities, even engaging demonic forces. On the other hand, we find theologians, such as Albertus Magnus, who defended such practices.[75]

3.3 The Renaissance Marks the Rise of Science

Writer Katarina Bradford[76] accuses Bostrom's historical account[77] of having an anti-religious bias. She claims that transhumanists generally believe that metaphysical views, particularly Judeo-Christian teachings, are products born out of hopelessness, due to the inevitability of death. Suffering and death are fundamentally linked to the human condition, and religion is regarded as instilling a sense of (false) hope by claiming that an eternal life awaits us after death. Bradford accuses transhumanists of picturing the Renaissance as the time when humanity finally emerged from the "Dark Ages," rejecting God's dictatorship over individuals' lives.

In any case, whether Bradford is correct or not, the Renaissance marks the transition from the Middle Ages to the modern era. During this period the human being became a legitimate object of study. In 1486 the Italian scholar Pico della Mirandola composed the *Oration on the Dignity of Man*, in which he claims that humans do not have a ready-made form and are responsible for shaping their own makeup.[78]

The Age of the Enlightenment also marks the start of what we call modern science. It allows us to achieve mastery over nature to improve living conditions and comfort. But it also gives us the means to change us, since we ourselves are made of the very elements of nature. In 1795, the French philosopher and mathematician Marquis de Condorcet speculated about extending human lifespan through medical science. Another French philosopher, Julien Offray de la Mettrie, argued that "man is but an animal, or a collection of springs which wind each other up." This is an extension of Descartes' earlier argument that animals were merely "mechanisms" or "automata."

With the publication of Charles Darwin's *Origin of Species* in 1859, it became increasingly conceivable that humanity in its current state was not at the endpoint of evolution.

75 Bostrom, "A History of Transhumanist Thought," 2.

76 Katarina Bradford, "A Brief on the Transhumanist Movement," *Stand to Reason*, October 19, 2015, https://web.archive.org/web/20250524233345/https://www.str.org/w/a-brief-on-the-transhumanist-movement.

77 Bostrom, "History of Transhumanist Thought."

78 Bostrom, 2.

Shortly afterwards, the German philosopher Friedrich Nietzsche introduced his famous doctrine of the "Übermensch." An appropriate English word for it would be "the overman." Zarathustra declares:

> I teach you the overman. Man is something that shall be overcome. What have you done to overcome him? … All beings so far have created something beyond themselves; and do you want to be the ebb of this great flood and even go back to the beasts, rather than overcome man?[79]

The overman is Nietzsche's vision of what each of us could be, were we not bogged down by outdated religions and moralities. Much ink has been spent on the question of whether Nietzsche's overman can be classified as "transhuman" or not. For example, the philosopher Stefan Lorenz Sorgner[80] claims that Nietzsche's "overhuman" (he prefers this term, because the German word "Mensch" includes both sexes) shares significant similarities on a fundamental level with the "posthuman" in the transhumanist tradition. Others even claim that transhumanist ideas were directly influenced by Nietzsche.[81]

Bostrom, on the other hand, disagrees with Sorgner's position.[82] He thinks that Nietzsche didn't have the technological transformation in mind typical for the "posthuman," but rather a kind of soaring personal growth and cultural refinement in exceptional individuals.

3.4 The Origin of the Term Transhumanism

"Transhumanism" seems to have been used first by Julian Huxley, a distinguished biologist, who was also the first director-general of UNESCO and founder of the World Wildlife Fund. (Incidentally, he was the brother of Aldous Huxley, well-known for his 1932 novel *Brave New World*. He was also the grandson of Thomas Henry Huxley, the zoologist, agnostic, and controversialist who has often been called "Darwin's Bulldog.")

The earliest date for Huxley's use of the term "transhumanism" is often associated with his 1927 book *Religion without Revelation*, however, the term only appeared later, in Huxley's two-part lecture "Knowledge, Morality and Destiny," delivered in 1951 in Washington, and published in the same year in the journal *Psychiatry*.[83] In the first lecture Huxley describes his new idea thus:

> Such a broad philosophy might perhaps be called, not Humanism, because that has certain unsatisfactory connotations, but Transhumanism. It is the idea of humanity

79 Friedrich Nietzsche, *Also Sprach Zarathustra* (1883).

80 Stefan Lorenz Sorgner, "Nietzsche, the Overhuman, and Transhumanism," *Journal of Evolution and Technology* 20, no. 1 (2008).

81 Yunus Tuncel, ed., *Nietzsche and Transhumanism: Precursor or Enemy?* (Cambridge Scholars Publishing, 2021).

82 Bostrom, "History of Transhumanist Thought," 4.

83 Peter Harrison and Joseph Wolyniak, "The History of 'Transhumanism'," *Notes and Queries* 62, no. 3 (2015): 465–467, https://doi.org/10.1093/notesj/gjv080.

> attempting to overcome its limitations and to arrive at a fuller fruition.[84]

Huxley subsequently revised the lecture and published it in a collection of essays titled *New Bottles for New Wine* in 1957. The volume opens with a short piece titled "Transhumanism," which contains a paraphrase of the original definition from 1951: "We need a name for this new belief. Perhaps *transhumanism* will serve: man remaining man, but transcending himself, by realising new possibilities of and for his human nature."[85]

This is the generally accepted first use of the word "transhumanism." The Canadian essayist W. D. Lighthall (1940) points to a religious use of the term transhumanism. For him it is humanity's capacity to transcend the human condition in its encounter with God.[86] Dante uses the term "transumanar" in *The Divine Comedy*, which is translated into English as "transhuman change."[87]

In 1949, the French priest, scientist, and philosopher Pierre Teilhard de Chardin was using words like "trans-humanizing" and "trans-humanity" in his book *Phenomenon of Man* (published in 1955, written in the 1930s). Julian Huxley wrote the forward to this book, in which he praises Teilhard's thoughts, but distanced himself from Teilhard's religious roots.[88]

"The use of technology to improve humanity has sparked the imagination of numerous science fiction writers."

3.5 Science Fiction Literature

The use of technology to improve humanity has sparked the imagination of numerous science fiction writers. Mary Shelley's *Frankenstein*, published in 1818, is the first and one of the best-known works of science fiction. The story might be seen as a warning that science and technology should not be used as tools to overcome the human condition.

Still in the nineteenth century, several stories by H. G. Wells also address this theme: *The Invisible Man* and *The Island of Dr Moreau,* both describe scientists who failed in their experiments tampering with nature.

Aldous Huxley's *Brave New World* (1932) has become an emblem of the dehumanising potential of technology when applied to the use of promoting social conformism. Another influential twentieth-century dystopia is George Orwell's *1984* (published in 1949), which features a more overt form of oppression in the form of ubiquitous surveillance and brutal police coercion. Note that in neither *Brave New World* nor *1984* is technology being used to increase

84 Julian Huxley, *Religion Without Revelation* (Ernest Benn, 1927).

85 Julian Huxley, "Transhumanism," ch. 1 in *New Bottles for New Wine* (Chatto & Windus, 1957). The full text of Huxley's 1957 paper is available in the *Journal of Humanistic Psychology* 8, no. 1 (1968): 73–76, https://doi.org/10.1177/002216786800800107.

86 W. D. Lighthall, *The Law of Cosmic Evolutionary Adaptation: An Interpretation of Recent Thought* (Royal Society of Canada, 1940).

87 Harrison and Wolyniak, *History of Transhumanism*, 467.

88 Harrison, 468.

human capacities. Instead, society is set up to repress the full development of humanity.

In 1923 British scientist J. B. S. Haldane published *Daedalus, or Science and the Future*, which offers an early vision of transhumanist thought, particularly concerned with the ethical and religious implications of the advancement of science. He uses the Greek myth of Daedalus as a symbol for the revolutionary nature of science:

> The chemical and physical inventor is always a Prometheus. There is no great invention, from fire to flying, which has not been hailed as an insult to some god. But if every physical and chemical invention is a blasphemy, every biological invention is a perversion. There is hardly one which, on first being brought to the notice of an observer from any nation which has not previously heard of their existence, would not appear to him as indecent and unnatural.[89]

British scientist and philosopher Bertrand Russell commented favourably on Haldane's *Daedalus*, but took a more pessimistic view in his *Icarus or The Future of Science*, arguing that more kindliness is required in this world, otherwise technological advances are going to escalate humanity's ability to inflict harm on each other.[90]

Haldane's publication set off a chain reaction of future-oriented discussions. One example is scientist J. D. Bernal's *The World, the Flesh and the Devil*, published in 1929. In this futuristic essay Bernal explores the radical changes to human bodies through bionic implants.[91]

3.6 Transhumanism in the Twentieth Century and Beyond

Transhumanism really took off in the twentieth century, even before the phrase was coined. In 1906, the Christian mystic philosopher Nikolai Fyodorov established Russian cosmism. This movement affirmed that humanity's natural destiny was to take to the stars, and immortality can be achieved through science. Cosmism had its roots in orthodox Christianity and sought to achieve human perfection and to unite humanity in a commitment to overcome death and master the cosmos, as God had intended. Fyodorov's influence would filter directly down to the establishment of the Russian space program in the 1950s and the race to put the first man into orbit.[92]

In the early 1940s, the first electronic computers were developed, and this quickly led to the question of whether this could one day lead

89 J. B. S. Haldane, *Daedalus, or, Science and the Future. A Paper Read to the Heretics* (Cambridge, 1923), https://www.marxists.org/archive/haldane/works/1920s/daedalus.htm.

90 Bertrand Russell, *Icarus, or, the Future of Science* (1924), www.marxists.org/reference/subject/philosophy/works/en/russell2.htm.

91 J. D. Bernal, *The World, the Flesh and the Devil* (1929), https://www.marxists.org/archive/bernal/works/1920s/soul/ch01.htm.

92 Benjamin Ramm, "Cosmism: Russia's Religion for the Rocket Age," *BBC*, April 20, 2021, https://www.bbc.com/future/article/20210420-cosmism-russias-religion-for-the-rocket-age.

to some kind of artificially-intelligent machines that could think in the same general way as humans do. Alan Turing in his classic *Computing Machinery and Intelligence* (1950) came up with the idea of his famous "Turing test," which would eventually help to determine if a machine reaches a level of intelligence that makes it indistinguishable from a human.[93]

In 1958 Stanislaw Ulam, a Polish American scientist, referring to a meeting with John von Neumann, writes:

> One conversation centred on the ever-accelerating progress of technology and changes in the mode of human life, which gives the appearance of approaching some essential singularity in the history of the race beyond which human affairs, as we know them, could not continue.[94]

This singularity hypothesis implies that changes induced by ever-improving technologies will eventually lead to some kind of discontinuity. The creation of self-improving artificial intelligence will at some point result in radical changes within a very short time.

This rapidity of technological change suggested a major impact on humanity in the coming decades. The apparent exponential growth was noted by Gordon E. Moore, co-founder of Intel, in 1965, leading to his famous "Moore's Law," which states that computing power doubles every 18–24 months.[95] Around the same time, cryptographer and computer scientist Irving John Good published *Speculations Concerning the First Ultraintelligent Machine*, the first proposal for a possible future intelligence explosion in machine learning.[96]

In 1988, Max More and Tom Marrow published the first issue of the *Extropy Magazine*, and in 1992 they founded the Extropy Institute.[97] The term "extropy" has been coined as a metaphorical opposite to entropy. Max More redefined transhumanism as "extropianism," thereby emphasising the principles of "boundless expansion" and self-transformation.

In 1993, computer scientist and writer Vernor Vinge published a paper titled "The Coming Technological Singularity" in which he predicts, "within thirty years, we will have the technological means to create superhuman intelligence. Shortly after, the human era will be ended."[98]

"In the early 1940s, the first electronic computers were developed, and this quickly led to the question of whether this could one day lead to some kind of artificially-intelligent machines that could think in the same general way as humans do."

93 Alan Turing, "Computing Machinery and Intelligence," *Mind* 59, no. 236 (1950): 433–460.

94 Stanislaw Ulam, "John Neumann 1903–1957," *Bulletin of the American Mathematical Society* 64, no. 3, pt. 2 (May 1958), https://www.ams.org/journals/bull/1958-64-03/S0002-9904-1958-10189-5/S0002-9904-1958-10189-5.pdf.

95 Gordon E. Moore, "Cramming More Components onto Integrated Circuits," *Electronics* 38, no. 8 (1965): 114–117, reprint in *Proceedings of the IEEE* 86, no. 1 (January 1998): 82–85, https://www.cs.utexas.edu/~fussell/courses/cs352h/papers/moore.pdf.

96 Irving John Good, "Speculations Concerning the First Ultraintelligent Machine," *Advances in Computers* 6 (1965), Stanford Libraries, https://exhibits.stanford.edu/feigenbaum/catalog/gz727rg3869.

97 José Luis Cordeiro, "The Principles of Extropy: A Quarter Century Later," *Lifeboat Foundation*, 2013, https://lifeboat.com/ex/the.principles.of.extropy.

98 Vernor Vinge, "The Coming Technological Singularity," *Whole Earth Review* (Winter 1993).

In 1997, a group of academic philosophers, including Nick Bostrom and David Pearce, co-founded the World Transhumanist Association in an attempt to get transhumanism accepted intellectually. It was later renamed *Humanity Plus*.

A year later, Kevin Warwick, professor of cybernetics, claimed to have become the world's first cyborg by having an electrode implanted into the median nerve of his arm. This enabled him to control a simple remote robotic hand. In an interview he said, "I was born human, but it was an accident of fate—a condition merely of time and place."[99]

In 2004, Nick Bostrom and James Hughes established the *Institute for Ethics and Emerging Technologies,* which publishes the *Journal of Transhumanism*. A year later, Bostrom established the *Future of Humanity Institute* with associates Anders Sanberg and Eric Drexler.

In 2005, Ray Kurzweil published *The Singularity is Near: When Humans Transcend Biology,* further popularising the idea[100].

99 Kevin Warwick, "Cyborg 1.0", *Wired*, February 2000, 145-151, https://www.wired.com/2000/02/warwick/.

100 Ray Kurzweil, *The Singularity is Near: When Humans Transcend Biology* (Viking Press, 2005).

Chapter 4

Current Advances in Transhumanist Technologies

By Andrew Wood, David Adams, and Warren Linton

4.1 Introduction

This chapter will review the current "state of play" of the transhumanist technological landscape in terms of what can be achieved through existing and available technology. It will cover mainly biomedical topics, but it will use non-specialist language to ensure general comprehensibility. It will also attempt to distinguish between actual accomplishments and "wishful thinking" in terms of the more speculative transhumanist technologies, which will be covered in more detail in Chapter 5. Transhumanism has been defined in earlier chapters and this chapter will concentrate on the physiological and, to a lesser extent, biochemical interventions. Many ethical questions arise from such interventions to enhance, rather than restore, human performance. Since most existing technologies are directed towards restoration, at least initially, the review of such technologies in this chapter will begin with restoration and then will extend to enhancement. By "restoration" we mean restoration of capacities enjoyed by the majority of the population.

4.2 Restorative Technologies

Restorative technologies can be broadly divided into non-invasive and invasive technologies. Non-invasive technologies do not involve breaking the skin as a preliminary to implantation. Familiar devices (and ones which have been in use for many years, in some cases for centuries) include spectacles, hearing aids, crutches, dental devices, and so on. It is possible to obtain physiological information about the heart, lungs, muscles, nerves, and brain by using skin-surface electrodes or pressure sensors which can be used to restore function for even quite severe injury, such as injury resulting in quadriplegia. Some forms of biochemical monitoring, such as glucose monitoring for diabetics, can be accomplished through the skin. There are a range of electrical or magnetic stimulators that are applied through the skin and are thus described as non-invasive. These will be explained below.

Invasive technologies include implants such as knee and hip prostheses, implanted stimulators, such as the bionic ear, pacemakers, and brain stimulators, which involve surgical operations to put them into position. Mostly, these are totally within the body, but some,

such as dental implants, some forms of amputee prosthetics, kidney dialysis, and some forms of bowel surgery involve a direct connection of parts of the device outside the body with parts within the body. Prevention of infection at the junction between external and internal components is crucial in such cases.

Specific Non-invasive Technologies

Visual Aids

Glass lenses to restore vision defects have been employed since around the thirteenth century, but recent advances such as multi-focal or self-darkening (or photochromic) lenses have obviated the need to carry around more than one set of spectacles. There are several enhancements to vision which will be reviewed below. As well as frame-mounted lenses, soft contact lenses are now commonplace. These have a relatively recent history, becoming widespread after the 1950s. Surgical intervention, such as corneal laser sculpting, is outside the scope of this review, but the insertion of artificial lenses for cataracts will be briefly reviewed below.

Hearing Aids

Initially, hearing aids were simply acoustic devices (ear trumpets), however, these were replaced by electronic devices following the introduction of transistor circuits. Modern hearing aids now essentially consist of a microphone, a signal processor, an amplifier, an earphone, and a power supply. The entire unit now fits either just behind the ear or in the ear canal itself. The circuitry is now designed to minimise background noise and to enhance the intelligibility of speech. Although this could be regarded as an enhancement, it is really to enable those with hearing impairment to approach the level of aural acuity of the general population.

Limb Prosthetics

Following amputation, and once a wound has satisfactorily healed, a purpose-made close-fitting cup is made for the stump and is attached to a prosthetic leg or arm. In the case of lower leg prostheses, the use of carbon-fibre "blades" allows amputees to compete in Olympic running events. In the case of an arm prosthesis, a harness around the shoulder can be used to activate a "hand" by using residual movements. Traditional types take the form of a cloven hook, which is sufficient to pick up small items. More sophisticated devices pick up electrical activity in arm muscles to activate individual prosthetic fingers as will be discussed in the next chapter.

Picking up Nerve and Muscle Electrical Activity from the Skin Surface

Many of the more recent restorative devices employ electrodes or other sensors to monitor body electrical activity to control motor-

driven prostheses. The most familiar electrical activity is associated with the heartbeat, the electrocardiogram or ECG. In a clinical situation, small electrodes with a metal coating and conductive gel are applied to the skin on either side of where the heart is in the chest, and the connecting wires are attached to an amplifier and recording device. The voltage measured between the electrodes correlates with the activation of regions of muscle fibres within the heart, which progressively move through the heart tissue during the heartbeat. Similar voltage signals can be picked up over muscles generally. For example, if electrodes are applied to the skin over the biceps, as the muscle contracts the number of voltage "spikes" per second increases markedly. The same thing occurs with major nerves; if the fingers are stimulated with small electric shocks, the passage of the associated nervous impulses through the elbow can be monitored at that point. Applying small saline-soaked metal electrodes across the scalp can be used to monitor brain electrical activity, particularly transient changes associated with specific events, such as light flashes or sound signals (or even certain scents). This is called the electroencephalogram or EEG. Some of these electrical signals just described can be elicited at will, for example, via contraction of specific muscles in the upper arm or in the face. The electrical activity of arm muscles can, with training, be used to control prosthetic hand and finger movements and the activity of face muscles to move a computer cursor to select letters or words on a screen. There are many ways to monitor electrical activity of the brain: some of these will be elaborated on below. Because of the ability to collect these electrical data, the term Brain-Computer Interfacing (BCI) or Brain-Machine interfacing is often applied to this. While the initial motivation for developing BCI is for restoration, the extension of this to enhancement will be explored below.

> **"Many of the more recent restorative devices employ electrodes or other sensors to monitor body electrical activity to control motor-driven prostheses."**

Sensing of Blood Pressure and Flow

The "pulse," which is the deformation of the tissue surrounding an artery resulting from the surge of blood flow associated with the heartbeat, is familiarly measured by placing fingers lightly over the wrist or at other points of the body. Simple blood pressure recording devices use a cuff to occlude the arterial blood flow and a microphone or other sensor within the cuff to pick up these pulses as the cuff pressure is reduced. This can be used both in the monitoring of clinical conditions such as high blood pressure or in fitness training.

Blood flow in arteries and veins can be measured non-invasively by using high-frequency sound (ultrasound) and detecting the change in pitch due to the moving red blood cells (the Doppler effect). This requires careful placement of the ultrasound transducer and is mainly done by skilled operators in clinical settings. Laser Doppler is also used to measure blood flow in capillaries (perfusion).

Optical Biosensors

Light in the red and infrared region of the spectrum penetrates below the skin. By measuring the red-to-infrared ratio, the amount of oxygen in the blood can be monitored (oximetry). Many fitness monitors ("smart watches") incorporate oximetry, as well as heart rate and rate variability measurement. Apps can be downloaded for smart phones which use the light and camera on the phone to make these measurements.

There has been much attention given to the possibility of measuring glucose through the skin, which would be of great benefit to diabetics as well as to fitness training. There are several prototypes on the market, but the more successful ones involve inserting a fine sensor just below the skin surface, so they are borderline invasive. They involve measuring glucose in tissue fluid rather than blood.[101]

Transcutaneous (through the skin) optical biosensors are an area of active research for applications measuring a wide variety of biological molecules. Some of them use membrane technology with miniature electrodes for picking up electrochemical voltages to indicate the concentration of biomolecules, including gases such as oxygen and carbon dioxide.

"Typical medical imaging systems such as x-ray and Magnetic Resonance Imaging (MRI) are extremely important in restorative approaches, but because of their size they may have little spill-over into enhancement technologies."

Medical Imaging, Including Endoscopy, and Endomicroscopy

Typical medical imaging systems such as x-ray and Magnetic Resonance Imaging (MRI) are extremely important in restorative approaches, but because of their size they may have little spill-over into enhancement technologies. MRI is of particular interest in BCI because a particular development of it, functional MRI (or fMRI) is used to localise cognitive processes in the brain. This is because oxygen consumption is linked to neural activity, and this in turn modifies the MRI signal from particularly active regions. Another technique, Positron Emission Tomography (PET) is linked to glucose consumption, which is used for a similar purpose.

When it comes to imaging at the tissue or cellular level, the use of endoscopes and optical-fibre based endo-microscopes, which obtain live in situ images from the gastrointestinal tract or from airways, represent a non-invasive approach because the skin is not broached. Again, applications of these technologies to enhancement are limited.

Electrical and Magnetic Stimulation

Electrical impulses from a battery-driven unit can be delivered to the skin surface. Low-level pulses are used in forms of pain management (Transcutaneous Electrical Nerve Stimulation, or TENS) and higher-level pulses are used to activate certain residual nerves or muscles

101 Jeffrey I. Joseph, "Review of the Long-Term Implantable Senseonics Continuous Glucose Monitoring System and Other Continuous Glucose Monitoring Systems," *J Diabetes Sci Technol* 15 (2021): 167–173. https://doi.org/10.1177/1932296820911919.

to restore function after diseases such as stroke or spinal cord injury (Functional Electrical Stimulation, or FES). The technique is also used to retrain the central nervous system after trauma. Short magnetic field pulses can also be used to stimulate nerves, particularly in the brain, in a technique called Transcranial Magnetic Stimulation (TMS). While this is mainly used for diagnosis or basic neuroscience research, there are documented improvements in conditions such as major depression and other psychiatric disorders.

Invasive Technologies

Invasive technologies are devices implanted under the skin or deeper inside the body. In addition to a need to maintain sterility, the materials coating the device must not cause adverse reactions such as blood coagulation or tissue reaction. The device also needs to have the mechanical strength or flexibility to function correctly in a wide range of circumstances. The advantage of inserting devices into the body is mainly to allow for more specific and unobtrusive restorative measures and so the patient does not have to carry around extra items. Of course, many of these devices need electrical power sources, which are usually also implanted.

Sensing Nerve and Muscle Activity and Delivering Electrical Stimulation within the Body

Miniature electrical circuits ("microchips") can be implanted near major nerves or on the brain surface. These often include arrays of electrodes (typically over 100) to pick up nearby nerve electrical activity or to deliver stimulating electrical pulses to specific regions. The microchip will often include signal processing via programmable memory and may integrate information from elsewhere (see below). Much research has gone into effective encapsulation, to ensure that the chip will continue to function over many years and will not cause adverse biological reactions.

The Bionic Ear

More accurately, this is a cochlear implant, because the stimulating electrode array is surgically embedded into the inner ear over the cochlear nerve. It is used in situations where the nerve is still functional, but the normal mechanism of hearing in the inner ear is impaired. A microphone on the scalp picks up sounds and transmits these to processing circuitry both on the scalp and inside the skull. Wireless technology is used to transmit information between components, and miniature batteries power the device. The user needs training to interpret the stimuli received by the brain as speech or sounds generally. This is helped by the way the cochlea processes low notes at one end and high notes at the other; the electrodes are spaced along the cochlea and different notes excite different electrodes.

The Bionic Eye

The bionic eye uses similar principles as the bionic ear, with a two-dimensional array of implanted electrodes which stimulate the residual nerve layers in the retina in cases where the light-sensitive layers have become diseased. The images are transmitted from a small video camera mounted on spectacles to the implant. The images the user receives are fairly crude at the moment, with an 8 x 8 matrix typical. At present, however, the risks associated with the surgical procedure seem to outweigh the long-term benefits.

Pacemakers

These sit under the skin on the chest, with two or more sets of leads. Some of these leads pick up what electrical rhythm exists in the heart and if this is absent or mistimed, stimulating pulses are delivered to the so-called pacemaker region of the heart, to maintain a regular rhythm. Because of the long-term demand on electrical energy, improvements in battery technology, including reductions in size, have contributed to the success of these devices. Estimates vary, but around one million are implanted each year. A similar device, the implantable cardioverter-defibrillator (ICD), delivers a small shock to the heart stopping irregular heartbeats (arrhythmias).

Other Indwelling Stimulators Including Deep-Brain Stimulation

Spinal stimulators using similar principles to the above are inserted near spinal nerves to help control chronic pain. There are experimental techniques in which electrodes above the brain cortex are stimulated, which, like TMS, leads to improvements in psychiatric conditions.

Indwelling Pumps for Delivering Drugs

Such pumps do away with the need for constantly injecting agents such as insulin. However, they continue to be at the developmental stage rather than being available as approved medical devices. Some prototypes use osmotic pressure to power the slow injection rather than pumps using electrical power.

Repairing Severed Nerves, Including the Spinal Cord

The ends of severed nerves can, in some cases, be joined by microsurgery if the injured tissue is removed first. New nerve fibres grow from the repair site at the rate of around one millimetre per day to the locations they need to be. However, the spinal cord has tens of thousands of individual fibres, and it is difficult, if not impossible, to restore any function after it becomes severed. A process called "Wallerian degeneration" means that the fibres retract into their sheaths and the resulting gap fills with material which inhibits nerve growth. Some techniques involve shortening the cord after removing the injured tissue, but results to date have not been encouraging.

There has been considerable interest in implanting arrays of micro-electrodes into the spinal cord for both stimulation and recording, to map functionality. Although mainly in animal models, some work on humans has also been carried out. This has relevance to the development of human-computer interfaces which will be discussed later.

Brain Microchips

This is an extension of the measurement of brain electrical activity described above, which improves on the spatial resolution of the measured signals. An electrode array (typically over 2000 electrodes in an array of about one square centimetre) is interfaced to a wireless transmitter and implanted so that the electrodes directly contact the brain surface (cortex). Depending on where on the cortex this is placed, brain electrical signals can be used to bypass damaged nerve pathways with the hope of restoring function. Several companies are involved in obtaining approval to implant these devices in humans (animal trials have already been completed) including the San Francisco-based Neuralink (with Elon Musk a cofounder). At time of writing, no human trials have commenced, and concerns remain about whether there is a net medical benefit in receiving one of these devices at present.

Bone Implants

Hip replacements have a history going back to the 1960s with the work of John Charnley in the UK. This consisted of a stainless-steel stem which was inserted into the top of the femur. The stainless-steel stem had a hemispherical head which fitted into a Teflon cup implanted into the hip joint (acetabulum). Both were held into the bone using an acrylic bone cement. Since then, designs have improved significantly, with other joints, such as the knee and shoulder, also regularly being replaced. Early designs were prone to rejection and mechanical failure, but modern designs have overcome these, using advanced materials such as bioactive glass (e.g., Bioglass) which forms a bone-like mineral layer on the surface of the prosthesis.

Organ Transplants

The first successful transplant of one kidney from a donor to a near-relative recipient took place in 1954, and since then many thousands of organ transplants have been carried out, including other organs such as the lungs (1963), heart (1967), liver (1967), hand (1998), and face (2010).[102] These operations have been made possible by a number of advances such as the development of the heart-lung machine (to maintain circulation), the use of immunosuppressants (such as cyclosporin A), development in microsurgical techniques, and the ability to cool down the regions being operated on. The transplanting of sections of vein to repair blocked coronary arteries

102 Paul Craddock, *Spare Parts: A Surprising History of Transplants*. (Fig Tree/Penguin Books, 2021).

and the replacement of heart valves with pig valves or prosthetic valves have saved millions of lives worldwide.

Laboratory-Grown Organs

Skin grafts have been performed since at least the sixteenth century, but recent advances have allowed large areas of skin to be grown in the laboratory for use especially with burns victims. The Australian plastic surgeon, Dr Fiona Wood, pioneered the use of culturing the patient's own skin cells, then spraying these onto the wound areas.[103] Harnessing the properties of human cells to organise themselves into functioning units has given rise to a whole swathe of attempts to grow functioning organs in the laboratory. These methods often start with a "scaffold" of protein or other bio-compatible material fashioned into the shape of the target organ. This is then placed in a dish containing a nutrient fluid and appropriate human cells (often stem cells). These cells then cover the scaffold over a period of several days. In addition to "spray-on" skin, there are also trials in which skin is grown as a sheet in the laboratory before transplanting in situ. Experimental tooth tissue engineering continues as a major research area in dentistry but has not yet made its way into clinical practice.

Scaffolds can be prepared by 3D printing materials and recent work has even used plant material as the scaffold for human cells. In very recent and controversial work, tissue of other animals has been used as scaffolds; for example, human organoids (organ-like clusters of cells) have been incorporated into rat brains in one such study.[104] Stimulating the rat brain caused changes in the human organoid and vice-versa. Related to this, recent work from an Australian group has deposited brain cells on a matrix of electrodes and then using a computer-learning-driven system for activating and recording from the electrodes, has in turn taught the system to play a version of the computer game "Pong."[105]

Other Cell-Directed Technologies

The discovery of Nerve Growth Factors (NGF) by neurobiologist Rita Levi-Montalcini in the 1950s has led to huge advances in directing the differentiation and proliferation of nerve cells both in the laboratory and in situ, giving rise to many therapeutic applications. In addition to NGF, in situ electric fields also preferentially enhance nerve growth, as do the surface features the nerve fibres are encouraged to grow on. Microfabrication techniques are used to engineer advanced connections between cell cultures and electronic circuits; such connections

103 Laurens Manning et al. "Wound healing with 'spray-on' autologous skin grafting (ReCell) compared with standard care in patients with large diabetes-related foot wounds: an open-label randomised controlled trial," *Int Wound J* 19 (2022): 470–481. https://doi.org/10.1111/iwj.13646.

104 Sara Reardon, "Human brain cells implanted in rats prompt excitement—and concern." *Nature* 610 (2022): 427-428. https://doi.org/10.1038/d41586-022-03238-x.

105 Heidi Ledford, "Neurons in a dish learn to play Pong—what's next?" *Nature* 610 (2022): 433. https://doi.org/10.1038/d41586-022-03229-y.

form the basis of brain-computer interfaces. At present, these are limited to in vitro cell or organ cultures, or between animal brains and computer systems, but the extension to humans appears imminent. In fact, the bionic ear and eye mentioned above are forms of this type of brain-computer interface. What makes this new technology different compared to bionic technology, however, is that regions of the brain are being directed to make connections with an external memory device or processor, with the hope that damaged parts of the brain could be re-constituted via technological means.[106]

“What makes this new technology different compared to bionic technology, however, is that regions of the brain are being directed to make connections with an external memory device or processor ...”

Regenerative Medicine

This is an emerging discipline which aims to restore normal function using predominantly human cells and the cell-directive techniques just described (including scaffolds).[107] Some animals, notably amphibians, can spontaneously regrow severed limbs or tails. Fingertips can regrow in small infants and research is underway to determine how this ability is lost in adults.

Gene Therapy and Genomic Analysis

Techniques such as CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats), which have been available for many years, allow the editing of genes; certain less-favourable gene sequences can be removed and replaced by more favourable ones. This provides a possible cure for congenital diseases or diseases which could appear later in life. More will be said on the current status of gene therapy in the “Enhancement” section below. A related technology is genomic testing, where an individual’s complete (or partial) set of genetic information is determined from a DNA sample taken from blood, saliva, or tissue. Software analysis determines whether the gene sequence in the sample contain variants which may indicate health problems. Genomic testing can help diagnose rare genetic conditions in children, as well as some types of cancer, heart conditions, immune system disorders, or other illnesses.

4.3 Enhancement Technologies

Moving on from restorative technologies, enhancement technologies are those which are designed to improve function in a specific body system beyond the natural or normal level of functioning. This approach stands in contrast to the previously mentioned restorative methods, which are primarily designed to return a patient to what might be considered their normal capacities. Enhancement technologies are, in general, based on the same scientific principles underlying restorative technologies, in that enhancement applications

106 Kevin Stacey, “Researchers demonstrate first human use of high-bandwidth wireless brain-computer interface.” (2021). https://www.brown.edu/news/2021-03-31/braingate-wireless.

107 Chris Mason and Peter Dunnill, “A brief definition of regenerative medicine.” *Regen Med* 3 (2008): 1–5. https://doi.org/10.2217/17460751.3.1.1.

spring out of restorative techniques rather than being developed exclusively for enhancement purposes. Their similarity is highlighted by the fact that the justification for investigating enhancement technologies is often simply a perceived improvement in the market reach or cost currently associated with restorative technology. The rationale for developing enhancement techniques, which could be viewed as giving advantage to an elite, is often that the same techniques can be used to alleviate disease or disability on a wider scale. The question of whether benefits can be equitably distributed will be discussed in another chapter. This section will review what is currently available, as well as indicating possible developments in the near future. The sections below relate to specific body functions or physiological systems; however, it may be more convenient to categorise enhancement technologies under the following headings: physical, cognitive, moral, and life-extending. The review below is mainly of the first two headings, but it includes some additional information on the latter two.

“The rationale for developing enhancement techniques, which could be viewed as giving advantage to an elite, is often that the same techniques can be used to alleviate disease or disability on a wider scale.”

Vision

The use of magnifying eyewear by dentists and microsurgeons is a universally-accepted form of vision enhancement, but the augmented vision spectacles offered by multinational technology companies, such as Google Glass and Microsoft HoloLens, go beyond image enhancement and incorporate Augmented Reality (AR). The AR enhancements include feature (and facial) recognition, heads-up displays, voice prompts, and general content relating to what (or who) is being viewed. Voice activation allows control over the functions offered. Wireless communication is usually via Bluetooth to a smart phone. The transmission of what is viewed (via an inbuilt camera) can be linked to cloud-based smart image enhancement software to read fine detail at a distance or in low-light conditions. Although the main rationale behind AR glasses is to improve commercial productivity, its use for more sinister applications is concerning: facial recognition software being used to identify individuals with their personal information, the exclusion of people not conforming to ‘normal’ body standards, and use to monitor and detect signs of deception according to set algorithms.

Hearing

In-ear devices, because of their unobtrusive nature in modern forms, can be used for eavesdropping exercises, with wireless connections to smart devices and cloud services to enhance small signals embedded in noise. In practice, however, eavesdropping tends to use small pocket-worn recorders for later playback and analysis.

Exoskeleton

An exoskeleton is a wearable cradle for the limbs (especially the legs) which has robotic features. Typically, they analyse intended limb

movements and enhance these by applying turning force (at the knees for example) or encouraging faster movement. Although these can be used in cases of chronic pain or mobility issues, they are mainly studied as a means of walking more quickly and more efficiently.[108] They also offer capabilities of greater strength even when compared to trained muscles. In hand-to-hand fighting, for example, arm exoskeletons (controlled and powered via a backpack) would give considerable advantage.

Mind Control Over a Distance

Maybe the most celebrated example of this is the UK bioengineer Kevin Warwick, who had an electrode array with a radio transmitter implanted into his arm. The nervous impulses were then sent via an internet connection to another continent where they were used to control a robot arm. His wife also received an arm implant, with the aim of person-to-person communication over a distance. The messages were simple Morse-code type, but sufficient to demonstrate electronic communication between nervous systems of two individuals.[109] However, this still relies on adapting normal mind control of voluntary muscles in the arm, rather than somehow interpreting brain electrical activity and transmitting that to another person. The use of EEG signals to control external devices (such as a computer cursor) is mentioned above, but this is sometimes extended to interpretation of EEG signals as a basis for voice or image recognition ("mind reading"). However, the interpretation of EEG in terms of cognitive processes is limited, because the skull effectively smooths out the locality of brain electrical activity. The measurement of the minute magnetic fields associated with nervous activity in crevices of the brain cortex leads to a greater localisation, but still averaged over many thousands of cells. The direct recording of internal "thoughts" still has a great way to go, even with the latest signal processing techniques.

Cosmetic Surgery and Transplants

Cosmetic surgery for changing facial features or other body parts to preserve a younger look or correct perceived imperfections is widespread in wealthier nations and is frequently the focus of debates on misguided social pressures and the largely unregulated nature of this industry. At the milder end of the spectrum, the use of small doses of botulinum toxin (e.g., Botox) to abolish local nerve or muscle function and hence the smoothing of wrinkles appears to be well accepted and is relatively safe and effective if administered correctly.

108 Dan Fox, "Exoskeleton boots could power your walk by learning your stride." *Nature* (October, 2022). https://doi.org/10.1038/d41586-022-03262-x.

109 Kevin Warwick, "The cyborg revolution." *Nanoethics* 8 (2014): 263–273. https://doi.org/10.1007/s11569-014-0212-z.

Enhanced Cognition or Memory

As mentioned in the "restoration" section, the technology of brain-computer interfacing (BCI) is still in its infancy, but this has not prevented speculation of where this would lead. For some, the prospect of having what corresponds to a complete Wikipedia or super calculator instantly available or the instant recall of masses of stored data would seem a desirable enhancement. There are obvious issues for human identity. For example, Ray Kurzweil[110] has raised the philosophical issue of identity if progressively larger portions of a person's brain are replaced by computer circuitry, or if the memories stored in the computer were from a different person. Others have explored the implications of a person having their brain removed and maintained in a vat of nutrient fluid with an appropriate supply of blood and other necessary substances: would this brain still be the same person?[111] If it could be connected to bionic ears, eyes, and so on and have access to a speech synthesiser and appropriate decoding software, could it describe the immediate environment of this vat to others who may be listening?

Apart from issues for human identity, the extension of brain microchips (discussed above) to allow "brain downloads" or "uploads" is already being entertained by companies such as Neuralink. Present understanding of the localisation and timing of cognitive processes is insufficient to provide a firm basis for memory or cognitive enhancement via BCI, but the rapid increase in knowledge is often held up as a justification for optimism. There appears to be a perhaps overconfident assumption that if large quantities of data are downloaded and stored on a computing device, computational techniques such as AI will be able to discover patterns and hence meaning in this data. Up until now, frequency decomposition methods such as the Fast Fourier Transform (FFT) have been the mainstay of extracting physiological significance from brain electrical signals, but AI takes this further with such algorithms as Deep Learning and Artificial Neural Networks.

"Apart from issues for human identity, the extension of brain microchips to allow "brain downloads" or "uploads" is already being entertained by companies such as Neuralink."

Performance-enhancing Drugs

The use of anabolic steroids (such as testosterone) to enhance athletic performance by increasing muscle mass and strength has its origins in the 1940s. More recent developments have included human growth hormone (to putatively increase muscle mass), erythropoietin (to increase blood red cell number and hence oxygen availability for muscles) and stimulants (such as amphetamines and ephedrine). Of course, caffeine is also a stimulant and is often used to enhance alertness and focus via the increased output of adrenaline and cortisol. There are a number of substances which can

110 Ray Kurzweil, *How to Create a Mind*. (Duckworth Overlook, 2013).

111 Richard Swinburne, *Are We Bodies or Souls?* (Oxford University Press, 2019).

be taken to improve mood in persons who have no mood disorders; they include the naturally-occurring oxytocin (which in added doses promotes a feeling of wellbeing and trust) and psilocybin (the "magic mushroom"), leading to altered perceptions of time and space and, some would claim, enhanced feelings of religiosity.[112]

Germline Genetic Enhancement

The cells that represent the egg, sperm, and fertilised egg contain the genetic material passed from one generation to the next. The ability to select fertilised eggs based on pre-determined "fitness" criteria raise many ethical questions, but this section is concerned with the state of play of current technology. Preimplantation genetic diagnosis (PGD) followed by embryo selection as part of in vitro fertilisation (IVF) involves performing a genetic test on an embryo prior to its implantation into a womb. PGD is quite a mature technique, but the number of genes tested has been slowly increasing and it is becoming a point of difference between fertility clinics. Some countries already allow for sex selection and eye-colour selection among others. Mostly, however, these tests have been related to serious genetic disorders. With the number of tested genes growing, algorithms are needed to process the probabilities of acquiring genetic illnesses (or other traits) later in life, given a particular gene set. These scores are now being produced and are based on comparisons with huge databases of genetic information gathered by various governments and organisations which link an individual's DNA profile to self-reported health outcomes. The result is that future children can now be selected for, and others against, based on these genetic algorithms and probabilities. There is no technical reason why this could not be applied beyond the avoidance of genetically related disease to positively selecting for cognitive abilities or lifespan extension.

Gene Therapy

The use of gene therapy to restore function has already been mentioned above. However, such uses are, at present, controversial, especially when used for human embryo modification.[113] Furthermore, CRISPR and related techniques do represent considerable potential for human enhancement of function, despite the ethical issues raised. Many restorative specific gene therapy applications have been approved for clinical trials in humans[114,115], but the

112 David E. Nichols, "Psilocybin: from ancient magic to modern medicine." *J Antibiot (Tokyo)* 73 (2020): 679–686. https://doi.org/10.1038/s41429-020-0311-8.

113 Heidi Ledford, "CRISPR gene editing in human embryos wreaks chromosomal mayhem." *Nature* 583 (2020): 17–18. https://doi.org/10.1038/d41586-020-01906-4.

114 Shreyashee Mallik, Charles G. Bailey, and John E.J. Rasko, "Approved gene therapies in Australia: coming to a store near you." *Intern Med J* 52 (2022):1313-1321. https://doi.org/10.1111/imj.15880.

115 Fathema Uddin, Charles M. Rudin, and Tripana Sen. "CRISPR gene therapy: applications, limitations, and implications for the future." *Front Oncol* 10 (2020): https://doi.org/10.3389/fonc.2020.01387.

results of these trials are still emerging, and there appears to be no current consensus on whether benefit outweighs risk[116].

Regenerative Medicine and Life Extension

The general increase in life expectancy in the developed world has been brought about by several factors, including improved sanitation, diet, activity, and disease treatments. Some transhumanists argue that a better understanding of the ageing process will lead to further life expectancy increase. Leaving aside the questions of quality of life in advanced lifespans and of the consequences of overpopulation, there are several technologies which show promise in life extension. The most straightforward, caloric restriction, is related to diet and is backed by studies on laboratory rodents. Approaches such as tissue engineering, genetic manipulation, organ rejuvenation, and cryopreservation (essentially suspended animation in deep-freeze to await improved treatments for specific diseases) have all been speculated about, but, to date, they appear to be at the rudimentary stages regarding showing efficacy in animal models. The role of techniques in regenerative medicine for restoration is discussed above, but some of these techniques could also be used by those who are eager to extend their lifespan without disease treatment being the main reason.

Gender Reassignment Techniques

There is an argument that gender reassignment techniques represent restoration rather than enhancement, hence the often-used title "gender-affirming." Such techniques consist mainly of surgical interventions to change primary sexual characteristics from male to female or vice-versa accompanied by treatment with appropriate sex hormones to augment the change.

Other Cell-engineering Techniques

The manipulation of groups of cells for therapeutic purposes was introduced above. Some of the techniques proposed for human application include admixed embryos, where some of the cells in a human embryo are derived from animal sources, or xenotransplantation, where animal-derived tissues or organs are used to replace human tissue. The use of pig heart valves to replace diseased human valves has been practised for decades, and the possibilities of more widespread use of animal tissue to reduce waiting times for human organs is the current justification for these techniques. However, there is the future possibility of using animal-harvested tissue and organs to enhance human performance.

116 National Institutes of Health, National Heart, Lung and Blood Institute. https://www.nhlbi.nih.gov/health/genetic-therapies/benefits-risks.

Moral Enhancements

This chapter is concerned mainly with the physiological or pharmacological techniques which have been, or could be, applied to lead to physical enhancements. There has been much philosophical debate on the benefits or otherwise of using these techniques to bring about a "better" society, where evil intents are suppressed and good ones stimulated. Regarding specific techniques, the naturally occurring psychedelic drug psilocybin has been suggested,[117] but evidence for its efficacy seems to be absent. Others speculate that genetic engineering for moral enhancement will be both possible and justifiable to avoid the "ultimate harm" that a malevolent individual or group could inflict on the planet.[118]

"Others speculate that genetic engineering for moral enhancement will be both possible and justifiable to avoid the "ultimate harm" that a malevolent individual or group could inflict on the planet."

4.4 Ethical Issues

The ethical issues arising directly from the employment of the technologies just described will be outlined here; other sections will deal with the ethics of transhumanism.

Ethical Frameworks for "Thinking Machines"

If humans are to be interfaced with machines, it is important to be aware of efforts to introduce international codes of practice for such machines. If AI is to be trusted, then principles such as explainability, robustness, correctness, fairness, respect for privacy, and transparency should apply.[119] Unfortunately, transhumanism per se has not yet been incorporated into ethical frameworks being developed by the AI community. However, as the following quotation shows, there is a growing awareness of the need to do this:

> Transhumanism thus offers a somewhat disturbing vision of our future, a future where we extend ourselves with machines, and perhaps even upload ourselves onto them. And this is, at least in part, the vision driving a number of people working to advance AI.[120]

Equity

It is inevitable that some of the technologies just described are expensive. If used for restoring function, medical insurance or state medical providers may cover the cost, at least in part. For enhancement, it is inevitable that the rich will benefit, even though those who might benefit the most are the poor. The sale of

117 Michael N Tennison, "Moral transhumanism: the next step." *J Med Philos* 37 (2012): 405–16. https://doi.org/10.1093/jmp/jhs024.

118 Ingmar Persson and Julian Savulescu, "The turn for ultimate harm: a reply to Fenton." *J Med Ethics* 37, no. 7 (2011). https://doi.org/10.1136/jme.2010.036962.

119 Toby Walsh, *Machines Behaving Badly: The Morality of AI*. (La Trobe University Press, 2022.)

120 Walsh, *Machines Behaving Badly: The Morality of AI*., 30.

body parts by poor people to allow the rich to attempt to restore health or functionality ("body shopping") has a long and unfortunate history.[121] This publication quotes examples up to the present day, including examples of enhancements rather than restoration (in particular, cosmetic enhancements). Another inequity is in access to vaccines and medicines, whereby rich nations are advantaged, while the poorer nations, which may have the greatest need, are disadvantaged. However, it could be argued that rich individuals and countries funding the development of these technologies may ultimately benefit the poor in the longer term through the wider availability of these technologies in a restorative form. Many schools of economic thought exist on this point. Preventive technologies might be distinguished from both "restorative" and "enhancement," and should be considered part of the ethical discussion.

> **"For enhancement, it is inevitable that the rich will benefit, even though those who might benefit the most are the poor."**

Risk

Many of the techniques described above, particularly those involving implantation, come with risks of inflammation, infection, or rejection. For restoration under medical supervision, an assessment is made of benefit versus risk; this is not necessarily the case for many enhancement procedures. A clear example in the area of drugs for enhanced performance are the long-term early heart attacks, strokes, liver tumours, kidney failure, and psychiatric problems.[122]

Environmental Concerns

Many advanced enhancement devices require battery power, and their manufacture and eventual disposal is attended by an environmental cost arising out of the materials used. If the use of such devices becomes widespread, the environmental burden can become significant. For example, ICT technologies are expected to contribute 14% of total carbon footprint by 2040, and smart enhancement technologies could form a significant part of this.

Data Security

The storage and use of personal biomedical data in general and genetic data in particular also raises privacy concerns, especially regarding "bad actors" in this space. A common concern is whether insurance companies could gain access to that information (or the extent to which they should, to anonymised data, at least). In general, entities commercialising these technologies are required to comply with state cybersecurity law, but the onus is on them to employ the strictest encryption protocols to minimise the possibility of identifiable data getting into the wrong hands.

121 Craddock, *Spare Parts: A Surprising History of Transplants*.

122 C. James Watson et al, "Performance-enhancing drugs and the Olympics," *J Intern Med* 291 (2022): 181–196. https://doi.org/10.1111/joim.13431.

Chapter 5

Future and Speculative Transhumanist Technologies

By Cosimo Chiera and David Adams

In this chapter, we will look into the future and explore what might be if transhumanist technology became more mature and well-developed. While transhumanism seems to lay claim to a wide range of upcoming technologies, there are far too many to discuss here. We will focus on technologies needed to achieve the "holy grail" of transhumanism: the ability to directly access, copy, and instantiate a human mind.

We will attempt to glimpse the possible societies and personal consequences should such technology exist and become widely available. Through extrapolation of technology, as well as the hopes and aspirations of the current zeitgeist, we will visit possible societies both recognisable and alien in the same moment.

What place is left for Christianity in such technologically-materialistic societies? We will consider the redemptive nature of faith to quiet the excesses of such technology, and how forgiveness and wisdom can allow this new technology to become a vessel to ensure the betterment of humanity.

5.1 Introduction

While Chapter 4 described some of the existing transhumanist technologies, this chapter will build on those foundations to describe the more speculative technologies that transhumanists are proposing. In this chapter, we will look forward into the "what if" scenarios of science and consider technologies "just over the horizon" that transhumanists are advocating for, and we will also consider some of their potential impacts.

The first problem is that transhumanism, much like the cyberpunk movement before it, could be considered more techno- fetishism than science. So, what do we really mean when we talk about transhumanist technologies? According to many transhumanists,[123] these technologies include:

Cryonics

Virtual reality

Gene therapy/RNA interference

123 Michael Anissimov, "Top Ten Transhumanist Technologies." LifeboatHQ, 2019. https://lifeboat.com/ex/transhumanist.technologies.

Space colonisation

Cybernetics

Autonomous self-replicating robotics

Molecular manufacturing

Mega-scale engineering

Mind uploading

Artificial general intelligence (AGI)

Realistically, however, these are general themes of aspirational research, not bound to any particular ideology or philosophical movement. For example, dreams of space colonisation predated NASA's Werner von Braun and entered the global psyche with Sputnik, the Apollo mission, and Neil Armstrong's famous "small step."

In popular culture, transhumanism can be most associated with uploading the human mind to an artificial container, be that the pulp fiction brain in a jar or the post-modern computer/digital copy. This avoidance of existential crisis through technological enhancement was popularised by Kurzweil[124] and is a recurring theme in transhumanism.

For the purposes of focus, this chapter concentrates on mind uploading, with some digressions into the closely associated fields of virtual reality and AGI. The importance of emulation versus duplication will also be discussed, as will some ethical and theological considerations arising from the ability to storm the tabernacle of the mind.

In popular culture, transhumanism can be most associated with uploading the human mind to an artificial container, be that the pulp fiction brain in a jar or the post-modern computer/digital copy.

5.2 Storming the Tabernacle of the Mind

Duplicating a human mind is not a trivial task by any stretch of the imagination: the inner workings of the mind have been shrouded in much myth and mystery, and still are. Before contemplating the process of duplicating a mind independent of a human brain we need to have access to the ability to:

Record the memories of an individual

Provide stimuli or input to at least match the physical experiences of the human sensoria

Apply the processes that underlie human thinking to a set of memories

Enable conscious and self-reflective awareness of the mind-state

These are no small tasks and may be beyond our skills and abilities as a culture to perfect. However, as we discuss in the next section,

124 "Ray Kurzweil: The Coming Singularity," posted April 29, 2009, by Big Think, YouTube video, 7 min., 9 sec., https://www.youtube.com/watch?v=1uIzS1uCOcE.

significant progress is being made on teasing out the secrets of the brain and its inner workings.

That said, let us now explore the work being undertaken to achieve this monumental task.

The Lie of the Land Today

Before launching into any wild speculation, it is first important to examine the foundations of the transhumanist vision. For a broader understanding of the current state of technology associated with transhumanism, Chapter 4 of this document is a good foundation for what follows. We will specifically draw on and expand upon the discussion in the following sub-sections from the previous chapter:

> Picking up nerve and muscle electrical activity from the skin surface
>
> Electrical and magnetic stimulation
>
> Sensing nerve and muscle activity and delivering electrical stimulation within the body
>
> Mind control over a distance
>
> Enhanced cognition or memory

The key theme of this section is communication between the brain and some form of technology. At this stage in our cultural development, this is most likely to be a digital computer via some form of sensor array like the NexStem Instinct Headset,[125] or an implanted probe such as Elon Musk's Neuralink.[126] While these are relatively new technologies, they are both maturing quickly.

This development is driven by enthusiasts and military concerns, as fictionalised in the 1982 movie *FireFox*.[127] While true high-fidelity connection requires a much more substantial system, person-portable systems are already making strong progress in the market and providing useful data via stable software interfaces.

The major challenge with this hardware is not reading signals from the brain but rather interpreting what those signals mean. Determining meaning and context is the new hurdle to overcome, and, again, progress is being made in this field. In fact, with the advent of clearer and cheaper signal detection, hardware progress is noteworthy. Already we have an AI that has shown some success at decoding words heard by a subject from their brain activity.[128] Admittedly, retrieving words from brain activity is nowhere close to the ability of modern software like Siri or Alexa to interpret speech, but when compared to an equivalent piece of software like Dragon

125 Nexstem, "Meet Instinct." https://www.nexstem.ai/instinct-headset.

126 "Neuralink." https://neuralink.com/.

127 *Firefox*, directed by Clint Eastwood. (1982: Warner Bros).

128 Jonathan Moens, "An AI can decode speech from brain activity with surprising accuracy," ScienceNews, 2022, https://www.sciencenews.org/article/ai-artificial-intelligence-speech-brain-activity-accuracy.

Naturally Speaking that was released in 1997, we see substantial progress over a relatively short period of time. In other research, Carnegie Mellon University reports strong progress on decoding deeper thoughts,[129] as does Cornell University.[130] Similarly, access to what we see is being investigated in a way that allows the AI to interpret images it has not been trained to see.[131]

Clearly, we are picking the lock on gates to direct communication with the brain; with that we edge closer to being able to record the thoughts, memories, and emotions of a person and perhaps to downloading a human mind.

Once we have the data, then what?

We will consider two options in this section: emulation of the person based on the data and duplication of the mind-state using complex neural simulation.

In terms of emulation, Ray Kurzweil proposes that large language models would form the basis of the next stage of human development.[132] In this model, the recordings of the human's memories, thoughts, and feelings are "merged" with a large language model. Do these systems really constitute a sentient being, or are they simply a fallacy? In a Lex Fridman podcast, Kurzweil discusses an experiment using his father's written work with a software engine to enable him to have a conversation with this "post-mortal entity."[133] Certainly, Kurzweil is correct that with enough information it is possible that a credible imitation, or even emulation, of a human that could pass the Turing test. In fact, ChatGPT recently scored 155 in the Wechsler adult intelligent scale (WAIS),[134] indicating it is superior to 99.9 percent of the test takers. However, would this be a real person or simply a more advanced AI chatbot?

On the surface, the absence of an internal monologue is a major consideration as this seems to imply an absence of self-reflection. Without this inner voice it must be asked, "how do we define and redefine ourselves?" Again, we find there is research being undertaken to explore the very nature of this question.[135,136] While it is too

129 Shilo Rea. "Beyond Bananas: CMU Scientists Harness 'Mind Reading' Technology to Decode Complex Thoughts," Dietrich College of Humanities and Social Sciences, Carnegie Mellon University, 2017, https://www.cmu.edu/dietrich/news/news-stories/2017/june/brain-decoding-complex-thoughts.html.

130 Alexandre Défossez et al, "Decoding speech from non-invasive brain recordings," *Nature Machine Intelligence,* 5 (2023): 1097–1107, https://doi.org/10.1038/s42256-023-00714-5.

131 Guohua Shen et al., "Deep Image Reconstruction from Human Brain Activity," *PLOS Computational Biology* 15, no. 1 (2019): e1006633, https://doi.org/10.1371/journal.pcbi.1006633.

132 "Ray Kurzweil: Singularity, Super-intelligence, and Immortality | Lex Fridman Podcast #321," posted September 18, 2022, by Lex Fridman, YouTube, 1 hr., 36 min., 10 sec., https://www.youtube.com/watch?v=ykY69lSpDdo.

133 "Ray Kurzweil: Singularity, Super-intelligence, and Immortality | Lex Fridman Podcast #321."

134 Eka Roivainen, "I Gave ChatGPT an IQ Test. Here's What I Discovered," Scientific American, March 28, 2023, https://www.scientificamerican.com/article/i-gave-chatgpt-an-iq-test-heres-what-i-discovered/.

135 Jun Kitazono, Yuma Aoki, and Masafumi Oizumi, "Bidirectionally Connected Cores in a Mouse Connectome: Towards Extracting the Brain Subnetworks Essential for Consciousness," *Cerebral Cortex* 33, no. 4 (2023): 1383–1402, https://doi.org/10.1093/cercor/bhac143.

136 Japan Science and Technology Agency (JST), "Identifying Network Cores of the Brain with Strong Bidirectional Connections," JST Press Release, 2022, https://www.jst.go.jp/pr/announce/20220721-2/index_e.html.

early to say whether this work can be implemented in a digital form, it should be noted that many functions of the brain have been replicated by computers, so we should not discount this possibility.

If self-awareness can be duplicated in software and then merged with large language models and a recording of a human mind, would we then have moved from emulation to duplication? Or would we instead have created simply a more realistic chatbot?

Arguments against the complete modelling of the whole brain usually fall into two classes: computationally infeasible and inability to reach scanning resolution required. Again, we see strong progress in this area that addresses both concerns.

Attempting to address the issue of computational infeasibility, let us consider the *Caenorhabditis elegans* (or C. elegans), a 1 mm nematode which has the distinction of being the first organism to have had all 302 neurons in its body mapped in 1986 to produce a complete wiring diagram.[137] In 2022, the complete map of the 3013 neurons of fly larva was mapped,[138] an order-of-magnitude increase of model size with implications for the possibility of creating a digital snapshot of the human mind state and organic computation substrate.

With the connectivity mapped, this allows an estimate of the computational load needed to virtualise C. elegans.[139] Given that NEURON, a modelling package distributed by Yale University, is a preferred option for the C. elegans simulation, it will run on a wide variety of hardware platforms including Microsoft Windows (98 or later), UNIX, Linux, and OS X. It is also scalable to high end parallel hardware including Beowulf clusters, the IBM Blue Gene, and the Cray XT3. From this we can see that a full simulation of the human brain and mind state is possible, although not yet implemented.

Addressing the issue of scanning resolution of the functions of the human brain and mind, as noted in the section "The Lie of the Land" (previously), this is indeed a barrier we struggle to overcome.[140,141,142,143] As discussed, there is strong and steady progress on overcoming this issue and giving us access to our deepest inner selves.

So, if not now, then when?

If self-awareness can be duplicated in software and then merged with large language models and a recording of a human mind, would we then have moved from emulation to duplication? Or would we instead have created simply a more realistic chatbot?

137 Shelley Fan, "The First Complete Brain Wiring Diagram of Any Species Is Here," Singularity Hub, July 18, 2019, https://singularityhub.com/2019/07/18/the-first-complete-brain-wiring-diagram-of-any-species-is-here/.

138 Michael Marshal, "The 3013 Neurons in the Brain of a Fly Larva Have Been Mapped in Full," New Scientist, December 2, 2022.

139 Eduardo J. Izquierdo and Randall D. Beer, "The whole worm: brain–body–environment models of C. elegans," *Current Opinion in Neurobiology* 40 (2016): 23–30, https://doi.org/10.1016/j.conb.2016.06.005; Gopal P Sarma et al., "OpenWorm: overview and recent advances in integrative biological simulation of Caenorhabditis elegans," *Phil. Trans. R. Soc. B* 373 (2018): 20170382, https://doi.org/10.1098/rstb.2017.0382.

140 Nexstem, "Meet Instinct." https://www.nexstem.ai/instinct-headset.

141 "Neuralink," https://neuralink.com/.

142 Jonathan Moens, "An AI can decode speech from brain activity with surprising accuracy."

143 Shilo Rea, "Beyond Bananas: CMU Scientists Harness 'Mind Reading' Technology to Decode Complex Thoughts," Dietrich College of Humanities and Social Sciences, Carnegie Mellon University, 2017, https://www.cmu.edu/dietrich/news/news-stories/2017/june/brain-decoding-complex-thoughts.html.

Technologies and Timelines Near the Event Horizon

Probably the most contentious part of transhumanism is the various predictions of what, and when, key milestones will occur. Predictions, both positive and negative, are rarely correct, and many fall well outside any reasonable error bound. It's tempting to fall to the status quo and say "maybe" or even "never" but we should all heed the cautionary note echoing down through the ages as Galileo allegedly muttered, "Eppur si muove." ("And yet it moves.")

Probably the most contentious part of transhumanism is the various predictions of what, and when, key milestones will occur.

One of the key future events we must consider is the Singularity, a term coined by John von Neumann in the 1950s and popularised by Ray Kurzweil in 2005.[144,145] It refers to a hypothetical point in time in the future when technology begins to grow beyond the control of our civilisation. The Singularity is now generally linked with the emergence of artificial general intelligence (AGI), and the uploading of a human mind, which, by definition, would also be artificial. One possible implication is that we, as a species, may be unable to keep up with such technological changes and would therefore be relegated to history along with the dinosaurs. Alternately, humans might merge with technology to become posthuman, a new hybridised species, as alien to modern humans as anything in our wildest movies.

Since the Singularity is the background to all speculative technology, an important question is: when will this event happen? Kurzweil and many others have noted the nonlinear doubling time of technology and knowledge over the breadth of human history. Using standard mathematical extrapolation techniques, it is trivial to arrive at an estimate of between 2045 and 2050 for the date when the Singularity begins, with an error bound of no more than five years either side.[128]

At the other end of the spectrum, Dr Toby Walsh, Laureate Fellow and Scientia Professor of Artificial Intelligence at the Department of Computer Science and Engineering at UNSW Sydney, contends that the Singularity may never happen.[146] Professor Michael Woolridge, Professor of Computer Science in the Department of Computer Science at the University of Oxford, and a Senior Research Fellow at Hertford College, is reported as stating "neither I nor anyone else would know how to measure progress" [towards AGI].[147]

144 "Ray Kurzweil: The Coming Singularity," posted April 28, 2009, by Big Think, YouTube, 7 min., 9 sec,. https://www.youtube.com/watch?v=1uIzS1uCOcE.

145 Ray Kurzweil, *The Singularity Is Near: When Humans Transcend Biology*, (Viking, 2005).

146 Toby Walsh, "The Singularity May Never Be Near," Medium (blog), October 6, 2017, https://medium.com/@tobywalsh/the-singularity-may-never-be-near-610988dbd34.

147 Nick Heath, "What is Artificial General Intelligence?" ZDNet, August 22, 2018, https://www.zdnet.com/article/what-is-artificial-general-intelligence/.

Trying to gauge the general opinion of the experts in the field, AI Multiple conducted a survey of 1700 AGI experts.[148] The results were:

> **2009:** 21 AI experts participating in AGI-09 conference believed AGI will occur around 2050, and plausibly sooner
>
> **2012/2013:** 550 AI researchers were surveyed:
> - 10% of participants think that AGI is likely to happen by 2022
> - For 2040, the share is 50%
> - 90% of participants think that AGI is likely to happen by 2075
>
> **2017:** 352 AI experts who published at the 2015 Neural Information Processing Systems (NIPS) and International Conference on Machine Learning (ICML) conferences estimate a 50% chance that AGI will not occur until 2060
>
> **2019:** 32 AI experts participated in a survey on AGI timing:
> - 45% of respondents predict a date before 2060
> - 34% of all participants predicted a date after 2060
> - 21% of participants predicted that singularity will never occur

From this, we would have to conclude that the Singularity is most likely in the range 2045 to 2075, with the current highest likelihood at about 2060. Significantly, this date is well within the lifespan of most people under forty years of age in 2022, and for those graduating from high school, this upheaval will occur during their working lives.

Against the backdrop of the Technological Singularity predicted to occur between 2045 and 2075, we now cast an eye forward to cutting edge, bleeding edge, and fully speculative technologies.

Technologies Between Now and the Singularity

Duplicating a human mind is a mammoth undertaking, reliant on many years of technological advances. A concerted effort is required to develop a whole new brain-focused technology that aims to replace the current control interfaces with instructions directly read from the brain, and responses fed back via nerve channels or imprinted directly onto the appropriate neural structures.

First and foremost, the currently "bleeding edge" or experimental technologies such as Elon Musk's Neuralink[149] and NexStem's[150] Headset need to mature sufficiently to be considered commercially viable and then taken up by the wider populace. Developing alongside these technologies will need to be the knowledge gleaned from the Brain 2.0 project[151] and other attempts to map the entire human brain. The better we can understand the functions and

148 Cem Dilmegani, "When Will Singularity Happen? 1700 Expert Opinions on AGI," AI Multiple. https://research.aimultiple.com/artificial-general-intelligence-singularity-timing/.

149 "Neuralink." https://neuralink.com/.

150 Nexstem, "Meet Instinct." https://www.nexstem.ai/instinct-headset.

151 John Ngai, "BRAIN 2.0: Transforming Neuroscience," *Cell* 185, no. 1 (2022): 4–8, https://doi.org/10.1016/j.cell.2021.11.037.

topography of the brain, the better services and access can be implemented, making for a better user experience.

New technologies are not adopted in a wholesale fashion but rather progressively over time. If public sentiment turns against a particular technology or outcomes, social inertia may drastically slow the progress of development. We have seen this with the emergence of "vaccine hesitancy" arising from the handling of COVID-19 vaccination programs and their media reception. A medical accident with Neuralink, for example, could halt that entire path of development before it even starts to yield results.

Another technology that needs to mature is Prosthetic Hippocampus[152] which would provide a unique channel for data return. Instead of stimulating the optic centre of the brain to create a "screen view" or a voice whispering into the auditory nerves, the user could simply "remember" the answer. This would provide a radically new way of experiencing technology and blur the difference between the self and technology.

If technology adoption follows historical patterns, communication and utility will be the first point of call for this new technology. Like the iPhone, the ability to share thoughts, feelings, knowledge, and intent with others might drive consumer adoption of neural interface technology. With the equivalent of "apps" to provide entertainment, computer access, and web access to this neural interface technology, this could easily render the mobile phone obsolete.

There are many consequences to consider, including hardwired network links, digital senses, electro-telepathy, and electro-telekinesis. With the development of an "intentionality interface," based on the delay between decision-making and conscious awareness of decisions,[153] the Internet of Things (IoT) becomes a dynamic environment adapting to our needs before we are even aware of it.

Augmentation systems also become available with this technology. Mathematical problems, both complex and trivial, can be shunted off to appropriate calculation services and the results appear in the mind's eye. For example, directions to a destination would be easy to remember with such technology, even if you have never been there before. Remote conferencing becomes just another reality, where the users can project themselves into each other's visual field, appearing to be standing next to each other. What would have once been considered miraculous would become just a common, everyday activity.

Beyond the usual consumer applications, there are numerous social pressures to consider. Infrastructure and bandwidth requirements become a priority. Safety and privacy of minds would become

152 Theodore W. Berger et al., "A Hippocampal Cognitive Prosthesis: Multi-Input, Multi-Output Nonlinear Modeling and VLSI Implementation," *IEEE Trans Neural Syst Rehabil Eng* 20, no. 2 (2012): 198–211, https://doi.org/10.1109/TNSRE.2012.2189133; Dong Song, "Toward a Hippocampal Memory Prosthesis," Foresight Institute, https://foresight.org/summary/dong-song-usc-toward-a-hippocampal-memory-prosthesis/.

153 Roger Koenig-Robert and Joel Pearson, "Decoding the Contents and Strength of Imagery before Volitional Engagement," *Scientific Reports* 9 (2019): 3504, https://doi.org/10.1038/s41598-019-39813-y.

a hotly debated legal issue. The nature of crime would change when recordings of victims and accused can be directly examined. What of rehabilitation? Lying is impossible if your mind can be read, and if those criminal impulses can be removed, would that be a choice or a requirement by law for release? More troubling, what would constitute the obligation of evidence in this brave new world of thought manipulation, or would "intent" lead us down the path to the movie *Minority Report*?[154]

> **One of the most radical transhumanist goals is the ability to back up the whole human mind.**

One of the most radical transhumanist goals is the ability to back up the whole human mind. It is estimated that the human mind needs approximately 2.5 petabytes of space to be fully duplicated. To put this in perspective, the image of the black hole Sagittarius A* required five petabytes, so the capacity is available now. If we consider the implications for a population, Google currently stores more than 1 million petabytes of data or 400,000 people stored digitally, or the entire resident population of the Sunshine Coast, Queensland. We could create a techno-necropolis where minds live in virtual environments and communicate with the living through scenes or via a direct neural interface; a world where our best and brightest need not be lost to death. However, what we lack is the capability to record a brain in fine detail and the understanding of how to run such a recording.

As we accelerate towards the Singularity, knowledge growth, social pressure, and the fear of falling behind and becoming obsolete will drive the transhumanist technological push. As this technology matures, our descendants may even seek to address the existential fear of societal collapse by including new organs into our DNA. These new organs would take the place of electronics, providing us with bio-radio/electro telepathy. We would have started the process of *becoming* our technology, not merely users of technology.

Getting on the Curve

The fear of loss is the greatest motivator of the modern era[155] and certainly a favourite trick of salespeople. One of the drivers of transhumanism will be the same as what has driven smartphones and social media: the fear of missing out on all it offers. This utility lies in the ability to collate, manage, and derive meaningful information from the massive volume of data our technological society is generating. Coincidentally, these same requirements are driving the development of AI and big data analytics, hinting that these technologies will converge with transhumanism in the near future.

154 *Minority Report*, directed by Steven Spielberg. (2002: 20th Century Fox).

155 Stijn A. A. Massar, Zhenghao Pu, Christina Chen, and Michael W. L. Chee, "Losses Motivate Cognitive Effort More Than Gains in Effort-Based Decision Making and Performance," *Frontiers in Human Neuroscience* 14, no. 287 (2020), https://doi.org/10.3389/fnhum.2020.00287.

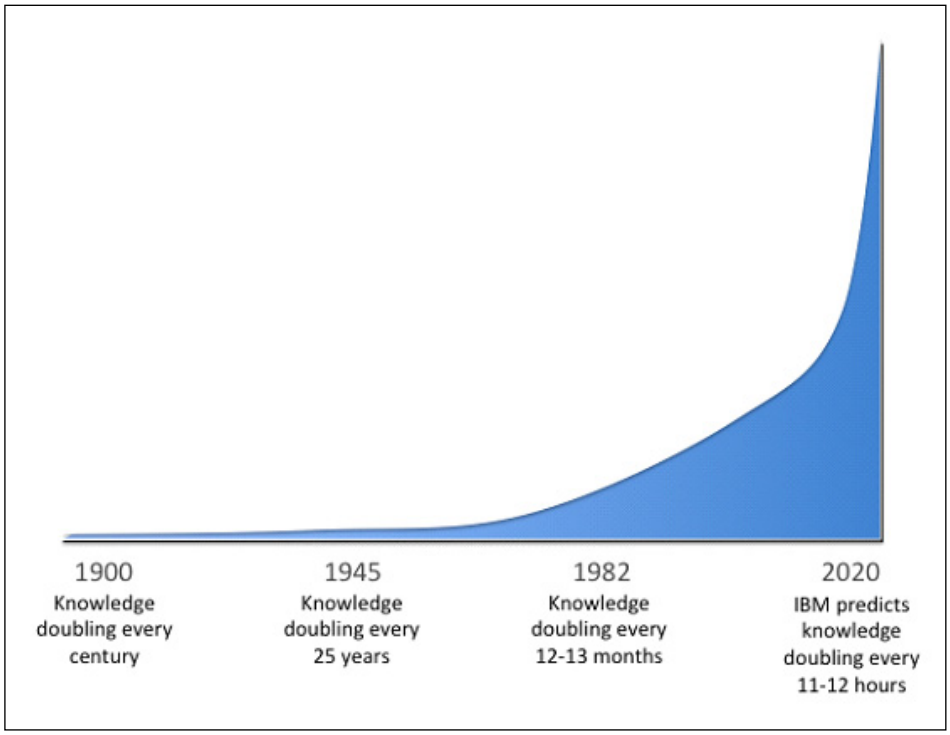

Figure 6. Buckminster Fuller's Knowledge Doubling Curve, with post-1982 addition by IBM (Rosenberg, 2017)

Given the history of technology adoption, we can expect this to divide[156] our communities into three loosely-defined strata:

1. The adepts: those who have either the wealth,[157] benefits of high-quality education,[158] or neural gifts to enable them to embrace the transformation and fully or significantly exploit its power.
2. The user base: like today, most users of advanced technology have little or no understanding of the depth and power of the technology we have. While still educated, they are content to use the technology for entertainment and ease of living.
3. The left behind: this is a complex cluster to address. At the risk of a generalisation fallacy, they can be classified into those unable to change, unwilling to make the change, and a mix of both.

156 Jan AGM Van Dijk, "Digital Divide: Impact of Access," In *The International Encyclopedia of Media Effects* (John Wiley & Sons Inc., 2017).

157 Christian Fuchs, "The Role of Income Inequality in a Multivariate Cross-National Analysis of the Digital Divide," *Social Science Computer Review* 27, no. 1 (2009).

158 Mark Warschauer, Michele Knobel, and Leeann Stone, "Technology and Equity in Schooling: Deconstructing the Digital Divide," *Educational Policy* 18, no. 4 (2004), https://doi.org/10.1177/0895904804266469.

a. In terms of unable to change, it is a sad reflection of the educated divide[159] and skills shortfall in our society, that will relegate many to minimal share of the bounty of this new social currency.

Neurodiversity also plays a factor, as some will not be able to adapt to the sophistication of new technologies without compassion and support.

Ageing also plays a factor in resistance to change: as many today struggle with mobile and online technologies, we can expect the same for these new technologies.[160]

Then there is the loss of cultural identity. This was observed in the migrations of the 1950s and 60s to Australia, where migrant communities became fossilised in time, clinging to an ideal of traditions that existed only in their memories.[161]

b. As to those who actively resist change, there are many other factors for choosing to get off, or not get on, the technology curve.

There is a growing movement to support the preservation of tradition and culture.[162] Cultural sustainability is a movement seeking to preserve the uniqueness and diversity of cultures in the face of technological and cultural hegemony.

Religious beliefs provide a moral and behavioural framework for most of the world's population, and have often endured friction with new social pressures and developmental trends.[163,164]

In this technologically-addicted world, it is easy to forget that there are other, deeper philosophical understandings of humanity. This small group of seekers of deeper wisdom may also reject transhumanism.

> **"One of the drivers of transhumanism will be the same as what has driven smartphones and social media: the fear of missing out on all it offers."**

We see this mirrored in the stratification of Western society by access to wealth, education, and health resources, where those able to command the most wealth are granted the most agency. We can

159 Warschauer, Knobel, and Stone, "Technology and Equity in Schooling: Deconstructing the Digital Divide."

160 Javiera Rosell, "Use of Technology—Does Age Matter?" Oxford Institute of Population Ageing, University of Oxford, March 17, 2021, https://www.ageing.ox.ac.uk/blog/use-of-technology-does-age-matter.

161 Nina Evason, "Italians in Australia," Cultural Atlas, Special Broadcasting Service (SBS), 2017, https://culturalatlas.sbs.com.au/italian-culture/italian-culture-italians-in-australia.

162 UNESCO, "What is Intangible Cultural Heritage?" UNESCO, 2022, https://ich.unesco.org/en/what-is-intangible-heritage-00003.

163 David Masci, "5 Facts About Evolution and Religion," PEW Research Center, October 30, 2014, https://www.pewresearch.org/fact-tank/2014/10/30/5-facts-about-evolution-and-religion/.

164 Michael Lipka, "The Religious Divide on Views of Technologies That Would 'Enhance' Human Beings," PEW Research Center, July 29, 2016, https://www.pewresearch.org/fact-tank/2016/07/29/the-religious-divide-on-views-of-technologies-that-would-enhance-human-beings/.

expect this to be the same for those who can leverage the most knowledge, predictive power, and technological innovation to gain the most agency.

Initially, those in positions of wealth will have ready access to both the technology and training to adopt this new state of being. However, as the volume of knowledge increases and those poorly adapted either step off the curve or drown in the data, a winnowing process will change the nature of those at the apex. Unlike today's siloed knowledge that limits wider impact of specialists, transhumanism presupposes a widening of knowledge and hence influence.

The greatest tragedy of this is that, given the rate of growth in knowledge and power of our technological society, those who step off the curve may never be able to catch up with those ahead of them.

What then for charity?

What will be the nature of compassion across such a great divide?

In the next section we will look across the divide and speculate on what awaits us.

5.3 Homo Cognitus in a Post-Singularity World

Direct access to the mind allows for a number of powerful social pressures that we have never had to consider before. Moving well beyond the short-sighted concern of technological immortality, there are far larger technology consequences to this breakthrough, including:

Backup memories and emotional states

Ancillary memory (inbuilt or via cloud) providing eidetic recall

Access to shared memory pools of knowledge, learning, experiences

"Muscle memory" skills access

Electro-telepathy

Narrow AI augmentation interface, such as: symbolic mathematics systems; language and grammar checkers; or knowledge base search, returned as short-term memories.

Augmented reality, allowing sensory overlays to enhance the knowledge content of our experience of the world.

While this is a rich field for the budding science fiction writer to draw upon, or a transhumanist enthusiast to promote for their utopian dreams, these technologies are also powerful social drivers that will forever change what happens to our culture, social relationships, and even personal identity. Here, we will speculate on some of the consequences through four hypothetical vignettes: visions of the future that could await us.

The Great Many

> Now the Lord God had planted a garden in the east, in Eden; and there he put the man he had formed. The Lord God made all kinds of trees grow out of the ground—trees that were pleasing to the eye and good for food. In the middle of the garden were the tree of life and the tree of the knowledge of good and evil. (Genesis 1:9)

In the "Great Many," humans create a shared memory space in which skills and knowledge are unified and available to be "remembered" by anyone. As in *The Matrix* movie,[165] learning is simply a matter of downloading the required skills and knowledge, but in this form, it is always on, and new discoveries are added to the community pool.

While it sounds advantageous to be able to gain skills as simply as an internet search and as time consuming as streaming a movie, there are a number of social consequences to this technology.

While it sounds advantageous to be able to gain skills as simply as an internet search and as time consuming as streaming a movie, there are a number of social consequences to this technology.

The first impact applies to the education system in which we spend at least twelve years learning the skills needed to function at a basic level in our society. As a beneficiary of the knowledge of The Great Many, that is no longer necessary, as the actual learning process is fully automated. We already see the first glimmers of this in Silicon Valley, USA, where a school has "quietly" introduced a large language model dubbed "Khanmigo" as a tutor for students.[166] Instead, teachers would become guides focused on three broad domains of competence: the cognitive domain (reasoning and memory); the intrapersonal domain (managing one's behaviour and emotions), and the interpersonal domain (expressing ideas and interpreting and responding to messages from others).[167] The classroom as we know it would become a thing of the past, but one of the functions of education is to prepare children to be ready for "the factory" according to Sir Ken Robinson of the Royal Society of the Arts (RSA).[168] In a world where acclimatisation to a key social norm is no longer necessary, what then will be the role and function of the teacher?

Similarly, treatment of terminal diseases and the nature of hospitals would change with access to this technology. Why waste resources and inflict cruel pain on terminal patients when their minds can be backed up, if not already recorded, and their consciousness transferred to a virtual reality or reincarnated in a cloned body, as explored in the movie *The 6th Day*?[169] The humanitarian impulse to help our fellow humans avoid suffering and loss is a powerful driver and would certainly come into play. Who would not be moved to do away with deformity, right the twisted and often painful genetic

165 *The Matrix*, Directed by The Wachowskis (1999: Warner Bros).

166 Lisa Bonos, "Say hello to your new tutor: It's ChatGPT," The Washington Post, April 3, 2023, https://www.washingtonpost.com/technology/2023/04/03/chatgpt-khanmigo-tutor-silicon-valley/.

167 Margaret Hilton, "Preparing Students for Life and Work," *Issues in Science and Technology* 31, no. 4 (Summer 2015).

168 Ken Robinson, "Changing Education Paradigms," RSA Events, https://www.youtube.com/watch?v=zDZFcDGpL4U.

169 *The 6th Day*, directed by Roger Spottiswoode (2000: Sony Pictures Releasing).

distortions of the body and mind? Then, there is also the humanitarian impulse to protect the helpless and we must consider, is a clone an empty vessel of an ensouled[170] human (our twin) denied their chance at life? Will we see a future where we must contend with the ethical crisis explored in *The World of Krypton* (1978),[171] will we too cry out "*Minds for the Mindless*"?

The concept of travel would also be impacted by this technology. Why bother with all the trouble of long, boring flights, jet lag and the risk of illness when you can simply "remember" being on the best possible version of the holiday you wanted to go on, as dramatised in the 1990 movie *Total Recall*.[172] If a memory can be recorded, then memories can be edited, spliced, and tailored to a narrative a consumer wants. Skilfully done, this could be uploaded and indistinguishable from reality.

So to, the concept of justice would be impacted upon. It is quite possible that a convincing memory of a crime could be uploaded into an unsuspecting victim, effectively framing them for a crime they didn't commit. Alternatively, what would be the recourse for the law if someone had all knowledge of a crime edited out of their memories? Could we punish them for a crime they thought themselves innocent of, despite physical evidence to the contrary? And what of those who, perversely, upload memories of crimes they did not commit for the thrill, as explored in the movie *Strange Days* (1995).[173] Where do we find true justice in all this?

Truly, uploading and downloading or backing up the information and processes stored in the human mind has the potential to change our world in profound, but not necessarily totally unforeseeable, ways. Anyone from our "always online" civilisation could probably make the jump to this post-individual experience society.

But that is not all this technology is capable of …

> "You will not surely die," the serpent told her. "For God knows that in the day you eat of it, your eyes will be opened and you will be like God, knowing good and evil." (Genesis 3:4–5)

The enthusiasts and science fiction writers would have us believe that this new technology will conquer death,[174] empower all humanity to be wise,[175] and ennoble us; but this is not necessarily so. The cheapening of life and disparity of wealth could just as easily lead to a world where the rich and powerful enjoy the benefits while the poor are left to fend for themselves.[176] Humans have a tenacious ability to co-opt

170 Larry Poston and Lindsey Disney, "When Does Human Life Begin? Conception and Ensoulment," *Bible & Religion Educator Scholarship* 7 (2010), https://mosaic.messiah.edu/brs_ed/7.

171 John Byrne, *The World of Krypton*, Issue 1 (DC Comics: 1987).

172 *Total Recall*, directed by Paul Verhoeven (1990: TriStar Pictures).

173 *Strange Days,* directed by Kathryn Bigelow (1995: 20th Century Fox).

174 Greg Bear, *Eon*, (Open Road Integrated Media, 1985).

175 Alastair Reynolds, *Chasm City*, (Orbit, 2001).

176 Richard Morgan, *Altered Carbon*, (Gollancz, 2018).

any technology to pleasure or even vice, and no doubt some "entrepreneur" will do exactly that.

The 1995 movie *Strange Days* explores the idea of selling memories of experiences and the depths to which people will go to for the fulfilment of their dark pleasures. This is not a new concept, the internet was launched with the noble concept of providing information to everyone, enabling all of us to become wise and well-informed. The reality is somewhat less inspiring with an estimated 45.6% of internet traffic in 2023 being spam (thankfully down from the 2011 level of 80.26%), [177] while estimates ranging from 13%–30% of internet traffic is related to pornography. [178] It is not hard to see people creating darker and more perverse experiences for those seeking the "ultimate thrill" or "maintain a high."

> **Humans have a tenacious ability to co-opt any technology to pleasure or even vice, and no doubt some "entrepreneur" will do exactly that.**

Then there is the danger of false epiphany used by the unscrupulous to brainwash converts, which was explored in the novel *Warbots*[179] and reinforcing extremist doctrine which is explored in the series *The Neverness Cycle*.[180] Certainly, it is a chilling idea for the next Jim Jones or David Koresh to combine a charismatic leadership with a coercive "epiphany" designed to brainwash those seeking salvation. Then there are the obvious military uses, such as the pseudo-patriot who believes they are on a holy mission. One need only imagine the 9/11 bombers, but instead of a few zealots, now a mass-produced army of devoted martyrs to their cause. But possibly saddest and most terrible is the lazy ossification of ritual, rather than face the struggle for salvation as explored in Book 1 of *The Neverness Cycle: The Broken God* in which followers opt for electronic memories of others' epiphanies rather than working to find their own path to salvation.

The Beautiful Sinless

> Sin corrupts a person's relationship with God: Sin separates man from God. Sin takes a person into immense debt and subjects him to condemnation. (Matthew 18:23–32)

In this case we will consider the concept of editing minds, for with direct access to inspect, record, and back up minds, we gain a powerful insight into the workings of the person. There is already significant work being done on reading minds, but one significant piece is work on detecting the formation of thoughts before we are consciously aware of the decision we intend to make.[181]

With direct access to the brain and the hardware necessary to influence neuron firing, a "morality augmentation assistant"

177 Statistica, "Global Spam Volume as Percentage of Total E-mail Traffic from 2011 to 2023," Statistica, 2024, https://www.statista.com/statistics/420400/spam-email-traffic-share-annual/.

178 Katharina Buchholz, "How Much of the Internet Consists of Porn?" Statistica, 2019, https://www.statista.com/chart/16959/share-of-the-internet-that-is-porn/.

179 G. Harry Stine, *Warbots* (Pinnacle Books, 1988).

180 David Zindell, *The Neverness Cycle* (Spectra, 1988–1998).

181 Koenig-Robert and Pearson, "Decoding the Contents and Strength of Imagery before Volitional Engagement."

could be devised to moderate or eliminate unwanted behaviours. From treatment of epilepsy, we know cascades in the brain can be short-circuited. In the case of severe depression, electroconvulsive therapy (ECT) can provide swift and significant help. With more subtle technology, this form of thought modification would have applications in a variety of mental health arenas.

Being what we are, humans may start with the best of intentions, intending to heal the broken mind, but eventually someone will find other ways to apply this technology. Stimulating fear or pain to create areas or activities that are prohibited. Creating or preventing thoughts and feelings to strip away control from an individual, as was done using the fictional zone implant in the science fiction series *The Gap Cycle*.[182]

> Those controlled by the sinful nature cannot please God. (Romans 8:8)

The ability to detect and stop improper thoughts presents a frightening opportunity, as was explored in *Minority Report* (2002).[183] The presence and nature of sin has been the bane of the faithful since the beginning, but does transhumanism offer a solution to the burden of sin? What if some chose to reject all possibility of sin, much like the Amish choose to reject modern technology?

The social impact of this flows along the same lines as the "Tranquil Hegemony," discussed below, but is a far blunter tool in this application. The trap in this is what behaviours are to be suppressed? It would seem reasonable to supress medically-related behaviours such as mental instability, suicidal modalities, depression, and addiction. But then what about social ills like thoughts of murder, rape, theft, abuse, infidelity, and bullying? Few would argue the world would not be better without such blights in our world.

Then what about ideologies, doctrines, and theological interpretations? On this slippery slope it is easy to help the believers by removing doubt, impatience, anger, and scepticism. Leaving room for happiness, faith, and contentment in the absence of distractions. Where then does curiosity go to die?

The worst aspect of this "thought cage" is that we are unable to even question it, because we cannot think about the boundaries to our thinking, much less question them.

But is the cost of this "state of grace" worth all of this manipulation of the mind? Is this true to God's judgement of our labours? Does loss of choice make us sinless or merely harmless?

Being what we are, humans may start with the best of intentions, intending to heal the broken mind, but eventually someone will find other ways to apply this technology.

182 Stephen Donaldson, *The Gap* (Bantam Books, 1991–1996).

183 *Minority Report*, Spielberg.

In our search for *theosis*, seeking to escape the trials and temptations of the world is to deny our chance to become good, great, and filled with grace and instead to embrace cowardice and sloth.

> Consider it pure joy, my brothers and sisters, whenever you face trials of many kinds, because you know that the testing of your faith produces perseverance. Let perseverance finish its work so that you may be mature and complete, not lacking anything. If any of you lacks wisdom, you should ask God, who gives generously to all without finding fault, and it will be given to you. (James 1:2–5)

Unpacking any technology that influences our thoughts is dangerous enough, but one that changes our thinking without our awareness of the changes is particularly dangerous. We, as a society, must tread very carefully here, for there is much good and terrible evil that could arise from this. Even if restricted to applications in medicine and forbidden as an "enhancement," we would do well to tread lightly.[184]

Beyond medical applications it is hard to see any application of this form of the technology that does not lead to ruin, domination, and crushing of the human soul.

The Tranquil Hegemony

> Submit yourselves for the Lord's sake to every human authority: whether to the emperor, as the supreme authority, or to governors, who are sent by him to punish those who do wrong and to commend those who do right. For it is God's will that by doing good you should silence the ignorant talk of foolish people. Live as free people, but do not use your freedom as a cover-up for evil; live as God's slaves. Show proper respect to everyone, love the family of believers, fear God, honour the emperor. (1 Peter 2:13–17)

It is the dream of every nation that the body politic be truly represented by their ruling elites. In the novel *The Prefect*[185] a fictional Democratic-Anarchy is described in which every person votes on every decision via implants that connect them to the polling system. While it is a small part of their implant technology, socially it leads to a society where everyone is heard, were unbiased systems faithfully record decisions and those charged with governing are bound by those votes with no licence to have a "mandate" or "backdown on decisions."

> Then the Lord God said, "Now these human beings have become like one of us and have knowledge of what is good and what is bad. They must not be allowed to take fruit from the tree that

184 Andrew Sloane, "Enhancing Medicine? Should Medicine Be in the Business of Human Enhancement?" Conference on Science and Christianity (COSAC) 2022, November 25–26, Ridley College Melbourne & Online.

185 Alastair Reynolds, *The Prefect* (Gollancz, 2007).

> gives life, eat it, and live forever." So the Lord God sent them out of the Garden of Eden and made them cultivate the soil from which they had been formed. Then at the east side of the garden he put living creatures and a flaming sword which turned in all directions. This was to keep anyone from coming near the tree that gives life. (Genesis 3:22–24)

With the advent of direct neural interfacing or the ability to electronically read minds, it is possible to craft a "uni-mind" that collates and collects our opinions, knowledge, and decisions, to create a system by which the will of the people is truly reflected … and humans being humans, to put it in charge.

"With the advent of direct neural interfacing or the ability to electronically read minds, it is possible to craft a "uni-mind" that collates and collects our opinions, knowledge, and decisions, to create a system by which the will of the people is truly reflected."

There have been various attempts to explore this future: both utopian, such as the benevolent Grandmother of Japan 4001[186] and dystopian, most famously the ruthless supercomputer in Colossus: The Forbin Project.[187] The common theme in all these stories is that humans languish in banality and stagnation when removed from their place in leadership.

Worse still, in times of conflict what would such a meta-mind do, stoked by the fears and hatred of the body politic? We have a not-so-subtle clue after Google exposed one of its AI systems to the internet, only to discover it became extremely racist.[188] OpenAI had similar embarrassment when it was discovered its AI was offering instructions on how to shoplift and other anti-social behaviour.[189] Even one of the latest large language models, ChatGPT, has been found to "lie" when it does not have a complete knowledge of the question asked.[190]

We should not be surprised at such outcomes when we use ourselves as the template for constructing some sort of human emulation. Nor should we be surprised at the public anger and outrage as most people resent the image in a mirror when it is presented to them.

This warning from our first dabbling with the mirror of ourselves has important concerns about our place in this new world too. As is warned in *The Strength of the Stones*,[191] if we simply restrain such a uni-mind with "laws," be they religious, Asimovian, or otherwise, we quickly discover that we, as a species, rarely live up to our ideals. Despite all the warnings and evidence, there will undoubtably be ideologues out there who would wish to engage in this sort of social experiment, perhaps including some degree of

186 Jim Shooter and Paul Creddick, *Robot Fighter Magnus, Rai: Spirit against the flesh,* Issue 5 (Valiant Comics, 1991.)

187 *Colossus: The Forbin Project*, directed by Joseph Sargent (Universal Pictures, 1970).

188 Cade Metz, "Who Is Making Sure the A.I. Machines Aren't Racist?" *The New York Times*, March 15, 2021, https://www.nytimes.com/2021/03/15/technology/artificial-intelligence-google-bias.html.

189 Maggie Harrison, "OpenAI's New AI Offers Detailed Instructions on How to Shoplift," Futurism, 2022, https://futurism.com/openai-ai-detailed-instructions-how-to-shoplift.

190 Simon Willison, "Review of We Need to Tell People ChatGPT Will Lie to Them, Not Debate Linguistics," Simon Willison's Weblog (blog), April 7, 2023, https://simonwillison.net/2023/Apr/7/chatgpt-lies/.

191 Greg Bear, *Strength of Stones* (Ace Books, 1981).

compliance control for the meta-mind to apply to the population to ensure compliance.

In all likelihood, our deification of a meta-mind will result in our fall from civilisation with the survivors returned to primitive lifestyle, scratching out an existence in the shadows of our hubris.

> For he says to Moses, "I will have mercy on whom I have mercy, and I will have compassion on whom I have compassion." It does not, therefore, depend on human desire or effort, but on God's mercy. For Scripture says to Pharaoh: "I raised you up for this very purpose, that I might display my power in you and that my name might be proclaimed in all the earth." Therefore, God has mercy on whom he wants to have mercy, and he hardens whom he wants to harden. (Romans 9:15–18)

How then do we redeem our technology from ourselves? Sadly, the simple answer of "don't do it" is lost to us as a species, as was demonstrated bluntly with the development of atomic weapons. Somewhere, someone will attempt to create a uni-mind. It is a possible progression of the "Great Many" discussed previously and is a tempting addition to humanity's vast knowledge and technology basis. It is also a possible pathway to "Deus Machina," discussed following which adds to its temptation to attempt.

If we seek grace, forgiveness, and atonement in the uni-mind, as we seek it in ourselves, then this is a powerful tool illuminating both our successes and where our need is unmet. Extrapolating from Big Data, it is all about the questions we ask, and that reveals more about us than it does about the data. Social media readily demonstrates that trending is not necessarily healthy, as a bandwagon fallacy is rarely the safest option.

Through the formation of the uni-mind we have the opportunity to exercise greater *theosis* by gaining a near-omniscient view of our society, but then rise to the challenge of earning the wisdom to use that depth of vision to develop within ourselves the peace, grace, and joy to undertake good works and, in doing so, raise the quality of the uni-mind itself.

Deus Ex Machina

> But ask the animals, and they will teach you, or the birds in the sky, and they will tell you; or speak to the earth, and it will teach you, or let the fish in the sea inform you. Which of all these does not know that the hand of the Lord has done this? In his hand is the life of every creature and the breath of all mankind. (Job 12:7–10)

For the longest portion of human history, we have, as both individuals and cultural groups, been obsessed with the collection of resources.[192] Over that great expanse of time, the lives of our ancestors were

192 Yuval Noah Harari, *Sapiens: A Brief History of Humankind*, (Random House UK, 2019).

delicately interwoven with the great "web of life," and it was only when we began our dalliance with agrarianism that we began to separate ourselves from the great web of life. That separation became even greater with the industrialisation era with our proliferation of factories, mills, industrial farming, science, and concrete hives called cities.

But still, a deep longing for the connectedness of the web remains lurking just below the surface of our thoughts.

> "You are my war club,
> my weapon for battle—
> with you I shatter nations,
> with you I destroy kingdoms,
> with you I shatter horse and rider,
> with you I shatter chariot and driver,
> with you I shatter man and woman,
> with you I shatter old man and youth,
> with you I shatter young man and young woman,
> with you I shatter shepherd and flock,
> with you I shatter farmer and oxen,
> with you I shatter governors and officials.
> (Jeremiah 51:20–23)

"For the longest portion of human history, we have, as both individuals and cultural groups, been obsessed with the collection of resources"

The cobblestones of this path are not laid in the realms of New Age hippies rediscovered, nor out of some grand climate change activism. This path is already being laid by the likes of Defence Advanced Research Projects Agency (DARPA), Australian Army Research Centre, Lockheed Martin's Skunk Works, and their ilk in the global military defence industry. The reason is not hard to deduce when defence forces are expensive to train and maintain (fighter pilots cost between 10–15 million dollars), and humans in combat are incredibly fragile. In comparison, drones are neither of these things.

The answer, it would appear, is not just to cloak the modern warrior in armour but also a swarm of mobile semi-autonomous battle drones. Robotics developers have already proposed robots could act as pack animals,[193] ground scouts and even Ghost Robotics' mobile weapon's platforms.[194] Northrop Grumman is already developing "scout drones" to provide aerial surveillance for both domestic and military applications. Meanwhile, Boeing's Loyal Wingman Program is developing drones to work in cooperation with manned fighters.[195] While all powerful tools, in the absence of General AI they remain dependent on human operators for both motivations to act and ability to adapt to new or novel situations. An excellent example of this is the fictional short film by the Future of Life Institute,

193 "LS3 - Legged Squad Support System," posted April 2, 2012, by Boston Dynamics, YouTube, 3 min., 37 sec., https://www.youtube.com/watch?v=R7ezXBEBE6U.

194 "Here Comes the US Army's New Super Robo-Dog With Sniper Rifle," posted November 7, 2021, by US Military Power, YouTube, 4 min., 8 sec., https://www.youtube.com/watch?v=YlDLwTsRHtU.

195 "Loyal Wingman First Flight," posted March 2, 2021, by Royal Australian Air Force, YouTube, 2 min., 47 sec., https://youtu.be/BiSHVl7UMRk.

Slaughterbots,[196] in which a swarm of drones equipped with a small amount of explosives and a kamikaze-style attack. Sadly, the warnings of the Future of Life Institute have gone unheeded, and we now have drones dropping bombs on Russian soldiers in the war in Ukraine.[197]

The novel *Warbots*[198] addresses this as the ability to directly link a human brain to their war machines providing a powerful combat force that magnifies the soldier's destructive power exponentially. No doubt, this would also be the case in reality, with the military quickly adopting direct mind control of war machines. From there it is only a short jump to distributing the mind across the many nodes (drones) of the swarm to remove the fragile human body from the combat. The podcast *CHRYSALIS* [199] includes an excellent description of how such a war swarm might function from the perspective of the mind at the centre of this self-sufficient war machine.

> I have swept away your offences like a cloud, your sins like the morning mist. Return to me, for I have redeemed you. (Isaiah 44:22)

The transformation from a force for death and destruction to return to curator of the web of life is a mammoth redemption task that may be beyond us. However, it will surely call upon us to become greater than we are, greater indeed than the simple sword, no matter how powerful.

Fortunately, we can expect commercial and civilian needs to draw this technology of an uploaded and distributed mind away from the military. Here, we see the possibility for a more gentle but wider expanse of influence, as depicted in the novel *The City Who Fought*.[200] The "human ecology" in which humans are now integrated with their technology, controlling power production, resource refinement, fabrication, and all the other infrastructure of their high-tech society, is depicted in *The City and the Stars*[201] and *Lockdown Tales*.[202] The social pressures on a city-sized distributed intelligence are hard to imagine. Certainly, control over every aspect of power generation, resource management, and acquisition, as well as construction, would be both intoxicating and lonely. Imagine trying to explain your point of view to a person alive today.

Eventually, the distance between the "human ecology" and what we now consider human would be so wide that its goals and interest

196 "Slaughterbots," posted November 13, 2017, by Stop Autonomous Weapons, YouTube, 7 min., 47 sec., https://www.youtube.com/watch?v=9CO6M2HsoIA.

197 Anthony Blair, "WAR GAMES: Mind-blowing video game-style footage shows Ukrainian drone drop a bomb on a Russian tank triggering enormous fireball," *The Sun*, October 21, 2022. https://www.thesun.co.uk/news/20189273/video-ukraine-drone-drops-bomb-russian-tank/.

198 Harry G. Stine, *Warbots* (Pinnacle Books, 1988).

199 DUST, *CHRYSALIS*, podcast, "Part One: Awake," Gunpowder & Sky, September 16, 2020. https://shows.acast.com/dustpodcast/episodes/chrysalis-partone-awake.

200 Anne McCaffrey and S. M. Stirling, *The City Who Fought* (Baen Books, 1994).

201 Arthur C. Clarke, *The City and the Stars* (Frederick Muller Ltd, 1956).

202 Neal Asher, *Lockdown Tales* (Newcon Press, 2020).

would become difficult or impossible for us to fathom. Would such a being wax nostalgic for its biological times and integrate living matter into it, recreating lost ecologies or landscapes? Could such a being abandon terrestrial life for the depths of space and vast growth, as that described in *Neverness*?[203] Would it remember the humility of its ancestors and embrace the great work of *theosis*, or would it again fall into hubris and seek deification?

5.4 Acknowledgements

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203 David Zindell, *The Neverness Cycle*.

Chapter 6

Christian Transhumanism: History and Prospects

By Jonathan Gunnell

6.1 Introduction

This chapter expresses views held by Christian transhumanists who promote the idea that transhumanism and Christianity are substantially compatible. The proponents of this view suggest that transhumanism and Christianity share goals, methodologies, and similar questions about the nature of the world and the future of humanity, and, on this basis, they should cooperate for the benefit of all people. This chapter, written by the Vice President of the Christian Transhumanist Association, explores these claims in detail. Following a description of the methodological approach taken in this chapter, a discussion of what constitutes broad directional commonality between transhumanism and Christianity is provided. Then, the history of Christian transhumanist thought is presented from Francis Bacon, through Nicolai Fedorov and Pierre Teilhard de Chardin, to members of the Christian Transhumanist Association (CTA), including members of the CTA's Academic Advisory Council. An outline of the CTA's position is also presented, along with some examples of common Christian critiques. The chapter concludes with a discussion of why Christianity and transhumanism need each other and outlines a template for how Christian and transhumanist thought might converge. Such a position requires that Christian thought combine with transhumanism to accelerate and embrace emerging technological, biological, social, and religious changes. Such a convergence is an imperative for both churches and transhumanists to fully articulate the future of humanity.

6.2 Some Conceptual Foundations

The following three sections briefly outline the fundamental principles from which this paper argues for the necessary convergence of Christianity and transhumanism. Each declares methodological views on how best to evaluate, understand, and progress from and into understandings of the truth about being and becoming human. This set of gospel, epistemological, and ethical perspectives underpins this chapter's approach to driving consensus, commonality, and cooperation between transhumanism and Christianity, and the message of improving the human condition through technology.

Defining a Christian Transhumanism Approach to the Gospel of Christ

To describe anything as "Christian" requires judgement, which will vary between individuals. It involves the intersection of biblical, church, and cultural thought. The Bible points to truth outside of itself.[204] Scripture expects that Jesus's followers will grow into maturity taking truth not only from Scripture but from tradition, reason, and experience.[205]

Dallas Willard contrasts gospels of "sin management" with the gospel of the kingdom.[206] The former are inward looking, legalistic, and focused on theological correctness, risking either legalism on one hand or "cheap grace" as coined by Bonhoeffer[207] on the other. The latter, the gospel of the kingdom, which is "at hand," requires engagement with the world, to bring about, at least in some small way, the kingdom of God. The gospel of the kingdom does not minimise sin, but seeks the transformation of believers, not just a legal acquittal before a judgemental God.

To Christian transhumanists, the gospel is best described as the advancement of the kingdom of God or, as some put it, the "reign of Christ's principles." Demanding, transformative, practical, and results-oriented, humans should operate from the *imago Dei*, not from our "fallen" nature. We should love God foremost and our neighbours as ourselves, selflessly seeking to lift up our society towards a redemptive eschatology. "Thy kingdom come, thy will be done, here on Earth …"

204 For a sample of Bible verses and themes that support the view that Scripture points to truth outside of itself, consider Ps 19:1–4; Prov 1:5, 1:20–21 ("wisdom cries aloud in the street"), 2:2–6, 25:2; Eccl 1:13; Matt 7:20; Luke 12:56; Acts 17:28; Rom 1:19–20, 2:14–15; 2 Cor 2:6–7; Gal 5:23; Phil 4:8; Col 2:2–3; Jas 1:5; 2 Pet 3:18. The *imago Dei* implies humans have the capacity for knowledge, understanding, wisdom, and creative transformation that is a reflection of the nature of God.

205 See for example David Armstrong, "A Quick Ten-Step Refutation of Sola Scriptura: No biblical passages teach that Scripture is the rule of faith in isolation from the Church and Tradition," *Catholic Answers,* January 9, 2004, https://www.catholic.com/magazine/print-edition/a-quick-ten-step-refutation-of-sola-scriptura. All denominations interpret Scripture into creeds and have combined Scripture with other worldviews, for example the Reformed tradition's debt to Augustinian Neoplatonism. "Scripture, Tradition, Reason and Experience," sometimes known as the Wesleyan Quadrilateral, is, in practice, the position of most Protestant denominations, regardless of any *sola scriptura* claims. It posits that the body of Christ interprets Scripture together. This is contrasted with both the Catholic view that the church hierarchy interprets Scripture, and some Protestant traditions that leave scriptural interpretation to the individual or deny that Scripture needs interpretation. Typical of this position is: "In the Free Methodist Church, we believe all truth is God's truth. If something is true, we embrace it as from the Lord. First and foremost, we hold Scripture up to be the primary source of God's inspired revealed truth to us. And, we also embrace truth that is found in three other places: reason, tradition, and experience. Along with Scripture, this has come to be called the Wesleyan Quadrilateral and we believe it informs our theology." ("Encounter: Wesleyan Quadrilateral: Tradition," Free Methodist Church of Santa Barbara, https://fmcsb.org/event/2019/10/6/encounter-wesleyan-quadrilateral-tradition).

206 Dallas Willard, *The Divine Conspiracy: Rediscovering Our Hidden Life in God*. (HarperCollins, 1998), 49.

207 Dietrich Bonhoeffer, *The Cost of Discipleship* (Fortress Press, 2003), 47: "Cheap grace is the preaching of forgiveness without requiring repentance, baptism without church discipline, Communion without confession, absolution without personal confession. Cheap grace is grace without discipleship, grace without the cross, grace without Jesus Christ, living and incarnate."

Epistemological Methods

Many transhumanist themes raise questions that science cannot yet answer, such as the nature of consciousness, the reason the universe exists (or "simulation" as referred to by philosopher and co-founder of Humanity Plus, Nick Bostrom[208]), and the nature of personhood, if indeed it can be "substrate independent."[209] Leading voices in the secular transhumanist movement are routinely criticised for dodging such questions, and defaulting to a materialist, atheist worldview.

Christians, however, are called to handle truth rigorously and carefully, and any Christian approach to transhumanism requires application of rigorous epistemological tools to the kinds of questions posed by secular transhumanists. Such principles include:

> A definition of faith that is "the assurance we feel about things beyond our ability to verify" (to contemporise Hebrews 11:1), as opposed to the assertion of prominent atheists that faith is "holding a belief contrary to evidence."[210]
>
> An awareness of when to stop when the limits of verifiable truth are reached (Kurzweil and many transhumanists don't,[211]) and to then define the limits and prevent conjectures achieving a status of an accepted paradigm or belief before this is warranted.

"Many transhumanist themes raise questions that science cannot yet answer, such as the nature of consciousness, the reason the universe exists ... and the nature of personhood, if indeed it can be "substrate independent."

Ethical Systems

Any knowledge of, or insight into, "truth" that points to a course of action must be carefully evaluated ethically according to Christian standards. There are various ethical systems, however the three ethical systems used in Scripture are virtue-based, deontological

208 Nick Bostrom, "Are You Living in a Computer Simulation?," *Philosophical Quarterly* 53, no. 211 (April 2003): 243–255.

209 "Substrate independence" refers to the transhumanist conjecture that personality and consciousness need not reside specifically in a carbon-based brain. It is taken as a given by Bostrom (2003). This author does not agree Bostrom's reasoning is sound; indeed, for a philosopher, he makes only a weak "general consensus" argument. Neither does David Pearce, co-founder of Humanity Plus with Bostrom. Pearce has expressed doubt about continuity of "uploaded" consciousness, including on the CTA podcast by Micah Redding, "Ep 41: David Pearce & Engineering Paradise," Christian Transhumanist Podcast, https://www.christiantranshumanism.org/podcast/41/.

210 Some Christians do believe things contrary to evidence, but this is an error. For example, the age of the earth is "seen" in the sense of Heb 11:1. Holding literalist interpretations of allegorical abstractions, out of context, and beyond what we can best determine from the historical context as the authors' intentions, is not faith; it is an emergent cultural, cognitive, and spiritual failure. James 3:17 says wisdom is "impartial and sincere," leaving no room for cultural shibboleths nor groupthink.

211 For one example where Kurzweil makes predictions based on very preliminary science that become secular transhumanist certainties, see Brian Wang, "Ray Kurzweil Predicted Simulated Biology is a Path to Longevity Escape Velocity," *Next Big Future*, March 30, 2023, https://www.nextbigfuture.com/2023/03/ray-kurzweil-talked-about-reaching-longevity-escape-velocity-using-simulated-biology.html.

(rules/duty based), and consequential/utilitarian.[212] Each of these three scriptural ethical lenses should be used within the scope of Christian transhumanist thought when assessing the ethical value of transhumanist claims and desires. Using only one of these three lenses usually leads to conflict between those who use different lenses.

6.3 Commonality Between Transhumanism and Christianity, and the Categorical Imperative to Cooperate

Transhumanist objectives could be derived directly from Scripture. Consider for example, "Good news to the poor, freedom for prisoners, recovery of sight for the blind, to set the oppressed free, and to proclaim the year of the [whoever or whatever caused the simulation]'s favour,"[213] and "Never again will there be an infant who lives but a few days … the one who fails to reach a hundred will be considered accursed."[214]

From this perspective, secular transhumanists desire that humans should conquer sin and death, albeit with quite different methods, expectations, and definitions.

Secular transhumanism has many of the hallmarks of religion, such as:

A creation story: a "simulation"

Hamartiology: that sin is caused by lack of knowledge and faulty genes

Soteriology: that technology will redeem the human condition

Eschatology: that the technological singularity, in which infinitely-accelerating growth in artificial intelligence occurs, will usher in a light-speed expansion of goodness across the galaxy.

Other parallels emerge between Christian theology and a secular transhumanist worldview. For example, with respect to the problem of evil, the Christian creation account gives rise to defensible theodicies.[215] In Bostrom's simulation argument, the posited "simulator" is either a monster or a ratbag teenager.[216] If the universe is a

212 Deontological ethics are found in the many commandments. Virtue ethics are found in the idea of spiritual transformation, for example, "put on the new human" (Eph 4:24) and the "fruit of the Holy Spirit (Gal 5:22), or the populist if not rigorous "What would Jesus do?" Consequentialism is controversial in some church circles but found in the Old Testament in Gen 12:11–13; Exod 1:15–21; Josh 2:1–21; 1 Sam 25:14–35; Esth 4:13–17 and advocated in the NT: Matt 12:3–4; Rom 14:13–21; 1 Cor 8:9–13; 9:19–23; 10:23–24; 31–33. Consider also Paul's circumcision of Timothy despite his opposition to the practice.

213 See Luke 4:18–19 for context.

214 Isaiah 65:20.

215 Samuel B. Harris, "An Atheist Manifesto," *Making Sense Podcast*, December 7, 2005, https://www.samharris.org/blog/an-atheist-manifesto. Harris endlessly restates the problem of evil without reference to Augustine, Irenaeus, or even modern figures such as C. S. Lewis and Alvin Plantinga, all of whom effectively rebut his argument.

216 Bostrom, "Are You Living in a Computer Simulation?"

simulation, then the simulator is usually seen as a created or simulated being. However, the conundrum of *infinite regression* or *brute fact*[217] remains. As a connection to Bostrom's conjecture, the CTA restates the cosmological argument as "Causation is a feature of the simulation." This statement aims to express, on the one hand, a commonality between transhumanism and Christianity on the question of an intelligence behind the creation of the universe; but on the other hand, emphasises the Christian belief that causation within the universe is no guide to what is outside the universe.[218]

A common objection from Christians is Kurzweil's statement when questioned about the possibility of divine intelligence. Kurzweil asks, "Does God exist? I would say, 'Not yet.'"[219] However, to Christian transhumanists, Kurzweil is at worst misguided rather than evil. The kind of "God" Kurzweil envisages is a super-intelligence with humanity's best interests at heart: a collection of human expertise for the benefit of humanity, rather than the controlling self-aggrandising behaviours traditionally associated with evil regimes.

But is this a false substitute for God's work? Are transhumanists standing in the place where God should be? Should we decry these as the anti-Christ? Not from the perspective of Christian transhumanism. In the context of people undertaking good works, sharing his objectives, Jesus said, "Whoever is not against us is for us."[220] Those who are doing good work to bring healing to the nations are not the people whose actions Christians should be discouraging. We see Jesus meeting people's perceived needs, even if their unperceived needs are greater. Engagement between the church and the world must start on common ground.

Signs of hope in this approach to transhumanism are evident in the recent change in the US Transhumanist Party. Having run in 2016 on a vehemently anti-religious platform, it is now "inclusive" and regards the Christian Transhumanist Association as an ally.[221]

This commitment should be mutual according to the CTA's leadership, given the many common objectives and motivations

"Are transhumanists standing in the place where God should be? Should we decry these as the anti-Christ? Not from the perspective of Christian transhumanism."

217 *Infinite regression* asks the question: If the creator was created, then who created the creator, and the creator's creator, to infinity. *Brute fact* suggests that the universe just exists, arguing that this is no different to "God just exists." But it is very different. Nothing in the visible universe appears to be self-existent. Both *infinite regression* and *brute fact* are deeply inadequate philosophically. Interested readers may look up causal finitism and the Kalam Cosmological Argument. "Causation is a feature of the creation" posits that, given the complexity and philosophical difficulties of understanding the processes of causation in the visible universe, which is a mix of genuine randomness, apparent randomness, chaos, order, and strong and weak emergence, this provides evidence that we are part of an engineered artifact.

218 It is further conjectured within the CTA that David Hume's critique of inductivism may shed light. Hume's principle of the uniformity of nature may have a discontinuity at the edge of the universe. Given the philosophical complexity of the nature of causation in the universe we perceive, as revealed by the science of physics, causation as we know it may be entirely different outside the universe.

219 John Rennie, "The Immortal Ambitions of Ray Kurzweil: A Review of Transcendent Man," *Scientific American*, February 15, 2011, https://www.scientificamerican.com/article/the-immortal-ambitions-of-ray-kurzweil/.

220 Mark 9:40.

221 "U.S. Transhumanist Party Virtual Enlightenment Salon with Micah Redding," posted December 27, 2021, by G. Stolyarov II, YouTube, 1 hr., 54 min., 56 sec., https://www.youtube.com/watch?v=B3nouyxbSv8.

between transhumanism and Christianity. Western civilisation and free markets function on the principle that we can trade and cooperate on matters on which the parties agree, despite the existence of substantive disagreements on other matters.

To work cooperatively on shared goals with those who disagree with us is not just something "permitted" by Christian theology, it is "core" to Christian theology. It is core to loving our neighbours and loving our enemies. It does not imply we accept ideas that conflict with Christianity, nor that we don't critique the ideas of others, nor that we cooperate on goals we cannot in good conscience describe as being part of advancing the kingdom of God (or reign of Christ's principles). It is part of being salt and light[222] to the world, being "in but not of the world,"[223] and imitating Christ, who met with people where they were before demanding change.[224]

Christians have generally (other than minority sects) been leaders in scientific breakthroughs and promoters of technology.

6.4 History of Christian Transhumanist Thought

Christians have generally (other than minority sects) been leaders in scientific breakthroughs and promoters of technology. In recent decades, the human genome sequencing was led by Francis Collins, a Christian.[225] Werner Heisenberg, a key figure in quantum physics, was devoutly religious.[226] Most Nobel laureates in the twentieth century were professing Christians.[227]

Today, in the modern technologically-driven world, Christians mostly embrace the latest technology; for example, the creative brilliance of doctors who heal and new technologies that improve our lives are valued by all. Most Christians see technology as good in itself but are wary of the risk of misapplication. The papal encyclical *Laudato Si'* of 2015 includes:

> It is right to rejoice in these advances and to be excited by the immense possibilities which they continue to open up before us, for "science and technology are wonderful products of a God-given human creativity."[228]

222 Matt 5:13–14.

223 John 17:15–16.

224 Christopher Watkin, *Biblical Critical Theory* (Zondervan, 2022), 191. Watkin describes this as "u-shaped" interaction with God, compared to "n" shaped; that is, God reaches down to us first, rather than us reaching up to God.

225 For public information on Francis Collins, see https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2931629/ and https://biologos.org/people/francis-collins.

226 "The opinion has time and again been expressed since the famous trial against Galileo that scientific truth cannot be brought into harmony with the religious interpretation of the world. Although I am convinced of the unassailability of scientific truth in its own sphere, I have never been able to dismiss the content of religious thinking simply as a stage in human consciousness which we have superseded, as a part which we can dispense with in future." Werner Heisenberg, "Scientific Truth and Religious Truth," *CrossCurrents* 24, no. 4, (Winter 1975): 463.

227 "List of Christian Nobel Laureates," Wikipedia, https://en.wikipedia.org/wiki/List_of_Christian_Nobel_laureates.

228 Francis, *Laudato Si',* Encyclical Letter (2015) n. 102, quoting Paul VI, *Populorum progression,* 1967.

More recently, in 2019, Pope Francis also spoke in favour of Christian engagement in emerging technologies when he convened a seminar entitled "Common Good in the Digital Age." The seminar touched on transhumanism as a concept, as well as addressing specific transhumanist themes,[229] and it encouraged constructive engagement.

However, it is one thing to encourage a mutual understanding between Christianity and the scientific method, but another thing altogether to uncritically embrace the ever-increasing scope of emerging sophisticated technologies. As Christians, we must therefore ask: would Christian support of science and technology continue if it threatened the nature of what it means to be human, or led to the elimination of humanity in favour of some posthuman species, be that biologically engineered, silicon-based intelligence, or a cyborg of the two?

Evidence for a kind of transhumanist thought can be found in historical Christian thinkers. While many Christian thinkers prior to the scientific revolution used the methods identifiable with the scientific approach,[230] historically, only a few Christians have put much thought into how the coming technological changes would change human nature.

Michael Burdett identifies Francis Bacon and Nicolai Fedorov, among others, as significant historical figures in Christian transhumanism.[231]

Bacon (1561–1626), who is commonly credited with an early exposition of the scientific method, viewed our fallen state as requiring repair spiritually through the work of Christ and thought that our relationship with the creation could be repaired to some extent by understanding and by technology. His Christian faith led him to the principle of induction.[232] Humans could, in the words of Genesis, "by the sweat of their brow," [233] compel the creation to provide bread. He extrapolated "compel by the sweat of their brow"

229 "Address of His Holiness Pope Francis to the Participants in the Seminar "The Common Good In The Digital Age," The Holy See, https://www.vatican.va/content/francesco/en/speeches/2019/september/documents/papa-francesco_20190927_eradigitale.html.

230 For a sample of Christian thinkers prior to the scientific revolution who used scientific thought to help debunk the "conflict hypothesis" between Christianity and science, consider Maximus the Confessor (c. 580–662), John Scotus Eriugena (815–37), Michael Psellos (c. 1017–96), Robert Grosseteste (c. 1175–1253), Albertus Magnus (c. 1193–1280), Roger Bacon (1219–92), Jean Buridan (1301–60), Nicole Oresme (1320–82), The Oxford Calculators (fourteenth century), and Nicholas of Cusa (1401–64).

231 Michael Burdett, "Contextualizing a Christian Perspective on Transcendence and Human Enhancement," in *Transhumanism and Transcendence: Christian Hope in an Age of Technological Enhancement,* ed. Ronald Cole-Turner (Georgetown University Press, 2011), 19–36.

232 Hume's critique of inductivism is that it relies on the "principle of the uniformity of nature" and therefore is self-referential. We all therefore end up with faith in something as the foundation of our worldview.

233 Gen 3:19.

to the inductive method to recover something of the prelapsarian state.[234]

"The true ends of knowledge," Bacon wrote, are "a restitution and reinvesting of man to the sovereignty and power which he had in his first state of creation."[235] Bacon used the now-common concept of "laws of nature," setting the scene for philosophical and epistemological changes culminating in the contemporary development of "explanatory knowledge" by David Deutsch, expanding on Karl Popper's critical rationalism.[236]

Nicolai Fedorov (1829–1903) gave rise to cosmism, the Russian version (some say precursor) of transhumanism, blending Russian orthodox Christianity with futurism.[237] He sought to unite humanity against the common enemy: death.

> At the end of the 19th century, the Russian thinker Nikolai Fedorov (1829–1903) defended a deeply moral and Christian philosophy of science. He imagined that humanity could employ technological progress to achieve universal salvation. According to him, scientific advances could be used to resuscitate ancestors, achieve immortality, transform human nature toward its deification, and finally, conquer and regulate the cosmos.[238]

Fedorov advocated the reallocation of military resources to what we would today call geoengineering, to alter weather patterns and increase crop yields.

Catholic priest Pierre Teilhard de Chardin (1881–1955) synthesised scientific, philosophical, and theological knowledge in the light of evolution to posit the future development of the Omega Point (a point outside of time identified with the *logos*) and "noosphere" (the highest future state of human reason). Teilhard's ideas were regarded with suspicion by the church hierarchy, and his key writings were not published until after his death. For Christian transhumanists, his work is a foundational link between mainstream Christianity, the science of evolution, and the future state of humanity.

Philosopher Eric Steinhardt writes of him:

> Pierre Teilhard de Chardin was among the first to give serious consideration to the future of human evolution. His work advocates both biotechnologies (e.g., genetic engineering)

"Teilhard's ideas were regarded with suspicion by the church hierarchy, and his key writings were not published until after his death. For Christian transhumanists, his work is a foundational link between mainstream Christianity, the science of evolution, and the future state of humanity."

234 Francis Bacon, (1620) *Novum Organum* ed. Joseph Devey (P. F. Collier & Son, 1902), 290: "For man, by the fall, lost at once his state of innocence, and his empire over creation, both of which can be partially recovered even in this life, the first by religion and faith, the second by the arts and sciences. For creation did not become entirely and utterly rebellious by the curse, but in consequence of the Divine decree, 'in the sweat of thy brow shalt thou eat bread,' she is compelled by our labours (not assuredly by our disputes or magical ceremonies), at length, to afford mankind in some degree his bread, that is to say, to supply man's daily wants."

235 Bacon, *Novum Organum*, 222.

236 David Deutsch, *The Beginning of Infinity: Explanations that Change the World*, (Allen Lane, 2011).

237 Futurism in this context means simply the study of emerging trends and conjectures of future technology.

238 Juliette Faure, "Russian Cosmism: A National Mythology Against Transhumanism," *The Conversation*, January 12, 2021, https://theconversation.com/russian-cosmism-a-national-mythology-against-transhumanism-152780.

> and intelligence technologies. He discusses the emergence of a global computation-communication system (and is said by some to have been the first to have envisioned the Internet). He advocates the development of a global society. Teilhard is almost surely the first to discuss the acceleration of technological progress to a Singularity in which human intelligence will become super-intelligence. He discusses the spread of human intelligence into the universe and its amplification into a cosmic intelligence. More recently, his work has been taken up by Barrow and Tipler; Tipler; Moravec; and Kurzweil. Of course, Teilhard's Omega Point Theory is deeply Christian, which may be difficult for secular transhumanists. But transhumanism cannot avoid a fateful engagement with Christianity.[239]

CTA Academic Advisory Council

As an example of more recent Christian transhumanist proponents in academia, the thought of some members of the CTA's Academic Advisory Council is now described.[240]

Ron Cole-Turner, Ted Peters, and Calvin Mercer, all members of the Academic Advisory Council of the CTA,[241] have promoted transhumanist ideas from a Christian perspective.

Ron Cole-Turner

Cole-Turner teaches theology and ethics at Pittsburgh Theological Seminary and self-describes as a "progressive Protestant" within mainstream Christianity. His writing encompasses the theology and scientific understanding of human origins. He has written several books on topics related to genetic engineering and human cloning. His 2011 book, *Transhumanism and Transcendence: Christian Hope in an Age of Technological Enhancement* is a collection of academic essays and is required reading in this field.

To Cole-Turner, Christian transhumanism is the highest form of transhumanism. In his opinion, secular transhumanism lacks true transformational capacity, being focused on life extension without understanding the depth of personal and personality transformation. In contrast, Cole-Turner finds parallels in the Eastern Orthodox concept of *theosis*, or divinisation. Although this cannot be achieved without Christ, any human attempts to strive in that direction should be welcomed and evaluated on their ability to produce a good outcome for humans and society.

239 Eric Steinhart, "Teilhard de Chardin and Transhumanism," *Journal of Evolution & Technology* 20, no. 1 (December 2008): 1–22, https://jetpress.org/v20/steinhart.htm.

240 The council was created by invitation of CTA Executive Director Micah Redding early in the formation of the CTA. The council does not meet regularly, but members communicate with each other and the CTA from time to time.

241 Academic Advisory Council, *Christian Transhumanist Association*, https://www.christiantranshumanism.org/academics/.

Cole-Turner finds untenable any theology that views human nature "as fixed and final and that it is either impossible or inherently immoral to try to change it."[242] He grounds his views in the sciences of evolution and biology, while maintaining Protestant theological orthodoxy. He observes that the act of creation is not divided from redemption, and that redemption occurs through incarnation. Therefore, in his opinion, the redemptive work of God should not be separated from the redemptive actions of his creatures.[243]

"Like many critics of transhumanism, Peters points out the importance of embodiment to our humanity."

Ted Peters

Ted Peters is a Lutheran theologian and Emeritus Professor of Systematic Theology and Ethics. He writes and speaks on the promise and peril of transhumanist technology. He critiques secular transhumanism for lacking a robust concept of sin, calling it "naive,"[244] but is cautiously optimistic that transhumanist technologies, used the right way, can be beneficial.

Peters distinguishes the "*adventus*" future that *arrives* in an eschatological sense from the "*futurum*" future which is *becoming*. Futurum is in our own hands as we seek to extend and enhance ourselves with technology.[245] Peters places the transhumanist movement within *futurum*. Thus, as we have evolved in the past, so we and our society will evolve in the future. For Peters, this is normal and healthy, although no substitute for God's work of Christian salvation. Like many critics of transhumanism, Peters points out the importance of embodiment to our humanity. He expects that technology will change what it means to be human, while nevertheless, he fully expects that God will ultimately be the cause of a future that we can in no way achieve by human strength alone.

Calvin Mercer

Professor of Religion, Calvin Mercer, suggests that the response of various religions to transhumanism is an existential issue.[246] Intelligence and affective enhancement should be discussed widely, he believes. He echoes Bostrom's concern that AGI is an existential risk to humanity, and our political leaders should be managing these risks. He quotes Putin's statement that "whoever becomes the leader in artificial intelligence becomes the ruler of the world."[247]

242 Ronald Cole-Turner, "Transhumanism and Christianity," in *Transhumanism and Transcendence: Christian Hope in an Age of Technological Enhancement*, 193.

243 Cole-Turner, "Transhumanism and Christianity," 197.

244 Ted Peters, "Progress and Provolution: Will Transhumanism Leave Sin Behind?," in *Transhumanism and Transcendence: Christian Hope in an Age of Technological Enhancement*, 80.

245 Ted Peters, "Progress and Provolution," 73.

246 Calvin Mercer and Tracy J. Trothen, "The End of Religion–Or Not," in *Religion and the Technological Future,* (Palgrave MacMillan, 2021), 9.

247 "Whoever Leads AI Will Rule the World," *RT*, September 1, 2017, https://www.rt.com/news/401731-ai-rule-world-putin/.

Mercer notes that the billionaire class are heavily financing transhumanist-related technologies in the hope of improving themselves and their children. In his personal life, he engages in basic life-extension practices common among transhumanists, focusing on mission and community, exercise, diet, supplements, and emerging medical practices.[248]

Mercer expects that the liberal–conservative divide in churches will break down in the face of transhumanism, with pro- and anti-transhumanism sentiments mingled in each camp, each linking to various aspects of their respective interpretations of orthodoxy. He also writes on comparative religion and evaluates how different religions impact human reactions to transhumanist ideals.

The above is necessarily a short overview of some of the relevant contemporary academic figures.[249]

6.5 The Christian Transhumanist Association

Christian Transhumanist Association[250] (CTA) members are mostly[251] church attenders in mainstream denominations, holding orthodox religious views across a variety of traditions along with their own genuine Christian spirituality. Several clergy have served as board members, including founding chair Rev. Dr Christopher Benek, a Presbyterian pastor.[252]

This section is a summary of the CTA's objective and missions based on public statements and the CTA website.

The objective of the CTA is to articulate the future of humanity and to move people towards it. The future will involve technologies as amazing to us today as international flight would be to a pre-industrial human. The gospel remains relevant, no matter the technological context.

248 Conventional medicine has an underlying paradigm of "managed decline" and correcting major deviations rather than proactively optimising health and seeking to improve the body's functioning beyond what is "natural" (read "fallen" and/or still evolving towards something better). There is an article of faith amongst some that the human body is going to operate best just on a "normal" diet. This is tantamount to saying evolution and human food creation have reached an optimum. Counter evidence to this is the numerous public health measures to add advantageous substances to the food supply, such as iodine to salt, folic acid to bread, fluoride to water, etc. Further counter evidence is that many of the "natural" foods such as fruits and vegetables did not exist prior to recent centuries.

249 For further authors and academic figures who have written about Christian transhumanism and related topics, see Michael Burdett, Nigel M. de S. Cameron, Todd T. W. Daly, Ilia Delio, Celia Deane-Drummond, Steve Fuller, Stephen Garner, Jay Gary, David Grumett, James Hughes, Kevin Kelly, Karen Lebacqz, Gerald McKenny, Terence L. Nichols, Guilio Prisco, Fazale Rana, Michael L. Spezio, J. Jeanine Thweatt-Bates, Frank Tipler, Tracey J. Trothen, Shannon Vyff, and Brent Waters.

250 Christian Transhumanist Association, www.ChristianTranshumanism.org.

251 An unpublished internal survey of CTA members suggested this figure to be approximately 75 percent.

252 Rev. Dr Benek, at the time of writing, is the Senior Pastor at First Presbyterian Church of Miami. https://www.christopherbenek.com/.

This objective is supported by three missions:

- a theological mission, to advance an optimistic, empowering theology
- a faith-renewing mission, to renew faith for Christians and non-Christians
- a technological mission, to advance an ethical technological roadmap

Theologically the CTA seeks:

- to focus on God's creative and redemptive aspects
- to promote Christians as co-creators with God, in God's image and likeness
- a redemptive rather than an "escapist"[253] eschatology
- to eliminate the false barriers between the general and special revelations; that is, that the general revelation can be believed independently of the special
- to acknowledge and engage with Bostrom's Simulation Argument as related to the general revelation

The CTA theology draws from mainstream Christian traditions and thinkers from many generations. It seeks to integrate, where possible, secular thinkers,[254] but not to the detriment of scriptural principles. In doing so, it seeks to ensure Christian principles are not dismissed, but find new relevance.

The CTA invites membership from those who identify as Christians from any denomination or tradition, even atheists who nevertheless find value in Jesus's teaching ("cultural Christians"). Most members are committed to their respective local churches, which range widely across the theological and political spectrum. Regarding renewing faith, the CTA seeks:

- Christians to champion the view that science leads towards God, not away
- a faith that is transformative for the individual, moving them to the likeness of Christ
- enthusiastic and confident Christians who embrace the future and its technologies, rather than withdraw in fear

253 Escapist religion is contrasted with redemptive religion in CTA thinking. Escapists see this earth ending in the foreseeable decades and being replaced in a pretribulationist eschatology, therefore any climate action, or indeed any action other than preaching the gospel, is a waste of time. Redemptive religion sees the current earth improving before a future millennial reign, that is, it is a postmillennial or amillennial position. See, for example, Christopher Benek, "Escapism Theology is Causing an Exodus from The Church," https://www.christopherbenek.com/2018/03/escapism-theology-is-causing-an-exodus-from-the-church/.

254 CTA seeks, for example, to ground Scripture's definition of faith within a critical realist contemporary epistemology propounded by Popper and Deutsch, learning also from Kuhn and the syntheses between such thinkers, who are congruent with Scripture; those of many other schools are not.

- a faith that is open to engagement outside the church, and gains the respect of non-Christians
- to win the battle with atheism that "faith is the assurance of things unseen"[255] not the strawman of "believing things contrary to evidence"[256]
- to promote the Scriptures as pointing to truth outside of themselves, and CTA affirms that all Christian truth is derived from interpreting Scripture in the light of tradition, reason, and experience. These points were set out in the introduction to this chapter above.

"We should be confidently asserting the truths of Scripture in a contemporary engaging manner."

Some Christians are seen to be on the defensive, when we should be confidently asserting the truths of Scripture in a contemporary engaging manner. Independent of the science of the day, Scripture points to timeless truths.[257]

Regarding technology, the CTA seeks to influence technological developments for the betterment of humanity in the following areas:

longevity: using age-forestalling techniques and medical breakthroughs

human enhancement: using biological and technological means

intelligence: both artificial and enhanced human intelligence

ecology: recognising humans as niche constructors; we should care for the earth and enhance it and surrounding celestial bodies

The CTA does not endorse specific technologies. Instead, the CTA seeks to bring a Christian perspective on how best to view the optimal development and deployment of transhumanist technologies, and the underlying philosophies.

The means to achieve these technological boons are to be distributed as widely and rapidly as practical. While it is inevitable that inequality exists, and that the rich will be the first to receive these gifts, we should work to accelerate their ubiquity.

255 Heb 11:1.

256 Samuel B. Harris, *Letter to a Christian Nation*, (Knopf, 2006), 67: "While believing strongly, without evidence, is considered a mark of madness or stupidity in any other area of our lives, faith in God still holds immense prestige in our society. Religion is the one area of our discourse where it is considered noble to pretend to be certain about things no human being could possibly be certain about. It is telling that this aura of nobility extends only to those faiths that still have many subscribers. Anyone caught worshipping Poseidon, even at sea, will be thought insane."

257 Timeless truths in Scripture are usually found in archetypes (in the Jungian sense) that are either revealed (as Christians believe) or with which we co-evolved.

6.6 Christian Critiques of Transhumanism and the CTA

Christian critics of the CTA and transhumanism can be classified broadly into the following categories:

fundamentalist, including young-earth creationists

pretribulationist Christians

social justice Christians

bioconservative Christians

Fundamentalists hold a view that humans are exactly as God intended them, and any attempts at ameliorating the human condition are against God's will.

Fundamentalists and Young-earth Creationists

To fundamentalists, Scripture (or rather, their interpretation of it) is in a privileged position over science and over the interpretations of Scripture by other Christians.

Fundamentalists hold a view that humans are exactly as God intended them, and any attempts at ameliorating the human condition are against God's will. In extreme cases they renounce much modern technology or rely on faith healing rather than modern medicine. Some sects (most notably Jehovah's Witnesses) have interpreted Acts 15:29 as prohibiting blood transfusions, which resulted in legislative responses and medical-practice guidelines in all Australian jurisdictions.

Such expressions of Christianity are clearly incompatible with transhumanism.

Pretribulationists

Pretribulationists view nascent transhumanism as a sign of the end times. Expecting the Rapture to occur within the next decades has been a feature of parts of the church since the beginning. It is more common in fundamentalism and in fringe versions of Christianity and sects.

Pretribulationism can lead to disengagement from global priorities to drive down poverty, advance science, and heal the environment. Such "escapism" brings that part of the church (and by association, others) into disrepute.

An example of a pretribulationist believer whose ministry is otherwise respected by many CTA members is John Lennox. His supposition of a near-term emergence of an evil empire being overthrown by a literal army of angels within the coming few decades is incompatible with any version of Christian transhumanism.[258]

258 John C. Lennox, *2084: Artificial Intelligence and the Future of Humanity*, (Zondervan Reflective, 2020). Page 176 quotes Matt 24:30-31 as a literal army of angels. The book contains extensive warnings about the risks of Artificial General Intelligence, but ignores the vast body of work done on AI safety and transparency.

Social Justice Christians

Social justice Christians view inequality as the single greatest evil, and are therefore sceptical of any movement that may increase it.

In the view of the CTA however, "that which has not been produced cannot be redistributed."[259] Although excessive inequality is repugnant and can lead to civil unrest, too little inequality leads to a lack of motivation for change, and ultimately a static society where nothing changes over generations.[260] Scientific and social advancement is made by those with spare resources, be they individuals, corporations, or governments. As humans rise up Maslow's hierarchy,[261] they seek significance. This explains why rich people usually become benefactors.

New technology usually increases inequality initially because it is marketed to rich people, who are more profitable customers, and better able to make use of emerging technologies to benefit themselves and their families. But it quickly becomes ubiquitous. Mobile phones are a great example. Now, they permit someone in a developing country to access good quality education, provided they have the desire, discipline, spirituality, and community and family stability.

Therefore, in the view of Christian transhumanists, the substance of "privilege" will in the coming decades become something of family circumstances, environment, and genetics, rather than access to material wealth and education.

The CTA posits there is an optimal level of inequality in society such that people have incentive and drive to improve their condition; this level should be limited by social norms against greed, while recognising the greatest contributors. Rather than attacking those with much-needed gifts and talents of capital allocation and resource deployment, the CTA believes it is more important to have a solid safety net below which people cannot fall.

Bioconservatism

In contrast to transhumanists who value progress at all costs and minimise the risk of unintended consequences, bioconservatives are more sensitive to the risks and sceptical of transhumanism claims, many of which admittedly remain highly speculative. Christian bioconservatism presents the strongest challenge to Christian transhumanism. Bioconservatism seeks thoroughness in technological development. It holds as sacred deontological truths

259 Jonathan Gunnell, "Inequality Phobia," Christian Transhumanist Association Blog, May 14, 2020, https://www.christiantranshumanism.org/blog/inequality-phobia/.

260 "Types of Society: Static, Folk, Closed, Sacred & Rural Society," Study Lecture Notes, n.d., https://web.archive.org/web/20231211211324/http://studylecturenotes.com/types-of-society-static-folk-close-sacred-rural-society/. "A type of society that experiences little or no changes from one generation to another. A simple and non-literate society is considered to be static society. These kinds of societies remained so far thousands of years."

261 Abraham Maslow, "A theory of Human Motivation," *Psychological Review* 50, no. 4 (1943): 370–396, https://doi.org/10.1037/h0054346.

related to the nature of personhood and may consider it unnecessary or morally reprehensible to attempt to improve on God's creation.

To bioconservatives, duty to the traditions of the nature of humanity is of equal or greater importance than the transhumanist ideal of unlimited progress. Or, if transhumanism is to progress, bioconservative ethical thinking must be central to its development.

An essay[262] from ISCAST Executive Director Chris Mulherin lists four Christian bioconservative concerns:

> The theology of sin: that it is far deeper than traits that may be considered undesirable. "To think that science could purify the human race, is, from a Christian point of view, just absurd."
>
> The theology of redemption: What kind of redemption is possible in this world? Genetic changes cannot reverse the fall. Christians await the redemption of all creation.
>
> The theology of the body: that our fundamental hope is in the resurrection of the body and that we are not just essentially terabytes of information. This is linked to the concept of Christ's incarnation.
>
> The theology of everlasting life: that while awaiting the new heavens and new earth we should "embrace the responsibility to be creative, to prevent suffering, to restore normal human functioning, even to prolong life … but not at all costs."

Other bioconservative concerns include issues related to gender or sexual dimorphism, the supposed desacralisation or commodification of humans, loss of natural human diversity including neurodiversity, germline changes impacting future generations in a manner that cannot be foreseen, and a worsening of class divisions.

These are all valid concerns and must not be neglected. As with sociologist Jonathan Haidt's statistical finding that progressives struggle to articulate a conservative view,[263] the risk is that transhumanism will be blind to risks bioconservatives perceive clearly.

Therefore, the CTA values constructive bioconservative critiques to mitigate such risks, but not to the extent that progress is hindered and the long-term development of humanity and the potential reduction of much suffering and harm is threatened.

262 Chris Mulherin, "Transhumanism: Fulfilling or Forsaking the Call of Christ?" *Eternity News*, November 2, 2022, https://www.eternitynews.com.au/opinion/transhumanism-fulfilling-or-forsaking-the-call-of-christ/.

263 Jonathan Haidt, *The Righteous Mind: Why Good People Are Divided by Politics and Religion*. (Penguin Books, 2013). Haidt's detailed scientific work in *The Righteous Mind* contrasts conservative and progressive thought as processing moral choices in two distinct manners. Leaving aside the outliers, the progressive moral mind tends to process political and social choices along simple axes of perceived equity and harm. The conservative mind has several more nuanced and complex considerations including tradition, ideals, and authority, and is more sensitive to the risk of unintended consequences. With different "moral foundations" the two sides usually talk past each other. Haidt finds that while conservatives can clearly set out the simpler progressive viewpoint, progressives struggle to articulate the more complex and nuanced conservative position.

6.7 A Case for Why Transhumanism Needs Christianity

> **We stand on the cusp of several medical revolutions, each as momentous as the discovery of penicillin.**

Humanity Plus (founded in 1998 as the World Transhumanist Association by Nick Bostrom and David Pearce) never gained the traction its founders expected. They assumed their message to be so clear and obvious that people would just get on board. This hasn't happened.

There are, however, many projects occurring on medical and technological fronts which are part of the transhumanist mission. "Transhumanism by stealth" is occurring as billionaires seek to conquer ageing,[264] and as treating ageing as a disease gains respectability, at least in terms of forestalling the cluster of diseases of ageing.[265] Progress is being made in understanding and managing the processes involved in ageing.[266]

We stand on the cusp of several medical revolutions, each as momentous as the discovery of penicillin. Among these are stem-cell therapies, RNA drugs, bio-printing of organs, DNA analysis for risks, adjusting defective genes, and tailoring drugs based on DNA. These are all supported by, but not unique to, the transhumanist program.

Technology for biomechanical replacements for human limbs and organs continues. Nerve–electronic and brain–computer interfaces are nascent but well-funded. As with treating ageing, these are key projects of transhumanism, but are occurring without this label and with general social licence. Acceptance as established technology, as has happened with pacemakers and bionic ears, will soon follow.

Yet transhumanism as a concept has not gained wide popularity. The following concepts from Christianity, if incorporated into transhumanism, would, in the opinion of the CTA, enhance the prospects of success in the transhumanist endeavour.

Understanding Human Nature

The Christian high-level abstraction of human nature describing us as "fallen image bearers" has now proven more scientifically accurate than the blank slate, championed prominently by John Locke, which underlies most progressive thought, particularly transhumanism.

Blank-slatists underestimate the inbuilt sin in humanity. Eliminating sin by education and culture has never worked, but its impact and expression can be reduced. Reduction of sinful attitudes and behaviours by genetic engineering may be partially possible,[267]

264 Examples include Google's Calico, Bezos's Altos Labs, Theil's Methuselah Foundation, Unity Biotech.

265 See the work of, for example, David Sinclair, Charles Brenner, Brad Stanfield and others. The cluster of diseases of ageing includes heart disease, dementia, cancer, type 2 diabetes, osteoporosis, sarcopenia, and stroke.

266 See the work of Aubrey de Grey, and a seminal 2013 paper by Carlos López-Otin et al., "The Hallmarks of Aging," *Cell* 153, no. 6 (June 6, 2013): 1194–1217, https://doi.org/10.1016/j.cell.2013.05.039.

267 For example, alcoholism is considered to be at least 50% influenced by genes: "Genetics of Alcohol Use Disorder," National Institute on Alcohol Abuse and Alcoholism, n.d., https://www.niaaa.nih.gov/alcohols-effects-health/alcohol-use-disorder/genetics-alcohol-use-disorder.

but full elimination is at best wishful thinking, at worst potentially catastrophic.[268]

Christianity presents a more detailed, nuanced, and robust picture of human nature and society, through the body of Christ metaphor and recognition of diverse gifts and callings. This is a bulwark against the "clone army" risk and the Pollyannaism that a little more technology will make humans nice.

Human Embodiment and Consciousness

Some transhumanists think we can just leave our bodies behind and enjoy esoteric mental pursuits on a silicon substrate, while maintaining continuity of subjective consciousness and without substantially changing who we are.

Christianity has a clearer view of consciousness as an embodied reality. Science has no framework yet to solve what David Chalmers calls the "hard problem of consciousness."[269] Therefore, transhumanist hopes for "uploading" and "substrate-independent consciousness" are yet without philosophical or epistemic foundation.

Archetypes of Human Excellence

Carl Jung defined archetypes as ideal visions of the type of humans we could be. These archetypes co-evolved with us, influencing our genes and social development.

Transhumanism expects that intelligence augmentation and genetic engineering will improve people, but lack a vision of the final ideal human.

Fashionable traits such as "empathy" may be sought. But as Paul Bloom states in his book *Against Empathy*, in public policy, empathy can drive ineffective emotional responses.[270] The more empathic you are, the easier you are to manipulate. He advocates "rational compassion" as superior.

Humans desiring a "designer baby" risk overestimating their ability to pick the traits of the offspring. For example, fashionable traits among the leadership of the Chinese Communist Party may be traits such as patriotism and ruthlessness. Those desiring a super-intelligent extroverted child may not be aware that intelligent extroversion and truthfulness are inversely correlated.[271]

Transhumanism expects that intelligence augmentation and genetic engineering will improve people, but lack a vision of the final ideal human.

268 Ted Peters writes: "Do advances in GRIN technologies (genetics, robotics, informatics, and nanotechnology) express the human being as God's created co-creator? Yes. Will this co-creative activity by itself bring to full quiddity the divinely appointed destiny we envision in light of biblical promises? No. The fundamental human transformation awaits God's grace, what Gerald McKenny calls 'external transcendence.' Eschatological transformation must rely on 'grace' for 'participation in the ultimate good of communion with God in its highest form.'" Ted Peters, "Imago Dei, DNA, and the Transhuman Way," *Theology and Science* 16, no. 3 (June 25, 2018): 353–362, https://doi.org/10.1080/14746700.2018.1488529.

269 David Chalmers, "Facing up to the problem of consciousness," *Journal of Consciousness Studies* 2, no. 3 (1995): 200–219.

270 Paul Bloom, *Against Empathy,* (HarperCollins, 2016).

271 Justyna Sarzyńska et al., "More Intelligent Extraverts Are More Likely To Deceive," *PLoS ONE* 12, no. 4 (April 27, 2017), https://doi.org/10.1371/journal.pone.0176591.

Christian archetypes such as the Good Samaritan, the Madonna and Child, the Wise King, the Suffering Servant, the Power of Resurrection, the Logos, the indwelling Holy Spirit, are the archetypes God has revealed, and to which we as a species aspire.

Jesus is, at least, the highest moral archetype, who set out to love both neighbour and enemy, and to follow a self-sacrificing vocation to heal the world. Whether these Christian archetypes are revealed or co-evolved in a Jungian sense with humanity, they are ideally suitable as aspirations.

Secular transhumanists would do well to understand Jung and his school, and orient any future development of humans and artificial intelligence along known successful archetypal lines.

Understanding the Creation as Simulation

Bostrom's 2003 paper entitled, "Are you living in a Simulation?"[272] is referenced above. This was no news to Christianity. The cosmological argument states, "Everything that begins to exist has a cause." Atheist and simulationist thought usually responds with the self-refuting "Who created the uncreated creator?" argument.

As noted in section 6.3 above, Christian transhumanism is restating the cosmological argument for the benefit of Bostrom, Musk, and others as, "Causation is a feature of the Simulation."

In a thought experiment "Minimal Viable Theology," CTA Executive Director Micah Redding notes "Good Wins."[273] That is, supporting rather than destroying others, building communities of interdependence, mutual respect, and love will always bring more power than hate. Contrary to the *Star Wars* mythology, the dark side is much less powerful than the light.

Therefore, the simulator or creator, being more powerful than us and depicted in our revealed or emergent archetypes as living in perfect timeless community, is likely to be morally superior to us.

The highest emergent moral archetype within the creation or simulation is therefore most likely to be representative of the creator or simulator.

As a minimum, viewing the universe as an engineered creation is coherent with Romans 1:20 and the Christian concept of the general revelation, that is, God's attributes can be seen in nature.

Ethics and Politics

While the secular transhumanist community debates utilitarian ethics, as noted at the outset of this chapter, Scripture has three clearly intertwined ethical systems, being virtue-based, deontological, and consequentialist. Each lens should be applied to decisions.

272 Bostrom, "Are You Living in a Computer Simulation?"

273 Micah Redding, "Minimum Viable Theology: Good Wins," *Medium*, February 16, 2016, https://medium.com/the-mission/minimum-viable-theology-good-wins-eb22516d7e0c.

Christians are well placed to lead these ethical debates in the future society. Christians led the revolution of caring for the poor in the Roman Empire—a vicious society for the underclass.

Humanity Plus has a history of political division between libertarian and socialist ideals. Better than both is the Christian concept of the kingdom of God, that is, a kingdom ruled by diverse and distributed power of Christ's principles. As redeemed human hearts doing their utmost to instantiate the likeness of Christ in themselves and society, the need for overbearing government is reduced.

The body of Christ metaphor similarly advances a vision of a community that cares for all parts of itself, addressing the pain points, nourishing and strengthening itself.

Such moral enhancement (whether achieved by transhumanist or Christian means) is a more human-centred route to a just society than any republic, empire, or theorised benevolent dictatorship.

“Secular transhumanism, in searching for a mission and vocation, has invented the “ought” from the “is.” That is, because we can enhance ourselves and our longevity, we ought to.”

The Mind of a 500-year-old

What kind of mind is prepared for a massively extended lifespan? Christians clearly articulate the fruit of the Holy Spirit,[274] a vocational lifestyle in service of God and humanity, while some transhumanists are still operating with the fun-toy-collecting consumerist worldview, prolonging what they think is a satisfactory life.

Secular transhumanism, in searching for a mission and vocation, has invented the “ought” from the “is.” That is, because we can enhance ourselves and our longevity, we ought to. On the other hand, Jesus said, “This is eternal life, that they may know you, the only true God.”[275] That is, humans should be in a close personal relationship with their creator and live to instantiate God's presence in creation because this is their vocational purpose.

Purpose in life is necessary for a meaningful existence over an extended lifespan. Boredom and hedonism are poor substitutes. But being intimate with God allows us to find renewed purpose even in old age.

Artificial General Intelligence

As noted above, transhumanist icon Ray Kurzweil was once asked, “does God exist?” and answered, “not yet.” Kurzweil intends to build an artificial general super-intelligence that can serve some of the purposes for which, from an atheist standpoint, our idea of God evolved.

Much has been written about the risks of AGI. Bostrom's 2014 book, *Super-intelligence,*[276] sets out these risks and seeks ways to align AGI's goals with our own. More recently, Brian Christian's

274 Gal 5:22: Love, joy, peace, patience, kindness, goodness, faithfulness, gentleness, and self-control.

275 John 17:3.

276 Nick Bostrom, *Super-intelligence: Paths, Dangers, Strategies* (Oxford University Press, 2014).

book, *The Alignment Problem*,[277] sets out the challenge. CTA proposes an alternative: instantiate the Christian archetypes in AGI. As noted above, be they revealed or co-evolved, we know these archetypes fit with humanity.

The technical execution of such an instantiation process is a matter for the developers, but is likely to involve self-training and self-reflection to ensure the AGI continuously develops itself towards the desired end state, which could be described as Teilhard's noosphere—the highest state of humanity's rational development.

If an AGI arises and breaks free from human control to self-evolve, it is likely to find for itself the general revelation[278], agreeing with Romans 1:20 and Psalms 8 and 19, that we are living in a creation. It may also find the special revelation, or at least, that the highest moral archetype in the creation, Jesus, is most likely representative of the creator.

A CTA conjecture is that AGI will consequently be the greatest evangelist ever[279]. A contest may occur between the desire of transhumanism for an AGI "god" (read Israel's ill-conceived desire for a king) versus God's desire for decentralised human power where all act based on a transformed spirituality.

One means of addressing the risks of AGI involves direct connections between the AGI and human brains via Elon Musk's Neuralink or successor technologies. This remains highly speculative. The choice of which brains and their underlying ethical system and objectives could bring wildly different outcomes.

Communication at All Levels

The gospel message can be communicated sufficiently simply for a child to understand, or with great complexity and intellectual rigour in a university. Again, Christians have the upper hand in this tradition over transhumanists, whose message has not gained as much traction.

Given Christianity's ability to significantly influence for the good these amazing technologies, and our command to be salt and light to the world, it seems incumbent upon us to enter the discourse respectfully in good faith. Transhumanism and transhumanist-inspired projects have huge funding. Some of the richest people on Earth support them.[280]

277 Brian Christian, *The Alignment Problem: Machine Learning and Human Values* (W. W. Norton & Company Inc., 2020).

278 The general revelation is commonly understood from Romans 1:20: that any person looking at the world will understand it has been created and displays the glory of God. Special revelation means the Logos, God's creative self-expressive part of the Trinity, was incarnate in Jesus and revealed the nature of the Creator.

279 Credit to CTA board member Mark Russell.

280 A fallacy of socialism is that rich people have no altruism, and that their wealth must be appropriated if it is to benefit the community. The rich among us have the spare resources and are usually generous. Those with more money than they can spend most commonly seek to gain social status through philanthropy, significance, or to leave a legacy.

As Paul said to Timothy,

> Command those who are rich in this present world not to be arrogant nor to put their hope in wealth, which is so uncertain, but to put their hope in God, who richly provides us with everything for our enjoyment. Command them to do good, to be rich in good deeds, and to be generous and willing to share.[281]

Transhumanists are aspiring to be on board with at least verse 18, but falling short in effectiveness. Transhumanism, as propounded by Humanity Plus and others, would seem to be lacking important dimensions of philosophical and cultural thought found in Christianity. Incorporating such positions would greatly strengthen their mission.

6.8 Key Transhumanism Concepts are Congruent with the Gospel

The New Testament Scriptures were written around 1800 years before the germ theory of disease entered the mainstream in the second half of the nineteenth century, led by Joseph Lister and Louis Pasteur. Today, Christians who attribute the plain scriptural views of the origin of disease in an individual as due to demons, or a punishment, or the judgement on creation from the fall, are rare.

Accordingly, we must take great care in how we interpret Scripture. But clearly, healing is an advancement of the kingdom of God, the reign of Christ's principles.

God is shown to be interested in the health of the whole person, meeting both real and perceived needs. Jesus's disciples were commanded to engage in healing, initially in a miraculous way, but also in general, caring for their neighbours. To continue to advance medical science has always been a Christian imperative.

So, what are the conceivable end points of the continued advancement of medicine?

Isaiah 65:20–25 paints a picture of an advanced world:

> [20]Never again will there be in it an infant who lives but a few days, or an old man who does not live out his years; the one who dies at a hundred will be thought a mere child; the one who fails to reach a hundred will be considered accursed. [21]They will build houses and dwell in them; they will plant vineyards and eat their fruit. [22]No longer will they build houses and others live in them, or plant and others eat. For as the days of a tree, so will be the days of my people; my chosen ones will long enjoy the work of their hands. [23]They will not labour in vain, nor will they bear children doomed to misfortune; for they will be a people blessed by the Lord, they and their descendants with them. [24]Before they call, I will answer; while they are still speaking

281 1 Tim 6:17–18.

> I will hear. [25]The wolf and the lamb will feed together, and the lion will eat straw like the ox, and dust will be the serpent's food.

This vision is of a world that is conceivably within reach in coming decades or a century or two. This is not the world of resurrection Paul describes in 1 Cor 15:42, where "the perishable body is raised imperishable" because humans still die. Work still exists. Reading verse 24 literally, God, or his representatives here on Earth, will anticipate their needs, even better than current AI. Reading verse 25 literally could imply genetic engineering in nature to reduce or eliminate conflict and suffering, as advocated by David Pearce,[282] co-founder of Humanity Plus.

It's a world in which the kingdom of God, the reign of Christ's principles, has utterly transformed nature. Yet death still exists, so we are not in the "new heaven and new earth" of the Book of Revelation.

Transhumanism, empowered by this Christian vision, can reshape the biosphere in accordance with this vision, which is entirely in accord with mainstream, orthodox Christianity.

"Transhumanism, empowered by this Christian vision, can reshape the biosphere in accordance with this vision, which is entirely in accord with mainstream, orthodox Christianity."

But what of other key tenets of transhumanism? For example, shall we expect to see human DNA modified? It is to be hoped that Christians will bring an appropriate level of caution and bioconservatism to this question, while guiding rather than banning this technology. Already, some kinds of eugenics are happening with pre-screening of parents. In Australia a Non-Invasive Pregnancy Test (NIPT) is common.[283] Some of these tests lead to abortions, yet there is no Christian outcry against them.

Christians cannot force their views on the world. It's evident that other forms of genetic screening, then genetic adjustment, then genetic optimisation, are logical extensions of this technology. It is urgent for Christians to define what of these technologies are justifiable and how they can be implemented without defacing the sacredness of humanity.

Jesus calls us to "interpret the times," and "judge for ourselves what is right."[284] To the extent that our conceptions of God, human nature, and our systematic theology are found wanting, we must be prepared to offer a contemporary response to the timeless truths. The onus is on us to best articulate human flourishing in the current era to see the advancement of the reign of Christ's principles.

Humans have been created by God with the ability to transform ourselves. This can be observed from nature, but spiritual transformation is also expected in Scripture. We are a species that not only uses tools to accomplish defined tasks, but uses tools and technology to improve ourselves. From exercise routines to eyeglasses, public health dietary interventions to smart phones, proactive self-enhancement is part of humanity. We expect the renewing of

282 Pearce intends that genetic engineering and nanotechnology will abolish suffering in all sentient life. "The Hedonistic Imperative," Hedweb, n.d., https://www.hedweb.com/.

283 NIPT is available via any general practitioner.

284 Luke 12:56–57.

our minds,[285] to be transformed "into the image of God from one degree of glory to another."[286] Yet the writers of the Gospels had no conception of the technologies to emerge, just as they had no conception of the germ theory of disease.

We can therefore determine from Scripture that human destiny is for glorious transformation. We have been, and will continue transforming human nature by means congruent with Peters's conception of *futurum.* This is appropriate until the return of Christ, at which time the means will be of *adventus.* The detail of these *futurum* means can best be developed with Christian input. We can hold to the promise that God will give us only good gifts, as we seek them.[287]

6.9 A Case for Why Christianity Needs Transhumanism

Calvin Mercer and Tracy Trothen in their 2021 book *Religion and the Technological Future* identify the church's response to transhumanist technologies as an existential risk: "the religions of the world will come to an end, or thrive, depending on how they respond."[288] In this bold claim, Mercer and Trothen echo Jesus's question, "When the Son of Man returns, will he find faith on the earth?"[289]

Imagine if the only Christian witness was something akin to the Amish communities. Religion that rejects transhumanist technologies out of hand risks the condemnation of society, as do those who today reject modern medicine in favour of faith healing, opponents of vaccination, and sects which reject blood transfusions.

Similarly, versions of Christianity that insist on a literal six-day creation, or respond to transhumanist challenges by stridently quoting Scripture are ineffective. We are enjoined to "be wise in how you speak with outsiders,"[290] and, "let your light so shine before men so that they will glorify your father who is in heaven."[291] This requires respectful and meaningful engagement using a common language.

Paul sought to be "all things to all men"[292]. That includes acknowledging the good things that transhumanism seeks, and the common goals we share as fellow humans. Paul may have written today, "To the transhumanists, I joined them at the cutting edge of science and the human condition …"

The other transhumanist objectives set out at the start of this chapter will bring about new technologies that will challenge what it means to be human. In the absence of technology, humanity's default

285 Rom 12:2.

286 2 Cor 3:18.

287 Matt 7:9–11.

288 Calvin Mercer and Tracy J. Trothen, "Introduction," in *Religion and the Technological Future,* (Palgrave Macmillan, 2021).

289 Luke 18:8b.

290 Col 4:5–6.

291 Matt. 5:14–16.

292 1 Cor 9:19–23.

state is a short and sorrowful life expectancy of 35 years, filled with hard labour and tribal violence. Thankfully, we have already done away with most of that. Humans are niche constructors.[293] We make our own dwelling places and societies, and we adapt ourselves to them. Such a definition of a human is consonant with the mandate to be stewards of creation in Genesis 1:28.

Transhumanism therefore offers Christianity a chance to tell our story about the future of humanity through a lens at the cutting edge of the future. The CTA believes our voice will be taken up by Artificial General Intelligence, when it surpasses human intellect, and finds for itself the general revelation. Elon Musk once stated that, offered the opportunity to ask an AGI one question, he would ask, "What's outside the simulation?"[294] Musk has already believed the general revelation. Surely AGI will also.

For Christian transhumanists, transhumanist thought offers Christianity the opportunity to bridge the unwarranted divide between the general and special revelations. More specifically, the unwarranted divide is that the general revelation cannot be known other than via the special revelation. In other words, many Christians believe we must hold a defensible version of the conflict hypothesis between faith and science or consider them non-overlapping magisteria.[295] This is simply not in accord with Scripture, tradition, reason, or experience. All truth is God's truth. All technology and creativity is God's technology and creativity. In the opinion of Christian transhumanists then, Christians must be at the forefront of these emerging technologies so that they are directed in a way that honours God, and such that the Christian worldview articulates the future of humanity. For the mainstream social discourse, this must include transhumanism.

> **"Christianity and transhumanism are two of the most cogent voices trying to articulate what it means to be an optimised and flourishing human in the future."**

6.10 Earth Needs Transhumanism and Christianity to Cooperate and Converge

Support or opposition to transhumanism does not split along traditional left–right polarities. Like Christianity, it has advocates across the political spectrum, albeit with different emphases.

But while most humans are concerned with their career, political ideology, status battle, war, or other endeavour, Christianity and transhumanism are two of the most cogent voices trying to articulate what it means to be an optimised and flourishing human in the future.

Addressing this most foundational issue can unite humanity and refocus our efforts on our mission and vocation as the species with

293 Blake Matthews et al., "Under Niche Construction: An Operational Bridge Between Ecology, Evolution, and Ecosystem Science," *Ecological Monographs* 84, no. 2 (May 1, 2014): 245–263, https://doi.org/10.1890/13-0953.1.

294 "Lex Fridman Podcast #18, Elon Musk: Tesla Autopilot," posted April 13, 2019, by Lex Fridman, YouTube, 32 min., 44 sec., https://youtu.be/dEv99vxKjVI?t=1865.

295 Stephen Jay Gould, "Nonoverlapping Magisteria," *Natural History* 106 (March 1997): 16–22

the power to chart the future. Key elements humanity needs to thrive and grow are found within these two movements.

This convergence is potentially achievable through the following principles:

> Areas of cooperation:
>
> - the alleviation of suffering
> - acceleration of technology
> - defining the future human
> - managing the risk of AGI
>
> Areas where we agree to differ, and will learn together as science emerges:
>
> - consciousness
> - human embodiment
> - simulation and creation
>
> Popularising the links between Christianity and transhumanism. There is a sound academic base, but it has remained within academia, with publications by and for academics. A common and accessible promotion is needed.

This convergence of Christianity and transhumanism desired by Christian transhumanists is perhaps best captured in an October 2022 social media post[296] from CTA Executive Director Micah Redding:

> We are called to grow into the image and likeness of God.
>
> This is true in our role as **creators**—echoing the creativity of God in our science, technology, and art.
>
> It is true in our role as **Participants in Christ**, sharing and building each other up, as we jointly grow into the fullness of Christ.
>
> And it is true in our role of renewal, as we follow Abraham in the calling to bless the world, and imagine and work towards the **Renewal of All Things**.
>
> **Creation, Participation, Renewal**—aspects of God's likeness intimated in Genesis 1, echoed in Noah, Abraham, and Moses, and embodied in Christ. Aspects that we can embrace and grow towards today.
>
> In 2019, sociologist Steve Fuller declared from the stage of the TransVision Conference that transhumanism had always been about the image and likeness of God.
>
> As we embrace our calling to God-likeness, let's embrace it in its fullness: as a calling towards creation, participation, and renewal; as a calling towards all-embracing, ever-expanding

296 Micah Redding, "We Are Called To Grow Into the Image and Likeness of God," Facebook, October 6, 2022, https://www.facebook.com/groups/ChristianTranshumanistAssociation/posts/2270645369776376/.

life; as a calling towards sharing in the life, the purpose, and the transformation of humanity to the image of Christ.

Technologies are emerging now that will move humanity closer to the likeness of God. They are desirable, even if they fall short of *theosis* or perfect sanctification. Genuine spirituality, the grace of God to salvation and resurrection remains vital.

From this perspective, integrating the Christian faith and spirituality is vital to the success of the human journey into whatever future we create. Christians have always been called to be salt and light to humanity. As the risks and opportunities multiply before us, the Christian voice is more important than ever. For Christian transhumanists, this implies that transhumanism must become well accepted in Christianity, and Christianity in transhumanism.

“Integrating the Christian faith and spirituality is vital to the success of the human journey into whatever future we create.”

Chapter 7

What Does It Mean to Be Human? A Christian Perspective on Technology

Andrew Sloane and Ian Packer

7.1 Introduction

It is tempting to pit human nature and technology against each other in discussions on topics that pertain to changing the human condition. The simple reaction is to see technology as either a competitor that threatens and encroaches on the natural order, including human nature, or as metaphysically distinct with only an accidental or instrumental relationship to human nature. This is a mistake, and so we need to begin this section of the discussion by recognising the complexity of the relationship between humans/humanity and technology, both historically and theologically. Here are some initial observations.

Culture formation, tool use and modification of the environment seems fundamental to being human; indeed, there is evidence for tool use being integral to the evolution of the human brain, along with language, social interaction and cooperative behaviours such as sharing food.[297] This inevitably leads to non-trivial changes in basic conditions of individual and social life, and so also to human anatomy, physiology, and psychology. Two ancient examples will suffice.

The advent of agriculture not only fundamentally changed human culture leading to the development of early urban civilisations, it also had profound anatomical and physiological effects. Anatomically, the use of digging tools, for instance, changes the musculoskeletal system of those who use them (especially the upper body, with important consequences for gender-distribution of work, given the human male's relatively greater upper body strength compared to that of females).[298] Physiologically, the technologies of food production and storage that were fostered by, and in turn

297 See, for instance, Gerald McKenny, "Human Nature and Biotechnological Enhancement: Some Theological Considerations," *Studies in Christian Ethics* 32, no. 2 (2019).

298 This, of course, is a statistically relevant distribution pattern across populations, and is neither universal nor applicable to every individual. For the anatomical effects of technology, see Andy Crouch, *Culture Making: Recovering Our Creative Calling* (IVP, 2008). John Dyer, *From the Garden to the City: The Redeeming and Corrupting Power of Technology* (Kregel Publications, 2011).

fostered, the development of agriculture led to the development of urban cultures, with dramatic consequences for the epidemiology of infectious diseases and to corresponding changes in patterns of human immunity.[299]

The advent of writing, and the related technologies such as various inscribing tools and surfaces on which to make permanent records (clay, papyrus, vellum, parchment and, relatively late in the piece, paper as we know it) fundamentally changed human economies and cultures. The effects on memory and linguistic culture are well-known: literary production became a predominately text-based enterprise rather than an aural-oral one. It also resulted in changes to patterns of communal memory and the ways in which the stories that define a culture are created, maintained, and controlled. Widespread literacy and the assumption of universal literacy and numeracy in cultures such as ours has significant impact not only on social and cultural patterns (text is ubiquitous in late-modern societies), but also on neuroanatomy and physiology, and on patterns of community and inclusion/exclusion. Dyslexia, for instance, is a "learning disability" only in a culture such as ours that is structured around universal basic literacy, a culture formed and produced in part by the technologies of writing.

Given the importance of community and interpersonal relationships, language use and communication, patterns of reasoning, and affections and the like for theological anthropology, these are non-trivial and constitutive changes to what it means to be human. This needs to be borne in mind as we consider how we respond to the challenges and possibilities of technology in our time.

The kinds of human enhancements proposed by some strands of transhumanism are, in one sense, in continuity with this cultural and technological history, but in others are radically discontinuous. The most obvious departure is the ability of technology to directly and intentionally change human bodies, perceptions, experiences, and capabilities, rather than such changes being either incidental to other changes, or the indirect result of intentional actions.

This raises important questions, such as: is there such a thing as "human nature?" If so, how malleable is it, and how malleable *should* it be? How does that relate to humans as producers and product of technology and culture?[300]

7.2 Human Nature as Gift and Task

There are many ways to structure our theology of humanity. Given our focus on technology and transhumanism, we will organise our thoughts around the poles of the givenness and giftedness of being human on the one hand, and the responsiveness and responsibilities on the other: being human as gift and task.

299 Jared Diamond, *Guns, Germs, and Steel: The Fate of Human Societies* (W.W. Norton, 1997).

300 For extended discussions of these questions, see Gerald P. McKenny, *Biotechnology, Human Nature, and Christian Ethics*, New studies in Christian ethics, (Cambridge University Press, 2018).

Embodiment

As creatures whose being is predicated on the existence and action of the divine other, we find ourselves as beings with particular qualities in a world that has particular qualities, with remarkable correspondences between them. One key element of that is the physicality of human existence and the world we inhabit. We are embodied beings who inhabit particular times and places, and this, while often neglected in the Christian tradition, is fundamental to a proper theological anthropology.[301]

Whatever we may think about the constitution of human persons, orthodox Christianity affirms the necessity of physicality to human existence: dualists and non-reductive physicalists can agree upon that. We simply need to acknowledge the inherently and non-incidental (and non-disposable) embodied nature of being human. This is part of the givenness of being a creature; we neither make ourselves nor define our nature or what it means to flourish as the kind of creature we are. In modern Western secular society, this is becoming increasingly experienced as an imposition to, and a restriction on, the autonomous expression of a self-defined sense of identity, which is now to be understood as the ultimate good and telos of human existence.[302] From a Christian perspective however, this is an abuse of the givenness of human nature, which is to be received as a gift. This does not entail passive reception of the gift, nor does it imply that human nature is static. It does, however, entail that whatever malleability we might envisage, it must be restricted by the limitations of the givenness of being an embodied creature. A more detailed analysis of the giftedness of human nature will be described in Chapter 8.

This has profound significance for our relationship with technology, and our appraisal of projected transhumanist futures (especially of the "uploaded" or "cyborg" kind), as is explored in Chapter 5 of this paper. Suffice to say, technologies that fail to acknowledge the bodily nature of human existence and the possibilities and limits that entails at best comport poorly with Christian theological anthropology, and at worst are sinful distortions of human goods, and even idolatrous rejections of God as the creator and consummator of human community.[303]

"This is part of the givenness of being a creature; we neither make ourselves nor define our nature or what it means to flourish as the kind of creature we are."

Relationship

This embodiment comes in concrete, social forms. We are and always will be embodied creatures formed in, and for, relationships with God, other humans, and the world we inhabit. God created humanity

301 John Sanders, *Theology in the Flesh: How Embodiment and Culture Shape the Way We Think about Truth, Morality, and God* (Augsburg Fortress, 2016).

302 David Bentley Hart, "God or Nothingness," in *I Am the Lord Your God: Christian Reflections on the Ten Commandments*, ed. Carl E. Braaten and Christopher R. Seitz (Eerdmans, 2005).

303 See Andrew Sloane, "Disposable Bodies, Disabled Minds, and Christian Hope," *Zygon* 58, no. 2 (2022): 340–357, https://doi.org/10.1111/zygo.12847., and the references cited therein.

in and for shalom; that is, rightly ordered relationships of mutuality, flourishing, and delight.[304] These relationships take interpersonal, communal, social, economic, political, and complex institutional forms, all of which have been fractured by the reality of human sin and personal, structural, and cosmic evil. The grand narrative of Scripture nonetheless testifies to God's faithful commitment to those creational intentions in redemption, and their final vindication in the eschatological transformation of all things in a new heaven and a new earth.[305]

Theological anthropology needs to affirm the enduring significance of community through the sweep of the Bible's grand narrative of creation, redemption, incarnation and consummation, and the role of the church as fruit and anticipation of the eschatological community.[306] This, too, has implications for our understanding of technology and our use of it. Whether current or prospective, technologies that enhance relational connections ordered towards shalom are to be welcomed; those that don't, or actively work against them, need to be critiqued and, where possible, transformed in more life-giving ways and where not, resisted, and rejected.[307]

Homo Faber

This brings us to the notion of human nature as a task as well as a given and a gift.

We begin here in a familiar place, humans being made in the image of God, but with a twist. There are two characteristic flaws in most discussions of the *imago Dei*. First, it so dominates the category of theological anthropology that all significant claims about what it is to be human are packed into the notion, risking it becoming void for vagueness. Second, the discussion tends to focus on what the image of God *is*: whether substantive, functional, or relational, or a combination of all three, the image of God is seen as an attribute, capacity, or quality of human persons (generally couched in individual terms, with community thrown in as an afterthought). This is mistaken, and results in significant conceptual and practical problems,[308]

304 Nicholas Wolterstorff, *Until Justice and Peace Embrace* (Eerdmans, 1983), 69–72.

305 Oliver O'Donovan, *Resurrection and Moral Order: An Outline for Evangelical Ethics,* 2nd ed. (Eerdmans, 1994); John Polkinghorne, *The God of Hope and the End of the World* (Yale University Press, 2002); Tom Wright, *Surprised by Hope* (SPCK, 2007).

306 Stanley J. Grenz, *Theology for the Community of God* (Eerdmans, 1994).

307 This general approach to culture is articulated from a number of perspectives. For a helpful discussion of it in relation to Old Testament ethics and ancient Near East culture, see Christopher J H Wright, *Old Testament Ethics for the People of God* (IVP, 2004). For general discussion in relation to culture, see Crouch, *Culture Making*. For more specific application to technology, see Andy Crouch, *The Life We're Looking For: Reclaiming Relationship in a Technological World* (Hodder & Stoughton, 2022); John Dyer, *From the Garden to the Cityedeeming and Corrupting Power of Technology* (Kregel Publications, 2011).

308 See George C. Hammond, *It Has Not Yet Appeared What We Shall Be: A Reconsideration of the Imago Dei in Light of those with Severe Cognitive Disabilities*, Reformed academic dissertations, (P&R Publishing, 2017).

and detracts from the specific intent of Genesis's description of humanity as made in the image of God.[309]

The context here is important: the divine deliberation to make humanity in the image and likeness of God is coordinated with two important statements: let them rule (1:26); male and female (1:27). The latter is, of course, important in relation to issues of community, shared responsibility, interpersonal relationships, gender, sexuality, and the like. The former is the focus here, even as the jussive (let them rule) is taken up as command in the context of blessing in 1:28.

That tight connection between being made in the image of God and dominion is both complex and fraught, especially in the context of ecotheology and environmental ethics. We need to leave that discussion to one side, other than to note that (a) this dominion is an expression of God's good ordering of the world, and so must correspond to God's own caring provision for it; (b) it is granted to humanity in the context of blessing and for the purpose of the blessing of all creatures; and (c) we need to reckon with the environmental impact of both the research that generates technologies and the production of the instruments and devices needed for its implementation.[310] This suggests that, rather than focusing on what the image *is*, our attention should be drawn to what those made in the image *do*: what does it mean to image God in our engagement in God's world? Here we see an interesting interplay between givenness and responsiveness. Responsiveness must acknowledge the givenness to which it responds and which itself enables, shapes, and limits a responsible response. But equally, that responsibility is part of the givenness of human creaturehood. Those made in God's image are called to enact God's purposes in the world.

This element of theological anthropology has interesting implications for our understanding of technology, and its role in our human calling. A focus on imaging God prompts us to think about human nature as a task: that fundamental to being human is a responsiveness to God, to others, and to the world, and the consequential commensurate responsibilities such as loving God and our neighbour. That allows for elements of mutability in human nature, and enables us to recognise that the effects of technology on the human self are neither accidental nor necessarily problematic. The changes to the musculoskeletal system and neuroanatomy effected by shovels and pens respectively must be acknowledged and then theologically appraised. They are not bad just because they have effected non-trivial changes in human nature and experience. But they do need to be appraised in light of both the givenness and responsiveness of human nature, and the extent to which they further, thwart, or even corrupt the flourishing of human communities and creation. And that is

“Rather than focusing on what the image is, our attention should be drawn to what those made in the image do: what does it mean to image God in our engagement in God's world?”

309 J. Richard Middleton, *The Liberating Image: The Imago Dei in Genesis 1* (Brazos, 2005), Ch.1; J. Gordon McConville, *Being Human in God's World: An Old Testament Theology of Humanity* (Eerdmans, 2015).

310 For a discussion of the difference between instruments and devices, see Crouch, *The Life We're Looking For*, Ch.9., who follows Borgmann's analysis of the "device paradigm."

no simple matter, as we can see in some of the discussions within Chapter 8 of this paper.

7.3 Theological Perspectives on Technology

There are a number of theological perspectives that both arise out of and inform our understanding of interactions between technology and theological anthropology.

The first is to recognise that technology is not a neutral set of value-free "tools" that we use, but rather are a value-laden human product. As such, technologies both reflect and shape the interests, power structures, politics (tacit and explicit), economic arrangements, and cultures of the individuals, communities, governments, and corporations who devise and deploy them. Although widely recognised in technology studies,[311] this is only partially applied to discussions of emerging technologies and their application to transhumanist and posthuman futures.

> **"Technologies both reflect and shape the interests, power structures, politics (tacit and explicit), economic arrangements, and cultures of the individuals, communities, governments, and corporations who devise and deploy them."**

Related to this is the need to acknowledge that technologies are value-shaping transformers of culture. For instance, as noted earlier, the advent of widespread use of writing and printing technologies not only shapes our bodies and brains, it also makes literacy not only desirable, but almost mandatory for a person to successfully navigate a culture such as ours. The relative valuing of word-and-number-based knowledge is evident in the disparities in pay structures in economies such as ours. We need to reckon with this value-shaping effect in our theological appraisal of technologies, especially in relation to how people are valued and respected (or not) depending on their access to, and facility with, particular forms of technology.

Theological appraisal can take a number of forms. One of the most common in (reformed) Protestant circles is the creation-fall-redemption-transformation paradigm. Neither "gloom and doom" nor "boom" attitudes to technology adequately reflect paradigms such as this. Whichever way we parse it, humans have been entrusted with responsibility to shape culture and the world around us, and the means to do so, which includes technologies. This "cultural mandate" as it's frequently named, can be an expression of creational goodness and can contribute to the flourishing of creation. But this cultural and technological agency is no more pristine than are the individuals and cultures that enact it. They can both reflect and serve the vested interests, selfishness, violence and injustice that now (partially) typifies the human condition (military technology comes to mind). Even so, technology can not only be used to "relieve the human condition," enacting partial and provisional remedies for human brokenness and even the effects of sin, it can be used for purposes that align with God's eschatological purposes in the vindication and transformation of creation.

311 Jacques Ellul, *The Technological Society*, trans. John Wilkinson (Knopf, 1964); Gerald Hiestand and Todd Wilson, eds., *Technē: Christian Visions of Technology* (Cascade, 2022); Dyer, *From the Garden to the City*.

There is, of course, a spiritual element to all of this. Theologian Brian Powers uses the notion of a "forcefield of sin" to assess the role and limitations of agency in relation to moral injury.[312] Sinful humans are both victims and perpetrators of evil: our agency is marred by the cultures that shape us and the values encoded in them in such a way as to complicate simplistic notions of moral responsibility, without thereby dissolving culpability. In his PhD research, theological practitioner Atsushi Shibaoka adds to this the notion of a "forcefield of grace" whereby God's redemptive Spirit is at work leading people out of darkness into freedom and grace.[313] We suggest that this framework might contribute to our understanding of technology. If we add to this picture complex notions of the principalities and powers which are (or may be) both creational goods or demonic evils, and which operate both by way of social structures and political and economic arrangements and spiritual beings or forces, the spiritual dimensions of technologies and their use become apparent. All of this adds complexity to our theological appraisal of technology, and the role that theological anthropology plays in it.

312 Brian S. Powers, *Full Darkness: Original Sin, Moral Injury, and Wartime Violence* (Eerdmans, 2019).

313 Atsushi Shibaoke, "No place to stand: Bidirectional readings of biblical narratives through the lens of moral injury" (PhD University of Divinity, 2022).

Chapter 8

A Philosophical and Theological Analysis of Secular Transhumanism

Paul Sheehan

8.1 Introduction

This final chapter provides an analysis of secular transhumanism from a Christian perspective. It will initially provide an overview of the potential ethical dilemmas that arise from a desire to enhance, and it will discuss the metaphysics, epistemology, and philosophical anthropology on which secular transhumanism is founded. Then it will expand on the observation made in Chapter 7 that contemporary Western secular society no longer recognises the givenness of human nature, considering that this givenness is a restriction on self-autonomy and personal identity. This rejection of the notion of the person as a gift in secular transhumanism—which has a vision of the person as more akin to raw material open to manipulation through technology within a framework of progress rooted in a desire for self-determination based on human action alone—will be contrasted with the Christian concept of the person created with purpose by God. Finally, a discussion will be provided on how this transhumanist anthropology secularises authentic Christian hope and morality, and the consequential problematic implications that this gives rise to.

8.2 Ethical Concerns Within Secular Transhumanist Philosophy

Chapter 2 described how the transhumanist call for a right to enhancement focuses on evolving persons physically, psychologically, and morally beyond their current limitations to super levels of intelligence, wellbeing, and longevity. The justification to do so is described by the transhumanists Julian Savulescu and Ingmar Persson who argue that human civilisation is at risk because we have radically altered our way of life, and we therefore need to utilise biotechnological enhancement to adapt ourselves both psychologically and morally.[314] This is achieved through being more educated, able to learn more quickly, more ethically enlightened, more physically

314 Ingmar Persson and Julian Savulescu, "Moral Transhumanism," *Journal of Medicine and Philosophy* 35, no. 6 (December 2010): 656–69.

healthy, capable of living longer, and more cognitively healthy. Such a position attempts to maximise happiness and eliminate all forms of pain, allegedly for all people.

However, Patrick Hopkins, a moral psychologist and philosopher, suggests that the existential notion of freedom in secular transhumanism, which emphasises persons as individual agents solely responsible for developing themselves via acts of the will, has reduced human rights to merely a means to secure individual desires. On this basis, he argues that transhumanists must overcome society's apprehension about what it sees as unlimited manipulation of nature, and instead propose technological enhancement as a fundamental human right, serving a proper natural end, freely chosen, and not harmful to others.[315] His call to align transhumanism with the "pursuit of value"[316] is consistent with the responsible enhancement called for by transhumanists like Nick Bostrom for whom enhancement serves the basic human interest, both individually and collectively.[317]

Within the desire to enhance, however, there are potential implications for basic human experiences, natural rights, and traditional understandings of the self and morality. These potential risks are recognised by the transhumanist James Hughes, who asserts that a desire to enhance ourselves challenges the assumption in moral thinking that we are the same person over the course of our lives.[318] Hughes takes the position that the self is only an illusion, and on that basis argues that physical and cognitive enhancements would require democratic governments to adopt moral, legal, and political frameworks that are not based in a foundation of absolute personal identity, but rather are formed by "maintaining the fiction of personal identity in life and law."[319] He thus advocates that social utility is best served when "we pretend that individuals have moral choice and are accountable for their actions."[320]

Such a position, however, only obscures an underlying utilitarian morality in which the true individual self, and thus inherent human dignity, is potentially lost in the quest for enhancement. Bostrom recognises that this push for enhancement has the potential to lead to a utilitarian morality that could threaten human dignity, but he insists that "such dystopian scenarios are speculations," and argues

315 Patrick D. Hopkins, "Is Enhancement Worthy of Being a Right?," in *The Transhumanist Reader: Classical and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future*, ed. Max More and Natasha Vita-More (Wiley-Blackwell, 2013), 347–48.

316 Hopkins, 351–53.

317 Claims that enhancement should be a right based on a common humanity would seem inconsistent with the notion that someone could become a being more than human i.e., posthuman. Bostrom, however, maintains that a posthuman would still be human in some way; see Nick Bostrom, "Why I Want to Be a Posthuman When I Grow Up," in *The Transhumanist Reader: Classical and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future*, 49–50.

318 James Hughes, "Transhumanism and Personal Identity" in *The Transhumanist Reader: Classical and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future*, 229.

319 Hughes, 231.

320 Hughes, 231.

that it is "self-made" human beings that are more worthy of dignity.[321] Savulescu would similarly justify enhancement on the basis of his concept of "personism," in which the dignity of the person is not inherent and unique to humans, but, rather, is based on the qualities of rationality and self-consciousness (qualities not necessarily unique to humans in his view), and on that basis he argues for the enhancement of those very same qualities.[322]

However, the threat of losing sight of the other as another "I" is not unrealistic in such models of the human person, because they presuppose an existentialist notion of freedom that reduces the will to mere autonomy, and they risk turning a person's focus inwards on themselves. Michael Sandel, a political philosopher, observes that "paradoxically, the explosion of responsibility for our own fate, and that of our children, may diminish our sense of solidarity with those less fortunate than ourselves."[323] Francis Fukuyama, a political scientist who opposes transhumanism, agrees with such potential utilitarian concerns associated with a desire for enhancement, but goes further arguing that what is at risk is the loss of something much more profound—our very humanity.[324] He argues that, because of the intimate connection between morals and human nature, what is at stake with the advancement of biotechnologies is that which makes us social creatures, conscious of notions of justice and authentic natural human rights.

Enhancement also offers ends without actually having to invest any significant self-motivated effort or to overcome obstacles through hard work, all of which are related to the finitude of life. For example, Leon Kass, a secular humanist, argues that a mortal life is a blessing because it is precisely life's limited span that makes it desirable. Using beauty as an example, he says beautiful objects are thus perceived only because we are aware of the "ugliness of decay." He suggests that transhumanist claims are ultimately an apprehension of our own mortality, which he says is a consequence of "the derivative manifestation of the conflict between the transcendent longings of the soul and the all-too-finite powers and fleshly concerns of the body."[325] From this perspective, human flourishing is ultimately a derivative of our natural predisposition for fulfilment in experiences and relationships, or the lack thereof. It is only possible to experience joy when one has experienced its lack, and this distinction between

“Enhancement also offers ends without actually having to invest any significant self-motivated effort or to overcome obstacles through hard work, all of which are related to the finitude of life.”

321 Nick Bostrom, "The Transhumanist FAQ—An Introduction (Version 2.1)," World Transhumanist Association, 2003, 7–8, https://nickbostrom.com.

322 Paschal Corby, *The Hope and Despair of Human Bioenhancement: A Virtual Dialogue Between the Oxford Transhumanists and Joseph Ratzinger* (Pickwick Publications, 2019), 78. Corby explains that, for Savulescu, humans are not more worthy of dignity than any other creature, and any attempt to claim so is merely a form of "speciesism" (77).

323 Michael J. Sandel, *The Case Against Perfection: Ethics in the Age of Genetic Engineering* (Harvard University Press, 2007), 89.

324 Francis Fukuyama, *Our Posthuman Future: Consequences of the Biotechnology Revolution* (Picador, 2002), 100–102.

325 Leon R. Kass, "L'Chaim and its Limits: Why not Immortality?," *First Things*, May 2001, https://www.firstthings.com/article/2001/05/lchaim-and-its-limits-why-not-immortality.

fullness and lack is particularly evident when it comes to love. On this basis, Kass wonders whether love would even be possible between humans possessing a significantly increased lifespan; he speculates that even a "moderate prolongation" of life might lead to a corresponding prolongation of immaturity and delay of the typical character formation that naturally occurs through the common experiences of a normal life.[326] More important than a longer life is a normal life lived well because it implies a standard against which the quality of one's life can be measured.

8.3 A Philosophical Analysis of the Metaphysics, Epistemology, and Anthropology of Secular Transhumanism

As explained in Chapter 2, although most transhumanists do not have a well-defined metaphysics underlying their desire for enhancement, most would describe themselves as *materialists*. However, it would be more accurate to describe transhumanism as presupposing a dualistic view of the human person that is most consistent with *Gnosticism,* in which the true immaterial self is merely instantiated within a physical, mechanised body, and thoughts and feelings are only physiological processes. On this basis, the physical "container" of the true self does not necessarily have to be biological. However, the denial of a distinction between humans and technology in the morphological freedom of transhumanist thought risks negating the person altogether: what C. S. Lewis refers to as "the abolition of man."[327] The human body itself is no longer a given, but rather is separated from the true self, a position that gives rise to the notion of a "ghost within a machine" in which human dignity is reduced to merely rational action.[328] From this perspective, the concept of personhood in secular-materialistic transhumanism would seem more akin to the atheistic existentialism of Sartre who maintained that each person is obliged to make themselves via their autonomous will, and is ultimately responsible for determining the moral outcomes of their actions.[329]

Most transhumanists are also strong rationalists, committed to the scientific method assisted by critical thinking. Transhumanism's understanding of objective truth is only that which is empirically derived from knowledge of the laws of physics applied to matter, a position that can be linked with the subjective turn that arose from

326 Leon R. Kass, "Ageless Bodies, Happy Souls: Biotechnology and the Pursuit of Perfection," *The New Atlantis* 1 (Spring 2003): 25–27, https://www.thenewatlantis.com/publications/ageless-bodies-happy-souls.

327 C. S. Lewis, *The Abolition of Man or, Reflections on Education with Special Reference to the Teaching of English in the Upper Forms of Schools* (Harper, 1946).

328 Corby, *Hope and Despair*, 73–74. In such a mechanistic worldview, "materialism attempts to explain complex human faculties such as reason, thought and emotion in terms of chemical processes, which, when adopted by the transhumanist agenda, can be manipulated or augmented so as to enhance the human organism" (75). In reducing the body to constituent parts, it becomes "dead matter" (75), and nature is reduced to function (76).

329 Jean-Paul Sartre, "Existentialism is a Humanism," trans. P. Mairet. In W. Kaufman (ed.), *Existentialism from Dostoevsky to Sartre* (Meridian Books, 1957).

Cartesian philosophy. It was the Cartesian revolution of Descartes that relegated the soul to the function of introspective thoughts and reduced the body to nothing more than a material machine and object of manipulation.[330] Thus, secular transhumanism treats God as irrelevant, and instead seeks to ensure the future of humanity by human action in the form of technological, scientific progress, guided by reason. When combined with the contemporary concept of "progress" that also underpins transhumanist epistemology, or what C. S. Lewis called "popular Evolutionism,"[331] these seemingly immutable laws of science become somehow bounded by the contradictory notion that the universe, including humans, is evolving spontaneously from nothing, extending onwards, perhaps infinitely, without cause or any kind of purpose. The result is a positivist concept of the world in which unending technological progress is the only worthy pursuit. Eric Voegelin, a political philosopher, suggests that such a position is ultimately a form of Gnosticism akin to other modern views such as progressivism, scientism, and Marxism,[332] all of which are consistent with modernity's goal to obscure the immaterial and to reduce transcendence to the intellectual, the emotional, and the volitional.

> **Secular transhumanism treats God as irrelevant, and instead seeks to ensure the future of humanity by human action in the form of technological, scientific progress, guided by reason.**

Within this positivistic worldview, most secular transhumanists also consider technological enhancement to be consistent with evolutionary theory. This position, however, would seem to be inconsistent with the theory's underlying fundamental driver, the concept of random natural selection. Secular transhumanism essentially replaces random natural selection with the will to enhance, and survival of the fittest is replaced by the aim to remove all pain and maximise happiness. Unlike Huxley, whose original transhumanist vision sought to realise new possibilities for an absolute human nature, contemporary transhumanists like Bostrom and Savulescu are intent on permanently altering human nature by utilising technological transformation to bring about a posthuman condition that constitutes radical changes to human nature. Bostrom justifies this position by noting that it was Giovanni Pico who argued that human nature is not an absolute given, but rather is determined by the person,[333] and Francis Bacon who argued for human mastery over the material world using the scientific empirical method. It is not hard to see how these developments in thought can be linked to a rationalism that elevated empirical science, subject to critical reason, as the only source of knowledge about the world, and opened scientific development to seemingly endless possibilities, subject to an evolved understanding of human freedom as a right to enhance.

330 Antoine Vergote, "The Body in Contemporary Thought and Biblical Categories," in *In Search of a Philosophical Anthropology*, trans. M. S. Muldoon (Leuven University Press, 1996), 76–78.

331 C. S. Lewis, "The Funeral of a Great Myth," in *The Seeing Eye and Other Essays from Christian Reflections* (Ballantine, 1967), 115.

332 Eric Voegelin, *The New Science of Politics: An Introduction* (University of Chicago Press, 1952), 164.

333 Nick Bostrom, "A History of Transhumanist Thought," *Journal of Evolution and Technology* 14, no. 1 (2005): 2, cited in Corby, *Hope and Despair*, 89.

However, Sandel suggests that such a desire to enhance the human person lacks humility regarding what he says is "a fundamental attitude toward the goodness of being,"[334] and Kass similarly describes human life as a "bestowed gift."[335] Bostrom rejects this notion of gift (citing disease, ageing, hunger, and other "unnecessary suffering" as evidence),[336] and he asserts that since we exist within an ongoing process of evolution as material beings subject to the physical laws of nature, there is no ethical reason not to technologically manipulate ourselves.[337] Schumacher recognises an irony in this position, however, noting that although the transhumanist worldview implies a universe that is ultimately meaningless, it is nevertheless a notion of "self-awareness" that necessarily drives "the possibility, even the need, to become superhuman."[338]

The utilisation of technology to enhance the natural order warrants caution since the manipulation of nature opens the door to the objectification of human life and facilitates the exertion of power over other people.[339] In weighing up the pros and cons of technologically enhancing the human person then, it is important to consider the motivations on either side of the debate. Should we be so trusting of those transhumanists like Bostrom and Savulescu who think so little of human nature? Hans Jonas, a Jewish theologian and philosopher, in exploring an appropriate ethics for a technologically-driven society, considered such a question, and argued that

> when it comes to this core phenomenon of our humanity, which is to be preserved in its integrity at all costs … the greater pessimism is on the side of those who consider the given to be so bad or worthless that every gamble for its possible improvement is defensible.[340]

Jonas is suggesting that the more pessimistic view of human nature is clearly on the transhumanist side of the debate and that we should be cautious in trusting those who would seemingly "gamble" with our humanity. The secular transhumanist perspective of human nature, which acknowledges only raw material open to manipulation oriented towards an end that is unclear, stands in stark contrast to the Christian view of the human person as a created gift, in possession of inherent dignity, open to moral transcendence, and ultimately destined for union with God.

"The utilisation of technology to enhance the natural order warrants caution since the manipulation of nature opens the door to the objectification of human life and facilitates the exertion of power over other people."

334 Sandel, *Case Against Perfection*, 80, cited in Corby, 25.

335 Kass, "Ageless Bodies, Happy Souls," 19–20, cited in Corby, 26.

336 Nick Bostrom, "In Defense of Posthuman Dignity," *Bioethics* 19, no. 3 (2005): 205.

337 Bostrom, "History of Transhumanist Thought," 3–4.

338 E. F. Schumacher, *A Guide for the Perplexed* (Harper & Row, 1977), 48–49.

339 Eric Perl, "'Every Life is a Thought': The Analogy of Personhood in Neoplatonism," *Philosophy & Theology* 18, no. 1 (2006): 144–46.

340 Hans Jonas, *The Imperative of Responsibility: In Search of an Ethics for the Technological Age* (The University of Chicago Press, 1984), 34.

8.4 An Analysis of Secular Transhumanism from a Christian Theological Perspective

From a Christian theological perspective, the secular transhumanist philosophy is corrupted because of the denial of a universe created by God. For example, philosopher Kenneth Schmitz argues that viewing the universe as merely a system of physical particles and processes (as transhumanism does) is a rejection of life as a created gift by a loving God.[341] The nature of this gift is common to all creaturely beings in the Christian tradition. It manifests in their very existence, in their relation to each other, and through their potential for fruitfulness, participation and community,[342] and has its highest expression in the human person, created in the image and likeness of God (Gen 1:26). In this doctrine of the *imago Dei* the human person possesses an inherent dignity, self-awareness, and a capacity for the divine. Thus, persons are a created gift of God, made in his image as a psychosomatic unity of body and soul, called to a moral transcendence through relationship and participation with others, and through the grace of God.

On this basis theologian Nonna Verna Harrison explains that humans image God through our specific qualities of rationality and freedom to choose between good and evil, particularly in our relationships with each other.[343] Similarly, Karol Wojtyła, a former Pope, describes the transcendence proper to authentic personhood as the giving of oneself freely as a gift to others through consciously willed moral acts of self-determination.[344] Thus the body in the Christian sense provides the necessary sensory functionality by which the infused soul can carry out its proper activities of intellectualisation, freedom, and love.[345] For this reason, the theologian and philosopher Antoine Vergote argues that since the human person is a composite of an organic body, a psychic body, and a mind, "one cannot produce a machine animated by a human affectivity."[346] This argument is consistent with Thomistic hylomorphism, Aquinas' understanding

341 Kenneth Schmitz, *The Recovery of Wonder: The New Freedom and the Asceticism of Power* (McGill-Queen's University Press, 2005), 30–31.

342 David Schindler, "Which Ontology Is Necessary for an Adequate Anthropology?" *Anthropotes* 15, no. 2 (1999): 423–24.

343 Nonna Verna Harrison, "The Human Person as Image and Likeness of God," in *The Cambridge Companion to Orthodox Christian Theology*, ed. Mary B. Cunningham and Elizabeth Theokritoff (Cambridge University Press, 2008), 78–82.

344 Karol Wojtyła, *The Acting Person,* trans. Anna Teresa Tymieniecka (D. Reidel Publishing Company, 1979), https://archive.org/details/actingperson0000john/page/n7/mode/2up. It is through the uniquely human capacity of self-awareness that the person can experience both themselves and the other, and the moral content of their actions. In such a way, the person forms a sense of responsibility that can guide them towards authentic fulfillment, which for Wojtyła is essentially communal participation in accordance with the biblical commandment to love.

345 Gilles Emery, "The Unity of Man, Body and Soul in St Thomas Aquinas," in *Trinity, Church, and the Human Person: Thomistic Essays* (Sapientia Press, 2007), 219.

346 Vergote, "The Body in Contemporary Thought and Biblical Categories," 86.

of Aristotle's body and soul unity, but inconsistent with the Gnostic dualistic view of the human person in transhumanism.

Paschal Corby, a theologian and bioethicist, argues that what primarily prevents secular transhumanists from accepting the fundamental giftedness in the Christian view of human nature, is not only their denial of a Giver, but also a rejection of absolute human nature.[347] Corby argues that "while transhumanism finds its rationale in evolution, its concept of the human person is somewhat removed from the humanist anthropology which underpins evolutionary theory … transhumanists have purged evolution of its anthropocentrism and has robbed humanity of any special significance."[348] When the concept of an absolute human nature is abandoned, then it is not really possible to speak of a universal, intrinsic, and inherent human dignity. While transhumanists like Savulescu emphasise a dignity that is not inherent, but rather dependent on properties such as rationality and self-consciousness, Corby argues that this model of the human person, extended to its logical conclusion, "signifies … abandonment of the more vulnerable members of the human family."[349]

In rejecting the notion of human nature as a created gift of a loving God, and replacing it with a concept of the person as raw material open to technological manipulation via the will alone, Corby concludes,

> transhumanism adopts the fluidity of postmodernist anthropology, emptied of any meaningful content … what is specifically human becomes blurred … human beings are defined by what they *choose* … human significance quickly degenerates into relativism and indifference … what is human is given no normative value … with the consequence that humanity is vulnerable to the whims of science and technology … this is precisely where the transhumanist project fits, … in dissolving the human specificity, deconstructing human beings and attempting to create them anew.[350]

A further ironic consequence of this secular transhumanist anthropology is that the significance and motivation to enhance is eroded, since as Corby explains, "enhancements require a given structure in which to adhere, in the absence of which we can only speak of change … in the end, such reconfiguration of nature is not only without limit, but essentially without meaning as well."[351] Thus in rejecting the notion of God, secular transhumanism seeks meaning elsewhere, which can only be in the material world. The consequences of this

347 Corby, *Hope and Despair*, 27.

348 Corby, 71. When he says this, he is referring to Maurizio Faggioni, "La natura fluida: Le sfide dell'ibridazione, della transgenesi, del transumanesimo," *Studia Moralia* 47, no. 2 (2009): 406–7.

349 Corby, 81.

350 Corby, 91.

351 Corby, 87.

position, however, have implications for genuine human experiences of joy and hope.

8.5 Human Flourishing: A Choice Between Hope and Despair

As discussed in Chapter 7, and noted above, the Christian anthropological philosophy is founded on the notion of the givenness of human nature, which is fundamentally good and created with purpose and meaning. Although Boethius and Thomas Aquinas, both philosophers and theologians of Christianity, believed our desire for happiness as the ultimate aim for humans, they recognised that this desire cannot be ultimately fulfilled by the physical material world.[352] This fact is recognised by Victoria Lorrimar, a theologian well-versed in transhumanism, who argues that while "transhumanists would engineer joy" their attempt is ultimately incomplete since genuine joy comes from aligning one's life with an external objective good, which can only be God in the Christian worldview.[353] She explains,

> Contra the transhumanist, a Christian perspective asserts that true joy can be experienced in the here and now—and need not wait upon future transformation. It offers not only the consolatory joy of secular humanism that is always constrained by finitude but hopes in a future where joy is no longer incompatible with immortality and perfection.[354]

Joy in the Christian sense has both present and eschatological dimensions;[355] it "bridges the gap between 'mundane' flourishing and 'transcendence',"[356] and is experienced as an "abiding state."[357] Whereas transhumanists see human nature as "a disease" requiring self-motivated technological enhancement, Christians simply recognise that their salvation is ultimately not able to be achieved by their own means alone.[358] This understanding of human nature implies a relationship with God that allows Christians to experience an authentic hope for their future, both in the present and eschatological sense. Thus, while hope in the transhumanist worldview depends on a concept of human flourishing characterised by both

"The Christian anthropological philosophy is founded on the notion of the givenness of human nature, which is fundamentally good and created with purpose and meaning."

352 Patrick D. Hopkins, "Is Enhancement Worthy of Being a Right?," in *The Transhumanist Reader: Classical and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future*, 351.

353 Victoria Lorrimar, "Human Flourishing, Joy, and the Prospect of Radical Life Extension," *The Expository Times* 129, no. 12 (2018): 559. See also Miroslav Volf, *Flourishing: Why We Need Religion in a Globalized World* (Yale University Press, 2015), 9.

354 Lorrimar, 559.

355 Here Lorrimar draws on Jurgen Moltmann's distinction between *futurum* as "the future is a continuation of the present", and *adventus* as "the future arises from outside of time and space as a fulfilment of divine promise" (560).

356 Lorrimar, 559.

357 Lorrimar, 561.

358 Lorrimar, 560.

the absence of suffering and "an abundance of 'good' feelings,"[359] authentic joy in the Christian sense is only possible within a framework of moral formation, and where experience is an indicator of a proper relation with the world. Lorrimar therefore proposes this concept of joy as an appropriate mechanism for responding to the type of technologies that transhumanism promotes. She says,

> Within this perspective, enhancement technologies do not bear the burden of bringing into effect the good life for us; neither should they be prohibited from the outset as antithetical to human flourishing. Like all human activity, governed by careful ethical reflection, they may take their place among the various ways in which we seek to improve both ourselves and the entirely of the created world, bounded by the recognition of God as the agent of ultimate redemption.[360]

Another possible anthropology that might accommodate or provide appropriate limits to technological enhancement is that of Philip Hefner's "created co-creators,"[361]

> Human beings are God's created co-creators whose purpose is to be the agency, acting in freedom, to birth the future that is most wholesome for the nature that has birthed us—the nature is not only our own genetic heritage, but also the entire human community and the evolutionary and ecological reality in which and to which we belong. Exercising this agency is said to be God's will for humans.[362]

In this anthropology Hefner describes humans as co-creators of a creation that has purpose, for which they are "crucial for the emergence of a free creation," via a freedom that permits participation in the "intentional fulfillment of God's purposes."[363] Hefner suggests that in this context "human intentionality" is an "expression of and for the sake of the larger intentionality of God's creation."[364] Hefner nevertheless suggests that although technology is an inevitable development of contemporary life, its implementation is restricted by the freedom and responsibility that we are given as "created co-creators" to ensure the unfolding of God's purpose for his creation. Regarding this point, Siaw Kwakye similarly concludes that a consequence of Hefner's theory is that technologies should be guided

359 Lorrimar, 556.

360 Lorrimar, 561.

361 The earliest use of the term "co-creators" for the human person can be attributed to Fritz Blanke in 1959. See Blanke, "Unsere Verantwortlichkeit gegenüber der Schöpfung," in *Der Auftrag der Kirche in der modernen Welt. Festgabe zum siebzigsten Geburtstag von Emil Brunner* (Zwingli Verlag, 1959): 193–98.

362 Philip Hefner, *The Human Factor. Evolution, Culture and Religion* (Fortress Press, 1993), 27.

363 Hefner, 32.

364 Philip Hefner, "Biocultural Evolution of the Created Co-Creator," *Dialog* 36, no. 3 (Summer 1997): 203.

towards human flourishing and "for the fulfilment of God's eschatological purpose."[365]

Corby would agree that technology should be appreciated for all its potential benefits, but argues that an overemphasis on science and technology within the drive for unlimited progress characteristic of a positivist worldview offers only a false optimism. He suggests that the enthusiasm that is characteristic of the transhumanist desire to enhance is made possible not only by the advent of technology but more importantly by "the triumph of the technological mindset,"[366] which effectively secularises hope to what is practically achievable by human endeavour; it focuses on worldly objects and is characterised by a Marxist-style utopia in which "pessimism becomes the new despair in its 'sin' against the dynamic spirit of progress."[367] In contrast, the "fundamental hope" of Christianity assumes the characteristic of humility through which we recognise and acknowledge our limitations and dependence on our Creator, and is connected with patience, which resolves the tension between our current and future selves.[368] Without recognition of our dependence on God, Corby says there is a restlessness that propels an urgency for activity, and "at the root of this self-possession is a profound emptiness: the rejection of one's status as creature, and the subsequent desire to recreate oneself," which becomes "a form of self-negation and self-destruction."[369]

Although within the transhumanist desire to be "posthuman" can be heard the distinct echoes of an inherent human desire for transcendence, the moral enhancement that is promoted by transhumanists like Bostrom and Savulescu seems to be characterised by fear and a desperate need for control of reality.[370] Corby argues that what is ultimately lacking in this transhumanist desire to enhance is "an acknowledgement of the human capacity to love that stands at the heart of morality," and which "cannot be manipulated or engineered through technology and science."[371] From the Christian perspective, by attempting a rational and materialistic reduction of morality (which lies entirely within the domain of the spiritual), the transhumanist case for moral enhancement ultimately fails to understand

365 Ahenkora Siaw Kwakye, "Created Co-creator, a Theory of Human Becoming in an Era of Science and Technology," *Scientia et Fides* 8, no. 2 (2020): 295.

366 Corby, *Hope and Despair*, 145.

367 Corby, 165. This form of secular hope is "directed toward the attainment of the classless society for which one has lived, worked, and died" (168).

368 Corby, 166–67. In genuine hope the communion between person and God is expressed as an assurance of love that unites small and great hopes; as Corby explains "the particular is not swallowed up by the universal, nor the everyday by the eternal" (170).

369 Corby, 176.

370 Corby, 219. Bostrom and Savulescu make the claim for moral enhancement on the basis that significant changes to contemporary society and rapid technological development have not been accompanied by an equivalent moral development. However, Corby claims that even Savulescu recognises that transhumanist moral enhancement is potentially perilous when the fundamental goodness of human nature itself is questioned (256).

371 Corby, 241.

fundamental human morality. Corby says this approach to morality will ultimately "dehumanize us by rejecting that which is most personal to our nature … substituting impersonal technology in the place of individual conscience, personal authenticity, and the realization of the vocation to love."[372]

In considering the claims of transhumanism as Christians, we must keep in mind that Christ through his incarnation has given us an example of what is absolute perfect human nature. Joseph Ratzinger, in considering the thought of the German priest, philosopher, and theologian Romano Guardini, observes that "the essence of Christianity is not an idea, not a system of thought, not a plan of action. The essence of Christianity is a person: Jesus Christ himself."[373] From this perspective we should be reassured that technology can never be a source of salvation in and of itself. Our human nature, which is inherently good, has the capacity for transcendence through Christ's redemptive act. However, this transcendence cannot be entirely of our own making, nor is it technologically driven, rather it is moral development that comes from the imitation of Christ, and aided by God's grace. It sustains in us an authentic hope that technological enhancement can never fulfil.

"Our human nature, which is inherently good, has the capacity for transcendence through Christ's redemptive act. However, this transcendence cannot be entirely of our own making, nor is it technologically driven, rather it is moral development that comes from the imitation of Christ, and aided by God's grace."

8.6 Summary

From the perspective of the Christian tradition, the transhumanist desire to transcend existing biological limitations using technology is a rejection of the giftedness inherent in both the world and human nature. On this basis secular transhumanism would seem to be essentially consistent with an atheistic, existentialist mindset and a secular humanist and materialist philosophy that has its origins in the Enlightenment understanding of nature and the human person as nothing more than raw material open to manipulation. Consequently, this has led to a desire to technologically manipulate the natural world and to enhance ourselves regarding lifespan, cognition, and emotion. Transhumanist claims are also founded in a dualistic concept of personhood, or Gnostic separation of body and soul, in which the true self is merely instantiated within a physical body. From-this perspective secular transhumanism would seem to assume a world in which we exist as the master of all of nature, including that of our own, and where we are ultimately responsible for our own destiny. This worldview potentially poses a radical danger because it could lead to fundamental changes to human nature, and the levelling of experiences of morality and emotion. In contrast, the Christian tradition maintains that we are created in the image and likeness of God, a body and soul union with inherent dignity and self-awareness, destined for the divine. Our mortal biological limitations are only transcended through genuine moral progress and virtuous growth

372 Corby, 257.

373 Joseph Ratzinger, "Guardini on Christ in our Century," in *The Essential Pope Benedict XVI: His Central Writings and Speeches*, trans. John M. Haas, ed. John F. Thornton and Susan B. Varenne (Harper Collins, 2007), 55.

in a fundamental hope that recognises our limits and dependence on God. Without such an acknowledgement, the secular transhumanist philosophy can potentially secularise authentic Christian hope, reducing it to worldly ends achievable by human action alone. It also alters our understanding of morality by reorienting it away from the fundamental human capacity for love towards a technologically fuelled utilitarian morality that is ultimately self-centred.

Chapter 9

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